University of Cape Town

Faculty of Health Sciences

Optimizing Learning & Teaching on Paediatric Ward Rounds

A dissertation submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy in Health Professions Education

Department of Health Sciences Education, Faculty of Health Sciences

University of Cape Town

March 2023

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DECLARATION

I, Savarra Mantzor, hereby declare that the work on which this thesis is based is my original work and that neither the whole work, nor any part of it, has been, is being, or is to be submitted for another degree in this or any other university. Sources that I have quoted have been acknowledged by means of references.

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March 2023

TABLE OF CONTENTS

Declaration ***5***

Acknowledgements ***19***

Abstract ***20***

List of Figures ***23***

List of Tables ***25***

List of Boxes ***26***

Abbreviations ***27***

Definition of Terms ***30***

Chapter 1 – Introduction ***31***

1.1 CHAPTER INTRODUCTION **31**

1.2 THE RESEARCHER, THE PROBLEM & THE STATUS QUO **31**

1.2.1 My entry point 31

1.2.2 Defining the 'problem' 34

1.2.3 Understanding the status quo 36

1.3 BACKGROUND **37**

1.3.1 Bedside teaching 37

1.3.2 Bedside teaching models 38

1.3.3 Clinical learning environment 38

1.3.4 Communities of practice 38

1.3.5 Perceived self-efficacy 39

1.4 CONCEPTUAL FRAMEWORK **39**

1.4.1 Bedside teaching's influence on perceived self-efficacy 40

1.4.2 Clinical learning environment's influence on perceived self-efficacy 41

1.4.3 Communities of practice's influence on perceived self-efficacy 42

1.4.4 Social research 42

1.5 RATIONALE FOR THE STUDY **43**

1.6 CONTEXT OF THE STUDY **43**

1.7 PURPOSE **44**

1.8 AIM **45**

1.9 RESEARCH QUESTIONS **45**

1.10 OBJECTIVES **46**

1.11 SCOPE & DELIMITATIONS **46**

1.12 TIMELINE & OVERALL RESEARCH DESIGN **47**

1.13 CHAPTER SUMMARY **49**

Chapter 2 – Literature Review ***50***

2.1 CHAPTER INTRODUCTION **50**

2.2 SEARCH STRATEGY **50**

2.3 BEDSIDE TEACHING **51**

2.4 BEDSIDE TEACHING MODELS **52**

2.4.1 SNAPPS 52

2.4.2 One-Minute Preceptor 57

2.4.3 SNAPPS vs OMP 61

2.4.4 SOAP 61

2.5 CLINICAL LEARNING ENVIRONMENT **62**

2.5.1 Defining the CLE 63

2.5.2 The unfavourable CLE 64

2.5.3 The favourable CLE 64

2.5.4 Learning- versus Performance-oriented climates 64

2.5.5 Modifying the CLE 65

2.6 SITUATED LEARNING & LEGITIMATE PARTICIPATION **70**

2.7 COMMUNITIES OF PRACTICE **71**

2.7.1 Workplace Learning 73

2.7.2 COP in the context of the CLE 74

2.8 PERCEIVED SELF-EFFICACY **75**

2.8.1 Factors that influence perceptions of self-efficacy 76

2.8.2 Effects of self-efficacy on cognitive processes 77

2.8.3 Effects of self-efficacy on motivational and selection processes 81

2.8.4 Effects of self-efficacy on affective processes 81

2.9 EVALUATING THE CLE, COP, AND PSE **82**

2.9.1 Evaluating the clinical learning environment 83
2.9.2 Evaluating communities of practice 84
2.9.3 Evaluating trainee perceived self-efficacy 85

2.10 CHAPTER SUMMARY 87

Chapter 3 – Methods 88

3.1 CHAPTER INTRODUCTION 88

3.2 ACTION RESEARCH & CHOICE OF METHODOLOGY 88

3.2.1 Definition of action research 88
3.2.2 Traditions of action research 88
3.2.3 Action research vs Traditional research 89
3.2.4 Why AR for my HPE project? 90
3.2.5 How AR influenced the *structure* of my dissertation 91
3.2.6 How AR influenced the *data collection* of my dissertation 92
3.2.7 How AR influenced the *data analysis* of my dissertation 94

3.3 MIXED METHODS DESIGN 95

3.3.1 Justification for use of mixed methods 95
3.3.2 Intent and type of mixed methods 96

3.4 QUALITY IMPROVEMENT METHODS 97

3.5 MY RESEARCHER POSITIONALITY 98

3.5.1 Phase 1 100
3.5.2 Phase 2 101
3.5.3 Phase 3 101

3.6 PARTICIPATORY POPULATION 102

3.6.1 Creating a project team 102
3.6.2 Additional partnerships 106

3.7 OVERALL RESEARCH DESIGN 107

3.8 POPULATION & CONTEXT 108

3.8.1 Study timeline 108
3.8.2 Study setting 108
3.8.3 Study population 112
3.8.4 Study sampling 114
3.8.5 Sample size 116

3.9 RECRUITMENT 116

3.9.1 Medical students and junior residents 116
3.9.2 Senior residents and paediatricians 117
3.10 STUDY INSTRUMENTS 118
3.10.1 Types of study instruments 120
3.11 DATA COLLECTION 124
3.11.1 Study procedure and data collection 124
3.11.2 Data types and sources 125
3.11.3 Qualitative data quality 125
3.11.4 Qualitative data handling 126
3.11.5 Surveys 126
3.12 DATA ANALYSIS 127
3.12.1 Qualitative data analysis 128
3.12.2 Quantitative data analysis 131
3.12.3 Mixed methods data analysis 131
3.12.4 Quality improvement data analysis 134
3.12.5 Critical reflection data analysis 136
3.12.6 Critical reflection through a CFIR lens 137
3.13 VALIDITY & TRUSTWORTHINESS 137
3.13.1 Validity 137
3.13.2 Trustworthiness 138
3.14 ASSUMPTIONS & LIMITATIONS 138
3.14.1 Assumptions 138
3.14.2 Limitations 139
3.15 ETHICS 140
3.16 CHAPTER SUMMARY 140
Chapter 4: Phase 1 - Examining the Problem 141
4.1 CHAPTER INTRODUCTION 141
4.2 Phase 1 - Researcher positionality 141
4.3 Phase 1 - Participatory population 142
4.4 PLAN: Phase 1 143
4.4.1 Methods 143
4.4.2 Phase 1 - Study population 145
4.4.3 Phase 1 - Study instruments 145

4.5 ACT: Phase 1 149
4.5.1 Phase 1 - Data collection 149
4.6 OBSERVE: Phase 1 151
4.6.1 Phase 1 - Results 151
4.7 CHAPTER SUMMARY 204
Chapter 5: Phase 2 – Generating a Solution 205
5.1 CHAPTER INTRODUCTION 205
5.2 Phase 2 - Researcher positionality 206
5.3 Phase 2 - Participatory population 208
5.4 Active Reflections on Phase 1 210
5.5 PLAN: Phase 2 210
5.5.1 Research design 210
5.5.2 Quality improvement science 211
5.5.3 Data sources and analysis 212
5.5.4 Phase 2 Timeline 212
5.6 ACT: Phase 2 213
5.6.1 Development of Phase 2 key activities 213
5.6.2 Key-activities 216
5.7 OBSERVE – Phase 2 232
5.7.1 Results 232
5.8 REFLECT - Phase 2 238
5.9 CHAPTER SUMMARY 238
Phase 3 – Assessing the Efficacy of our Potential Solution 239
Chapter 6: PHASE 3 – Cycle 1 239
6.1 CHAPTER INTRODUCTION 239
6.2 Phase 3 - Researcher positionality 240
6.3 Phase 3 - Participatory population 241
6.4 Phase 3 - Research design 242
6.5 Phase 3 - Timeline 243

6.6 PLAN: Phase 3 – Cycle 1 244
6.6.1 Methods 244
6.6.2 Cycle 1 - Timeline 244
6.6.3 Cycle 1 - Research design 245
6.6.4 Cycle 1 - Study population 246
6.6.5 Cycle 1 - Study instruments 246
6.7 ACT: Phase 3 – Cycle 1 247
6.7.1 Educational Series 247
6.7.2 Testing the feasibility of SNAPPS 248
6.7.3 Cycle 1 - Data collection 249
6.7.4 Cycle 1 - Data analysis 250
6.8 OBSERVE: Phase 3 – Cycle 1 252
6.8.1 Attendance of educational series results 252
6.8.2 Cycle 1 - Qualitative results 256
6.8.3 Cycle 1 – Quantitative (SNAPPS testing surveys) results 269
6.8.4 Cycle 1 – Quantitative (survey) results 272
6.8.5 Cycle 1 – Mixed methods results 276
6.9 REFLECT: Phase 3 – Cycle 1 279
6.9.1 Phase 3 - Cycle 1 divergences from planned Phase 2 activities 279
6.10 CHAPTER SUMMARY 291
Chapter 7: PHASE 3 – Cycle 2 292
7.1 CHAPTER INTRODUCTION 292
7.2 Phase 3 – Cycle 2: Researcher positionality and participatory population 292
7.3 PLAN: Phase 3 – Cycle 2 292
7.3.1 Influences from Cycle 1 292
7.3.2 Methods 296
7.4 ACT: Phase 3 – Cycle 2 302
7.4.1 Continued educational series 302
7.4.2 Monitoring the usage of SNAPPS 302
7.4.3 Cycle 2 - Data collection 302
7.4.4 Cycle 2 - Data analysis 304
7.5 OBSERVE: Phase 3 - Cycle 2 307
7.5.1 Cycle 2 – Qualitative results 307

7.5.2 Cycle 2 – Quantitative results 334
7.5.3 Cycle 2 – Mixed methods results 348
7.6 REFLECT: Phase 3 – Cycle 2 351
7.7 CHAPTER SUMMARY 352
Chapter 8: PHASE 3 - Reflective Pause 353
8.1 CHAPTER INTRODUCTION 353
8.2 SNAPPS, an easy uptake? 353
8.3 Why SNAPPS? 355
8.4 The Consolidated Framework for Implementation Research 357
8.4.1 (i) Intervention characteristics 357
8.4.2 (ii) Outer setting 359
8.4.3 (iii) Inner setting 361
8.4.4 (iv) Characteristics of individuals 369
8.4.5 (v) Process 371
8.5 CHAPTER SUMMARY 372
Chapter 9: PHASE 3 – Cycle 3 373
9.1 CHAPTER INTRODUCTION 373
9.2 Phase 3 – Cycle 3: Researcher positionality 373
9.2.1 A growing "fixed mindset" versus a fixed "growth mindset" 374
9.3 Phase 3 - Cycle 3: Participatory population 376
9.4 PLAN: Phase 3 – Cycle 3 376
9.4.1 Influences from Cycle 2 376
9.4.2 Methods 378
9.5 ACT: Phase 3 – Cycle 3 384
9.5.1 Continued educational series – Cycle 3 384
9.5.2 Cycle 3 - Data collection 384
9.5.3 Cycle 3 - Data analysis 386
9.6 OBSERVE: Phase 3 – Cycle 3 387
9.6.1 Cycle 3 – Qualitative results 387
9.6.2 Cycle 3 – Quantitative results 409
9.7 REFLECT: Phase 3 – Cycle 3 409

9.8 CHAPTER SUMMARY 409

Chapter 10: Discussion..... 410

10.1 CHAPTER INTRODUCTION 410

10.2 THE INFLUENCES OF SNAPPS ON CLE, COP & PSE 411

10.2.1 A conceptual shift in foci 411

10.2.2 Re-visiting SNAPPS 413

10.3 SNAPPS INFLUENCES ON THE CLE 413

10.3.1 Defining the learning climate 413

10.3.2 Reviewing the SNAPPS literature through the lens of CLE 414

10.3.3 Beyond the conceptual argument – our CLE findings 415

10.3.4 A true change in climate 417

10.3.5 CLE shift, not just for trainees, but faculty, too! 419

10.3.6 More than just asking questions: a shift in the 'medical' paradigm 420

10.3.7 Was this all just SNAPPS? 420

10.3.8 CLE Conclusion 421

10.4 SNAPPS INFLUENCES ON COP 421

10.4.1 The community of practice of medicine 421

10.4.2 Content is key 422

10.4.3 Environment is key 423

10.4.4 SNAPPS vs SOAP 423

10.4.5 Reviewing the SNAPPS literature through the lens of COP 424

10.4.6 Beyond the conceptual argument – our COP findings 427

10.4.7 COP Conclusion 432

10.5 SNAPPS INFLUENCES ON PSE 433

10.5.1 Reviewing the SNAPPS literature through the lens of PSE 433

10.5.2 Beyond the conceptual argument – our PSE findings 437

10.5.3 Mastery experiences 441

10.5.4 Vicarious experiences 443

10.5.5 Verbal persuasion 444

10.5.6 Psychological state 444

10.5.7 SNAPPS' influences on trainee motivation & confidence 444

10.5.8 SOAP – 'mimicking' mastery 445

10.5.9 Mastery experiences beyond the specific case 446

10.5.10 PSE Conclusion 446

10.6 BEYOND THE SNAPPS LITERATURE 447

10.6.1 Beyond 'Narrow' - Adaptive Approaches to SNAPPS 447
10.6.2 Beyond the primary diagnosis – Non-traditional uses of SNAPPS 450
10.6.3 Beyond bedside teaching - Unexpected benefits of using SNAPPS 451
10.7 CHAPTER SUMMARY 453
Chapter 11: Limitations 454
11.1 CHAPTER INTRODUCTION 454
11.2 PROCESS 454
11.2.1 Traditional vs action research 454
11.2.2 Measuring what, exactly? 456
11.3 DEMOCRATIC 456
11.4 CATALYTIC 457
11.5 DIALOGIC 457
11.6 OUTCOME 458
11.7 CHAPTER SUMMARY 458
Chapter 12 - Conclusion 459
12.1 CHAPTER INTRODUCTION 459
12.2 CONTRIBUTIONS 459
12.2.1 The influences of SNAPPS on the CLE, COP and PSE 459
12.2.2 Adaptive approaches and non-traditional uses of SNAPPS 460
12.2.3 SNAPPS, an easy uptake? 460
12.2.4 A few educational novelties 461
12.3 RECOMMENDATIONS 461
12.4 CHAPTER SUMMARY 463
References 464
Appendix 474
Appendix A - Recruitment Materials (back) 474
Appendix B – Study Instruments 502
B.1. Medical student & junior resident focus group discussion guide (back Ch.3; back Ch. 4) 502
B.2. Senior resident focus group discussion guide (back Ch. 3; back Ch. 4) 504
B.3. Faculty interview guide (back Ch. 3; back Ch.4) 506

B.4. Debrief guide (back, Ch. 3) 508
B.5. Action research journal – excerpt (back, Ch. 3) 509
B.6. DREEM survey (back Ch. 4) 513
B.7. PHEEM survey (back Ch. 4) 517
B.8. Elements for Effective Learning survey – Development (back, Ch. 4) (back, Ch.5) 519
B.9. Elements for Effective Learning survey - Phase 1, original (back Ch. 4) (back, Ch.5) (Appendix E.3) (Appendix E.10) 522
B.10. Perceived Self Efficacy survey – Development (back, Ch. 4)(back, Ch.5) 524
B.11. Perceived Self Efficacy survey – Phase 1, original (back, Ch. 4) (Appendix E.7) (Appendix E.11) 526
B.12 Work-flow on ward rounds – Data collection tool, PMW/PHO (back, Ch. 5) 528
B.13 Work-flow on ward rounds – Data collection tool, NNU (back Ch.5) 528
B.14 Resident perceived self-efficacy leadership survey (back Ch.5) (Appendix E.12) 530
B.15 Faculty perspective of resident leadership skills survey (back Ch. 5) (Appendix E.13) 532
B.16 Resident perceived self-efficacy of patient care at PMH (back Ch.5) (Appendix E.14) 533
B.17 Educational Climate Inventory – PMW – MBBS 3/5 (back Ch.5) (Appendix E.15)(back Ch.7) 534
B.18 Educational Climate Inventory – NNU – MBBS 3/5 (back Ch.5) 535
B.19 Educational Climate Inventory – PHO – MBBS 5 (back Ch.5) 536
B.20 Educational Climate Inventory – PHO – Resident (back Ch. 5) 538
B.21 Educational Climate Inventory – Dept of Peds – Resident (back Ch.5) 540
B.22 Observation & Learning Tool for Clinical Supervision – Self (back Ch.5) (Appendix E.16) 542
B.23 Observation & Learning Tool for Clinical Supervision – Peer (back Ch.5) 546
B.24 Elements for Effective Learning – Dept of Peds – MBBS 3/5 (back Ch.5) (Appendix E.17) 550
B.25 Elements for Effective Learning – Dept of Peds – Resident (back. Ch.5) 552
B.26 Motivated Strategies for Learning Questionnaire – Dept of Peds – MBBS 3 (back Ch.5) (Appendix E.18) (back Ch.7) 554
B.27 Motivated Strategies for Learning Questionnaire – Dept of Peds – MBBS 5 (back Ch.5) 556
B.28 Motivated Strategies for Learning Questionnaire – Dept of Peds – Resident (back Ch.5) 558
B.29 Daily Rounds: Perceived Self-efficacy – PMW – MBBS 3 (back Ch.5) (Appendix E.19-E.21) 560
B.30 Daily Rounds: Perceived Self-efficacy – PMW – MBBS 5 (back Ch.5) 561
B.31 Daily Rounds: Perceived Self-Efficacy – PMW – Resident (back Ch.5) 562
B.32 Daily Rounds: Perceived Self-Efficacy – NNU – MBBS 3 (back Ch.5) 563
B.33 Daily Rounds: Perceived Self-Efficacy – NNU – MBBS 5 (back Ch.5) 564
B.34 Daily Rounds: Perceived Self-Efficacy – NNU – Resident (back Ch.5) 565
B.35 Daily Rounds: Perceived Self-Efficacy – PHO – MBBS 5 (back Ch.5) 566
B.36 Daily Rounds: Perceived Self-Efficacy – PHO – Resident (back Ch.5) 567
B.37 Daily Rounds: Communities of Practice – MBBS 3/5 (back Ch.5) (Appendix E.22) 568
B.38 Daily Rounds: Communities of Practice – Resident (back Ch.5) 570
B.39 SNAPPS - ‘How to?’ (back Ch.6) 572

B.40 SNAPPS – 'Helpful?' - Faculty (back Ch.6) 574
B.41 SNAPPS – 'Helpful?' – Trainee (back Ch.6) 575
B.42 Faculty Rounding Log (back Ch.7) 576
B.43 Development of Trainee Rounding Log (back Ch.7) 577
B.44 Trainee Rounding Log (back Ch.7) 588
B.45 SNAPPS Debrief – Faculty (back Ch.7) 590
B.46 SNAPPS Debrief – Trainee (back Ch.7) 591
B.47 Updated SNAPPS Debrief – Faculty (back, Ch.9) 592
B.48 Updated SNAPPS Debrief – Trainee (back, Ch.9) 594
B.49 PHO Trainee SNAPPS Feedback survey – Version 1 (back, Ch.9) 595
B.50 PHO Trainee SNAPPS Feedback survey – Version 2 (back, Ch.9) 596

Appendix C – Data Analysis 597

C.1. Six steps of thematic analysis (back Ch. 3) 597
C.2. Example of mixed methods joint display diagram (back, Ch. 3) 605
C.3. Critical reflection data analysis (back, Ch. 3) (back, Ch. 5) 606
C.4. Consolidated framework for implementation research constructs (back, Ch. 3) (back, Ch.8) 607

Appendix D – Ethics (back, Ch. 3) 613

Appendix E – Results 622

E.1. DREEM survey results (back, Ch. 4) 622
E.2. PHEEM survey results (back, Ch. 4) 624
E.3. Elements for Effective Learning survey results; Medical students (back, Ch. 4)(Appendix B.9) 626
E.4 Elements for Effective Learning Survey results, Communities of Practice; Medical students (back, Ch. 4) 629
E.5. Elements for Effective Learning survey results; Junior residents (back, Ch. 4) 631
E.6. Elements for effective learning survey results, Communities of practice; Junior residents (back, Ch. 4) 634
E.7. Perceived self efficacy survey results, Medical students (back, Ch. 4) (Appendix B.11) 636
E.8. Perceived self efficacy survey results, junior residents (back, Ch. 4) 638
E.9. Phase 1 – Joint display diagram (back, Ch. 4) 640
E.10. EEL-original Dec 2016 vs EEL-original Feb 2018 survey results (back Ch.5) (Appendix B.9) 655
E.11. PSE-original Dec 2016 vs PSE-original Feb 2018 survey results (back Ch.5) (Appendix B.11) 656
E.12. Resident perceived self-efficacy leadership survey results (back Ch.5) (back Ch.6) (Appendix B.14) 657
E.13. Faculty perspective of resident leadership skills survey results (back Ch.5) (back Ch.6) (Appendix B.15) 659
E.14 Resident perceived self-efficacy of patient care at PMH results (back Ch.5) (back Ch.6) (Appendix B.16) 660

E.15 Educational Climate Inventory survey results, Phase 2 (back Ch.5) (Appendix B.17, B.18, B.19, B.20, B.21) 661
E.16 Educational Climate Inventory survey results, Phase 3-Cycle 1 (back Ch.6) (Appendix B.17, B.18, B.19, B.20, B.21) 662
E.17 Educational Climate Inventory survey results, Phase 3-Cycle 2 (back, Ch.7) (Appendix B.17, B.18, B.19, B.20, B.21) 663
E.18 Observation & Learning Tool for Clinical Supervision survey results (back Ch.5) (Appendix B.22, B.23) 664
E.19 Elements for Effective Learning (modified) survey results, Phase 2 (back Ch.5) (Appendix B.24, B.25) 665
E.20 Elements for Effective Learning (modified) survey results, Phase 3 (back Ch.6) (Appendix B.24, B.25) 666
E.21 Motivated Strategies for Learning Questionnaire results – Phase 2 (back Ch.5) (Appendix B.26, B.27, B.28) 667
E.22 Motivated Strategies for Learning Questionnaire results – Phase 3-Cycle 1 (back Ch.6) (Appendix B.26, B.27, B.28) 668
E.23 Motivated Strategies for Learning Questionnaire results – Phase 3-Cycle 2 (back, Ch. 7) (Appendix B.26, B.27, B.28) 669
E.24 Daily Rounds: Perceived Self-efficacy – All survey results, Phase 2 (back Ch.5) (Appendix B.29-B.36) 670
E.25 Daily Rounds: Perceived Self-efficacy – All survey results, Phase 3 (back Ch.6) (Appendix B.29-B.36) 671
E.26 Daily Rounds: Perceived Self-efficacy – MBBS 5 survey results, Phase 2 (back Ch.5) (Appendix B.29-B.36) 672
E.27 Daily Rounds: Perceived Self-efficacy – MBBS 5 survey results, Phase 3 (back Ch.6) (Appendix B.29-B.36) 673
E.28 Daily Rounds: Perceived Self-Efficacy – Resident survey results, Phase 2 (back Ch.5) (Appendix B.29-B.36) 674
E.29 Daily Rounds: Communities of Practice survey results, Phase 2 (back Ch.5) (Appendix B.37, B.38) . 675
E.30 Daily Rounds: Communities of Practice survey results, Phase 3 (back Ch.6) (Appendix B.37, B.38) . 676
E.31 Phase 3-Cycle 1: Joint display diagram (back Ch.6) 677
E.32 Trainee Rounding Log – SNAPPS 'Yes' Run chart results (back, Ch.7) 698
E.33 Trainee Rounding Log – SNAPPS 'Yes' Descriptive results (back, Ch.7) 707
E.34 Trainee Rounding Log – SNAPPS 'No' Descriptive results (back, Ch.7) 709
E.35 Phase 3-Cycle 2: Joint display diagram (back, Ch.7) 711

Appendix F – Phase 2 activities & reflections (back, Ch. 5) (back, Ch.8) 719

F.1. Evolution of Phase 2 driver diagram 719
F.2. Evolution of Phase 2 project measures, data collection tools, and surveys 720

F.3. Evolution of Phase 2 change ideas 721

Appendix G – Phase 3 Educational Series (back, Ch.6) (back, Ch.7) (back, Ch.9) 722

G.1 Educational series calendar, Cycle 1 722

G.2 Teach-the-teacher: “What does it mean to be a clinical teacher, Part 1” 723

G.3 Teach-the-teacher: “What does it mean to be a clinical teacher, Part 2” 724

G.4 Teach-the-teacher: “Why learner-centred teaching, and how” 725

G.5 Teach-the-teacher: “Intro to SNAPPS: A learner-centred bedside teaching model” 726

G.6 Residents-as-teachers: “Top 10 tips to surviving the pre-round” 727

G.7 Residents-as-teachers: “Intro to SNAPPS: A learner-centred bedside teaching model” 728

G.8 Residents-as-teachers: “Leadership workshop” 729

G.9 “Giving and receiving feedback” 730

ACKNOWLEDGEMENTS

I would like to acknowledge the faculty and staff within the Department of Health Sciences Education at the University of Cape Town. Particular thanks goes to Ms. Shaneel Nutt for her endless supportive communication and the practicality of keeping me enrolled throughout this process.

A special thank you to Prof Madie Duncan whose verbal persuasion kept my self-efficacy alive!

A special thank you to Prof Nadia Hartman whose practical guidance and concrete support pushed me across the finish line.

To all my co-investigators, what a pleasure and privilege to work with each and every one of you!

A huge thank you to Dr. Tonya Arscott-Mills, whose practical perspective was always so refreshing; and for her tireless dedication and support which allowed this project to come to fruition.

I am forever grateful to Prof Vanessa Burch - the "Cadillac" of mentors! - her guidance, insight and unyielding belief in me have been instrumental. I am not nearly the same woman I was when this began, much of this is due to her passion, guidance and belief in me.

To my children – in response to, "Are you done with your PhD, yet?" . . . "Yes! Ema has finished!"

To my husband – this is as much yours as mine. I can write +100,000 words, but I will never find the words to express how much your endless love and support have meant to me. Truly, thank you for this gift.

And to the Motswana trainees whom I have worked with 'in the trenches' as it were – you are some of the most remarkable people I have ever met. Thank you for teaching me how to be resilient, to be flexible, to be creative and compassionate. The road ahead to achieve the healthcare your country needs is long, but do not give up on yourselves or the task ahead. Botswana needs you – your patients need you – you need each other. Be strong, united, determined, stubborn, unyielding leaders! Leaders who understand the balance of compassion and ambition and use it to direct a goodness in growth. Do not complacently accept tragedy as 'normal' – excel! PULA!

ABSTRACT

Bandura's Social Cognitive Theory asserts that an individual's perceptions of his/her self-efficacy influence not only their ability to *learn* knowledge and skill, but more importantly, influences their ability to *act* utilizing that knowledge or skill. In the context of health professional education, it is not enough to know the facts of medicine, but learners must also have a positive perception of their self-efficacy in order to practice medicine as a competent physician. The aim of this study was to improve the quality of ward round learning and teaching for University of Botswana medical trainees working in the Department of Paediatrics at Princess Maria Hospital in order to enhance their self-efficacy beliefs regarding their ability to provide paediatric patient care. Specifically, we utilized a three-pronged approach to 1) improve trainees' participation in, and sense of belonging to, a local community of clinical practice, 2) introduce a structured bedside teaching model, and 3) promote a favourable clinical learning environment, all of which we postulated could improve trainees' self-efficacy beliefs.

In this research I assert that four educational elements, (i) the *method* of teaching (i.e. bedside teaching), (ii) the *environment* in which learning occurs (i.e. the clinical learning environment), (iii) the *epistemological* value of social participation (i.e. communities of practice), and (iv) an individual's ability to both *acquire and utilize* their knowledge (i.e. perceived self-efficacy), are not distinct phenomena, but are interrelated, dynamic forces that influence each other in meaningful ways.

This study was conducted as an action research (AR) project using mixed methods evaluation for data capture and analysis. Following the iterative *Plan-Act-Observe-Reflect* cycles of action research, a total of three phases occurred. In Phase 1, we developed an in-depth understanding of trainees' and faculty's perceptions of the prevailing paediatric ward rounds. In Phase 2, through ongoing departmental collaboration and review of the literature, we conceptually analysed the findings from Phase 1 to determine specific interventions for Phase 3. In Phase 3, we implemented the Phase 2 generated solutions, including the introduction of a structured bedside teaching model, SNAPPS (*Summarize-Narrow-Analyse-Probe-Plan-Select*); this was subsequently adapted to provide local and contextual relevance. Throughout all Phases, we conducted serial measurements of trainees' perceptions of (i) the clinical learning environment (CLE) on ward rounds, (ii) their sense of participation in, and belonging to, the community of practice on ward rounds (COP); and (iii) their perceived self-efficacy (PSE) to provide paediatric patient care.

The types of study instruments and data sources included focus group discussions, interviews, debriefs, my action research journal, and questionnaires. Four consecutive types of data analysis occurred throughout the project: qualitative data analysis, quantitative data analysis, mixed methods integration, and critical reflection.

Over the 28-month study period, there was a total of 208 participants, including representation from faculty, senior residents, junior residents, and medical students. There were three primary outcomes of this action research project. 1) Trainee use of SNAPPS was associated with (i) a CLE that was more favourable to respecting uncertainty; (ii) an increase in trainees' participation in and, sense of belonging to, a paediatric ward round; and (iii) positive influences on their perceived self-efficacy to manage patients. 2) We identified several non-traditional uses of SNAPPS that created opportunities for trainees to learn and faculty to teach beyond the primary diagnosis. 3) In contrast to the literature, we were unsuccessful at introducing SNAPPS at a department-wide level.

Note, when I first set out to do this research, I postulated that bedside teaching, the clinical learning environment, and participation in a community of practice all had the potential to influence an individual's perceived self-efficacy. I assumed that while bedside teaching models (BTM) provide a structured approach to student engagement to enhance the content of bedside teaching, they do not, in and of themselves, regulate the clinical learning environment in which they occur. I did not consider the influence of a BTM on a learner's sense of belonging to a community of clinical practice. Through the findings of this project, I discovered the power of the BTM itself, which shifted the foci of influence, that not only does it have the potential to positively influence learner's PSE, but indeed has direct influential effects on the CLE and elements of COP. These findings compliment and broaden my original assumptions that the educational dimensions involved are not isolated elements, but together simultaneously impact learning and teaching.

Note, during the course of this project, my positionality as the researcher underwent considerable shifts from "outsider" conducting "participatory action research" to "insider" conducting "practitioner research". In turn, an unexpected secondary aim and outcome developed – to explore, understand and articulate the influences of SNAPPS on my own practice as a physician and clinical teacher.

Limitations included: over utilization of traditional research instruments and analysis; lack of quality control of the implemented intervention; difficulty in interpreting results; delays in important critical

reflections during the project; inability to achieve full collaboration with other department members; and unsuccessful attempt to introduce SNAPPS department-wide.

Based on the findings from this study, a structured bedside teaching model, specifically SNAPPS, offers a holistic approach to maximize learning and teaching, addressing several learner and environmental needs concurrently. That said, when clinical teachers set out to introduce SNAPPS, they ought to be prepared to offer ongoing support for the successful implementation beyond a brief SNAPPS sensitization. The flexibility and potential advantages of SNAPPS promotes its use, especially in clinically challenging teaching environments.

List of Figures

FIGURE 1: ENTRY PROCESS OF ACTION RESEARCH PROBLEMS [3,7] 35
FIGURE 2: INTERACTIVE INFLUENCES ON PERCEIVED SELF-EFFICACY 40
FIGURE 3: RESEARCH DESIGN 48
FIGURE 4: THE INTERVENTION-CAUSATION PATHWAY [85] 69
FIGURE 5: THE INFLUENCES ON AND OF SELF-EFFICACY 75
FIGURE 6: MY SHIFTING POSITIONALITY AND ITS INFLUENCES ON THE TYPE OF ACTION RESEARCH BEING CONDUCTED 99
FIGURE 7: OVERALL RESEARCH DESIGN [3,134] 107
FIGURE 8: OVERALL STUDY TIMELINE 108
FIGURE 9: STUDY INSTRUMENTS 119
FIGURE 10: EXAMPLE RUN CHART[155] 135
FIGURE 11: RUN CHART 'RULES'[155] 136
FIGURE 12: PHASE 1 - RESEARCH DESIGN 144
FIGURE 13: PHASE 1 - TIMELINE 145
FIGURE 14: PHASE 1 THEMATIC ANALYSIS RESULTS 154
FIGURE 15: PHASE 1: THEME 1 - CLINICAL LEARNING ENVIRONMENT 155
FIGURE 16: ILLUSTRATION OF PHRASE *"THE PEOPLE AROUND THE BIG TABLE"* 163
FIGURE 17: THEME 2 - TEACHING 169
FIGURE 18: THEME 3 - LEARNING 181
FIGURE 19: PHASE 2 RESEARCH DESIGN 210
FIGURE 20: PHASE 2 RESEARCH ACTIVITY TIMELINE 212
FIGURE 21: GROUP USE OF QI TOOLS 214
FIGURE 22: PHASE 2 GENERATED DRIVER DIAGRAM 217
FIGURE 23: PHASE 2 GENERATED DCT AND SURVEYS 219
FIGURE 24: PHASE 2 GENERATED CHANGE IDEAS 225
FIGURE 25: PLANNED TIMELINE FOR PHASE 3 226
FIGURE 26: PLANNED PHASE 3 DATA COLLECTION CALENDAR 227
FIGURE 27: PHASE 2 RESEARCH DESIGN 228
FIGURE 28: PHASE 2 – PILOTING AND BASELINE DATA COLLECTION TIMELINE 230
FIGURE 29: PHASE 3 CYCLES OF PLAN-ACT-OBSERVE-REFLECT 243
FIGURE 30: PHASE 3 - RESEARCH ACTIVITY TIMELINE 243
FIGURE 31: CYCLE 1: RESEARCH ACTIVITY TIMELINE 244
FIGURE 32: CYCLE 1 RESEARCH DESIGN 245
FIGURE 33: CYCLE 1 EDUCATIONAL ACTIVITIES 248
FIGURE 34: CYCLE 1 DATA COLLECTION 249
FIGURE 35: EDUCATIONAL SERIES ATTENDANCE OF PAEDIATRICIANS AND SENIOR RESIDENTS 253

FIGURE 36: EDUCATIONAL SERIES ATTENDANCE CATEGORIZED BY GROUP 253
FIGURE 37: EDUCATIONAL SERIES PERCENTAGE OF ATTENDEES PER GROUP 254
FIGURE 38: EDUCATIONAL SERIES NUMBER OF SESSIONS ATTENDED PER INDIVIDUAL 254
FIGURE 39: EDUCATIONAL SERIES ATTENDANCE BY JUNIOR RESIDENTS 255
FIGURE 40: CYCLE 1- RESULTS OF THEMATIC ANALYSIS 256
FIGURE 41: RESULTS: SNAPPS 'HOW TO?' 270
FIGURE 42: RESULTS TO SNAPPS 'HELPFUL?' - FACULTY 271
FIGURE 43: RESULTS TO SNAPPS 'HELPFUL?' - TRAINEE 272
FIGURE 44: CYCLE 1: ACTUALLY COLLECTED SURVEY DATA 273
FIGURE 45: PLANNED PHASE 3 RESEARCH DESIGN 281
FIGURE 46: ACTUAL PHASE 3 - CYCLE 1 RESEARCH DESIGN 282
FIGURE 47: PLANNED DATA COLLECTION FOR PHASE 3 285
FIGURE 48: ACTUAL DATA COLLECTION FOR PHASE 3 - CYCLE 1 285
FIGURE 49: PHASE 3 - *PLANNED* DATA ANALYSIS 287
FIGURE 50: PHASE 2 - BASELINE-DATA DATA ANALYSIS 287
FIGURE 51: EXAMPLE RUN CHART DURING PHASE 3 - CYCLE 1 288
FIGURE 52: EXAMPLE PRE/POST ANALYSIS DURING PHASE 3 - CYCLE 1 289
FIGURE 53: PHASE 3 - CYCLE 1 - *ACTUAL* DATA ANALYSIS 289
FIGURE 54: *PLANNED* PHASE 3 ACTIVITIES 290
FIGURE 55: *ACTUAL* PHASE 3 ACTIVITIES 290
FIGURE 56: CYCLE 2: RESEARCH ACTIVITY TIMELINE 297
FIGURE 57: CYCLE 2 - RESEARCH DESIGN 298
FIGURE 58: A) CYCLE 2 - RESULTS OF THEMATIC ANALYSIS 308
FIGURE 59: B) CYCLE 2 - RESULTS OF THEMATIC ANALYSIS 325
FIGURE 60: FRL LENGTH OF ROUNDS & TIME PER PATIENT 335
FIGURE 61: OVERALL FACULTY SNAPPS USE 336
FIGURE 62: MY SNAPPS USE 336
FIGURE 63: FACULTY SNAPPS USE (NOT INCLUDING MY RESULTS) 337
FIGURE 64: PERCENTAGE OF SNAPPS USE ON ROUNDS BY INDIVIDUAL FACULTY 337
FIGURE 65: TRL QUESTION 4 RESULTS 338
FIGURE 66: TRL QUESTION 8 RESULTS 339
FIGURE 67: TRL QUESTION 9 RESULTS 340
FIGURE 68: TRL QUESTION 10 RESULTS 341
FIGURE 69: TRL QUESTION 11 RESULTS 342
FIGURE 70: TIMELINE OF PHASE 3 ONGOING REFLECTION 353
FIGURE 71: FACULTY & SENIOR RESIDENT USE OF SNAPPS 355
FIGURE 72: SNAPPS POTENTIAL AREAS OF INFLUENCE 356
FIGURE 73: CYCLE 3 - RESEARCH ACTIVITY TIMELINE 379

FIGURE 74: CYCLE 3 - RESEARCH DESIGN 380
FIGURE 75: CYCLE 3 - RESULTS OF THEMATIC ANALYSIS 387
FIGURE 76: EXAMPLES OF TRAINEE-LED 'SELECT' MINI-PRESENTATIONS 396
FIGURE 77: CANMEDS MODEL OF THE EXPANDED PHYSICIAN ROLE 399
FIGURE 78: ORIGINAL - DYNAMIC INFLUENCES OF EDUCATIONAL ELEMENTS 411
FIGURE 79: MODIFIED - DYNAMIC INFLUENCES OF EDUCATIONAL ELEMENTS 412
FIGURE 80: RELATIONSHIPS BETWEEN SNAPPS AND MEDICAL EXPERT SKILLS 434
FIGURE 81: RELATIONSHIP BETWEEN SNAPPS, 'MEDICAL EXPERT' SKILLS & PSE 436
FIGURE 82: CYCLE 3 - RESULTS OF THEMATIC ANALYSIS THRU A PSE PERSPECTIVE 441
FIGURE 83: CATEGORIZATION OF PREVIOUS SURVEY QUESTIONS INTO PSE SUB-CATEGORIES 577

LIST OF TABLES

TABLE 1: NUMBER OF INDIVIDUALS IN EACH ROLE OVER THE COURSE OF THE STUDY 112
TABLE 2: PROCEDURE FOR IMPLEMENTING A CONVERGENT MIXED METHODS DESIGN[134] 132
TABLE 3: INFLUENCING ELEMENTS ON THE CLE - FAVOURABLE & UNFAVOURABLE 167
TABLE 4: RESULTS OF DREEM AND PHEEM 197
TABLE 5: ELEMENTS FOR EFFECTIVE LEARNING SURVEY 198
TABLE 6: ELEMENTS FOR EFFECTIVE LEARNING SURVEY - COMMUNITIES OF PRACTICE 199
TABLE 7: PERCEIVED SELF-EFFICACY SURVEY RESULTS 200
TABLE 8: COMMON CONTENT AREAS IDENTIFIED FROM MIXED METHODS CONVERGENT INTEGRATION 201
TABLE 9: WORK-FLOW ON WARD ROUNDS, DATA COLLECTION TOOL RESULTS 233
TABLE 10: COMMON CONTENT AREAS IDENTIFIED FROM MIXED METHODS CONVERGENT INTEGRATION 276
TABLE 11: TRAINEE ROUNDING LOG RESULTS - GROUP 1 (SNAPPS-YES) 343
TABLE 12: TRAINEE ROUNDING LOG RESULTS - GROUP 1 (SNAPPS-NO) 343
TABLE 13: TRAINING ROUNDING LOG - GROUP 1: SNAPPS YES VS NO 344
TABLE 14: TRAINEE ROUNDING LOG - GROUP 1: SNAPPS YES VS NO, BY SUB-CATEGORY 345
TABLE 15: TRAINEE ROUNDING LOG - GROUP 2: SNAPPS YES VS NO 346
TABLE 16: TRAINEE ROUNDING LOG - GROUP 2: PHO SNAPPS-YES VS SNAPPS-NO 347
TABLE 17: COMMON CONTENT AREAS IDENTIFIED FROM MIXED METHODS CONVERGENT INTEGRATION 348
TABLE 18: TRL QUESTIONS 7 & 8 349
TABLE 19: TRL QUESTION 11 351
TABLE 20: ADAPTIVE APPROACHES TO 'NARROW' 448

List of Boxes

BOX 1: EMAIL INTRODUCTION 33
BOX 2: MY DESCRIPTION OF A 'TYPICAL' DAY IN THE DEPARTMENT OF PAEDIATRICS 36
BOX 3: PAOR – INVITATION TO RE-CAP SESSIONS 255
BOX 4: PAOR - CLARIFICATION OF 'ASSESSMENT' WITHIN SNAPPS 260
BOX 5: PAOR - INCLUDING INTERNS IN THE EDUCATIONAL SERIES 263
BOX 6: PAOR - ADAPTING SNAPPS FOR MBBS 3 264
BOX 7: PAOR - GETTING FEEDBACK ON THE USE OF SNAPPS 268
BOX 8: PAOR - GETTING INFORMAL VERBAL FEEDBACK ON THE USE OF SNAPPS 269
BOX 9: PAOR - RESPONSE TO ONGOING TRAINING ISSUES 313
BOX 10: PAOR - SNAPPS POCKET CARD 314
BOX 11: PAOR - RESPONSE TO STUDENTS MISSING THE WARD ROUND 316
BOX 12: PAOR - RESPONSE TO TRADITIONAL ROUNDS VS SNAPPS 320
BOX 13: PAOR - SOLUTIONS TO 'NARROW' I) NARROW THE CAUSE OF A SECONDARY DIAGNOSIS FROM THE PATIENT'S PROBLEM LIST 329
BOX 14: PAOR - SOLUTIONS TO 'NARROW' II) NARROW THE INITIAL PRESENTING SIGNS & SYMPTOMS 330
BOX 15: PAOR SOLUTIONS TO 'NARROW' III) NARROW RISK FACTORS THAT A PATIENT MIGHT HAVE FROM OR FOR A PRIMARY/SECONDARY DIAGNOSIS 330
BOX 16: PAOR SOLUTIONS TO 'NARROW' IV) NARROW THE NARROW 331
BOX 17: PAOR SOLUTIONS TO 'NARROW' V) NARROW THE PHYSICAL EXAM FINDINGS ONLY 331
BOX 18: PAOR SOLUTIONS TO 'NARROW' VI) START WITH A PROBE, THEN NARROW 332
BOX 19: PAOR SOLUTIONS TO 'NARROW' VII) USING SELECT TO BROADEN THE NARROW & DEEPEN THE ANALYSIS 332
BOX 20: PAOR SOLUTIONS TO 'NARROW' VIII) NARROW ON THE SPOT WITH ONLINE RESOURCES 333
BOX 21: PAOR - SOLUTIONS TO 'NARROW' IX) RE-VISITING THE NARROW 392
BOX 22: PAOR - SOLUTIONS TO 'NARROW' X) 'BACKWARD' NARROW 393
BOX 23: PAOR - SOLUTIONS TO 'NARROW' XI) ADVANCED LEVELS OF NARROW 393
BOX 24: PAOR - SOLUTIONS TO 'NARROW' XII) NARROW THE LAB RESULTS ALONE 394
BOX 25: PAOR - SOLUTIONS TO 'NARROW' XIII) NARROW THE VITAL SIGNS 394

ABBREVIATIONS

AR = action research

ARJ = action research journal

BTM = bedside teaching model

CSF = cerebral spinal fluid

CHOP = Children's Hospital of Philadelphia

CLE = clinical learning environment

COP = communities of practice

CRIF = Consolidated Framework for Implementation Research

CT = computerized tomography

DCT = data collection tool

DME = Department of Medical Education

DoP = Department of Paediatrics

DREEM = Dundee Ready Educational Environment Measure

ECI = Educational Climate Inventory

EEL = Elements of Effective Learning survey

FD = faculty development

FGD = focus group discussion

FRL = Faculty Rounding Log

HIV = human immunodeficiency virus

HPE = health professional education

HPI = history of present illness

IHI = Institute for Healthcare Improvement

KDD = key driver diagram

L&T = learning and teaching

MBBS 3 = Bachelor of Medicine, Bachelor of Surgery – 3rd year

MBBS 5 = Bachelor of Medicine, Bachelor of Surgery – 5th year

MCPI = Manchester Clinical Placement Index

MiniCx = mini clinical examination

MMed = Master of Medicine

MO = medical officer

MOHW = Ministry of Health and Wellness

MPhil = Master of Philosophy

MSLQ = Motivational Strategies for Learning Questionnaire

NICU = Neonatal Intensive Care Unit

NNU = Neonatal Unit

OLTCS = Observation and Learning Tool for Clinical Supervision

OMP = One-Minute Preceptor

PAOR = Plan-Act-Observe-Reflect

PAR = participatory action research

PAT = peer assessment tool

PD = primary driver

PE = physical exam

PG = project group

PGY = post-graduate year

PHEEM = Postgraduate Hospital Educational Environment Measure

PHO = paediatric haematology oncology

PMH = Princess Marina Hospital

PMW = Paediatric Medical Ward

PSE = perceived self-efficacy

QI = quality improvement

R-a-T = Residents as Teachers series

RCT = randomized control trial

RSA = Republic of South Africa

SAAHE = South African Association for Health Educationalists

SAT = self-assessment tools

SD = standard deviation

SFDP = Stanford Faculty Development Program

SNAPPS = Select, Narrow, Analyse, Probe, Plan & Select

SOAP = Subjective-Objective-Assessment-Plan

T-t-T = Teach the Teacher series

TCH = Texas Children's Hospital

TRL = Trainee Rounding Log

UB = University of Botswana

UCT = University of Cape Town

UPenn = University of Pennsylvania

US = United States

WFWR = Work-flow on Ward Rounds data collection tool

WPL = workplace learning

DEFINITION OF TERMS

For the purposes of this study, the following terms are as defined:

- *'medical trainee'* and *'clinical trainee'* are synonymous to each other and to any specific level of trainee, including *'medical student'* and *'junior resident'*

- *'resident'* is synonymous with 'registrars' or 'specialists-in-training'

- *'junior resident'* refers to those paediatric residents who are in the process of completing the first part of their specialist training and have not yet completed their clinical, examination or research components of their residency training

- '*senior residents'* refers to those paediatric residents who have completed the clinical and examination components of their residency, but have not yet completed the research component of the Masters in Medicine degree in paediatrics; colloquially known as *'chief resident'* within the Department of Paediatrics

- '*faculty*' will refer to *all* paediatricians and clinical teaching staff who conduct clinical ward rounds: specialists, consultant, attending, and/or faculty

- *'questionnaire'* and '*survey'* are used interchangeably

- *'new'* or *'newly generated'* survey/instrument refers to a survey that was created for the purposes of this study

- *'modified'* survey/instrument refers to any newly generated survey that then undergoes updates (i.e. modifications) during the course of the project based on going project feedback

CHAPTER 1 – INTRODUCTION

1.1 CHAPTER INTRODUCTION

This chapter serves to introduce the reader to me, the researcher, how the 'problem' was identified, and the 'status quo' prior to our interventions. In addition, this chapter will introduce the overall research study, including the background, conceptual framework, rationale, context, purpose, aim, questions, objectives, and delimitations of the study. Included will be a brief introduction to bedside teaching, bedside teaching models, clinical learning environment, communities of practice, and perceived self-efficacy, of which the details of each can be found in Chapter 2.

1.2 THE RESEARCHER, THE PROBLEM & THE STATUS QUO

Action research is a "problem-focused, reflective, and action-oriented" type of research.[1] Therefore, when describing the background of the project, three fundamental questions need to be answered: 1) who is the researcher and how did he/she become involved with the project? 2) how was the problem identified or where did the research question(s) come from?, and 3) what was the status quo surrounding that particular issue?[2,3]

1.2.1 MY ENTRY POINT

In early 2015, I was selected to be the David N. Pincus Children's Hospital of Philadelphia (CHOP) Global Health Fellow in Botswana. This endowed fellowship was established at CHOP in 2008 with the support of David N. Pincus, with the mission to "extend CHOP's clinical, education, research, and advocacy programs beyond the borders of the United States and into international partner communities" as a means to ultimately train leaders in paediatric global health.[4] At its inception, the global health fellowship founded two partner countries: the Dominican Republic and Botswana. Botswana was established as a partner country to build on the long-standing partnership between Botswana Ministry of Health, University of Botswana (UB), and the University of Pennsylvania (UPenn). Established in

2001, the Botswana-UPenn Partnership was initially developed in response to the HIV/AIDS epidemic, and over the years, this partnership continued with the mission to build healthcare and research capacity in Botswana.[5]

Each global health fellowship class is composed of two fellows: a Dominican Republic fellow, and a Botswana fellow; I was chosen as the Botswana fellow based on my previous undergraduate work in southern Africa, and my ongoing global health interests and experiences. As such, my global health fellowship entailed that my family and I move to Botswana full-time for two years. During that time, I would practice clinically as a paediatrician in the Department of Paediatrics (DoP) at Princess Marina Hospital (PMH) in conjunction with the University of Botswana. As part of my fellowship, a scholarly project was required, so even before I arrived to Botswana, I started to brainstorm ideas for what my scholarly project could be. Previous global health fellow scholarly projects were focused on areas of diarrheal diseases in children, pneumonia outcomes in HIV-exposed-uninfected children, quality of life for patients with paediatric lymphoma, and burnout rates among UB residents.[4]

During my residency program training and my previous year as chief resident of that program, I had a growing interest in graduate medical education – indeed, one of the reasons I was so excited about the fellowship in Botswana was that there was a relatively young paediatric residency program that had only formed five years before. As only the second class to graduate my own young residency program, I felt kindred to this young program and envisioned myself contributing to the UB residency program in similar ways I had contributed to my own residency program. During my residency and chief year, I had participated in our growing graduate medical education in several ways, including the creation of several resident curriculums in areas of quality improvement and patient safety, paediatric obesity and its impacts on health, as well as organized resident projects around advocacy, research, and individual learning plans, among others – I felt confident that all of these recently acquired skills and resources would assist me in my global health scholarly project. I also had a keen interest and some experience conducting qualitative research and quality improvement projects and was excited to use these methodologies for my scholarly project. Despite having otherwise very little experience in health professional education outside of my residency training and chief year, I thus set out to do my scholarly fellowship project in the realm of medical education, and an email was sent out on my behalf from a CHOP faculty member to other faculty that reflects the initial scholarly project ideas being generated. *(Box 1)*

BOX 1: EMAIL INTRODUCTION

June 2015

"Dear [CHOP Pediatric Residency Program Leadership]

I am writing to "connect" you with Savarra Mantzor who will begin a CHOP Global Health Fellowship this July. Savarra completed her medical education at the Medical School for International Health (Ben-Gurion University in collaboration with Columbia University) and is now finishing a Chief year at Our Lady of the Lake Pediatric Residency Program in Baton Rouge, LA. When she started residency, this was a very new program and she was excited about the opportunity to work with the dynamic faculty she found there who were "building" their educational program. For her scholarly work/research in Botswana, she wants to develop a project related to improving medical education.

Savarra will be in Philadelphia for the month of July to take classes and meet with CHOP faculty. I think you will all be great resources for her and likely will have wonderful ideas about how she can make the most of her time and talents in Botswana. So, I hope you will be able to meet with her early during her time in Philadelphia.

Thanks in advance for your help in welcoming Savarra to the "CHOP team."

Sincerely,

[Global Health Fellowship Program Leadership]"

In the context of 'Global North-Global South' relationships, there is often the Northern-perspective bias of the South 'needing' something to improve that the North can provide.[6] Indeed, from an uncritical perspective, 'why else would there be a global health fellowship?' 'why else would I be going if there wasn't something that I could help improve?' From this limited viewpoint, while in Philadelphia, I had a call with the UB Paediatric Residency Program Director, whose dual role was also Head of the Department of Paediatrics at PMH.

During our conversation, I told him of my interests in medical education and asked him if there was an area of need around medical education that I could position my scholarly project. He reflected and then recommended that I do a project to improve bedside teaching on ward rounds. The year before, I had participated weekly in a six-week course under the Stanford Faculty Development Train-the-Trainer Program which looked at ways to enhance the clinical learning environment, so I was very excited to pursue this. While I otherwise had no prior training in faculty development and was generally unfamiliar with the bedside teaching literature, during my residency and chief year, I had experience conducting ward rounds and valued my own training during ward rounds. I had experienced both positive and challenging learning environments as a learner during bedside teaching

and felt excited to pursue this project, particularly around empowering learners. I also thought this would be a great opportunity to apply quality improvement methods to an academic problem. Therefore, while still in Philadelphia, I started reaching out for mentor support in both medical education and quality improvement. Eventually it was decided that I would work with a Botswana-based University of Pennsylvania faculty and with a United States (US)-based Quality Improvement (QI) consultant at CHOP for medical education and QI support, respectively.

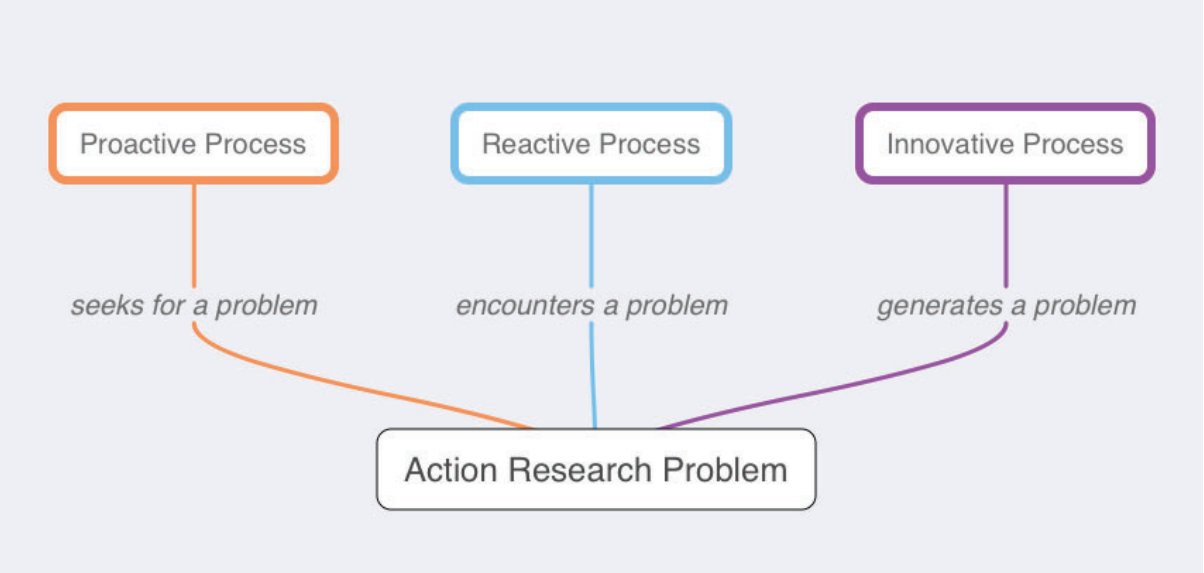
After six weeks in Philadelphia, my family and I moved to Botswana in August 2015 to officially start my fellowship program. Shortly after I arrived in Botswana, I met with the Department Head and he continued to support the idea of me doing a project related to improving learning and teaching on ward rounds.

From this perspective, my project began even before I arrived in Botswana. Which meant that when this project first started, I was in every sense of the word, an 'outsider' coming into a new environment to try and collaborate with 'insiders' to achieve some undefined organizational learning. This type of collaborative action research is a well-established and commonly used practice, in that "it is more common for outsiders to initiate research projects than insiders."[2]

1.2.2 Defining the 'problem'

The 'problem' in action research is a 'practical' problem – a problem which is experienced by the practitioner(s) involved, whereas traditional research identifies a gap in the literature and tries to address that gap by addressing the 'research' problem.[3,7] Craig describes three entry processes for how action research problems are generated: *proactive*, *reactive*, and *innovative*. A 'proactive' process is one where the practitioner "seeks for" a problem, where he/she considers their current practice and *proactively* search for areas that could be improved. A 'reactive' process is one where the practitioner is "encountering" a problem in his/her daily practice and as a *reactive* response, he/she tries to find solutions to that problem. An 'innovative' process is where the practitioner comes across a new solution or standard of practice in the literature or in another practitioner's practice and in order to incorporate that solution into his/her practice, he/she *innovates* a problem in their practice to be solved.[3,7] (*Figure 1)*

FIGURE 1: ENTRY PROCESS OF ACTION RESEARCH PROBLEMS [3,7]



Elliot describes action research as "a form of practice . . . essentially linked to the problems of bringing about change in those practices."[1] But not all problems in a practice need action research, "it is only when people experience a need for a more profound change and novel solutions that they adopt an action-research stance towards their practice."[1]

The action research problem for this study was generated through a *proactive process*. As described above, my fellowship required me to complete a scholarly project. In this way, I was obligated to the proactive process to "seek" out and generate a problem related to my scholarly interests. As such, I sought advice from the head of the department who suggested that I do a project around improving bedside teaching.

This encounter – an 'outsider' soliciting an 'insider' to proactively reflect on his current departmental practice to seek challenges around medical education is how my action research problem was identified. At the time, I thought that was all the invitation I would ever need to do this project. The head of the department (what I took to be the embodiment of an 'insider') identified a need within his department and I was charged to produce a scholarly project around this area and to find a solution. This simple conversation and introduction to the identified 'problem' is crucial for understanding the next three and a half years of my action research project, and as I reflect later, it is

likely one of the major reasons that my project did not have as much of a departmental impact as I had envisioned.

1.2.3 UNDERSTANDING THE STATUS QUO

An important aspect of action research is understanding the current tradition or status quo of practice within an organization. This reflection not only provides insight into how to solve the problem, but to understand how we (as an organization or group of individuals) have helped to create the problem.[2] This is essentially what was asked and considered during Phase 1 of the project when trying to answer research questions 1 thru 4. In conjunction with Phase 1 results, below is a practical description of a 'typical' day within the DoP and the 'traditional' way in which ward rounds were conducted prior to any intervention based on my own observations. *(Box 2)*

BOX 2: MY DESCRIPTION OF A 'TYPICAL' DAY IN THE DEPARTMENT OF PAEDIATRICS

The average day starts at 7:30am with the department morning meeting. This is held in a classroom a few minutes' walk from the ward. All medical students, interns, medical officers, residents and paediatricians are required to attend. The meeting is comprised of the overnight handover (admissions and deaths overnight), followed by a short didactic session. The department then returns to the ward for juniors to pre-round at 9am.

Ward rounds generally start at 10:30am and last for up to two hours. Rounding teams are generally comprised of third and fifth year medical students, interns, a junior resident or medical officer, a senior resident, and a paediatrician. Rounding on a patient entails a trainee reading directly from the patient's paper file, including the history of present illness or overnight events, the complete physical exam, an assessment and plan, and then followed by a list of laboratory findings.

Any missing history is collected directly from the parent/patient during the rounds. The physical exam presented may or may not indicate pertinent positives or negatives for the specific patient. The assessment is usually a reiteration of pieces from the presenting illness and physical exam findings, which may or may not include a differential diagnosis. The plan is a list of items that should be done, but sometimes are structed by system or problem list. The labs are read aloud verbatim, sometimes these

are interpreted by the presenting trainee. If available, printed radiographic images are reviewed at the bedside by the paediatrician.

In some cases, after a case has been presented, the paediatrician may or may not make an amendment to the plan, and then proceed to the next patient. In other cases, the paediatrician may wish to discuss the case with the presenting trainee and team, ask or answer questions, or assign reading material, but there is no formal standard or model of teaching.

From 1-2pm, everyone breaks for lunch. This is followed by ward work and scheduled didactic sessions. At 4pm, an afternoon handover is done for intensive care and high-dependency patients, and consists of a basic summary of the patient, current medical condition and items to be done overnight.

1.3 BACKGROUND

Note: At the inception of this project, we were tasked with 'improving bedside teaching on paediatric ward rounds'. We entered into this project with the held perspectives that the ward round (1) occurs within the clinical learning environment, (2) is a manifestation of situated learning, and (3) that the goal of the bedside teaching is to ensure the application of knowledge and skill accrued during the clinical encounter. It is from these perspectives that our framework of the conceptual model below evolved.

1.3.1 BEDSIDE TEACHING

An integral part of any medical school or residency programme is access to high quality clinical teaching within a rich learning environment.[8-10] The most historic (yet increasingly underutilized) method of clinical teaching takes place at the bedside.[11] This method provides an opportunity for faculty to "engage in clinical reasoning and problem-solving" with students and residents during authentic patient encounters.[11] Bedside teaching allows for role modelling opportunities as well as "the integration and learning of certain important clinical skills." However, the practice of bedside teaching is declining.[11] This decline has been attributed to increasing patient loads, time constraints, and clinical staff who are not trained and do not feel confident to conduct teaching at the bedside.[12,13]

1.3.2 BEDSIDE TEACHING MODELS

To preserve and foster the practice of bedside teaching, several teaching models and descriptions have been developed to overcome the constraints placed on the teacher-learner interaction. Examples of these instructional strategies include: SNAPPS (Summarize, Narrow, Analyse, Probe, Plan & Select) and the One-Minute Preceptor (OMP).[14,15] Each strives to improve the quality of teaching at the bedside while addressing common barriers to bedside teaching. Yet SNAPPS, and other such bedside teaching models (BTM), were developed in resource-rich healthcare environments, and therefore may not anticipate additional challenges to provide clinical teaching in resource-limited healthcare systems.[8]

1.3.3 CLINICAL LEARNING ENVIRONMENT

All bedside teaching encounters occur within the context of the clinical learning environment (CLE). While the afore mentioned bedside teaching models provide a structured approach to student engagement to enhance the content of bedside teaching, they have not been shown (in and of themselves) to regulate the clinical learning environment in which they occur. Literature shows that the clinical learning environment can often be quite unfavourable for students and residents.[16,17] This in turn can negatively affect the learner and impair academic performance.[17] Therefore, it is critical to develop and sustain a CLE that is "nurturing" to promote learning and learner well-being.[16,17]

1.3.4 COMMUNITIES OF PRACTICE

Wenger's theories of Communities of Practice asserts that learning and knowing occur through social participation. A Community of Practice (COP) requires interplay of three characteristics: *domain*, *community*, and *practice*. From this perspective, medicine is a community of practice where the *domain* is medicine, the *community* is composed of physicians, and the *practice* is the delivery of health care. Through the *work of engagement* communities of practice are formed, where "the ability to take part in meaningful activities and interactions" occur.[18] Thus, through participation, individuals "engage and contribute" and communities "refine practice and ensure new members."[18]

Medical students or residents entering the community of practice of medicine are on *inbound trajectories* where "newcomers are joining the community with the prospect of becoming full participants in its practice."[18] It is through engagement and developed competence that medical students and residents become members of the community and identify themselves as such. Therefore, it is important to ensure that students and residents have the opportunity to partake in the *work of engagement* to enhance their integration into the community of practice of medicine.

1.3.5 PERCEIVED SELF-EFFICACY

Perceived self-efficacy (PSE) is the degree to which an individual believes that his or her actions effect outcomes in their lives.[19] This in turn "influence[s] how people feel, think, motivate themselves, and behave."[19] Bandura's Social Cognitive Theory asserts that "perceived self-efficacy contributes to cognitive development and functioning."[19] In that, an individual's perceptions of his/her self-efficacy influence not only their ability to *learn* knowledge and skill, but more importantly, influences their ability to *act* utilizing that knowledge or skill.[19,20] Factors that influence perceptions of self-efficacy are: i) mastery experiences (successful experiences); ii) vicarious experiences (observation of others' successful experiences); iii) verbal persuasion (evaluative feedback); and iv) physiological and psychological states (the "emotional arousal" during the experience).[19]

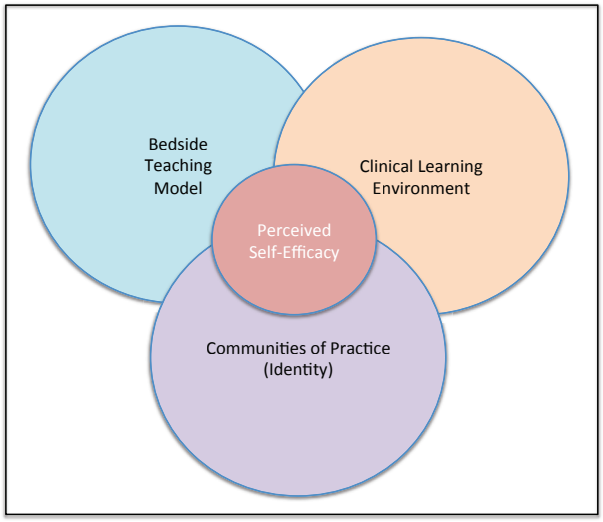
Since "self-efficacy is highly predictive of behavioural performance," in the context of medical education, it is not enough to *know* the facts of medicine or to possess certain procedural or exam skills, but learners must also have a *positive perception* of their self-efficacy in order to practice medicine as a competent physician.[20] Therefore, a priority of clinical teaching is to ensure the enhancement of the self-efficacy beliefs of medical trainees.

1.4 CONCEPTUAL FRAMEWORK

In this research, we postulate that structured clinical teaching, as compared to unstructured clinical teaching, may have a positive influence on trainees' self-efficacy beliefs regarding their clinical competence by contributing to the four inputs known to influence self-efficacy beliefs, i.e. mastery

experiences, vicarious experiences, verbal persuasion, and psychological states. This method of teaching may also facilitate participation in, and a sense of belonging to, a clinical community of practice, which may further contribute to enhanced self-efficacy. (*Figure 2*)

FIGURE 2: INTERACTIVE INFLUENCES ON PERCEIVED SELF-EFFICACY



1.4.1 BEDSIDE TEACHING'S INFLUENCE ON PERCEIVED SELF-EFFICACY

Bedside teaching offers learners opportunities for mastery experiences, vicarious experiences and verbal persuasion, which can influence their perceptions of self-efficacy in regards to their clinical and analytical skills in managing patients.

Bedside teaching creates ample opportunities for mastery experiences. Unlike classroom lectures or 'table' rounds, at the bedside, learners have the opportunity to experience real-life patient care. With each successful experience, the learner builds their self-efficacy beliefs of their ability to manage patients effectively.

During ward rounds, learners also have abundant opportunities to observe their juniors, peers and superiors in performing patient management. This allows them to build a sense of informative

comparison for where they are in the acquisition of mastering the skills for patient management, which can influence their self-efficacy beliefs in their own ability to manage patients competently.

An essential component of bedside teaching is feedback. After each case presentation, the learner ought to receive evaluative feedback. Each feedback moment creates an opportunity for the teacher's verbal persuasion to influence the learner's self-efficacy beliefs in his/her ability to manage patients. If a learner is offered positive performance-driven evaluative feedback on ward rounds, then this verbal persuasion could positively affect the learner's self-efficacy beliefs. But if the feedback is deficiency-focused, then this can degrade the learner's self-efficacy beliefs.

1.4.2 Clinical learning environment's influence on perceived self-efficacy

The clinical learning environment can influence learners' perceptions of self-efficacy through verbal persuasion and learners' psychological states in either a positive or negative manner. A positive CLE can positively affect learners' self-efficacy beliefs. "Learning environments that construe ability as an acquirable skill, deemphasize competitive social comparison, and highlight self-comparison of progress and personal accomplishments are well suited for building a sense of efficacy that promotes academic achievement."[19]

A negative CLE can negatively affect learners' self-efficacy beliefs. In that, if a student or resident is not adequately engaged and supported each time they present their patient case, this can lead to experiences of 'un-mastery', where the learner feels he/she has 'failed' in their ability to manage patients. Likewise, if the learning environment is not adequately supportive, learners may make unhealthy social comparisons, creating vicarious experiences that diminish their sense of self-efficacy. These repetitive negative experiences can create irrational thought patterns and evoke stressed or anxiety driven emotions for the learner, which will only exacerbate the negative influence on their self-efficacy beliefs.[19] Often the above negative clinical learning environments are created by unbalanced power and inappropriate physician-identity construction.[21]

1.4.3 Communities of practice's influence on perceived self-efficacy

In the context of Communities of Practice learning theory, bedside teaching acts as the 'living curriculum', where the 'work of engagement' occurs, allowing a space for 'new comers' (medical students and residents) to actively participate in the community of practice of medicine. Through *participation* and *reification*, the learner gains meaning (*learning as experience*), has the opportunity to practice (*learning as doing*), becomes actively involved into the community (*learning as belonging*), and the opportunity to participate in the ongoing evolution of identity (*learning as becoming*).[18] It is through these repeated acts of participation and reification that learners' self-efficacy beliefs are influenced. In that, through participation and developed competence, mastery experiences occur; and reification (synonymous with social persuasion) creates opportunities for verbal persuasion; both of which can positively influence learners' perceived self-efficacy beliefs.

Yet it is also important to understand the nature of the COP the trainee is entering. If the nature of the clinical community of practice is negative with unbalanced power issues and inappropriate physician identity construction, then the trainees will learn and propagate this negative community, which is likely to negatively affect the trainees' self-efficacy beliefs.[21]

1.4.4 Social research

The methodologic framework of this study is action research. Action research by its nature is more 'data-driven' than 'theory-driven', therefore, I did not commit to a specific theoretical framework. That said, this study draws heavily on the social learning theories of Wegner and Bandura. Since "action research is an approach to *social* research – understanding how human beings interact with one another, and how we respond to events and situations," it made sense to use an applied social research.[2] Therefore, if learning is achieved through social practice and action research is the study of social situations, then it is fitting to use action research to test and implement change within the context of social learning.

1.5 RATIONALE FOR THE STUDY

Based on this overview of the literature it is clear that bedside teaching, the clinical learning environment, and participation in clinical communities of practice, which are all integral components of a ward round, each have a significant influence on trainees' self-efficacy beliefs about their ability to practice medicine. These beliefs have a profound influence on trainees' learning behaviour, academic performance, and ultimately their practice as clinicians. The mandate to deliver bedside teaching on ward rounds which creates an engaging learning environment, provides opportunities for participating in, and becoming members of communities of practice, and has a positive impact on trainees' self-efficacy beliefs is clear. Studies that address these aspects of clinical training, therefore, have the potential to significantly influence trainee learning, performance at university and clinical practice once graduated. This has clear implications for the quality of patient care likely to be delivered by these graduates.

1.6 CONTEXT OF THE STUDY

Africa is home to a near quarter of the global burden of disease, but with less than two-percent of the world's physicians.[8] Literature shows that the number of healthcare workers directly impacts the health of communities.[22] Therefore, in order to address this burden of disease and improve communities' health, it is essential to create a high quality and sustainable healthcare workforce in Africa.[8,9] One strategy considers the training of future healthcare professionals with a full realization that "The 21st century is bringing new challenges . . . [which] place enormous expectations and responsibility on the role of health training institutions."[8]

Focus has been directed to "develop or expand and enhance models of education" within Sub-Saharan Africa.[23] Yet persistent challenges remain in ensuring access to high quality clinical teaching. According to the *Survey of Sub-Saharan African Medical Schools*, a descriptive survey of medical schools in Africa, "faculty related issues were most commonly cited as the single greatest need in order to improve the quality of graduates."[24] In their discussion, they proposed, "investment in faculty and curricula might improve the quality of doctors trained."[24]

At the initiation of this study, Botswana had 3.4 physicians per 10,000 population, of which less than a quarter of these physicians are citizens of Botswana.[25] In response to the need for a local, sustainable healthcare workforce, in 2009, the University of Botswana opened the country's first medical school, UB Faculty of Medicine. And in 2010, to ensure continued training opportunities for graduating medical students, the country launched its first postgraduate medical education residency programs in Paediatrics, Internal Medicine, Emergency Medicine, Family Medicine, Pathology, Anaesthesia, and Public Health.[9,24]

Despite the many successes of the new medical school, the article *Establishing a New Medical School: Botswana's Experience,* emphasized that "Perhaps the biggest challenge the school faces is recruiting and retaining local and expat academics."[9] This highlights the need that with limited faculty numbers for medical students and residents, a key area of focus should be to ensure access to high quality teaching. Specifically, bedside teaching, which forms the cornerstone of clinical education for medical students and residents, in that, "[e]arly exposure to clinical practice . . . promotes competence by teaching students how to integrate and apply knowledge in practice settings, learn from role models, and experience interdisciplinary and team approaches to the provision of health services."[8]

Review of the literature, including the scholarly output from the Botswana Medical Education Partnership Initiative, indicates that there have been no published evaluations of clinical teaching, the clinical learning environment, or trainees' self-efficacy beliefs within the UB Faculty of Medicine Department of Paediatrics & Adolescent Health.[26-28] Without this information, and specific strategies to address issues found wanting, it is unlikely that the mandate to address the quality of teaching at the university will be achieved. Strategies to do so are urgently needed.

1.7 PURPOSE

The purpose of this study was to determine in which ways clinical learning and teaching could be optimized to best support trainees' perceptions of their self-efficacy within a clinical context. Specifically, we considered elements that could potentially create opportunities to positively impact factors that influence perceptions of self-efficacy; i.e. elements that increase positive i) mastery experiences, ii) vicarious experiences, iii) verbal persuasion, and iv) psychological states.

1.8 AIM

The aim of this study was to improve the quality of ward round learning and teaching for University of Botswana medical trainees working in the Department of Paediatrics at Princess Maria Hospital in order to enhance their self-efficacy beliefs regarding their ability to provide paediatric patient care.

Note, during the course of this project, my positionality as the researcher underwent considerable shifts from 'outsider' conducting 'participatory action research' to 'insider' conducting 'practitioner research'. In turn, an unexpected secondary aim and outcome developed – to explore, understand and articulate the influences of the project on my own practice as a physician and clinical teacher.

1.9 RESEARCH QUESTIONS

This study focused on answering seven questions with regards to clinical teaching on ward rounds conducted in the Department of Paediatrics at Princess Marina Hospital, Botswana.

1. What are faculty and medical trainees' understanding of, attitudes towards and experiences of teaching and learning on ward rounds?
2. What are medical trainees' perceptions of the clinical learning environment in the hospital, and more specifically on ward rounds?
3. What are medical trainees' perceptions about their participation in, and sense of belonging to, the departmental community of practice, as experienced on ward rounds?
4. What are medical trainees' self-efficacy beliefs regarding their ability to provide patient care?
5. Do medical trainees' perceptions of the clinical learning environment and the departmental community of practice on ward rounds influence their self-efficacy beliefs regarding their ability to provide patient care?
6. Based on the findings of the study (Questions 1 – 5) how could one or more existing models of clinical teaching be adapted to provide locally and contextually relevant structured bedside teaching on paediatric ward rounds at Princess Marina Hospital in Botswana?

7. Does the introduction of a structured approach to bedside teaching enhance the CLE on ward rounds, improve trainee participation in, and sense of belonging to, the departmental community of practice on ward rounds, and/or improve trainees' self-efficacy beliefs about the ability to provide clinical care?

1.10 OBJECTIVES

Using a mixed-methods approach, the research questions were answered by addressing the five following objectives:

(1) assess the prevailing teaching and learning environment on paediatric ward rounds at Princess Marina Hospital in the Department of Paediatrics, University of Botswana,

(2) explore influences on and determine the prevailing self-efficacy beliefs of medical students and residents about their ability to provide paediatric patient care,

(3) adapt and introduce a structured approach toward ward round teaching

(4) use an iterative approach to further refine the ward round teaching model to enhance its local relevance, and its effect on the self-efficacy of medical students and paediatric residents, and

(5) conduct serial measurements of trainees' perceptions of:

(i) the clinical learning environment on ward rounds,

(ii) their sense of participation in, and belonging to, the community of practice on ward rounds, and

(iii) their perceived self-efficacy to provide paediatric patient care.

1.11 SCOPE & DELIMITATIONS

The iterative, data-driven, encompassing aspects of action research (AR) created a scenario whereby the content of this project was very large and touched on many themes. These themes included: faculty development, resident wellness, feedback, identity construction, hidden curriculum, effective elements of learning, effective elements of teaching, role-modelling, residents-as-teachers, workplace learning, experiential learning, development of clinical reasoning, socio-cultural influences on

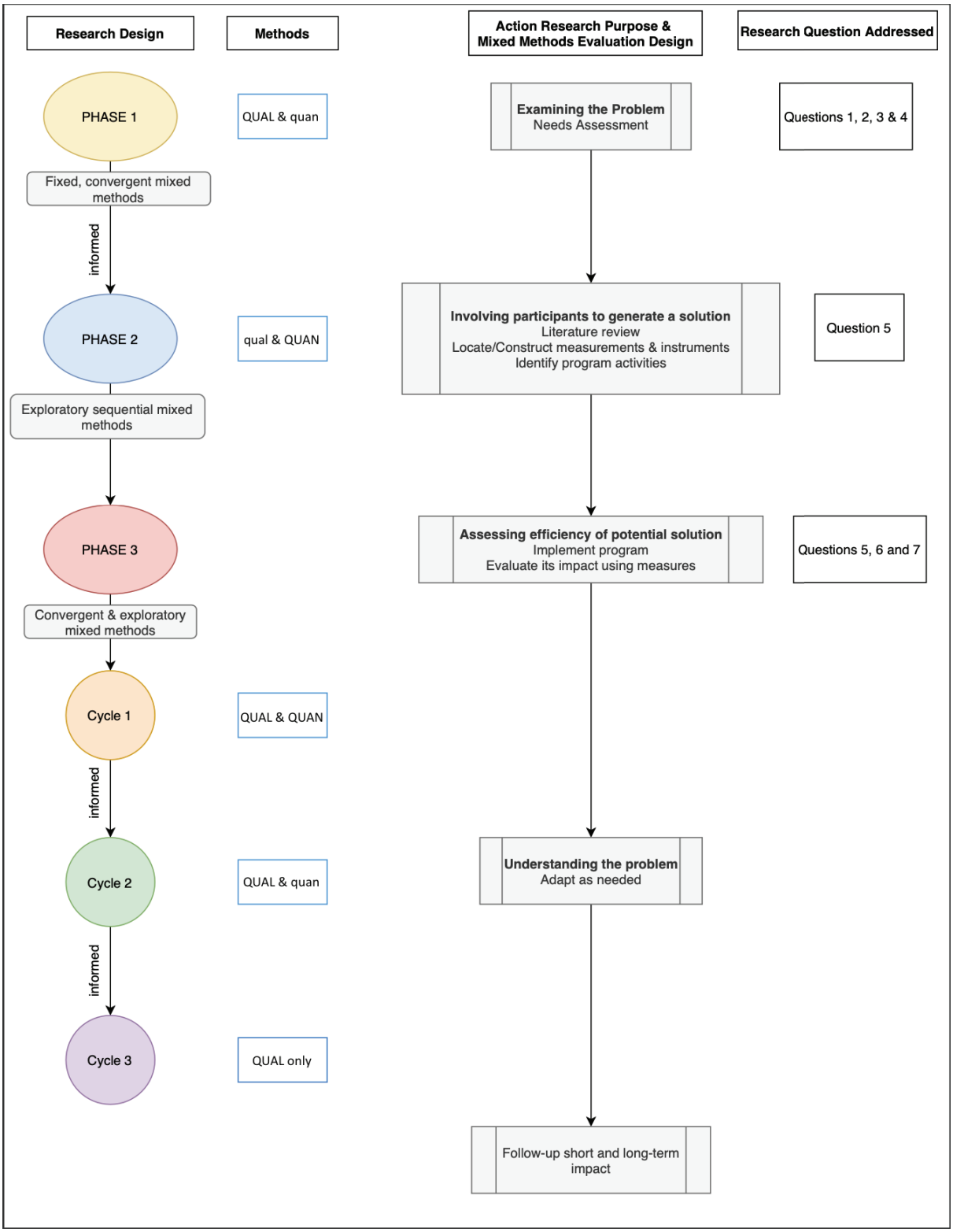
learning, and North-South relationship, among others. Despite the broad array of topics touched during the AR project, the scope of this dissertation will be limited to inpatient bedside teaching as it relates to learner-centred bedside teaching models, the clinical learning environment, communities of practice within a clinical setting, and perceived self-efficacy. These delimitations are to ensure we remain in accordance with the stated aim and conceptual model of the project.

Note, while the researchers involved in this project recognize and appreciate the much broader scope of health professional education (HPE) vs medical education, since this research only focuses on medical faculty and medical education trainees, the terms have sometimes been used interchangeably. This was not meant to be exclusionary to the fields beyond medicine within health professions, and while our hope is that our findings will be relevant to the broader HPE community, only medical education trainees and faculty participated in this study, so we can only comment directly on that scope of participation.

1.12 TIMELINE & OVERALL RESEARCH DESIGN

This study took place between November 2016 and March 2019 and was conducted in three distinct phases; with Phase 3 having three cycles. Each phase of the study addressed different research objectives. The purpose of Phase 1 was to develop a detailed understanding of the current paediatric ward rounds. Phase 2 drew from the findings of Phase 1 to determine specific interventions that would be used in Phase 3. And Phase 3 tested, modified, and implemented the interventions generated in Phase 2. *(Figure 3)*

FIGURE 3: RESEARCH DESIGN



1.13 CHAPTER SUMMARY

In this chapter, I introduced myself and motivations as the researcher, how the 'problem' was identified, and provided a basic description of the DoP's status quo in regards to ward rounds. In addition, I introduced the values, assumptions and dynamic influences of bedside teaching, the clinical learning environment, communities of practice, and perceived self-efficacy within the context of medical education. I described the rationale, purpose and aim of the project. I introduced the specific research questions and objectives, as well as provided scope for the dissertation. The next chapter will more deeply explore the literature in relation to these topics.

CHAPTER 2 – LITERATURE REVIEW

2.1 CHAPTER INTRODUCTION

This chapter will introduce the reader to the relevant literature in regards to the history, theories and evaluation of bedside teaching, bedside teaching models, clinical learning environments, communities of practice, and perceived self-efficacy. Literature pertaining to specific methodology will be reviewed under the Methods Chapter.

2.2 SEARCH STRATEGY

The literature review was conducted utilizing the University of Pennsylvania's, Texas Medical Centre's, and the University of Cape Town's online library resources, which all have access to several journal publications, books and interlibrary loan. Specific chapters from books were scanned and emailed per request. Specific search engines used included PubMed, EBSCO, and Google Scholar. Initial broad search included our main topics in bedside teaching, CLE, COP and PSE. This was supplemented by further searches which reviewed the list of all Best Evidence Medical Education published guides[29] and the list from "The top-cited articles in medical education: a bibliometric analysis"[30] for any relevant topics and corresponding authors. Key words in search engines included: authors names, bedside teaching, bedside teaching model, clinical learning environment, 'hidden curriculum', self-efficacy, communities of practice, legitimate participation, feedback & medical education, effective teaching & medical education, clinical learning environment & survey &/or measurement, the Stanford Faculty Development Program, SNAPPS, faculty development, and clinical teaching. References from pertinent articles were scanned to broaden search; as relevant, these references were then reviewed and included in the search. As the project progressed, the literature continued to be reviewed and updated based on the needs of the project, including updated articles that were published after the first search review. The search review also included all Methods-related topics, such as action research, the behaviour change model, and the Consolidated Framework for Implementation Research, but will be discussed in detail in the Methods Chapter. *Note*: This literature review was not meant to be comprehensive, but limited to the scope of the project.

2.3 BEDSIDE TEACHING

Bedside teaching, defined as "teaching in the presence of a patient,"[31] has historically formed the backbone of engagement between clinician teachers and students at the bedside.[11,31] This form of engagement is diverse and includes demonstration or observation of important clinical skills, such as history-taking, physical exam techniques, and bedside procedures. Bedside teaching allows teachers to involve trainees in clinical problem-solving and decision-making, which can highlight the importance of evidence-based medicine and self-directed learning. Here, the teacher is also a role model for appropriate communication skills, time-management, and professionalism, including teamwork and dealing with ethical challenges.[11,13,31-34] In addition, being at the bedside allows the patient to be an active participant in his or her own care. There is growing evidence that "patients favour bedside teaching and report better understanding of their illness after participating in bedside teaching."[13,32,35,36] Furthermore, bedside teaching is an embodiment of "learning in context" which improves learning, because information can be recalled easier and learned content can be transferred from one patient to another.[33,37] Therefore, bedside teaching "offers lifelike preparation and has more relevance to the trainee's future" that cannot be simulated in a classroom.[33]

Despite the clear merits of bedside teaching, the practice of this skill is fading. In United States medical schools bedside teaching has significantly declined since the 1960s - from 75% to roughly 15% today.[12,31,38] Its decline has been attributed to increasing patient loads, time constraints, advances in technology, unavailability of patients, ad hoc nature, noisy wards, limitations to cover the whole curriculum, and "conflicting pressures of teaching and service delivery."[11,13,33] One of the most notable reasons for not performing bedside teaching, is that "many physicians are not comfortable with bedside teaching and do not go into patients' rooms with the intention to teach."[12,32] As Janicik et al. describe, "This reluctance has created a generation of teachers uncomfortable and unfamiliar with the basic principles of teaching at the bedside."[32] This is compounded by the findings that there is very little bedside teaching "how to" instruction within medical education texts.[11] This has resulted in a decline in bedside teaching that has become a "threat to the development of skills and attitudes essential for the practice of medicine."[31]

2.4 BEDSIDE TEACHING MODELS

To sustain and foster bedside teaching, several models have been developed to overcome the constraints placed on the teacher-learner interaction. Examples of these instructional strategies include: SNAPPS, the One-Minute Preceptor, concept mapping, the Three-Domain Model, and the Patient-Based Model.[14,15,32,33,39] Each strives to improve the quality of clinical teaching while addressing commonly encountered barriers to bedside teaching. Yet, from a recent review of "effective teaching strategies used in a clinical setting", only SNAPPS and OMP were "well-established teaching strategies consistently proven effective in the clinical setting,"[40] therefore only these two models will be discussed in detail.

2.4.1 SNAPPS

In 2003, in response to the need for an effective, yet practical, ambulatory teaching model, Wolpaw et al. developed a learner-centred model for outpatient education called "SNAPPS",[14] which entails 6 steps: ***S**ummarize* the history and physical exam, ***N**arrow* 2-3 possible differential diagnoses, ***A**nalyse* the differential, ***P**robe* the preceptor for any uncertainties, ***P**lan* management care for the patient, and ***S**elect* a case for self-directed learning. It drew on the works of Nendaz and Bordage in cognitive learning, Osterman and Kottkamp in reflective practice, and Foley for clinical teaching concepts.[41-43] Integral to its design is a learner-centred approach, built-in experiential learning, verbalization of critical reasoning and uncertainties, and self-directed learning.

The learner-centred approach of SNAPPS highlights the need to move away from the often-constraining fact-based presentation/probing teaching style toward encouraging analytical thinking.[14,43,44] Foley et al. describe "low-level" versus "high-level" aspects of clinical teaching.[43] Low-level clinical teaching includes aspects pertaining to reporting, reading, summarizing, giving or asking directions, and/or asking about facts. Whereas high-level clinical teaching provides or asks students information regarding: comparing, contrasting, evaluating, synthesizing, predicting, and hypothesizing. Foley et al. argue that, "Medical students will become better problem-solvers when provided with opportunities to engage actively in problem-solving, whereby the student rather than the teacher solves the problem."[43] In this way, the SNAPPS model offers an outline for quality bedside

teaching by “link[ing] learner initiation and preceptor facilitation in an active learning conversation,” which is an essential aspect of bedside teaching.[14]

Wolpaw et al. conducted a pilot study of their SNAPPS model for fifty 3rd year US medical students during their three-week ambulatory rotation over the course of one academic year. General feedback of the use of SNAPPS was captured from students and preceptors and was found to be overall positive. Students particularly enjoyed the “unique approach of questioning the preceptor and selecting a focused issue for self-directed learning.”[14] In addition, the students reported that the model was “intuitive and easy to learn”, and they felt “capable of assuming an active role” in the learner-driven process.[14] Preceptors also gave positive feedback on the SNAPPS model, particularly in regard to the “student-initiated questions”, which they felt created a more engaged student and stimulated learning encounter where teaching was now more student-driven and directed.[14]

Shortly after their pilot study, Wolpaw and colleagues conducted a randomized control trial (RCT) to assess the influence of the SNAPPS technique on student’s “expression of clinical reasoning and learning issues” and published their findings in 2009.[45] Utilizing a post-test-only comparison model, from the 64 case presentations that underwent comparative analysis, the SNAPPS group was found to have more concise summaries, expressed twice as many differential diagnosis, justified their diagnostic possibilities more than five times more often, compared and contrasted between diagnostic possibilities more often, formulated nearly eight times more questions and uncertainties, initiated management discussions nearly 30% more often, and were the only group to have student-initiated selection of readings occur.[45] All of these benefits were found without the burden of extra time to present student cases. These findings confirmed the researchers’ hypothesis that the SNAPPS technique does indeed “enhance expression of diagnostic reasoning and uncertainties during case presentations” in an outpatient setting for undergraduate medical trainees.[45]

In 2012, Wolpaw and colleagues published their findings of a follow-up study which considered “the nature of uncertainties expressed by medical students using the six-step SNAPPS technique” and to discover how preceptors responded to these uncertainties.[46] This secondary analysis of the previously captured RCT data underwent qualitative content analysis for the “type of student uncertainties, nature of preceptor responses, alignment of preceptor responses with uncertainty types, and expansion of preceptors’ responses beyond addressing uncertainties.”[46] From the 60 case

presentations that underwent secondary analysis, the researchers found that the SNAPPS group expressed uncertainties twice as much as the comparison group and that of the uncertainties expressed by students using SNAPPS, these were more focused on "diagnostic reasoning" as compared to the non-SNAPPS group.[46] Preceptors' frequency, content and expansion of responses to student uncertainties were found to be similar between SNAPPS and non-SNAPPS groups, but that the content of the preceptor response was indeed directly related to the student-expressed uncertainty.[46] When considering these paired findings that 1) the SNAPPS technique engages students to express uncertainty more often, and of these uncertainties expressed, more are likely to be of diagnostic reasoning content, and 2) that the "student's questions triggers a teaching-learning moment"; the researchers therefore concluded that the SNAPPS model is an "effective cognitive forcing strategy that transforms students' clinical reasoning and uncertainties from private thoughts to accessible, discussable teaching opportunities for teachers."[46]

2.4.1.2 Further research and literature post-SNAPPS

Since the original 2003 Wolpaw et al. publication, as of October 2020, it has been cited 134 times.[47] Of these, there have been seven review articles[40,48-53] and thirteen original research activities directly related to the testing or use of SNAPPS.[54-66]

2.4.1.2.1 - Review articles

Since 2004, seven review articles have been published that directly discuss SNAPPS as part of their overall commentary.[40,48-53] In general, these review articles advocate for the use of bedside teaching models and consider in which ways the SNAPPS model can be useful to the practicing clinical teacher, often with editorial comparison to other bedside teaching models, most notably the One-Minute Preceptor. Each review article has varying emphasis on different perceived barriers to clinical teaching, such as: teaching in front of the patient, teaching in busy clinical settings, or how to enhance trainee diagnostic reasoning. Notably, one of these review articles was a realist synthesis review of the "effectiveness of teaching strategies used in the clinical setting on the development of clinical skills among health professionals," which offered a comprehensive review of several bedside teaching strategies.[40]

While Wolpaw's original studies only included 3rd year US medical students in internist and family medicine ambulatory settings, some review articles make editorial comments on the application of SNAPPS in varying settings and/or with different trainee populations. Specifically, several review articles commented on the application of SNAPPS in an inpatient or emergency room setting, with postgraduate trainees, and/or in other non-US English-speaking countries, such as Australia and Canada. While these review articles offer a positive perspective and theoretical application on the use of SNAPPS in multiple settings with multiple trainee types, they offer no new substantiated information beyond the original Wolpaw work. Notably, despite the lack of new evidence provided in these review articles to generalize the SNAPPS model to these different settings or trainee populations, often subsequent authors reference these review articles as having established SNAPPS' effectiveness in these other settings/populations contrary to the lack of evidence provided.

2.4.1.2.2 - ORIGINAL RESEARCH

From 2014 to 2020, there have been 13 publications describing research directly aimed at testing or obtaining feedback on the use or adaptation of SNAPPS, (11 original research manuscripts[54-60,63-66] and 2 editorial letters[61,62]). Of these publications, two manuscripts could not fully be reviewed because only the abstracts were available in English[58,63]; one manuscript described an accompanying strategy to the SNAPPS model[54]; two studies performed a head-to-head comparison of SNAPPS versus OMP[59,65]; and T. Wolpaw was a co-author on two.[54,56] *Note*: due to the divergent purpose or lack of information, three studies were not included in the following summations.[54,58,63]

Of the remaining 10 publications (eight original manuscripts[55-57,59,60,64-66] and two editorial letters[61,62]), all but one occurred outside the US[61]; the other publication locations included: India (x4)[55,60,62,64], Japan (x2)[59,66], Thailand (x1)[56], Iran (x1)[57], and Brazil (x1)[65]. With the exception of one inpatient study[64], all studies occurred in the outpatient setting. The clinical context encompassed internal medicine (x5)[56,59,62,64,66], paediatrics (x2)[60,65], surgery (x1)[55], gynaecology (x1)[57] and psychiatry (x1)[61].

Trainee populations were comprised of postgraduate residents (x5)[55,59,60,62,64], medical students (x3)[56,65,66], midwifery students (x1)[57], and one study included a mix of postgraduate residents and sub-

specialty fellows[61]. The number of trainees recruited varied dramatically between studies, ranging from 4 to 128 trainees, although not all recruited trainees participated in the SNAPPS training and experience but instead were used for comparison/control groups. The teacher population was often not described, but of those studies that did include this information, preceptors using SNAPPS ranged from 1 to 6 within a given study.

The duration of exposure to SNAPPS and the frequency of its use was difficult to gather from many of the studies. While the study periods ranged from 2 months to 3 years, the actual trainee time spent using SNAPPS was often limited to days or weeks; and of the SNAPPS presentations for data analysis purposes, studies used from 3 to 10 real-patients or 1-2 paper patient encounters. No studies commented on the use of SNAPPS beyond the study period, but one editorial letter described a 7-year experience of implementing and using SNAPPS within their psychiatric clinic.[61]

All of the studies aimed to measure some aspect of the effects of SNAPPS on clinical reasoning, case presentation content, clinical skills and/or trainee and faculty's feedback on SNAPPS. Only one study aimed to ask the question "does SNAPPS generalize" into a non-US based academic clinical setting.[56]

To answer these research questions, six studies used a randomized control trial design[56,57,59,62,64,65], one used a cross-over intervention method[60], and three studies used a post-intervention descriptive assessment[55,61,66]. Many of the studies used data collection and analysis techniques similar to Wolpaw's original 2009 RCT, including the use of audio recording case presentations, using coding/checklists to measure clinical reasoning outcomes based on the six steps of SNAPPS and length of time of case presentations.

Similar to Wolpaw et al. these subsequent studies found positive effects on clinical reasoning when using SNAPPS, particularly in terms of including more differential diagnosis, justifying their differential diagnosis more often, expressing more questions and uncertainties, and selecting cases for self-directed learning more often as compared to the control/comparison groups. For those studies that did not do a direct comparison, but a descriptive post-intervention, they found overall promising outcomes and positive feedback from trainees on the use of SNAPPS.

2.4.1.2.3 - GAPS IN THE SNAPPS LITERATURE

Despite several SNAPPS original research articles, there continues to be large gaps in the literature about its use. Notably, with the exception of Connor's editorial letter, no publications discussed their SNAPPS implementation strategies, barriers and successes; uptake, upscale or sustainability of its use.[61] To that end, based on their realist synthesis review, Pierce et al. recommend that, "Future studies should include the following: [1] description of teaching strategy, [2] description of the teacher and learner orientation process to the strategy (including the format of orientation, duration, and frequency), [3] the frequency of use of the strategy, [4] the duration of exposure to the strategy, [5] the number of teachers delivering the strategy, [6] the number of learners receiving the strategy, and [7] the number of learners and teachers for which outcomes data are collected."[40]

Further, with the exception of Jain et al., no studies have examined SNAPPS use in an inpatient setting.[64] This significantly limits our understanding of SNAPPS' use during a dynamic ward round with multiple complex patients, rounding on the same patient multiple days in a row, with multiple trainee levels on a single-team, and simultaneous interdisciplinary learners. There is limited report of faculty perceptions of learning and using SNAPPS and its effects on their clinical teaching. And there is no report of the effects of the use of SNAPPS beyond clinical reasoning, expression of uncertainties, and engagement in self-directed learning; specifically, in terms of 'soft skills', such as "the domains of empathy, communication, or professionalism."[40]

2.4.2 ONE-MINUTE PRECEPTOR

In 1992, the One-Minute Preceptor model, or synonymously, the "Five-Step 'Microskills' Model of Clinical Teaching", aimed to enhance teaching at the bedside, was published.[15] Originally designed to deal with time constraints in the outpatient setting, it is teacher-led utilizing five-steps for conducting brief teacher-learner interactions to maximize the teachable moment.[15,51,52] Drawing from previous work done by Koen and Vivian,[67] that identified "18 microskills" for effective clinical teaching, the authors of this model focus on five of the previously identified microskills. The specific microskills were chosen to identify resident's needs as a learner and to "focus the preceptor-resident encounter on the decision-making process used by the resident."[15] The five microskills are: 1) Get a commitment, 2) Probe for supportive evidence, 3) Teach general rules, 4) Reinforce what was done right, and 5) Correct

mistakes. Each microskill is accompanied by example questions for the teacher to ask the learner to form a teacher-learner discussion and to prevent the teaching session from becoming a "mini-lecture."[15]

The microskills are designed to occur in a sequential "step" manner from most to least important to ensure that if time limitations prevent conducting all five steps, the model at least allows the learner to complete step one, *Get a commitment*; "By making a commitment, the resident feels responsible for patient care and enjoys a more collaborative role in problem solving."[15] Whereas, step five, *Correcting mistakes,* is placed last, to emphasize that that the earlier steps are more important, especially because it "is the nature of many [teachers] to put this microskill first."[15]

In contrast to the SNAPPS model where the learner is encouraged to Probe the teacher, step two, *Probe for supportive evidence,* is designed for the teacher to probe the learner about the patient encounter. Also unlike the SNAPPS model, it does not have a built in step for self-directed learning, but the authors note that step three, *Teach general rules*, can offer an opportunity for modelling self-directed learning.

OMP has incorporated feedback at steps 4 and 5. The authors emphasize that step four, *Reinforce what was done right*, "is not general praise, which serves to reinforce no particular behaviour," but should "focus on those specific behaviours that the resident will be able to repeat consciously."[15] Likewise, step 5, *Correct mistakes*, should also be specific and should provide information on "how to correct the problem or avoid it entirely in the future."[15]

The authors reflect on the limitations of this model, stating, "it has no direct provision for addressing the psychological state of the resident,"[15] which is known to have impact on the learner.[16,17,19] This also highlights the importance of a supportive learning environment for this model to be effective and "that these questions not become a means of grilling residents about general concepts."[15]

2.4.2.1 Further research and literature post-OMP

Based on a realist synthesis review of the effectiveness of teaching strategies,[40] from 2001 to 2020, there have been 8 publications[68-75] and 3 abstracts[76-78] describing research directly aimed at assessing the effect of OMP on teaching skills[68-73] or on the adaptation of the OMP model[74,75]. Three of these publications were produced by the same three authors and used very similar settings and methodologies[70-72]; and two of the abstracts were produced by the same author describing ongoing work from a single institution[76,77]. Of these, two manuscripts could not be fully reviewed based on availability of the abstract only.[74,75] *Note*: this list does not include the bedside teaching review articles already described above; or the two head-to-head comparison publications described below.

Of the remaining 9 publications, all but one[73] occurred within the United States. Three studies showcased scripted videos set in a typical ambulatory internal medicine setting[70-72]; the remaining clinical contexts included: inpatient internal medicine (x2)[68,78]; outpatient internal medicine (x3)[69,76,77]; and a clinical dental setting in Singapore (x1)[73].

Participant populations were comprised of: medical students[72], postgraduate internal medicine residents[68]; postgraduate dental residents[73], internal medicine faculty[70,71,78], a combination of senior internal medicine residents and medical students[76,77], and a combination of internal medicine faculty and medical students[69]. Trainee total number of participants varied from 22 to 164, and faculty participant numbers ranged from 6 to 116; some of which were used for control purposes only.

The duration of exposure to the teaching model varied significantly from single viewing of pre-scripted video-taped encounters, to single or multiple encounters post-resident/faculty development workshops. With the exception of one study which described 47 discrete post-workshop encounters[69], it was overall difficult to determine the extent and frequency of trainee post-workshop exposure to the teaching model. No studies commented on the use of OMP beyond the study period, but one abstract described a three year aggregate of data of a residents-as-teachers elective that used OMP as part of its residents-as-teachers training workshop[77].

All of the studies aimed to measure some aspect of the effects of OMP on teaching effectiveness, with particular emphasis on OMP verses traditional non-structured methods of bedside teaching. Three of the studies primarily focused on resident use of OMP as part of ongoing resident-as-teachers initiatives[68,76,77], and one study focused on the quality of faculty feedback with the introduction of OMP[69].

To answer these research questions, one study used a randomized control trial[68]; three used pre-post workshop intervention model[69,73,78]; three used within groups experimental design[70-72]; and the two related abstracts used a post workshop assessment[76], followed by a three-year-pooled mixed data analysis assessment[77]. Most studies used surveys generated to assess some combination of overall clinical teaching, the five elements of OMP, and learner perceptions, among others. Participant survey responses were generated from either viewing scripted video encounters or single/multiple non-scripted 'real world' encounters pre and post OMP introduction.

The three studies that used scripted video clinical scenarios showed positive results with both students and faculty rating the OMP-used encounters as "more effective and efficient . . . model of teaching" when compared to non-OMP encounters.[70,72] In addition, OMP-viewed encounters "shifted teaching points away from generic clinical skills toward disease-specific teaching" as compared to traditional models.[71] Of the six studies that occurred in a non-scripted clinical setting, the three studies that considered OMP impact on residents-as-teachers all showed positive outcomes with improved perceptions of clinical teaching and/or teaching confidence.[68,76,77] Of the final three studies, one study showed increased faculty confidence in teaching, but did not show change in use of microskills post-intervention[78]; another study showed modest improvement in faculty feedback, but no change in student satisfaction post-intervention[69]; and the final study showed no improvement between pre and post OMP-intervention groups.[73]

2.4.2.1.2 - Gaps in the OMP literature

Despite these contributions, outside of OMP's use within a residents-as-teachers curriculum, there remains a paucity of information regarding the practical advantages or use of OMP in a clinical setting. Only one study looked at faculty use in an inpatient setting with multiple trainee levels, which results

were somewhat conflicting. It is difficult to extrapolate direct comparisons of medical residents to dental residents, but it is concerning that the only non-US-based study showed no improvement post-OMP introduction. Additionally, the most robust data supporting the use of OMP came from scripted video encounters and lacked the 'real world' medical clinical context where OMP would be most often used.

2.4.3 SNAPPS vs OMP

SNAPPS and OMP share the goal of practically enhancing the clinical teaching encounter. Additionally, both "uniquely structure the conversation between teacher and learner and deliberately incorporate steps that foster collaborative dialogue and provision of feedback."[40] Research has shown effectiveness in both, but only OMP demonstrated effectiveness in the hospital and ambulatory settings; there have been limited studies of SNAPPS in the inpatient setting. The main difference between SNAPPS and the OMP is that SNAPPS is "learner-led" and OMP is "teacher-led", which has "implications for their application to specific clinical teaching contexts."[40]

Two head-to-head SNAPPS versus OMP studies have been published. Seki et al. aimed to "ascertain the differences between SNAPPS and the OMP in case presentation content and learner evaluation when used to teach residents about case presentations."[59] They found that SNAPPS induced "more meaning units related to questions and uncertainties and [gave] more satisfaction to residents than the OMP."[59] Likewise, Fagundes et al. aimed to "compare the content of the case presentation" between SNAPPS and OMP.[65] They found that while OMP and SNAPPS "equally promote medical students' expression of clinical reasoning," SNAPPS was more effective than OMP in "helping students to take on an active role during the case presentation."[65] Both studies recommended the use of SNAPPS for learners.

2.4.4 SOAP

The Subjective-Objective-Assessment-Plan (SOAP) format preceded the above BTMs. While the SOAP format is not technically considered a BTM, it continues to be the most predominant and traditional

method for trainees presenting on ward rounds.[79] Developed in 1964 by Weed, it was created as "a problem-oriented tool to teach medical students and residents to analyse patient signs and symptoms and to represent the four major categories of documentation."[79] Initially developed as a teaching guide for students to "organize their thoughts and logically pursue lines of investigation," today, the it provides several additional practical functions, including medical record documentation, physician communication, and billing.[79]

The SOAP format provides a systemic way to approach and document each patient encounter. ***S**ubjective* "contains information about the problem from the [patient's] perspective," including the chief complaint, history of present illness, and pertinent review of systems, social and past medical histories.[79,80] ***O**bjective* "consists of those observations" made by the health care provider; this includes vital signs, physical exam findings, and any initial laboratory or imaging work-up.[79,80] ***A**ssessment* "demonstrates how the subjective and the objective data are being formulated, interpreted, and reflected upon" by the provider.[79,80] Here, the provider must make connections between the Subjective and Objective steps and "reflects the culminating point of synthesizing" to provide a working diagnosis for the patient; sometimes this can be a list of problems if an accumulative diagnosis cannot be made at initial presentation.[79] Finally, ***P**lan* "summarizes the treatment direction" based on the overall Assessment and includes the who, what and when important to further management.[79,80]

In practice, trainees use the SOAP format to pre-round on the patient and then recite this documentation during the ward round. Generally, this is when faculty will respond to the trainee with comments and questions about the patient and/or the trainee's thought process, but there is no built-in structure for how this is done within SOAP. While it does provide a framework for which problem solving can occur, "the SOAP format will not assure good problem-solving skills" will occur.[80]

2.5 CLINICAL LEARNING ENVIRONMENT

All bedside teaching encounters occur within the context of the clinical learning environment. While bedside teaching models can provide an outline to potentially enhance the content of bedside

teaching, they have not been, in and of themselves, shown to regulate the clinical learning environment in which they occur.

2.5.1 Defining the CLE

The clinical learning environment has been described as "an elusive concept" and despite the many decades of its description, assessment and conversations within HPE literature, there remains a "lack of conceptual clarity."[81,82] In its broadest sense, the HPE CLE has "three key elements: clinical work; learning; and environment" and has been described as the "overlapping space between the 'work environment' . . . and the 'educational context'" for clinical trainees.[81] Within this broader framework exist "different dimensions and elements" including "environment, climate, atmosphere, milieu, and culture."[81] One all-encompassing definition of the CLE is the "social interactions, organizational cultures and structures, and physical and virtual spaces that surround and shape participants' experiences, perceptions, and learning."[81,83] To provide further clarity, Gruppen et al. separated the CLE into "four central components," including: "personal, social, physical and virtual, and organizational."[82] Similarly, Nordquist et al. divided the CLE into six different "avenues", including "psychological, educational, diversity and inclusion, sociocultural, digital, and architectual."[81]

In practice, the CLE relates to both micro and macro influences trainees experience as part of their clinical education, including interactions with faculty, peers and staff, direct supervision, hours worked, team dynamics, patient care, and systems support, among others. Literature has shown that a "suboptimal CLE has been associated with adverse patient care and learning outcomes," and that the "quality of the learning environment" is a "predictor of the quality of care provided by graduates for years after graduation."[81] Therefore, promotion of "an effective and supportive CLE" is important for the "quality and safety of patient care [and] to the health and well-being of the medical workforce."[81]

2.5.2 THE UNFAVOURABLE CLE

Unfortunately, literature shows that the clinical learning environment can often be quite unfavourable for trainees, leading to: stress, depression, burnout, trainee abuse, moral distress, and lack of support to emotional aspects of clinical care, such as death and dying.[16,17] This in turn can negatively affect the learner: impaired academic performance, development of cynicism, academic dishonesty, and in some instances, substance abuse and most worrisome, suicide.[17]

In 1993, the United Kingdom's General Medical Council published *Tomorrow's Doctor*, which reported "problems such as bullying, gender discrimination, harassment, quality of supervision and the presence of poor role models among clinical teaching faulty."[81,84] Similarly, in 2000, the Institute of Medicine published *To Err is Human*, which "highlighted the conditions under which health care professionals were being trained and the culture in which training was imbedded," and its influence on patient safety.[81,85] Subsequent literature has shown that CLEs have "the potential for having a serious deleterious effect on health care and health professions training."[81]

2.5.3 THE FAVOURABLE CLE

In contrast, a favourable clinical learning environment is not merely the absence of those elements which make the environment unfavourable, but it has been described as an environment that is "nurturing" for the trainee and one that values egalitarianism.[17] Methods to promote a nurturing learning environment include, valuing student autonomy, building faculty-trainee relationships, utilizing pass/fail evaluation systems, and modelling compassion and professionalism.[17] It is also recognized that in order to achieve a positive learning environment, the wellbeing of faculty must be considered as well.[17]

2.5.4 LEARNING- VERSUS PERFORMANCE-ORIENTED CLIMATES

The CLE can also be distinguished as either a *learning-oriented* or a *performance-oriented* climate.[86] Krupat et al., in an attempt to find a more meaningful way of assessing medical schools' educational

climate, drew on the work of cognitive psychologist, Carol Dweck, researching motivation.[86,87] She theorised that a student's mindset can have either a 'fixed' or 'growth' mindset.[87] Her work found that "students who believed their intelligence could be developed (a growth mindset) outperformed those who believed their intelligence was fixed (a fixed mindset)."[88] The latter were often *performance-oriented*, i.e. "the goal of validating one's ability through one's performance . . . the goal of looking smart and not dumb."[88] Whereas the former were more learning-oriented, "the goal of increasing one's ability, that is, the goal of getting smarter."[89] This differentiable mindset echoes Bandura's "individuals' perception of the nature of ability"[19], discussed in greater detail later.

Drawing from this theoretical model, Krupat et al. extrapolated the same concepts of an individual's mindset to medical training climate as either 'fixed' i.e. *performance-oriented* or 'growth' i.e. *learning-oriented*.[86] In the 'fixed' or 'performance-oriented' climate, the clinical environment "places emphasis on the demonstration of competence rather than its development," whereby "students are concerned more about the *appearance* of competence than the *growth* of competence."[86] In this performance-oriented environment, trainees "are likely to hide their uncertainty" and "avoid feedback for fear of its possible negative consequences."[86] In contrast, a 'growth' or 'learning-oriented' climate is focused on "students' development and growth" and "is geared toward not only increasing knowledge and skills but also encouraging critical thinking and self-directed learning."[86] In this learning-oriented environment, "uncertainty is to be embraced rather than feared; faculty value students' ability to reason, not just whether their answers are correct; and students receive a great deal of detailed feedback and are encouraged to reflect on how to improve."[86]

2.5.5 Modifying the CLE

The ultimate goal of clinical training is to meet the "public's need for a physician workforce capable of meeting the requirements of the rapidly evolving health care environment."[81] And literature argues that the promotion of a positive CLE "will benefit patients, the public, and the profession, in addition to the individual [trainee]."[17] Therefore, educators and accreditors alike are concerned with the influences of the CLE on current patient care and safety, and the future impact on trainees' post-graduation practice.[90] "Differences in medical learning environments among medical schools and among different departments within the same medical school" suggests that the CLE is modifiable.[17] To that end, efforts have been made to promote CLEs to achieve these expectations. Specifically, in

2013 in the US, this resulted in the CLE-Review, which aims to ensure resident engagement and focus in the areas of patient safety, health care quality, transitions in care, supervision, duty hours and fatigue management, and professionalism.[90] And in 2018, the Royal College of Physicians and Surgeons of Canada "hosted a global consensus conference" with the objective to "delineate tangible short- and longer-term goals towards improving clinical learning environments."[81]

2.5.5.1 THE EFFECTIVE CLINICAL TEACHER

Arguably, one of the most influential aspects on the CLE is the effectiveness of the teacher; "the teacher's actions, attitudes, . . . enthusiasm, and interest in the subject will affect learners indirectly. The capacity for subliminal messages is enormous."[91] Bandura argues that "the task of creating environments conducive to learning rests heavily on the talents and self-efficacy of teachers."[19] In this regard, the clinical teacher has significant influence on the development of the CLE.

The "effective clinical teacher" has been previously described in the literature as one who exhibits organization and clarity in teaching, is a positive role model, provides dynamic group teaching, is enthusiastic and stimulates the learner, is knowledgeable, is clinically competent, and provides appropriate clinical supervision.[92,93] Whereas the ineffective clinical teacher lacks these skills and additionally is "characterized by negative personal attributes."[92,93] Caverzagie et al argue that improving clinical teachers skills in "learner assessment, feedback, and role-modelling will contribute to establish learners' trust and contribute to enhanced perceptions of psychological safety."[94] Here, the concept of psychological safety aligns with the previous description of a *learning-oriented* environment and is defined as an "individuals' perceptions that they can speak out in a work environment without consequences for their professional standing."[94] In turn, "trust and confidence built within the learner-teacher relationship allows for emotional engagement in the learning activity," and enhanced clinical learning overall.[94]

While we recognize that the clinical teacher "is one of the most powerful variables in the educational environment," we also recognize the pressures for a clinical teacher differ than those of a non-clinical teacher.[95] In that, insertion of the learning environment into the clinical context complicates an already dynamic learning environment. Occurring in 'real time', the teaching session is often

unpredictable, limiting the teacher's influence to control the environment. In addition, the CLE adds further complexity for the teacher, such that: he/she is required to teach multiple levels of trainees simultaneously; the medical cases presented are unpredictable, which limits preparation for teaching; a wide variety of teaching methods are required; and finally, the clinical teacher is not only responsible for teaching, but is also responsible for "ensuring excellent patient care." [96]

2.5.5.2 FACULTY DEVELOPMENT

While it is recognized that "academic vitality is dependent upon faculty members' interest and expertise,"[10] often in medicine, it is assumed that clinicians inherently possess the skills to transfer their knowledge onto the next generation of trainees, "leaving many ill-prepared for their teaching responsibilities."[97] This creates a tension between being the 'expert clinician' and the 'novice teacher'. To promote and enhance teaching skills of clinical teachers, faculty development becomes an important component.[97]

The overall goal of faculty development (FD) is to improve outcomes for patients by "improving educational knowledge and teaching practice" which in turn promotes the quality of future practicing clinicians.[97] While there are many challenges to planning and implementing FD, and historically "meaningful or long-term outcomes" of FD have been difficult to measure, it continues to be a principal component of any clinical teaching setting.[97] Strategies to promote FD success include a six-step approach: 1. Problem identification; 2. Needs assessment; 3. Goals and measurable objectives; 4. Educational strategies; 5. Programme implementation; and 6. Evaluation and feedback.[97,98]

2.5.5.2.1 - THE STANFORD FACULTY DEVELOPMENT PROGRAM (SFDP)

One method to enhance clinical teaching effectiveness is the Stanford Faculty Development Program (SFDP).[96] The SFDP is an evidence-based educational initiative created to improve the "instructional skills of clinical teachers", and highlights seven elements for effective clinical learning to occur: 1) Establish a positive learning environment, 2) Control of session, 3) Communication of goals, 4) Promotion of understanding and retention, 5) Feedback, 6) Evaluation, and 7) Promotion of self-

directed learning.[96,99] This model can be used to simultaneously enrich clinical teaching while promoting a positive learning environment.

2.5.5.2.2 - Observation and Learning Tool for Clinical Supervision (OLTCS)

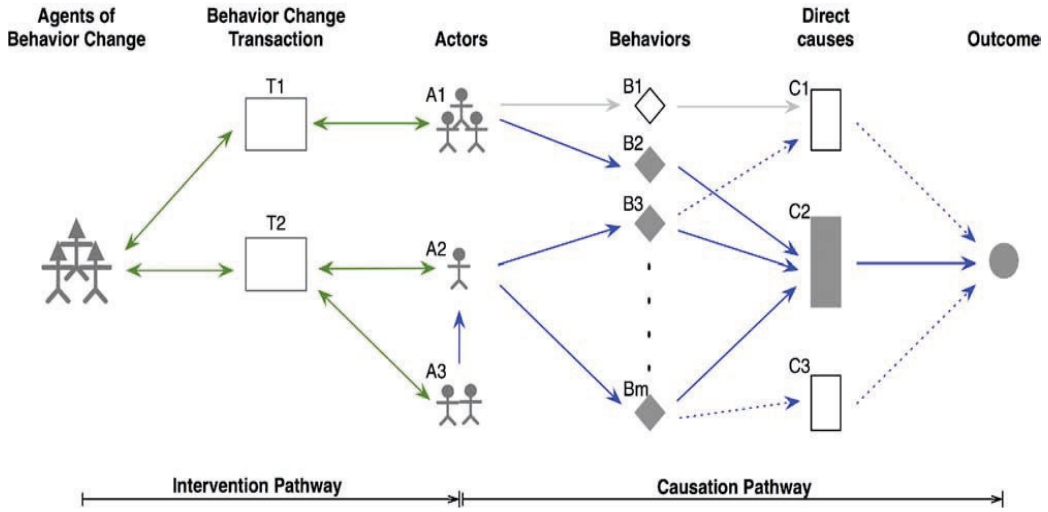
In the same vain, in an attempt to measure clinical teaching effectiveness, Sommer et al. created the *Observation and Learning Tool for Clinical Supervision* (OLTCS).[100] This tool was developed as a "descriptive tool for peer review of clinical teaching skills" and is composed of sixteen items with three steps: 1) Organizes the supervision, 2) Helps the learner to learn from the case, and 3) Ends the supervision.[100] Two unique aspects of the OLTCS make it an appealing tool.

First, while most publications only provide descriptions of a 'good clinical teacher', integral to the summative design of the OLTCS, not only does it define *what* characteristics and skills a clinical teacher ought to possess, it also describes *how* to execute these skills. As such, the OLTCS provides clear descriptions of how an excellent clinical teacher provides bedside teaching, and simultaneously provides descriptions of what a 'less than ideal' clinical teaching scenario looks like. This "helps bridge the gap between theory and practice," and allows the clinical teacher to directly compare and evaluate his/her teaching practice with the provided descriptions.[100]

Second, the OLTCS recognizes the limited time a busy clinical teacher has to learn new skills. Therefore, the tool was designed in accordance with skill sets clinicians typically already have: (i) the ability to provide patient-centred care and (ii) the ability to structure clinical encounters (Calgary-Cambridge communication model). In this way, already possessed clinical skills are paired with new teaching skills: i.e. (i) patient-centred with learner-centred and (ii) the structure of the clinical encounter with the structure of a teaching session. In turn, current strengths of the clinician are highlighted, allowing him/her to "translate [these skills] from one area to another."[100] Thus, instead of focusing on teaching deficits, the OLTCS promotes "a sense of mastery of their teaching tasks," which has the potential to increase the interest and confidence of the clinical teacher.[100]

While FD needs to "be planned at different levels", including departmental and institutional, much of the FD change will occur at the individual level; "success and sustainability will ultimately depend on the commitment to change and the change in the individual teachers (i.e. attitudes, behaviour, conceptions, and hopefully teaching practice)."[97] Kumar et al argue that in order for people to adopt a new behaviour or cease a current behaviour, it requires a multifaceted approach, which they describe as the Intervention-Causation Pathway.[101] *(Figure 4)* In this model, the "Behaviour Change Transaction" occurs between "Behaviour Change Agents" and "Actors", which in turn can effect behaviours and eventually outcomes.

FIGURE 4: THE INTERVENTION-CAUSATION PATHWAY [85]



Within this Behaviour Change Transaction are "fundamental determinants of behaviour change", which must be addressed in order for the transaction to be successful.[101] The first of these fundamental determinants is that education alone is not enough to elicit behaviour change, but that new information needs to be contextualized for the transaction to occur. In that, individuals are not "empty cups" waiting to be filled with knowledge, but are already filled with culture, experiences, and beliefs which constitute a "local wisdom" – and rather than trying to "fill the cup", new information needs to be dissolved into the existing content.[101]

In terms of faculty development, this may be reflected in the current teaching style donned by the faculty, which is likely a reflection of how he/she was trained. It is therefore critical to understand how best to deliver clinical teaching effectiveness information in a contextualized manner - i.e. this information needs to be 'dissolved' into that which is 'already in the cup'. Understanding who the faculty are, the context in which they work, and previous teaching experiences both as a learners and as faculty will be essential.

2.6 SITUATED LEARNING & LEGITIMATE PARTICIPATION

The theory of situated learning as described by Lave and Wenger, emphasize that situated learning is not just "learning by doing" but that "learning is an integral and inseparable aspect of social practice."[102] From this perspective, the social practice is the primary event where learning occurs, rather than social practice merely being a process of learning.

Legitimate peripheral participation is a "description of engagement in social practice that curtails learning as an integral constituent."[102] Through engagement in social practice, the learner participates and gains a legitimate peripheral experience allowing him/her to learn about the practice towards full membership. "[N]ewcomers' legitimate peripherality provides them with more than 'observational' lookout post: It crucially involves participation as a way of learning – of both absorbing and being absorbed in – the 'culture of practice'."[102]

In the context of medicine, the 'shadowing' medical student observes the social practice and begins to become familiar with the culture and practice of medicine. Whereas the intern, already a full participant by their qualification as "doctor" continues to engage in legitimate peripheral participation as they learn the skills needed to be an independent and competent physician. From this perspective, "there is no activity that is not situated" within the clinical learning environment and all aspects of bedside teaching are situated learning events.[102]

2.7 COMMUNITIES OF PRACTICE

From situated learning and legitimate peripheral participation, evolved Wenger's theories of Communities of Practice, which asserts that learning and knowing occur through social participation.[18] Communities of practice are defined as "people who engage in a process of collective learning in a shared domain of human endeavour," and require an interplay of three characteristics: domain, community, and practice.[18,103] From this perspective, medicine is a community of practice where the domain is medicine, the community is composed of physicians, and the practice is the delivery of health care.

Communities of practice are formed through work of engagement, and engagement occurs through participation and reification. Participation is defined as "the ability and the legitimacy to make contributions to the pursuit of an enterprise, to the negotiation of meaning, and to the development of a shared practice."[18] Reification can be described as "what our communities pay attention to reifies us as participants," and having "access to the full reificative paraphernalia of practice," including "symbols, tools, language, [and] documents."[18] It is from participation and reification within a community of practice that learning occurs and knowledge is acquired, and indeed, "[a] lack of access to either participation or reification results in the inability to learn."[18] In this way, "the class is not the primary learning event," but rather it is the community of practice which "acts as a living curriculum for the apprentice."[18]

Communities of practice theory also describes the process of becoming as related to identity. As medical students enter the community of practice of medicine, they are on inbound trajectories where "newcomers are joining the community with the prospect of becoming full participants in its practice. Their identities are invested in their future participation, even though their present participation may be peripheral."[18] Through participation and reification "[s]uch participation shapes not only what we do, but also who we are and how we interpret what we do."[18] Learners develop an advancing level of competence, i.e. "practice translates into an identity as a form of competence."[18] Thus, through engagement and developed competence, learners become members of the community and identify themselves as such.

Of the many abilities a physician must possess to "effectively meet the healthcare needs of the people they serve", and thus become a full member of the COP of medicine, the fundamental goal is to become a "medical expert."[104] Medical expertise can be achieved through the acquisition and interplay of two skills sets: "information literacy and knowledge management."[105] Information literacy is the "ability to collect, store, collage, retrieve, and use information to solve complex problems," and knowledge management "captures both the experiential and the empirical knowledge derived from the outcomes of practice . . . to serve as a decision-making resource."[105] To this end, "medical education has been aimed primarily at helping medical students develop the power of critical reasoning, the capacity to generalize, the ability to acquire and evaluate information, and the intellectual tools to become lifelong learners."[106]

The underpinning to the development of clinical reasoning skills comes from dual process theory. This theory describes two major systems of thinking: *non-analytical process* and *analytical process*.[107] The *non-analytical process* is described as the "quick and spontaneous recognition of the nature of a problem."[107] Whereas the *analytical process* is described as the "more conscious, analytical and slower approach" to a problem.[107] The dual process theory maintains that both systems are reliant on underlying knowledge and work either sequentially or simultaneously depending on the circumstance. When applied to a clinical scenario, generally "novices use analytical processes in the early stages of learning how to make a diagnosis, [and] they begin to use rapid non-analytical processes more frequently as they accumulate clinical experience."[108] Yet, even experienced clinicians will use either strategy depending on the "individual's knowledge, skill and clinical experience as well as the context of the patient encounter," and often will switch between the two strategies depending on the clinical scenario and its progression.[108] Patel et al argue that the development of clinical reasoning ought to be within a clinical context in the 'real-world' workplace and thus promote the integration of dual process theory with that of situativity theory and the social-cognitive theory to aid in the development of clinical reasoning for trainees. [108]

Therefore, activities that promote learner engagement (participation and reification) to practice these medical expert skills facilitate the entrance of newcomers into the COP of medicine. Literature has advocated for "access for all learners to a range of authentic activities" within the clinical setting because workplace learning (WPL) activities are "solidly grounded in the nature of medical practices, and these practices shape the conduct of both the work and the learning that take place."[109] Thus,

WPL activities promote learning within a COP because they allow for "learning and work [to] converge as learners in medicine proceed through the educational continuum, moving from the classroom to the workplace of the practicing physician."[109] Traditionally, the most common WPL activity used in the clinical setting is bedside teaching.

Bedside teaching fits well into this perspective of learning and knowing, because by the very nature of going to the bedside, the teacher engages the learner in real-time clinical practice with authentic patient encounters. This dynamic interaction between the teacher and the learner allows for the work of engagement to occur, i.e. as the learner presents the patient case and verbalises his/her thinking, a space for participation is created; and as the faculty responds and provides feedback, a space for reification is created. From this perspective, clinical teaching becomes the living curriculum of social participation, and bedside teaching is the platform upon which the work of engagement takes place.

2.7.1 Workplace Learning

Billett's workplace learning (WPL) theory is nestled within Wegner's communities of practice theory. This theory asserts that workplaces "afford opportunities for learning" and are in and of themselves "learning environments".[110] Specifically, it is participation in work activities and access to "direct and indirect support" that "act to reinforce, refine or generate new forms of knowledge."[110] While different learning strategies within the workplace are important, it was found that the "readiness of the workplace to afford opportunities for individuals to participate" was a key factor in the overall learning quality.[110] WPL theory cautions readers not to "ignore the role of human agency" within the workplace, but instead describes a dynamic interplay between the "work practice" and "individuals' knowledge" and describes how "individuals' existing knowledge" influences "what and how they learn from" their workplace experiences.[110] Therefore, depending on the individual and the specific workplace encounter, either "mastery" or "appropriation" is achieved. Mastery is the "superficial acceptance of knowledge coupled with the ability to satisfy the requirements for public performance," whereas appropriation is the "acceptance by the individual of what they are learning and their desire and effortful engagement to make it part of their own repertoire of understandings, procedures and beliefs."[110] In the context of a clinical setting, bedside teaching is therefore a workplace learning activity that is not only influenced by the learning strategy used (e.g. "modeling, coaching, questioning," etc.), but also by the readiness of the faculty to allow trainees to participate, and

trainees' existing values, knowledge, history and experiences - which combined, can result in either mastery or appropriation of the desired clinical skill.

2.7.2 COP IN THE CONTEXT OF THE CLE

Establishing a safe, "respectful, welcoming, and supportive" learning environment is absolutely necessary for the work of engagement to occur.[109] While it is readily acknowledged that "a flawed learning environment inhibits learning and diminishes the sense of belonging of all involved,"[109] unfortunately, literature has also shown that learner mistreatment at the bedside is ubiquitous.[111]

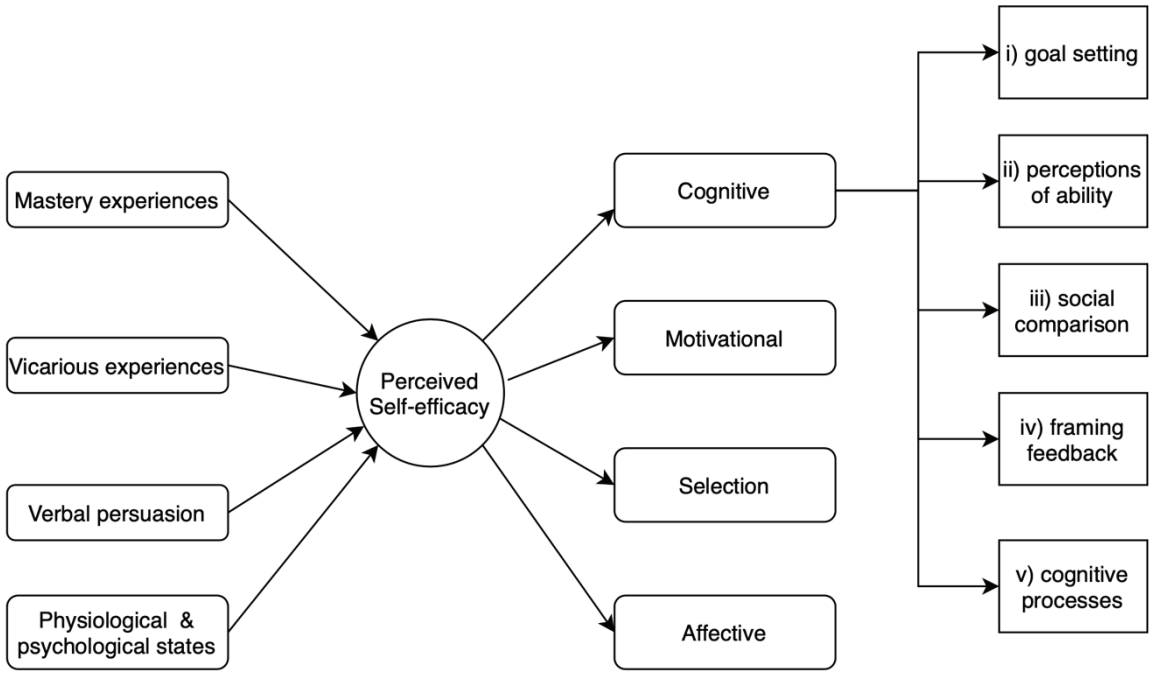
Bedside teaching has the potential to offer learners relevant and authentic opportunities to practice medical expert skills, yet too often the "verbal interaction between clinical teachers and learners," instead of promoting work of engagement, transforms into a "toxic" learning environment where the learner is devalued, belittled and humiliated.[111] From the falsely held belief that "public humiliation as part of feedback will lead to improvement in future performances," trainees are often subjected to mistreatment and this then becomes perceived as "normal occurrence".[111] Instead of leading to improved performance, what is more likely to occur within this type of learning environment is that trainees "are likely to hide their uncertainty" and "avoid feedback for fear of its possible negative consequences," which is indeed hiding from the important reification process itself.[86]

Traditionally, the COP of medicine is known to be "exclusionary" and has "well-established internal hierarchical structure and power relationships."[109] Indeed, the mirroring of previous teaching experiences creates a self-reinforcing environment since "social structures tend to reproduce themselves, perpetuating existing hierarchies, power structures, and inequities."[109,112] Therefore, while it is acknowledged that the COP of medicine "must be inclusive of all involved in the enterprise and be welcoming to those at the periphery, who represent its future," due to the historic and engrained traditions of medicine, this will be a persistent challenge that will need to be addressed at every bedside teaching encounter.[109]

2.8 PERCEIVED SELF-EFFICACY

Perceived self-efficacy is the degree to which an individual believes that his or her actions effect outcomes in their lives.[19] This in turn "influence[s] how people feel, think, motivate themselves, and behave."[19] Bandura argues that the perceptions of self-efficacy influence not only an individuals' ability to learn knowledge and skill, but more importantly, influences their ability to act utilizing that knowledge or skill.[19,20] Therefore, in the context of medical education, it is not enough to know the facts of medicine or to possess certain procedural or exam skills, but learners must also have a positive perception of their self-efficacy in order to practice medicine as a competent physician. Perceptions of self-efficacy are influenced by: i) mastery experiences, ii) vicarious experiences, iii) verbal persuasion, and iv) physiological and psychological states.[19] And in turn, individual self-efficacy beliefs influence four major processes: i) cognitive, ii) motivational, iii) selection, and iv) affective processes.[19] *(Figure 5)*

FIGURE 5: THE INFLUENCES ON AND OF SELF-EFFICACY



2.8.1 Factors that influence perceptions of self-efficacy

Four factors influence perceptions of self-efficacy: i) mastery experiences, ii) vicarious experiences, iii) verbal persuasion, and iv) physiological and psychological states.[19] Although none of these factors will directly influence self-efficacy, because it is "cognitively derived", these factors can still play a significant role in influencing the individual's "cognitive appraisal" of their self-efficacy.[113]

2.8.1.1 Personal performance mastery experiences

The most powerful way to promote learner self-efficacy beliefs is through gained mastery experiences, i.e. experiences that result in "authentic successes in dealing with a particular situation."[113] Gained mastery experiences give the learner a set of positive experiences that he/she can draw on in the future that reference their success at a given task. For example, if a medical student correctly differentiates bronchiolitis from asthma in a patient during ward rounds, then he/she will be more confident in their ability to diagnose bronchiolitis or asthma in the next patient who presents similarly.

2.8.1.2 Vicarious experiences

Vicarious or observed experiences are when "[o]ther people's performances . . . provide a common source of information about skills and abilities."[20] Bedside teaching offers many opportunities for vicarious experiences – students and residents on rounds have the opportunity to observe the attending physician, each other, and the patients on rounds. Each of these observed experiences could lead to an enhanced sense of self-efficacy. For instance, in the same example from above, if a medical student observes his/her peer successfully differentiate between bronchiolitis and asthma, then through the vicarious experience, the observing individual can deduce "information about their own capabilities."[113] Although there are more opportunities for vicarious experiences, this type of experience "has a weaker effect than does performance-based information, [therefore] people with little mastery experience or those who are uncertain about their capacities, are more sensitive to it."[113]

2.8.1.3 Verbal persuasion concerning one's abilities

Verbal persuasion (evaluative feedback) is an important component of both bedside teaching and the promotion of self-efficacy. If the appropriate person delivers evaluative feedback that is also appropriate in both content and delivery, this can positively influence trainees' self-efficacy beliefs. In that, verbal persuasion can "affirm or persuade them that they are able to perform a task," which in turn influences their self-efficacy beliefs regarding that task.[113]

2.8.1.4 Inferences made from one's physiologic and affective state

Social Cognitive Theory argues that "people make inferences about their abilities from emotional arousal and other physiologic cues experienced while enacting a behaviour or anticipating its enactment."[20] The type of emotions experienced can influence an individual's perceived self-efficacy, "positive interpretations of arousal, such as excitement, enhance self-efficacy," whereas "negative interpretations of arousal, identified as fear or anxiety, reduce one's sense of self-efficacy."[20] Since inferences from one's physiologic state can affect their self-efficacy beliefs, this highlights the importance of ensuring a positive CLE where learners are not needlessly made to feel anxious or stressed. Unnecessary stress or anxiety, could lead the learner to negatively infer that the stress they feel is a reflection of their ability. But if the situation is stressful or anxiety provoking by the nature of the event itself, which is often the case in medicine, then the clinical teacher can reassure the learner that this is a natural part of the experience. This reassurance will allow the trainee to infer that their emotions are not a reflection of their ability, but are a natural part of the experience.[20]

2.8.2 Effects of self-efficacy on cognitive processes

Individual cognition is affected by perceptions of self-efficacy through an interplay of: i) goal setting, ii) perceptions of ability, iii) social comparison, iv) framing feedback, and v) cognitive processes.[19]

2.8.2.1 GOAL-SETTING

Based on individuals' perceptions of their own self-efficacy, this will determine how and what kind of goals they set for themselves. "The stronger the perceived self-efficacy, the higher the goal challenges people set for themselves and the firmer is their commitment to them."[19] For medical trainees, appropriate goal setting is critical to complete course work, pass exams, and do well on rotations. Specific to bedside learning, trainees need to be able to set and achieve goals related to history taking, physical examination, analysis of findings, devising a plan, and presentation skills. Appropriate goal setting is also a key part of planning future career paths and commitment to self-directed learning.[19]

2.8.2.2 PERCEPTIONS OF ABILITY

Perceptions of personal ability are intrinsically related to perceptions of self-efficacy.[19] Bandura discusses ability from two perspectives: (a) the influence of an individual's self-efficacy beliefs on their ability, and (b) the individuals' perception of the nature of ability.[19]

(a) Bandura first discusses that 'ability' is not just about doing something, but that the act of doing something is influenced by many other factors of the individual. In that, ability is "a generative capability in which cognitive, social, motivational and behavioural skills must be organized and effectively orchestrated."[19] It is this orchestration that will determine whether or not an individual will use their knowledge or skills; "there is a marked difference between possessing knowledge and skills and being able to use them well under taxing conditions."[19]

In medicine, there are often "taxing conditions" which require physicians to make difficult decisions under stress, execute critical resuscitation efforts, handle emotionally charged situations, perform analytical thinking under time constraints, and manage high patient volumes. Therefore, the ability to practice medicine in this regard is not only about knowledge and skill, but also about the perceived self-efficacy to utilize that knowledge and skill in a variety of often-stressful circumstances.

One of the most “taxing conditions” physicians face is resuscitation efforts. In their work, Maibach et al. highlight scenarios where self-efficacy beliefs influenced individuals’ ability to perform paediatric resuscitation despite their prior level of knowledge and skill. Their study supported Bandura’s notion that “people who perform poorly may do so because they lack the skills or they have the skills but they lack the sense of efficacy to use them well.”[19] Maibach et al. concluded, that “although self-efficacy is only one of the many characteristics of resuscitation proficiency, it may be one of the most important.”[20]

(b) Bandura goes on to relate ability to cognition in terms of the individuals’ perception of the nature of ability. There are two ways in which ‘ability’ is perceived by individuals: one is the “acquirable skill view” and the other is the “inherent capacity view”.[19] The acquirable skill view assumes that ability is learned through knowledge and experiences. In contrast, the inherent capacity view assumes that ability is something that one either possesses or does not.

For medical trainees, their assumption about the nature of ability will have great implications for their learning. If they perceive the ability to practice medicine as something inherent, this will have devastating effects on their perceived self-efficacy, because no one inherently has the ability to practice medicine – it is an ability that takes years of training to acquire. In contrast, if they perceive the ability to practice medicine as something which is acquired, this can result in “a highly resilient sense of personal efficacy.”[19]

2.8.2.3 Social comparison influences

Social comparison describes the way in which individuals evaluate themselves using others as a reference marker. During bedside teaching, trainees are often asked to ‘perform’ in front of an audience composed of the attending physician, residents, house officers, medical students, nurses, the patient and the patient’s family. When trainees present their patient case, this creates an opportunity for direct comparison to occur. How and with whom the learner applies their social comparison can influence learner self-efficacy beliefs in either a positive or negative way.

For instance, if a resident compares his/her ability with that of a medical student, it may validate their progress as a physician in training. But if a medical student compares his/her ability with that of the resident or an excelling peer, he/she may feel their ability is inadequate. It is important for trainees not to misconstrue 'social' comparisons with 'direct' comparisons, which likely will not hold true for all scenarios. Each case presentation can be influenced by the complexity of the patient case, the varying levels of training of those presenting, and the nature that some individuals require more time than others to master different skills.

2.8.2.4 Framing feedback

Bandura describes two ways to frame feedback, feedback that highlights performance and feedback that highlights deficiencies. Performance feedback "focuses on achieved progress [that] underscores personal capabilities" while deficiency feedback "focuses on short-falls."[19] The method of how feedback is delivered can affect individual self-efficacy beliefs. Bandura highlighted several studies which showed that, "accenting the gains achieved enhances perceived self-efficacy," whereas, "highlighting deficiencies undermines self-regulative influences with resulting deterioration of performance."[19] Feedback is an integral part of bedside teaching, the clinical learning environment, and the reification process of communities of practice. Unfortunately it is widely recognized that while important, feedback is lacking in most clinical encounters with faculty.[114-117]

2.8.2.5 Influence of self-efficacy beliefs on cognitive processes

The final way that self-efficacy influences cognition is through cognitive processes.

"A major function of thought is to enable people to predict events . . . Such skills require effective cognitive processing of information that contains many ambiguities and uncertainties . . . people must draw on their knowledge to construct options, to weigh and integrate predictive factors, to test and review their judgments against the immediate and distal results of their actions, and to remember which factors they had tested and how well they had worked. It requires a strong sense of efficacy to remain task oriented in the face of pressing situational demands and failures that have social repercussions."[19]

This statement describes the daily practice of medicine: to draw upon previous knowledge in order to analyse new information in the context of the current patient and then to make often heavily-weighted and difficult decisions. For the paediatric resident, they are making decisions that will influence the lives of children, and this requires a strong sense of self-efficacy – especially as a trainee whose previous experiences to draw upon are limited. If the teacher verbalizes his/her own cognitive processes at the bedside during ward rounds, the clinical teacher can role model and reinforce the cognitive processes required in medicine.

2.8.3 Effects of self-efficacy on motivational and selection processes

Bandura argues that most motivational and selection processes are "cognitively generated."[19] In this regard, an individual's self-efficacy beliefs influence their motivation in the types of goals they set for themselves, and their commitment to achieve those goals. Since medical students and residents have applied for and have been accepted to medical school and residency programs, respectively, it may be a safe assumption that at some point these individuals possessed a relatively healthy perception of self-efficacy, otherwise they wouldn't have applied for medical school or residency in the first place.

But changing environments may challenge previous beliefs in self-efficacy. As Drybe describes, "joining a peer group of equal motivation and intelligence can be intimidating for young adults accustomed to rapid mastery of material and academic distinction."[17] In the face of this challenged self-efficacy, the medical trainee with a previous healthy sense of self-efficacy may now no longer pursue their goals of becoming a physician with the same commitment.

2.8.4 Effects of self-efficacy on affective processes

The final cognitive process influenced by self-efficacy is the 'affective process'. The thought patterns and emotions that individuals experience during different circumstances are influenced by their self-efficacy beliefs. When confronted by a situation that an individual has poor perceived self-efficacy in performing, he/she can then develop "inefficacious thinking" which leads to "distress and impair[s] their level of functioning."[19]

Mailbach et al. described in a series of cases that an individual's self-efficacy beliefs in performing paediatric resuscitation influenced their affective processes during the resuscitation. "High resuscitation self-efficacy should help [learners] imagine positive outcomes as a result of their efforts, think analytically, and control their self-defeating thoughts," whereas learners "with low self-efficacy are more likely to dwell on the potential of an undesirable outcome, and respond with emotional states that may cause them to lose access to their knowledge or skills."[20]

The affective processes that learners experience (thought patterns and emotional reactions) during bedside teaching can either be positive or negative for the learner. If the learner perceives the CLE to be intimidating, this may provoke "inefficacious thinking" and emotions such as anxiety. This, in turn, may diminish their analytical thinking skills and mask their knowledge, resulting in an experience of inability as opposed to mastery, which could reinforce their perceptions of poor self-efficacy. At the same time, Bandura describes that learners with high levels of perceived self-efficacy are more likely to tolerate stressed learning environments over those with low levels of perceived self-efficacy; "to alleviate scholastic anxiety; it is best reduced not by anxiety palliatives but by building a strong sense of efficacy."[19] In this way, positive self-efficacy beliefs can protect learners from the effects of an undesirable learning environment.

2.9 EVALUATING THE CLE, COP, AND PSE

An important part of this research is to adequately evaluate three key educational components to bedside teaching: 1. the clinical learning environment on ward rounds; 2. trainee sense of participation in, and sense of belonging to, the COP on ward rounds; and 3. trainee perceived self-efficacy to provide paediatric patient care.

2.9.1 EVALUATING THE CLINICAL LEARNING ENVIRONMENT

There are several validated assessments for evaluating the CLE, including the Dundee Ready Educational Environment Measure (DREEM), the Postgraduate Hospital Educational Environment Measure (PHEEM), and the Educational Climate Inventory (ECI).[86,118,119] We describe these three assessments based on their use within our project. We were initially drawn to the DREEM survey based on its use and validity in several global settings; the PHEEM survey based on it similarity to the DREEM survey, and ECI since this was found to be more relevant to our setting at later stages in the project.

2.9.1.1 DREEM

In response to sizeable reforms within health professional education globally during the 1990s, in 1997, the DREEM survey was developed and validated as a means to provide "a universal inventory that equips health profession educators with a diagnostic tool to measure the state of their school's learning and teaching climate."[120] Since its initial publication, the DREEM survey has been found to be globally relevant and validated in other international settings.[121] *(Refer to Chapter 4)*

2.9.1.2 PHEEM

Building upon the success and usefulness of the DREEM survey, in 2005, the PHEEM survey was developed and validated in the UK, as a means to evaluate "hospital-based clinical teaching and learning [environments] for junior doctors."[119] *(Refer to Chapter 4)*

2.9.1.3 ECI

In 2017, in response to three systematic reviews of medical school learning environment instruments, which "indicated that most of these instruments do not meet appropriate psychometric standards," Krupat et al. published their work on developing an alternative approach to assess the educational climate of medical schools, the Educational Climate Inventory.[86,122-124] The ECI differs from DREEM and

other previously published tools in two main ways. First, instead of trying to capture broad aspects of a medical school environment, the ECI limits its focus "on one critical aspect of the medical school environment, the educational climate."[86] Also, unlike other previously published tools that were determined to be "neither informed by nor derived from conceptual or theoretical frameworks," the ECI adapted Dweck's theoretical model of 'fixed vs growth' mindset to medical training.[86,122-124] *(Refer to Chapter 5 and 6)*

2.9.2 EVALUATING COMMUNITIES OF PRACTICE

Interestingly, despite communities of practice being an important topic within health professional education, literature is sparse on validated tools to measure trainee participation in, or sense of belonging to, a clinical community of practice. Likewise, literature to evaluate a clinical encounter or setting's proficiency in supporting or promoting work of engagement was also difficult to find.

In non-HPE COP circles, several "measures of value creation" in communities have been proposed for evaluation, where "value creation" is the "value of learning enabled by community involvement."[125] While these provide a broad framework for measuring the value creation within a COP, there is no specific or standard 'check-list' provided.

Within education circles, measurement within or of a COP considers the outcome of the trainee achieving the goals of membership within the community. For example, "student learning outcomes" or "professionalism."[18,109] Cruess et al. argue that "because joining medicine's community of practice is indivisibly linked to the acquisition of a professional identity, progress toward membership in the community can be gauged by measuring progress toward 'thinking, acting, and feeling like a doctor.'"[109]

Yet, Cruess et al. describe the difficulty of actually measuring "professional identity formation," stating that "assessment is complicated by the fact that individuals move from peripheral to full participation in the community at different rates."[109] And that while "some methods are available to assess the status of a professional identify . . . their feasibility on a large scale is still questionable."[109]

Likewise, in their publication, "Assessing medical professionalism," Honghe et al. attempted to provide a systematic review of currently available medical professional instruments and their measurement properties. The conclusion of their work, based on "best-evidence synthesis" resulted in only three recommended instruments, covering health professional areas of nursing, nurse practitioners and psychology, but none specific to the field of medical education.[126]

Regardless of the current difficulties to measure professional identity formation, there remains an even greater paucity of literature considering how to evaluate and measure the training encounter or setting itself and in which ways it does or does not promote learner engagement. Specifically, for this project, we wanted to measure the effectiveness of an individual ward round to provide opportunities for participation and reification; (i.e. were there activities that promote learner engagement? was the trainee allowed to provide meaningful contributions to the ward round? did the faculty provide feedback or attempt to refine the practice of the trainee? and was the engagement and feedback helpful for the trainee to feel more part of the clinical COP?)

The one notable exception is the Manchester Clinical Placement Index (MCPI) developed by Dornan et al. in 2012. The MCPI is an 8-item questionnaire "developed specifically to evaluate experienced-based learning" for undergraduate medical students.[127] Using a 0-6 Likert scale (disagree-agree) and free text space, the MCPI was found to "reliably measure the social/material quality of workplace learning environments."[127] The MCPI is directly linked to Communities of Practice theory and evaluates for "the quality of the learning environment" and measures the "support given to students' rehearsing and contributing" to their WPL activity.[127] (Note, the MCPI was not used in this study, because the researchers were not aware of the MCPI prior to data collection.)

2.9.3 Evaluating trainee perceived self-efficacy

In his writing, Bandura provides a "Guide for Constructing Self-Efficacy Scales".[128] A key aspect of these scales is that they ought not to evaluate for "global traits" but should be limited to "distinct realms of functioning".[128] The reasoning is that the "efficacy belief system" is not a generalized self-assessment, but is a "differentiated set of self-beliefs" in regards to a specific task.[128] To this end, Bandura

encourages researchers to measure participant's self-efficacy in regards to a specific task or "domain of functioning" by recording confidence level on a scale from 0 to 100.[128]

In terms of medical education, capturing trainees' perceived efficacy of specific tasks can be challenging. While "self-efficacy is usually assessed through surveys that ask students to rate how confident they are with respect to accomplishing a given task," due to the broad spectrum of material and domains medical trainees are responsible for, this can affect how their efficacy is measured.[129] In order to capture the variety of tasks, evaluators "would have to measure self-efficacy for each specific task to adjust clinical reasoning interventions to different students."[129] For instance, "a student might have high self-efficacy for diagnosing cardiological conditions as well as having low self-efficacy for diagnosing neurological diseases."[129] For these reasons, assessing self-efficacy in medical trainees has been described as "far more complex than assessing diagnostic accuracy."[129]

In his guide, Bandura goes on to describe that "efficacy items should accurately reflect the construct", in that "perceived efficacy is a judgement of capability" and survey items need to represent this.[128] Specifically, "items should be phrased in terms of *can do* rather than *will do,*" because "*can* is a judgement of capability; *will* is a statement of intention;" and that efficacy should not be confused with self-esteem, which is a "judgement of self-worth."[128] These nuances are essential when trying to capture actual perceived efficacy as opposed to other constructs.

Within higher education, alternative ways to measure trainees' PSE have been created and widely used.[130] One such example is the Motivational Strategies for Learning Questionnaire (MSLQ).[131] The MSLQ was developed by Pintrich and DeGroot in 1990 in an attempt to better understand the relationships between student self-regulation and motivation.[131] To that end, the MSLQ, a self-reported survey to evaluate academic self-efficacy in students was developed.[131] (*Refer to Chapter 5 and 6)*

Despite the use of MSLQ and other self-efficacy measurements, it is noteworthy that literature has shown doubt in self-reported self-efficacy, whereby "research has demonstrated varying degrees of discrepancy between self-assessment and observers' ratings of corresponding skills."[132] Some researchers have identified areas where "the concordance of self-assessment towards expert ratings

tended to be poor," and others found that "the lowest degree of accuracy in self-assessment tended to occur among the least-skilled physicians who also reported most confidence in themselves."[132-134] This "lack of positive correlation between self-efficacy assessment and expert ratings" is a very important consideration when undertaking a task of self-reported trainee perceptions in self-efficacy where the results may or may not be reliable based on the available literature and may indeed lead to an unintentional limitation of the study.[132]

In lieu of quantitative-only evaluation of PSE, the literature also advocates for the use of qualitative methods to adequately capture PSE, specifically the use of narrative interviews has been well described. "The forced-choice structure of survey scales typically used to assess self-efficacy sources does not allow for elaboration."[135] For this reason, to more accurately capture perceptions of self-efficacy, "researchers in the area of self-efficacy have agreed that quantitative studies need to be complemented by qualitative inquiry to provide the opportunity for rich description that is available through narrative."[135] In terms of PSE, "employing narrative inquiry as a means of reflecting on those experiences . . . that constitute a sense of self-efficacy" can be useful to gain a more holistic picture of one's PSE in relationship to a specific task or domain by examining his/her related experiences.[136]

2.10 CHAPTER SUMMARY

In this chapter, I provided a detailed description of relevant literature as it pertains to the history, theories and evaluation of bedside teaching, bedside teaching models, clinical learning environments, communities of practice, and perceived self-efficacy. The next chapter will describe the methodology used in this study.

CHAPTER 3 – METHODS

3.1 CHAPTER INTRODUCTION

This chapter serves to introduce the reader to the methodology used in this research project. Specifically, this chapter will define the types of methodologies used and discuss the rationale for their use. My researcher positionality and participatory population will be described. In addition, the overall research design, setting, population, recruitment procedures, instruments, data collection, data analysis, validity, and ethics of the study will be discussed.

3.2 ACTION RESEARCH & CHOICE OF METHODOLOGY

3.2.1 DEFINITION OF ACTION RESEARCH

In its most basic description, action research is the combination of research *and* action; i.e. research of a specific problem that will lead to an action to address that problem.[3] It has a rich history representing a large spectrum of activity and focus over the years, which has resulted in several definitions of action research depending on the positionality and ideology of the researcher. Nevertheless, there are general unifying themes: action research is problem-oriented, collaborative, and reflective, utilizing an "emergent design" of "systemic inquiry" to understand problems in "social settings", leading to interventions to improve problems.[137,138]

3.2.2 TRADITIONS OF ACTION RESEARCH

From the "diverse intellectual traditions" of action research, for the purposes of this study, we consider the influences from the works of Lewin's 'organizational development', Argyris' 'action science', Schon's 'reflective practice', and Elliot's 'teachers as researchers'.[1,137-141]

Lewin proposed that “knowledge should be created from problem solving in real-life situations” and that through viewing change as discrete events of unfreeze-float-freeze, improvement can occur.[137,140] A central theme for Lewin was “action research’s insistence on worker participation” creating a venue for “workplace democracy” to occur, where the workers were not only being researched *on*, but were active members of the research team toward “local problem solving”.[137,140]

Argyris viewed “organizations as self-correcting systems” and was concerned with “the ability of organizations to learn”.[137,139] Argyris emphasized the importance of “theories of actions,” which is concerned with not only the specific problem, but how that problem came to be.[137,139] The focus should not be only on fixing the problem, but self-reflection of causative influence should be incorporated into the problem solving technique to understand why something is currently being done and how the status quo of that particular action developed in the first place. Unlike Lewin, Argyris’ interpretation of improvement is continuous, as opposed to “discrete episodes.”[137,139]

While Lewin’s and Argyris’s foci are predominantly on the collaborative forms of action research, Schon describes a form of action research whereby the “researcher *learns* about her/his own practice” through “reflective practice”.[138,141] From this perspective, action research is “itself a form of education” for the practitioner through the process of “critical self-questioning”, which encourages “reframing experience and of experimenting with possible interpretations” for the practitioner to better understand and thus improve his/her practice.[138,141] Similarly, Elliot, from an education perspective, describes action research as a “reflective critique of the value interpretations embedded in practice”.[1,138]

3.2.3 Action research vs Traditional research

Action research differs from traditional forms of research (i.e. positivistic and naturalistic) in several ways.[137] Firstly, research is done *by* or *with* participants but never *on* them, rendering it *participatory* in nature. The success of action research is often measured by its degree of participatory or “democratic” engagement.[137,138] It goes beyond just capturing participants’ responses to pre-determined questions, as it strives for participants having a meaningful ‘voice’ during the study, including but not limited to: problem identification, data gathering, data analysis and interpretation

of results. By placing value on "the experiential knowledge of practitioners" and "developing knowledge with others", this allows for the creation of a "culture of inquiry", which can lead to meaningful change whereby "individuals can begin to collaborate in the search for solutions"[1] that are "relevant to the local setting."[137,138]

Secondly, it follows an iterative, cyclical four-step process: *Plan-Act-Observe-Reflect*, (PAOR). This iterative process influences ongoing data gathering and analysis. Data gathering methods are "not settled in advance, but [are] negotiated" over the course of the project.[138] In turn, data analysis in action research is a "process of learning through critical reflection" of the data, and results from one cycle guides the next set of data gathering and decision making.[137,138] In this way, data analysis is not meant to be purely descriptive but seeks to "push beyond what we already know" as a means to "provide insight" for the next sequence of action steps.[138]

Thirdly, the focus is "learning and implementing change", not necessarily "constructing an interpretation"; therefore, the *process* of action research is as valuable as its *findings*.[138] Unlike traditional forms of research, the *action* of action research requires an intervention to be embedded within the research itself. This has been described as the "double burden" of action research – the need to simultaneously provide "action (improvement of practice . . .) and research (creating valid knowledge about practice)."[137] But it is through this "double burden" that action research allows us to close "the gap between 'theory' and 'practice',"[137,138] thus enabling a greater understanding of the problem, our practice, and our social systems; and facilitating the development of more practical, sustainable and meaningful solutions to the problem.[138]

3.2.4 WHY AR FOR MY HPE PROJECT?

We chose action research as our framework to optimize the learning and teaching on paediatric ward rounds for several reasons. First, it has a rich history in general education and a growing presence in health and social care.[137,138] A clinical teaching environment is, in a sense, a combination of these environments. Therefore, we believe that action research lends itself well to the enhancement of HPE because it provides "a collective route to professional and institutional change," and offers a "source of knowledge about teaching."[137] This is evident in several HPE studies which utilized action research

to respectively address curriculum development, teaching of core competencies, bedside teaching, communication skills, and assessing needs of clinical teachers.[142-146]

In addition, action research is at once both "situational" and "practical."[1] Action research is 'situational' "because it comprehends a particular set of circumstances" and it is 'practical' "because it involves discerning and discriminated practically rather than just theoretically."[1] Since our project's focus is *how to best optimize the learning and teaching on paediatric ward rounds in a tertiary public hospital in Botswana*, we needed a framework which would be both representative of our unique clinical situation and practical to apply devised solutions.

Finally, our study's overall conceptual framework is founded on Wegner's and Bandura's concepts of social learning. And AR is an "approach to *social* research – understanding how human beings interact with one another, and how we respond to events and situations."[138] Therefore, if learning is achieved through social practice and action research is the study of social situations, then it seemed fitting to use AR to test and implement change within the context of social learning.

3.2.5 How AR influenced the *structure* of my dissertation

The choice to use action research greatly influenced the structure of my dissertation. It does not follow the traditional "linear methodology", but is a "continuous spiral with each cycle leading through to the next."[147] Since the AR dissertation seeks to portray the actual evolution of the research and "the reasoning behind the methodological decisions made," it was important for me to structure the content of my dissertation to allow the evolution of the research to be depicted.[137] Indeed, "action research is concerned just as much with the process of inquiry as with its 'findings'."[138]

To achieve this, in addition to the traditional dissertation chapters (Introduction, Literature Review, Methods, and Discussion) the Results chapter will be broken into three 'Phase' chapters to describe in detail the iterative methods, analysis, results and reflections of the project. Subsequently, Phase 3 will be further broken down into three 'cycle' chapters. These 'Phase' and 'cycle' chapters will follow the AR structure of 'Plan-Act-Observe-Reflect' to enable a better appreciation for the events that

occurred over the course of the project, and how the continuous critical reflection of these events influenced the ongoing momentum of the project.

Another obvious divergence is the narrative style to report the dissertation. It is very common and accepted practice for AR dissertations to "present knowledge in the form of narratives of personal experience" and are generally written in a "more organic fashion".[137,138] The purpose of this reflective narrative is to provide a "detail of events and different perspectives in such a way that it brings the situation to life."[138]

Since a large component of this study will include my own self-reflexivity as a researcher, it was important that my narrative account described this "very personal learning process", in that my narrative needed to include "the uniqueness, complexity, and ambiguity of the researcher's lived experience."[138,148] It is through this narrative report that the reader will come to appreciate the "work that took place" of the project, not just "a single, final analysis of 'results'."[138] Therefore, in this dissertation, the narrative style will need to reflect *both* the experience of the department, *and* my personal experience. It will also need to capture the dynamic nature of the project based on the transition of my research positionality over the course of the study.

Diverging from the conventional dissertation format to write an action research dissertation is not novel. Davis, in her reflective article *"Writing an action research thesis: One researcher's resolution of the problematic of form and process"* goes into considerable detail on the value and importance to diverge from the conventional format and provides several supportive references.[147]

3.2.6 How AR influenced the *data collection* of my dissertation

As described above, action research is at once both "situational" and "practical."[1] Therefore, AR requires us to gather evidence to gain situational and practical understanding, which often forces the action researcher to collect data outside the boundaries of traditional research.[1,138] Accordingly, Elliot describes what he refers to as "methodological canons of insider research." Firstly, *"All is potential evidence and should be regarded as bearing possibilities of significance."*[1] Thus, during my data

collection, everything was included as possible data sources – emails, notes from meetings, bits of informal conversations, attendance sheets, photos, etc. – which provided me with evidence for greater situational and practical understanding.

Secondly, *"No single kind of method of information gathering can meet the requirement of comprehensiveness."*[1] For this reason, several data types and sources were used to gain situational and practice evidence: quantitative surveys, qualitative interviews/focus groups, department and individual 'debriefs', my action research journal, emails, meeting notes, etc. The concept of 'triangulation' of data was an integral part of this study, hence the heavy reliance on mixed methods data collection and joint data analysis within each of the phases.

Thirdly, the importance of capturing data *"as events 'naturally' unfold within the flow of everyday experience"*[1] necessitate action researchers use of "unobtrusive methods which enhance rather than disrupt the practitioner-researcher's capacity."[1] This became very relevant, particularly in Phase 3 of the project when I asked faculty to capture real-time data on the testing of the bedside teaching model while simultaneously conducting their ward round.

Fourthly, the *"progressive focusing"* of data collection to avoid using data collection tools that are too focused upfront: "Methods which are used to gather pre-coded information (e.g. structured questionnaires and interviews . . .) can inhibit the development of a comprehensive understanding by trapping reflection in sets of pre-judgements about the situational significance."[1] Winter and Munn-Giddings echo this canon: "it is very easy to phrase questions in a way which is either too general (so that they don't help to focus the issues of the project) or too specific (so that they lead participants in a predetermined direction)."[138]

They go on to describe other limitations of questionnaires in action research. First, questionnaires "create a clear distinction between researchers and respondents", which in an AR setting where all are considered participatory researchers, can cause role confusion.[138] Second, questionnaires involve "anticipating possible responses", which prevents the goal of AR to "collect data that are genuinely new . . . so that we can learn from them in ways we had not anticipated."[138] Third, questionnaires "create material for a description", when in fact, we want to collect data that that will "help guide a

practical intervention."[138] Fourth, questionnaires "create an expectation that the analysis of data will take the form of counting similar responses," but the goal of analysis is critical reflection for informative measures, not merely descriptive.[138]

Despite these limitations, questionnaires continue to be a very simple, and convenient means of collecting data. We selected them to "expand the range of people consulted" and provide another form of triangulation in the study.[138] As the study progressed, we made sure to be flexible with the content and type of data collected, allowing participants to contribute to both *how* and *what* data was collected.

Several of the limitations described for questionnaires hold true for structured interview questions as well. Winter and Munn-Giddings warn against using structured interview questionnaires that may feel more formal or worse, like an "interrogation."[138] Instead, in the spirit of collaborative research, "we want others to bring out ideas, experiences and perspectives that we haven't yet thought of as being important for the investigation" by using inviting questions and listening to the details of individuals' experiences.[138] Hence, it was important for us to be creative and flexible to acquire data from individuals during the study.

3.2.7 How AR influenced the *data analysis* of my dissertation

A fundamental aspect of action research is how data is analysed. In traditional forms of research, data analysis attempts to "*construct an interpretation*" of the data, whereas in action research, the aim is concerned with "*learning and implementing change*".[138] The emergent design of action research illustrates that data is not being collected for interpretation alone, but how that data can be used to "stimulate new possibilities for action."[138] Indeed "data analysis begins immediately and guides further data gathering and decision making."[137]

Winter and Munn-Giddings describe three general points when considering data analysis in action research. First, since it is likely that the data sample size will be small, the "results are not likely to have a very firm statistical base", therefore the data analysis should not be only "concerned to create

a comprehensive interpretation of all the data", but how that data can be used to facilitate the ongoing project.[138] Second, as with all aspects of action research, the data analysis should include "as many participants as possible" to ensure a "collaborative process of negotiation."[138] And third, data analysis needs to be practical for the needs of the project and should not be "so time-consuming and elaborate that it distracts us from the collaborative and action-oriented progress of the work."[138]

The 'reflect' step of the Plan-Act-Observe-Reflect cycle of AR is a very important component of ongoing data analysis. Winter and Munn-Giddings describe critical reflection as having "two major dimensions: '*reflexivity*' (i.e. self-questioning, taking one's own interpretations of events as 'data' to be subjected to examination) and '*dialectics*' (i.e. focusing on the contradictions, tension and dilemmas inherent in a situation)."[138,149] Therefore, it was essential that our data analysis remained inclusive, flexible, practical and reflective throughout.

3.3 MIXED METHODS DESIGN

3.3.1 JUSTIFICATION FOR USE OF MIXED METHODS

Literature suggests that a combination of qualitative and quantitative methods are important, because they afford researchers the opportunity to increase "the integrity and applicability of findings."[150] While each method on its own ought to be able to 'stand-alone' to answer the question, the combination has the ability to "contribute to the strength of the research."[151,152] This is achieved by analysing the data of each data set on its own and then again through the lens of mixed methods integration data analysis.

From the perspective of medical education research, there is growing support for the use of mixed methods. Schifferdecker and Reed describe that while "medical education research . . . is subject to increasing calls for evidence-based medical education," they argue that the "emphasis on evidence-based practice threatens to reduce research questions to the pragmatics of technical efficiency and effectiveness."[150] Their concern is that quantitative approaches alone, "will not encourage research which explores the wider social, philosophical or ethical issues inherent in educational and policy

decisions."[150] For this reason, they recommend "the combination of [method] approaches" to allow medical education researchers to "enhance the relevance, depth, applicability and triangulation of their research findings."[150]

We selected a mixed methods design for data collection and analysis having recognized the limitations of a single data collection method for action research and medical education, [1,138] and noting that many AR projects have made a similar choice.[152,153]

3.3.2 Intent and type of mixed methods

The intent of using mixed methods for our study varied depending on the Phase of the study, but the overall intent of using mixed methods was to have the means to evaluate the current perspectives of ward rounds and the effects of our interventions to optimize the learning and teaching on ward rounds through "a series of processes and activities."[151] Therefore, we chose a *mixed methods evaluation design*, which "combines both sequential and concurrent strands over a period of time."[151] The mixed methods evaluation design "is typically used in program evaluation in which quantitative and qualitative approaches are used over time to support the development, adaptation, and evaluation of specific programs."[151] And in our case, this design facilitated the three phases of our study to define, develop and evaluate ways to optimize our learning and teaching on ward rounds. Within the larger complex mixed methods evaluation design were core mixed method designs, where "connecting" and "merging" of data occurred both within and between phases.[151]

3.3.2.1 Phase 1

The mixed methods intent of Phase 1 was twofold. First, in order to best answer our research questions, we foremost needed to obtain "a more complete understanding of [the] problem."[151] The second intent of Phase 1 was to pilot the feasibility of the surveys for future phases of the study. Therefore, the Phase 1 design was a *fixed convergent mixed methods* design where qualitative and quantitative data was obtained from the same group of participants simultaneously with the purpose of developing a comparative analysis of the results.

3.3.2.2 PHASE 2

The mixed methods intent of Phase 2 was threefold. First, use the results from Phase 1 to develop surveys that could be used in Phase 3. Second, pilot the feasibility of the newly developed surveys. And third, determine the content and structure of the interventions to be used in Phase 3. Therefore, the Phase 2 study design was *exploratory sequential mixed methods* whereby the findings of the previous phase were used to provide "contextually appropriate" information to help "generate a quantitative feature from qualitative exploration."[151]

3.3.2.3 PHASE 3

The mixed methods intent of Phase 3 was threefold. First, conduct the educational series. Second, determine the feasibility of using the bedside teaching model on the ward round. And third, modify the bedside teaching model as needed to aid in its implementation and use. The Phase 3 study design used a combination of *convergent mixed methods* as well as *exploratory mixed methods* to be flexible to the dynamic nature of the testing and implementing process of introducing the bedside teaching model.

3.4 QUALITY IMPROVEMENT METHODS

In the early half of the twentieth century, derived from management theory, Shewhart and Deming, founded the *'science of improvement'* or '*quality improvement*' methodology, which asserts that combining 'subject matter knowledge' with 'profound knowledge' will increase the capacity "to make changes that will result in improvement in a variety of settings."[154] Fundamental to QI is the focus on the local system, with the application of problem-solving science, resulting in sustainable improvement.

While we predominately adhered to the action research traditions of *organizational development*, *action science, and critical reflection* as described above, we also drew on methods offered by Deming's *'model of continuous improvement'*.[154,155] This is not unique to our project, but in fact,

several action researchers have "demonstrate[ed] the linkage of the scientific methods with Action Research," and it is recognized that several "features derived from management theory can apply well to action research."[137,156] Note, by drawing on the methods offered by QI, we are not advocating that these "philosophies are epistemologically, methodologically, or ideologically compatible," but that QI methodology has readily available and accessible tools that we felt could enhance the collaborative and participatory process of our project.[137]

Using the QI methodology provided us a dual purpose. First, it provided a systematic guide to engage in the AR iterative cycles of inquiry: Plan-Act-Observe-Reflect. Second, in recent years, QI and the model of continuous improvement has been used widely in the healthcare setting as a means to improve patient safety and enhance efficiency and efficacy in healthcare systems.[154,157] By introducing QI tools and the 'model of continuous improvement' to department members allowed us to provide applicable capacity development, which in itself is a goal of action research: catalytic validity.[137] Specifically, we used parts of the 'model of improvement' and several QI tools during Phase 2 of the project. And in Phase 3, we attempted to generate run charts for data analysis purposes.[154]

3.5 MY RESEARCHER POSITIONALITY

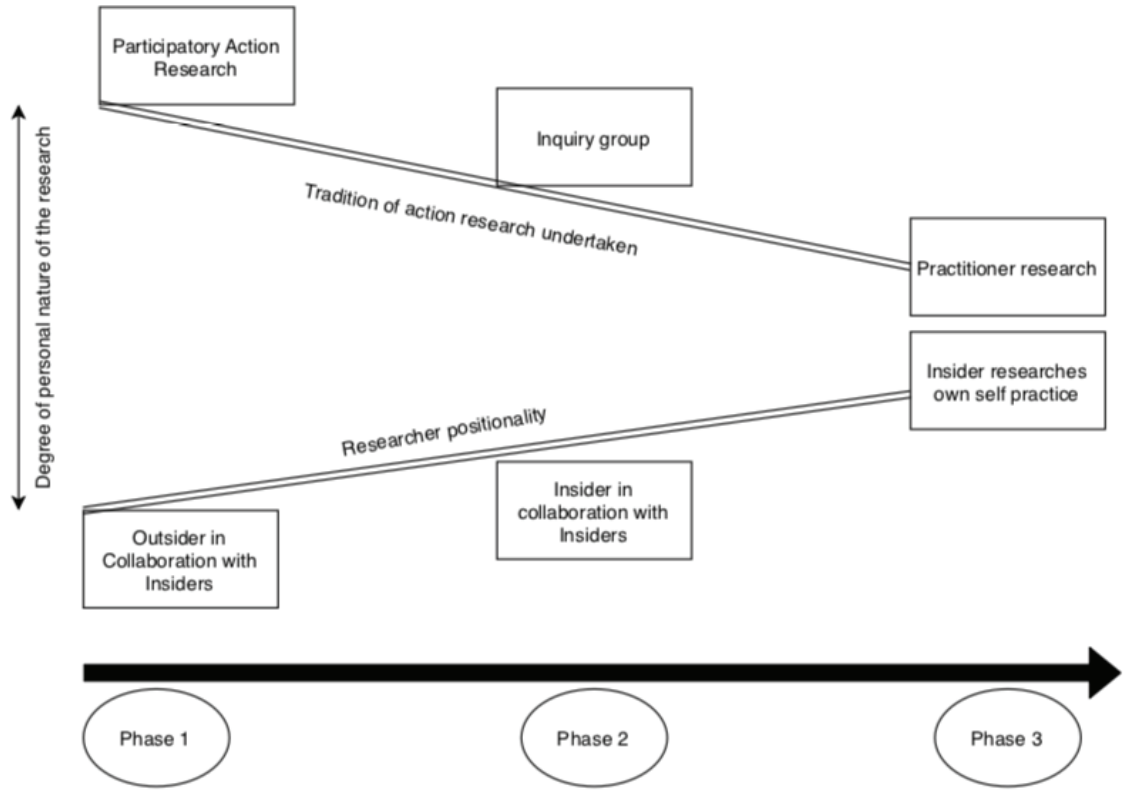
On the day I received my Princess Marina Hospital identification badge, the man handing it to me said, "Now you belong." [ARJ]

The positionality of the researcher is crucial to understanding the type of action research being conducted. Herr and Anderson emphasize that the "degree to which researchers position themselves as insiders or outsiders will determine how they frame epistemological, methodological, and ethical issues in the dissertation."[137]

As part of this description of researcher positionality, they note that "positionality doesn't fall out in neat categories and might even shift during the study."[137] For me, over the 3.5 years of this project, I underwent considerable shifts in my positionality and this had significant implications to the "type" of AR I was conducting. To consider the action research methods used in this study, it is imperative to

consider how my positionality shifted over the course of the project. As my positionality changed, in essence, the type of action research also changed accordingly. The dynamic nature of my positionality influenced the type of action research that was occurring, from: 1) outsider conducting participatory action research, to 2) insider collaborating with other insiders as a form of inquiry-study group, to 3) insider researching on my own practice as a form of practitioner research. *(Figure 6)*

FIGURE 6: MY SHIFTING POSITIONALITY AND ITS INFLUENCES ON THE TYPE OF ACTION RESEARCH BEING CONDUCTED



There were many influences on the maturation of my positionality – time, physical presence, and experience – all of which will be described in more detail in the Phase chapters. This occurrence of researcher positionality shifting has been cited in other action research projects. One example is David Prideaux's work in using action research to create curriculum changes in a medical school.[144] He describes his transition from "outsider to insider" and the challenges he experienced with his "partial outsider-insider role". He notes the time scale of the project, his visible presence, and an inherent

status within the department as influences on his change in positionality from outsider gradually toward insider.

It is important to note that while a researcher's positionality may be dynamic over the course of a project, it should not be ambiguous.[137] As an action researcher it is my "obligation to interrogate [my] multiple positionalities in relationship to the question under study," and to "avoid the blind spots that come with unexamined beliefs."[137] Therefore, both during and at the conclusion of the project, I spent considerable time considering my role and identity within the department and in which ways and when shifts had occurred and how that shift influenced the ongoing project.

3.5.1 PHASE 1

During Phase 1, I was very much still an 'outsider' conducting collaborative research with 'insiders', better known as "participatory action research" (PAR). The traditions of participatory action research are concerned with providing groups of individuals a 'voice' in the research that is being done on or for communities or organizations to which they belonged. This type of research is grounded on the empowerment of individuals within groups to determine their own problems and own solutions to these problems, and is concerned with "equity, self-reliance, and oppression problems."[137]

Therefore, despite my status as an 'outsider' I took several measures to ensure that the type of research being conducted was in-line with the traditions of PAR and did not slip into traditional forms for research where I, as the outsider, was conducting research on members of the department. These measures included creating a team of 'insiders' who I could collaborate with to help guide the research, making sure that the focus of Phase 1 was to hear the 'voice' of the department prior to any intervention, and with time, becoming a more active member of the department in my own right.

3.5.2 PHASE 2

By the time Phase 2 began, my researcher positionality within the department had considerably changed and I now considered myself to be an 'insider'. This produced a significant shift in type of action research being conducted. As an 'insider', I was now conducting research in collaboration with other insiders as a form of 'inquiry group'. As such, the goal of the research was to "engage in inquiry in ways that help the group move from working as isolated individuals toward a collaborative community," to produce "work toward influencing organizational change" and offer "opportunities for personal, professional and institutional transformation."[137]

Phase 2 was essentially the link between Phase 1 and Phase 3. In that, Phase 2 provided the reflective space for us as a group of insiders to consider the Phase 1 results (which essentially were the 'voice' of the department), and based on what that voice had collectively said, we were able as a group to generate intentional and relevant educational courses, interventions, and surveys to be used in Phase 3 of the project.

3.5.3 PHASE 3

While Phase 3 was still very much inquiry group research with me as an insider working in collaboration with other insiders, there was an additional fundamental (and unexpected!) shift in my positionality as a researcher. I went into Phase 3 with the notion that, as a group, we would conduct our newly designed educational courses and test our interventions as planned in Phase 2. But as I was collecting data from my colleagues on their experiences of using the bedside teaching model, I also began capturing my own experiences of testing and using the model. This unintentional but natural shift in focus toward a self-reflective perspective of the research we were conducting created a new space where I was actually conducting research on my own practice – i.e. practitioner research.

Practitioner research provides an "account of how one practitioner went about learning his or her craft and what was learned in the process."[137] Through this self-practice reflection, the researcher can "build a knowledge base that can inform the research community about the actions and beliefs of

practitioners – a knowledge base that is otherwise unavailable."[137] Because of this, practitioner action research has "become popular as a form of education for professional staff, in which learning arises from the process of engaging in practice-based inquiry."[138] Therefore, during the Phase 3 processes, two parallel types of action research evolved – the first was the continuation of the inquiry group from Phase 2, and the second was my own practitioner research.

3.6 PARTICIPATORY POPULATION

3.6.1 CREATING A PROJECT TEAM

From a participatory action research perspective, gaining the support of 'insiders' was essential to the success of the project. I therefore set out early on to create a 'project team' of insiders who could actively engage, participate and contribute to the research project. My approach was to assemble an interdisciplinary team that would represent all of the different stakeholders that would be effected by a bedside teaching project, including: medical students, junior residents, senior residents, and paediatricians.

After several weeks of arriving to Botswana and observing different departmental activities, there were a few individuals who stood out as representatives of their 'position' within the department. Based on these observations, in combination with suggestions from my co-supervisor who knew the department quite well, I approached seven individuals to gauge their interest in collaborating on the bedside teaching improvement project. Simultaneously, I approached the UB Department of Medical Education (DME) head about my project interests. He gave his full support and even suggested that one of his department members join. This brought the total number of 'insider' team group members to eight. Everyone I approached was keen and readily accepted.

The first, AK, was a 5th year medical student – an excelling student and natural leader. Born and raised in Botswana, AK was part of the first UB medical school classes, and as such, her personal and direct experience of being a medical student at UB and within PMH provided instrumental insight for our project. She was key to recruitment of medical students and provided ongoing engagement, energy,

and challenging questions throughout the project. During the project, she graduated medical school, did her internship year at PMH, and eventually was hired on as a medical officer at PMH within the Department of Paediatrics. Thus, despite her advancing roles, she remained relatively close to the department until the final stages of the project when she went on to pursue her own residency experiences in public health.

Second, was LM. LM was born and raised in Botswana, and underwent her medical training in Melbourne, Australia. At the start of the project, LM was a recent medical school graduate, had completed her internship, and was working as a medical officer for the last year within the Department of Paediatrics and was in the process of applying for residency to the UB Paediatric Residency Program. Always a very skilled and poised clinician, she was readily accepted in the UB residency program and excelled. Her daily duties on the ward both as a medical officer and eventually a junior resident provided us within insight into the daily challenges our young trainees faced, particularly around the tensions of clinical responsibility verses clinical education. She was key in organizing the focus group discussions in Phase 1 and provided ongoing feedback of our data collection tools throughout Phase 2 and early stages of Phase 3 of the project. Eventually, after her second year of residency, she moved to South Africa to continue her resident training, but was otherwise very much involved in the project throughout.

Third was ZP. ZP was born and raised in Botswana, and underwent medical training and his internship in Johannesburg, South Africa. At the start of the project, he was a junior resident finishing his final clinicals before advancing to senior resident within the department. Over the course of the project, he graduated his paediatric residency, then worked as a paediatrician under the Ministry of Health and Wellness in the Department of Paediatrics, and eventually became University of Botswana faculty in the same department. ZP's transition from trainee to faculty over the course of the project provided incredibly valuable insight. In addition, his friendly and generous character mixed with his deep desire to see improvement within the department for both patients and learners provided a passionate yet pragmatic perspective for the project. He provided key support of data collection development and ongoing trialling of change ideas throughout.

Fourth was TD. TD was born and raised in Botswana, and underwent his medical training in Galway, Ireland. At the start of the project, TD was at the very final stages of his paediatric residency, and soon

became one of two of the very first paediatricians ever to graduate from the UB Paediatric Residency program and was Botswana's first "home grown" paediatrician. As the first class of UB paediatricians, he provided great insight into the training of paediatric residents within the department. His enthusiasm and support was a welcome addition for the early phases of the project, but soon after his graduation, he went on to pursue a paediatric cardiology fellowship outside of the country and was no longer involved with the project.

Fifth was FB. Born and raised in Malawi, he underwent his medical training in Malawi and his paediatric training in South Africa. At the start of the project, FB was a UB faculty paediatrician, and advanced to senior lecturer by the end of the project. Having worked as clinical faculty for nearly two years at the start of the project, FB provided insight into the daily rewards and challenges of providing clinical teaching and simultaneous patient care at PMH. This perspective paired with his endlessly kind nature allowed for engagement in ongoing conversations and feedback about our data collection tools and reflections on collected data throughout.

Sixth was SN. Born and raised in Botswana, he underwent his medical training and paediatric training in Dublin, Ireland. At the start of the project, he had been working as a paediatrician within the Department of Paediatrics at PMH for the Botswana Ministry of Health and Wellness for nearly 4 years. His perspective as a Ministry of Health and Wellness employee and first-hand experience with the transition of PMH into a teaching hospital was very valuable. But early on during the project, he was promoted to the role of PMH Hospital Superintendent and was unable to continue to participate.

Seventh was MM. MM was born and raised in Botswana, and he underwent his medical school training in Melbourne, Australia. He had completed his internship and had recently started with the UB DME as the Clinical Skills Coordinator for the UB medical school. He was very passionate about teaching and improving medical education and was actively pursuing his own Masters of Philosophy in Health Professional Education during the project. He became a key co-content expert throughout the project and provided excellent insight into the balance of education literature with available local educational resources for the project.

Finally, TA. TA doubled as my co-supervisor for the project. As a US-citizen, she completed her medical and paediatric training in the United States, and thereafter had extensive global health experiences in several countries. At the start of the project, she had been a key clinical faculty and research personnel for the Botswana-UPenn partnership for several years. In addition to key project activities, she had notable involvement with the project throughout, particularly as my ongoing 'sounding board' or 'critical friend' as we advanced through the several phases of the project.

It is noteworthy to mention that the relationships between myself and group members and between the group members themselves were all very friendly. Despite the multiple ranks represented within the project group, no formal hierarchy within the group occurred since no one directly reported to anyone else in the group. There was always supportive responses and discussion and a genuine sense of camaraderie from those working on the project. The project members had many non-project related interactions, both professional and personal outside of the project, which likely aided in the ease of openness and discussions within the group.

In addition, as in any academic environment, the inherent progression of individuals within a program made this group very dynamic – for instance, AK, our medical student representative soon became an intern and then a medical officer, and likewise, the others followed their natural progression through the ranks of the department, which meant that over the course of the project, the members' roles and responsibilities, both within and outside the project, changed over time.

Now having a committed project group who represented all key stakeholders, we could commence brainstorming and creating a bedside teaching improvement project. To ensure that the 'voice' of all members of the department (not just our project team's voice) was obtained, we designed the first part of our project as a basic 'needs assessment' to understand the current practices on ward rounds through focus groups, interviews and surveys. To ensure that the project group was not merely a group of 'inside' researchers conducting research on their peers, all project members were included in the interview and focus groups and survey processes, essentially conducting research on themselves.

While the group members were eager to contribute to the project, it is important to note that for me, as the 'outsider' and with the responsibility to complete my scholarly fellowship project, the other group members did not have an "equal level of commitment to the project," which is common in participatory action research.[137]

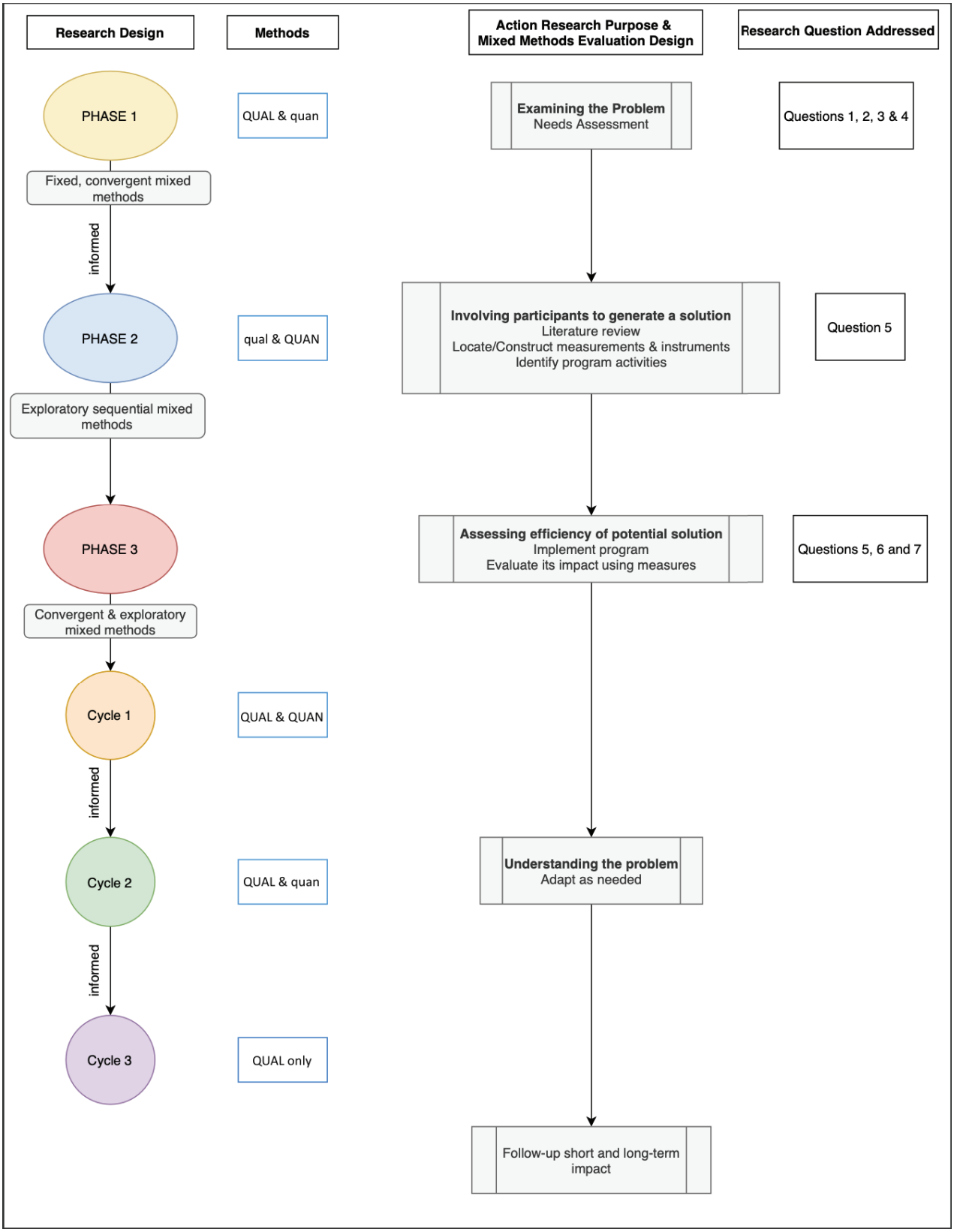
3.6.2 Additional partnerships

Shortly after arriving to Botswana, I attend the annual South African Association for Health Educationalist (SAAHE) Conference as a way to introduce myself to regional issues surrounding medial education.[158] While at the SAAHE Conference, I attended a pre-conference workshop on "How to do health professional education research". After attending the workshop, I was motivated to add more robust educational theory and expertise to my fellowship scholarly project, and decided to apply for and was eventually accepted into the University of Cape Town (UCT) Health Professional Education Master of Philosophy (MPhil) program.

My fellowship project now doubled as a UCT MPhil in HPE (which would later be upgraded to a doctorate dissertation). This added tremendous complexity to the project – now there were new stakeholders (and thus new tensions) spanning three countries and six institutions: 1) my employer and fellowship program home-institution, The Children's Hospital of Philadelphia, 2) the Botswana-University of Pennsylvania Partnership, 3) the University of Botswana, both the Department of Paediatrics and the Department of Medical Education, 4) the Botswana Ministry of Health and Wellness (MOHW), 5) Princess Marina Hospital, and 6) the University of Cape Town. While this gave potentially richer buy-in for the project from multiple facets, it also added a lot of complexity to the project, such as needing to go through a total of six institutional review boards for ethical approval, and being accountable to six leadership positions. It also created for me as the 'researcher' a difficult balance of prioritization – on top of my other clinical duties, I was now simultaneously responsible for my fellowship scholarly project, a UCT MPhil/doctorate in HPE, and an actual bedside improvement project in the Department of Paediatrics at PMH. Understanding and reflecting on these relationships and tensions is an important part to portray in action research.

3.7 OVERALL RESEARCH DESIGN

FIGURE 7: OVERALL RESEARCH DESIGN [3,151]



3.8 POPULATION & CONTEXT

3.8.1 STUDY TIMELINE

This study took place between November 2016 and March 2019 and was divided into three phases. *(Figure 8) Note*: The gap between Phase 1 and Phase 2 was my maternity leave (May – July 2017).

FIGURE 8: OVERALL STUDY TIMELINE

3.8.2 STUDY SETTING

3.8.2.1 CLINICAL SETTING

Botswana, situated in Southern Africa, has a population of 2.1 million.[25] The country has 3.4 physicians per 10,000 population, of which less than a quarter are citizens of Botswana.[25] In response to the need for a local, sustainable healthcare workforce, the University of Botswana (founded in 1982) opened the country's first medical school in 2009, the UB Faculty of Medicine. A year later, the medical school launched its first postgraduate medical education residency programmes to ensure continued training opportunities for graduating medical students.[9]

Historically a tertiary hospital without an attached medical school program, Princess Marina Hospital was established in 1966. With the opening of the new medical school, PMH became home to the

majority of clinical training for all UB undergraduate and postgraduate medical trainees, staffed by a combination of MOHW employees, UB clinical faculty, and physicians from affiliate overseas universities. PMH is Botswana's largest national referral hospital and only one of two tertiary hospitals in the country.

The Department of Paediatrics within PMH is home to the majority of paediatric training for UB medical students and paediatric residents. The DoP is composed of the Paediatric Medical Ward (PMW), the Neonatal Unit (NNU) and the Paediatric Haematology-Oncology ward (PHO). Combined, these wards have nearly 3,000 admissions annually, with the vast majority of these being children under five years of age. The PMW is divided into three rounding teams (A, B and C); the NNU is divided into four rounding teams (neonatal intensive care unit (NICU), premature infants, full term infants, and isolation infants); and the PHO service rounds as a single team. Additionally, any paediatric patient admitted to a non-paediatric ward requiring paediatric care are the responsibility of the paediatricians and are assigned to PMW/PHO teams as required, including Accident & Emergency department, Intensive Care Unit, Surgical, Orthopaedic, etc.

The PMW and PHO services share the same physical space for inpatients, although most PHO patients are admitted to the "side ward" of the larger general paediatric ward to decrease the risk of infections for that patient population. Combined, the PMW and PHO services accommodate approximately 50 beds, with additional mattresses placed on the floor as needed for subsequent admissions. The PMW admits up to age 13-years, whereas the PHO service admits up to 21-years-old based on the diagnosis of the patient. The NNU is located in a separate space of the hospital (approximately 5-minute walk from the PMW/PHO ward) and generally is able to accommodate 6-8 ventilated NICU beds, and roughly 40 non-ventilated beds.

3.8.2.2 Academic Setting

The Bachelor of Medicine, Bachelor of Surgery (MBBS) programme is a five-year undergraduate medical degree programme divided into two parts. The first part encompasses the first two years of training and consists of a fully integrated basic medical science curriculum, utilizing problem-based learning, general didactic lecture sessions, as well as clinical skills teaching. The second part occurs

over the last three years and is composed of clinic and hospital rotations in all major disciplines, including paediatrics. Eligibility requires completion of high school and one year of A-levels or Bachelor of Science 1 year equivalent. Students undergo continuous evaluation as well as written and clinical examinations throughout each year of training. The UB Faculty of Medicine MBBS Programme has approximately 50 students per class, the majority of which are from Botswana. Medical students rotate through the Department of Paediatrics for two eight-week periods during their undergraduate training, once in their third year and again in their fifth year of training. The DoP hosts approximately 20 UB medical students (10 third year and 10 fifth year) at a time for each rotation.

At the end of their medical school training, all graduates are required to complete the Botswana national Medical Internship Programme prior to being eligible to practice medicine independently. This internship is 12 months in duration and interns are expected to rotate through all major disciplines for 12 week durations. The medical internship programme is composed of roughly 75 interns each year and includes both recent UB MBBS graduates as well as foreign medical student graduates, many of which are Motswana coming home from overseas medical school training. The DoP hosts approximately 10-12 interns at a time for each 12 week rotation. Interns essentially function as practicing junior physicians but with close supervision and are included in all educational activities.

After the successful completion of the internship programme, trainees are now eligible to practice medicine under their own medical license as medical officers. Medical officers are unspecialized general physicians. Once this position is achieved, individuals can work independently in general practice without ongoing supervision and do not need further training, unless they work in specialized areas, such as paediatric inpatient medicine; this is equivalent to an advanced practice provider. The Department of Paediatrics, under the MOHW, employs approximately 5-6 dedicated medical officers. Medical officers are required to attend all department meetings, join rounds with supervising paediatricians, and are invited to all educational activities, but this is not required.

The paediatric Master of Medicine (MMed) programme is a 4 year postgraduate programme. To be eligible, individuals must have completed their internship year and worked as a medical officer for at least one year prior to applying. The majority of paediatric residency training occurs at PMH in the PMW and NNU accounting for over 70% of the residents' Botswana-based clinical training. Residents are evaluated at the end of each rotation utilizing the CanMEDS physician competency framework.[104]

The remaining training is comprised of several subspecialty services within Botswana and 18 months spent in Republic of South Africa (RSA) for additional core rotations. Final examinations are done through the Fellowship of the College of Paediatricians of South Africa, and include two parts. Part I is a multiple choice examination, and Part II is a combined written clinical scenarios exam as well as an observed comprehensive clinical assessment with paediatric patients. In addition to their clinical training and examinations, MMed candidates are required to complete a comprehensive research project during their residency. This must be of publishable quality before the MMed can be achieved. The UB Faculty of Medicine Paediatric and Adolescent Health MMed programme has approximately 4-6 residents per class.

In addition, the Department of Paediatrics is also host to several international visiting medical students and paediatric residents annually from various institutions.

Teaching primarily occurs at the bedside during rounds, supplemented with daily morning reports, weekly lectures, student case presentations, student problem-based learning, and resident objective structed clinical mock exams. Rounding teams are comprised of rotating 3rd and 5th year medical students, interns, medical officers, junior and senior paediatric residents. Each team is led by one paediatrician and/or senior resident.

Ward work expectations for all trainees vary somewhat by clinical level of training, but generally include: pre-rounding and rounding on all established patients, provide written documentation on all patients, admit all new patients, respond to any acute patient needs including immediate resuscitation, obtain all required blood draws, place and follow up all orders, transport patients to and from radiology and/or subspecialty clinics, provide sedation as needed for imaging and/or procedures, attend to outpatient patients as needed, and navigate healthcare system as needed to ensure patient has all required investigations and/or interventions including blood bank, pharmacy, radiology, etc.

Note, while Setswana is the local language in Botswana, English is considered the ‘professional’ language of the country. The Department of Paediatrics requires all trainees and staff to be fluent in English; therefore, all of the research activities, including focus group discussions (FGD), interviews, questionnaires, and debriefs were conducted in English.

3.8.3 STUDY POPULATION

This study focused on the medical staff working in the DoP at PMH and the undergraduate and postgraduate UB medical trainees who had completed, or were currently engaged in training in the department.

Since the study occurred over a several year period, while the numbers generally held stable over time, there was shifting of trainees within different roles as they advanced through the program. There was also turnover of staff as new paediatricians were recruited and others moved out of the department for a variety of reasons. This resulted in a shift of our study population over time. For instance, an individual may have been a senior resident during Phase 1 of the study, but then as they advanced through the ranks of their programme, they could have been a paediatrician during Phase 3. Over time, generally, the added population represents those from previous earlier stages of training. For example, of the 11 added paediatricians, 6 were previously senior residents. The table below is a reflection of the dynamic nature of the study population. *(Table 1)*

TABLE 1: NUMBER OF INDIVIDUALS IN EACH ROLE OVER THE COURSE OF THE STUDY

	Phase 1 Nov-Dec 2016*	**Phase 2 Aug 2017 - June 2018**	**Phase 3 – Cycle 1 June-Sept 2018**	**Phase 3 – Cycle 2 Sept-Dec 2018**	**Phase 3 – Cycle 3 Jan-Mar 2019**	**Total # *** Nov 2016 – Mar 2019**
Paediatricians	14	18 *(3 departed, 7 added)*	17 *(3 departed, 2 added)*	17 *(no change)*	19 *(0 departed, 2 added)*	**25** *(i.e. 14+7+2+2)*
Senior Residents	13	13 *(4 grads, 4 incoming)*	8 *(9 grads, 3 incoming)*	7 *(no change)*	6 *(1 grad, 0 incoming)*	**20** *(i.e. 13+4+3)*
Residents rotating in RSA	7	7 *(4 advanced, 4 incoming)*	4 *(3 advanced, 0 incoming)*	4 *(no change)*	7 *(0 advanced, 3 incoming)*	**14** *(i.e. 7+4+3)*
Junior Residents**	9	13 *(5 moved out or up, 9 incoming)*	11 *(2 moved out or up, 0 incoming)*	11 *(no change)*	9 *(4 moved out or up, 2 incoming)*	**20** *(i.e. 9+9+2)*
Medical Students****	20	120	20	40	20	**220**

**Note, there was no participant recruitment from Jan 2017 – Feb 2018.*

*** Note, not all junior residents advanced to RSA residents for a variety of reasons*
**** Total number refers to total number of individuals who held this position during the entire project. i.e. From Nov 2016 – March 2019, there were 25 paediatricians working in the department, but the actual number of paediatricians during any given phase of the project was variable.*
***** Total number of medical students who rotated through the Department of Paediatrics during our study period.*

3.8.3.1 MEDICAL STUDENTS

Over the course of the study, approximately 220 Bachelor of Medicine, Bachelor of Surgery (MBBS) students rotated through the Department of Paediatrics. Most of the medical students are from Botswana, generally in their early 20's with a near equal distribution of male to female ratio. *Note*: 'MBBS 3' refers to 3rd year medical students, and 'MBBS 5' refers to 5th year medical students.

3.8.3.2 PAEDIATRIC RESIDENTS

Over the course of the study, 40 paediatric residents were enrolled in the residency program. At the start of the study, there were 29 residents, an additional 11 entered into the program, 14 graduated from the program, and 4 left the program for various reasons, leaving 22 residents in the program at the end of the study.

Nearly all residents are from Botswana, but all received their medical school training outside of Botswana and therefore entered into the residency program with a variety of background skill level and clinical experience. All residents are generally in their late 20s or early 30s; with roughly equal gender ratios.

Residents' roles within their residency training can be divided into three functions: *junior residents in Botswana* completing the first part of their specialist training; *junior residents rotating in South Africa* and unavailable to participate in the study; and *senior residents* who had completed all of their specialist training and were in the process of completing their MMed research project (the final training requirement before formal registration as paediatricians in Botswana).

Note: For the purposes of this study, once a resident achieved *'senior resident'* status, (locally referred to as "chief resident") he/she was invited to participate in paediatrician educational sessions and surveys based on their level of seniority and active teaching role within the department.

3.8.3.3 PAEDIATRICIANS

Over the course of the study, the DoP had a total of 25 full- and part-time paediatricians, with 14 to 19 actively working paediatricians at any given time. At the start of the study, there were 14 paediatricians, an additional 11 joined the department, and 6 left the department for various reasons. Paediatricians working in the department are comprised of UB faculty (42%), Ministry of Health and Wellness staff (25%), and paediatricians from affiliate universities (33%).

This group of paediatricians is diverse in their country of origin (9 countries), first language spoken (9 languages), country of medical and paediatric training (9 training countries), training in paediatric sub-specialties (4 sub-specialties represented), age, and previous experience in teaching. At the beginning of the study, the paediatrician male-to-female ratio was 10:4, but shifted to 11:8 by the end of the study. At the beginning of the study, the paediatrician non-Motswana to Motswana ratio was 11:3, but shifted to 12:7 by the end of the study based on the incoming recent UB graduates into junior faculty positions. Non-Motswana include paediatricians from continental Africa, Asia, and North America, including Central America.

Note: For the purposes of this study '*faculty*' will refer to all paediatricians and clinical teaching staff who conduct clinical ward rounds; although locally 'faculty' only refers to UB paediatricians.

3.8.4 STUDY SAMPLING

In order to obtain a broad perspective of teaching and learning on paediatric ward rounds at PMH, the study sample included 3rd and 5th year medical students who had, or were busy completing their first or second paediatric rotation, junior and senior paediatric residents currently training in the DoP and all paediatricians currently working and teaching in the DoP at PMH.

3.8.4.1 MEDICAL STUDENTS

In Phase 1, purposive sampling, stratified by year of study, was used to select medical students for focus group discussions. To be eligible to participate in the FGDs, participants had to be currently rotating in the Department of Paediatrics, or was an MBBS 3, 4, 5 or intern who had previously rotated in the department within the last 12 months.

For all Phases, convenience sampling was used to select medical students to complete surveys and/or provide verbal feedback, (i.e. to be eligible, the medical student had to be currently rotating in the department at the time the survey/feedback was captured); there was no other exclusion criteria.

3.8.4.2 JUNIOR RESIDENTS

Purposive sampling was used to select junior residents to participate in FGDs, complete surveys and/or to provide verbal feedback. To be eligible, the junior resident had to be currently rotating in the Department of Paediatrics at the time the data was captured; i.e. junior residents rotating in South Africa were excluded from participating until they returned to Botswana; there was no other exclusion criteria.

3.8.4.3 SENIOR RESIDENTS

All senior residents working in the department at the time of the study were eligible to participate in the FGDs, complete surveys and/or provide verbal feedback. Based on their teaching role and seniority within the department, senior residents were invited to complete the same surveys and verbal feedback as the faculty and were essentially treated as faculty for the purposes of the study.

3.8.4.4 PAEDIATRICIANS

All paediatricians working in the department at the time of the study were eligible to participate in the interviews, complete surveys, and/or provide verbal feedback. During Phase 3, purposive sampling (those who had attended at least two prior educational activities) was used to select senior residents/paediatricians to complete surveys and provide SNAPPS-specific verbal feedback.

Note: Despite being a paediatrician, I was excluded from the Phase 1 faculty interviews and Phase 2 faculty surveys so as not to skew the data with my preconceived biases. Whereas, since I was also new to using SNAPPS, I did include myself as part of the faculty study population during Phase 3.

3.8.5 SAMPLE SIZE

The scope of this study was limited to the DoP at PMH, we therefore were limited in our sample size based on the number of students, residents and faculty available to participate. Based on this small sample, power calculations were not preformed.

3.9 RECRUITMENT

3.9.1 MEDICAL STUDENTS AND JUNIOR RESIDENTS

The study population included trainees, therefore, there was an inherent 'dependent relationship', i.e. medical students and junior residents are 'dependent' on their supervisors' evaluations for further progress through the department. In order to ensure that the trainees' decision to participate in the study was not influenced by the dependent relationship, recruitment announcements were only presented in department forums, allowing interested individuals to seek enrolment, (i.e. I did not approach individual trainees to participate, but recruitment was limited to department announcements, emails, flyers, and word-of-mouth from other students and residents).

Recruitment for focus group discussions, interviews and surveys for all phases of the study were conducted by me at the Department of Paediatrics' daily morning report meeting. During Phase 1, my verbal recruitment announcements were supplemented via email and hardcopy flyers. During Phases 3, trainees were also made aware of the study after their SNAPPS training, which was held in a group forum similar to the morning meeting. *(Appendix A)*

In Phase 1, two separate written consents were required for individuals to participate in either the FGDs and/or to complete surveys. Individuals who had participated in Phase 1 underwent new recruitment and consent process for Phase 2 and 3. In Phases 2 and 3, an additional separate consent was needed to complete surveys. All participants received a hard-copy information sheet prior to the focus group discussion and/or survey distribution. *(Appendix A)* Participation was fully voluntary. There were no penalties for any student or junior resident who did not wish to participate; and were coordinated so as not to interfere with clinical care.

3.9.2 Senior residents and paediatricians

Senior residents and paediatricians were recruited via department forum verbal announcements. In addition, I would also deliver the same verbal recruitment announcement in the faculty lounge on an individual basis. *Note*: since senior residents had completed all clinical course work and there was no ongoing evaluation process required for their completion of residency, there was no longer a dependent relationship.

In Phase 1, written consent was required for individuals to participate in either the senior resident FGD or paediatrician interviews. Individuals who had participated in Phase 1 underwent new recruitment and consent process for Phase 2 and 3. All participants received a hard-copy information sheet prior to the focus group discussion, interviews and/or survey distribution. *(Appendix A)* Participation was fully voluntary. There were no penalties for any senior resident or paediatrician who did not wish to participate; and were coordinated so as not to interfere with clinical care.

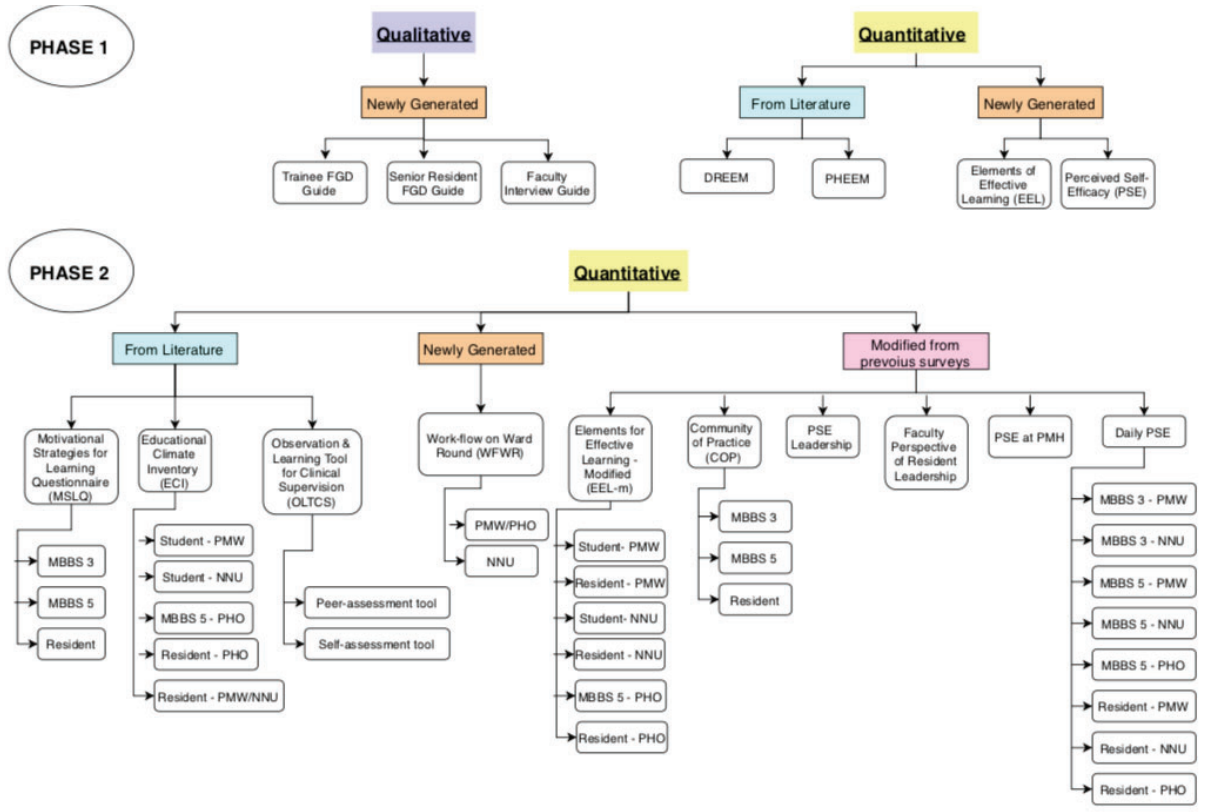
3.10 STUDY INSTRUMENTS

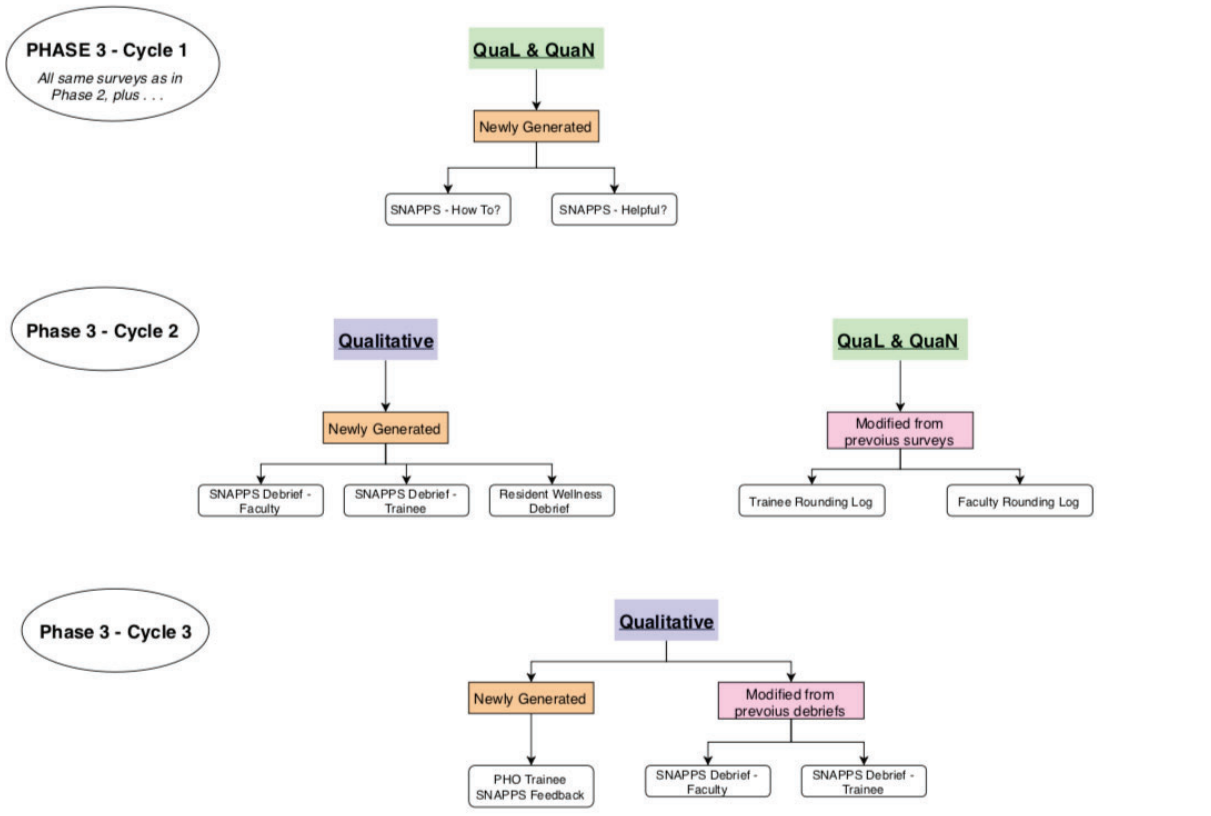
Inherent to action research is its emergent design, where the "data drives the study" and action researchers anticipate "shifts in questions, methods and designs" as part of the "spiralling synergism" of AR.[137] While the steps remain the same: Plan-Act-Observe-Reflect, the action researcher needs to remain flexible to allow each cycle of the PAOR to direct the researcher.[137,138] Therefore, over the course of the study, several study instruments and data sources were used.

While the objective of what we were trying to capture did not change over the course of time (maintaining integrity to the overall research questions), the way in which we tried to capture that data changed significantly over the Phases. With each phase and cycle, we learned more and more about which instruments worked and which did not. We discovered issues with the data collection itself and how this influenced our ability to analyse the data. With each new insight, we modified the instruments to help us obtain better data and provide a more robust analysis.

The consequence of this very responsive iterative process was that for the overall study, 48 study instruments were used (of those, 28 were stratified versions of an original survey; five were previously used surveys found in the literature; 12 were newly generated; and ten were ongoing modified versions of previously used surveys). *(Figure 9)*

FIGURE 9: STUDY INSTRUMENTS





While this may seem like a sizable number of surveys to answer seven research questions, what we were trying to measure (PSE, COP, and CLE) are not generally easy paradigms to quantify, particularly in a dynamic clinical teaching setting. Therefore, in order to discover the best possible method to accurately capture the desired construct, we needed to be flexible and responsive to each version of instrument feedback. Ultimately, our final study instruments were able to capture key findings that aided us in answering our final research questions.

So as not to overwhelm the reader with the number of instruments used in this study, I've structured it so that this chapter will only include a brief description of the type of research instrument used and the common method for how newly generated questionnaires were developed. Details of the specific instruments, decisions about why instruments were modified, no longer used, or inclusion of new instruments will be described separately within the appropriate Phase/cycle chapter.

Note: Due to the study's small sample size, the instruments and questionnaires generated were not formally piloted or locally validated. In lieu of a formal piloting, all study instruments were reviewed by the project team prior to data collection as a means to assess for relevance and likely comprehension of the questions. While some literature-based surveys had previously been shown to be internationally validated, none were validated in Botswana.[119-121,159-161]

3.10.1 TYPES OF STUDY INSTRUMENTS

3.10.1.1 FOCUSED GROUP DISCUSSION GUIDE

Focus group discussions were conducted in Phase 1 and were used to investigate trainees' motivations, perspectives, beliefs and attitudes around the current clinical learning environment on ward rounds. Since FGDs are "best for gaining a deeper understanding of the phenomenon from the participants' perspective," it was thought that utilizing FGDs would be the best method to obtain this information.[162] The FGDs followed a predominately exploratory guide with elements of needs assessment to assess for any barriers discussed about the CLE. The aim was not meant to be

generalizable data, but to provide a rich understanding specific to the Department of Paediatrics at Princess Marina Hospital. *(Appendix B.1) (Appendix B.2)*

3.10.1.2 Interview guide

Interviews were conducted in Phase 1 to obtain a more in-depth understanding and richer appreciation of the faculty's perspectives of clinical teaching. Based on the heterogeneous backgrounds of the paediatric faculty and their varying positions within the department, it was felt that more would be gained from one-on-one interviews as opposed to FGDs. Interview questions were generated to elicit key information, which could enhance the future impact of the ongoing project. *(Appendix B.3)*

3.10.1.3 Debrief guides

As described above, we knew that traditional forms of study instruments, such as questionnaires and formal interview guides had limitations in regards to conducting action research. To address some of these limitations, especially in Phase 3 where departmental feedback was crucial to the success of the project, overtime, the pre-determined questionnaires were slowly phased out of the project, with both trainees and faculty preferring to provide open-ended or verbal feedback. Instead of conducting formal interviews or focus groups, I chose to do 'debriefs'.

A debrief is "a simple, yet powerful tool that enables a team to self-correct, gel as a team, and enhance their performance."[163] During debriefs, "team members reflect upon a recent experience, discuss what went well and identify opportunities for improvement."[163] The debriefs gave supplemental verbal context for the surveys being used in Phase 3. They allowed us to capture data that was difficult to obtain from the surveys alone. The less-formal nature of the debrief also allowed us to more readily respond to the needs of the project without committing to a predetermined focus group or interview guide. *(Appendix B.4)*

3.10.1.4 ACTION RESEARCH DIARY/JOURNAL

An action research diary or journal is an essential instrument used in action research to capture data throughout the entire project. Specifically speaking, a "diary" is described as a "personal and private document in which the author not only documents life events and experiences but reflects about their emotional responses to them."[1] Whereas a "journal" is described as "the record of 'the journey' by the traveler."[1] The purpose of the diary is to "construct a portrait of the self for the self from the data of experience," whereas the purpose of the journal is "concerned with constructing accounts of observable happenings for an audience."[1]

For the purposes of this study, I used my action research account as both a diary and a journal simultaneously and therefore use the terms interchangeably. I reflected at least weekly in personal and practical ways utilizing a single Word document to capture events and activities of the ongoing project, annotated with dates as a progressive timeline. Included were my personal thoughts and reflections about the study events as well as my ongoing learning with updated literature review and study findings. This document is also where I captured my notes of pertinent conversations, emails, phone calls, and meeting minutes. *(Appendix B.5)*

3.10.1.5 QUESTIONNAIRES

A variety of questionnaires were used throughout all Phases of the study. Questionnaires were conducted to gain additional insight toward answering the research questions. Despite the potential pitfalls described above of using surveys in action research, the strengths of using surveys was to be able to broadly capture the 'voice' of the department at an individual level – particularly for trainees who may have not felt comfortable providing verbal feedback.

3.10.1.5.1 - DEVELOPING QUESTIONNAIRES

After reviewing the results of Phase 1, obtaining future feedback from trainees and faculty was an important aspect of the ongoing project. In order to improve the quality of our questionnaires, I

followed the seven-step guide offered by Artino et al in their *AMEE Guide No 87 - Developing questionnaires for educational research* in the hopes to "improve the probabilities" we would "accurately measure what [we] intend to measure."[164] *Note*: this method was not used to develop the Phase 1 newly created surveys; only in Phase 2 was this method identified and used to create further questionnaires.

The seven-steps are as follows: 1) Conduct a literature review, 2) Conduct interviews and/or focus groups, 3) Synthesize the literature review and interviews/focus groups, 4) Develop items, 5) Conduct expert validation, 6) Conduct cognitive interviews, and 7) Conduct pilot testing.[164] Following these steps, our questionnaires were designed with particular emphasis on the construct, wording and language, the response scale, and the overall visual format of the questionnaire.

Step 1 occurred prior to Phase 1, but we continued to have ongoing literature review updates during the process of narrowing our constructs. Step 2 occurred during Phase 1 of the project. Steps 3 and 4 occurred during Phase 2 of the project when the bulk of the surveys were designed. For most of the surveys, I decided to use a 5-point bipolar response scale because I wanted a simple survey (as opposed to 7-point); and the bipolar model (as opposed to unipolar) would create a neutral point response, which would allow trainees and faculty to indicate if no difference was being made based on our interventions.

From Steps 3 and 4, I had rough drafts of my surveys. I then shared these drafts with my PhD Supervisor who in detailed conversations, provided content expert validation, consistent with Step 5. Note: due to limited resources, the content expert validation was limited to a single expert, as opposed to a panel of experts, but we felt that her input helped to "establish that individual survey items [were] relevant to the construct being measured."[164]

For Step 6, in order to ensure "response process validity" all surveys used in Phases 2 and 3 were reviewed by a small group of trainees and/or faculty for feedback prior to its use for data collection. We used an informal cognitive interviewing process combining the "think-aloud" technique whereby "respondents verbalize every thought that they have while answering each item" and the "verbal probing" technique whereby the "interviewer asks the respondent specific questions about their

thought process as the respondent answers each questions"; this was then recorded and adjustments made accordingly.[164]

Finally, Step 7, while we did not formally pilot our surveys in the traditional sense, in accordance with the iterative process of action research, throughout Phase 2 and 3 of the project, we remained responsive to all feedback about our surveys and survey responses and continued to adjust the surveys as needed to ensure ongoing collection of validity evidence.[164]

3.10.1.6 DATA COLLECTION TOOLS

In quality improvement science, data collection tools (DCTs) are any type of instrument used to collect information about the system in relation to a specified project measure.[154] *Note*: for the purposes of our study, 'survey' or 'questionnaire' refers to subjective information from an individual about their personal experiences (e.g. feelings of discomfort on ward rounds); whereas 'data collection tool' refers to objective information gathered about an event or system (e.g. length of ward rounds) and therefore is not dependant on the individual collecting the data.

3.11 DATA COLLECTION

3.11.1 STUDY PROCEDURE AND DATA COLLECTION

The study was conducted in three distinct phases. Each phase of the study addressed different research objectives. The purpose of Phase 1 was to develop a detailed understanding of the current paediatric ward rounds. Phase 2 drew from the findings of Phase 1 to determine specific interventions that would be used in Phase 3. And Phase 3 tested, modified, and implemented the interventions generated in Phase 2. As such, the data collection process for each phase of the study was adapted to the ongoing research objectives during that phase. Therefore, this chapter will only describe general data collection processes that were consistent throughout the entire project, while specific variations of data collection will be presented within the respective Phase/cycle chapter.

3.11.2 DATA TYPES AND SOURCES

Data included both qualitative and quantitative sources. In Phase 1, qualitative data types included all transcriptions from audio recorded FGDs and interviews, as well as all field notes. In Phase 3, qualitative data sources included all informal observations and comments noted in my action research journal, my notes from the educational series, my own reflections of testing SNAPPS, daily notes on my patient rounding sheet, trainees' presentations of 'Select', informal and formal SNAPPS debriefs with faculty testing SNAPPS, informal debriefs of faculty not using SNAPPS, trainee SNAPPS group debriefs , pertinent photos, emails, phone calls, meeting minutes, and all open-ended survey questions. Quantitative data sources included the educational series attendance lists, data collection tools, and all survey instruments.

3.11.3 QUALITATIVE DATA QUALITY

In Phase 1, all focus group discussions and interviews were recorded by field notes and supplemented with a digital audio recorder. Participants were made aware of the note-taking and recording process. To confirm data quality, we ensured that the data had been acquired following the recommended FGD and interview guidelines.[165] The collected data was transcribed verbatim, including nonverbal utterances, by a professional service. The audio recordings and transcriptions were reviewed by me to ensure accuracy of transcriptions. The transcriptions were found to be of good quality, with the exception of a few medical terminology spelling errors, which were corrected. Of note, the professional service used was comprised of locally trained staff, and despite their previous experience in providing verbatim transcriptions, they had not been previously trained in voice identification numbering, this was only discovered after the majority of transcriptions had been completed; therefore, our transcriptions are limited to the individual's role (i.e. faculty vs trainee) but does not portray the individual (i.e. trainee #1 or trainee #2).

In Phase 3, due to the 'real time', impromptu, conversational and potentially sensitive nature of the responses, there was no formal recording system in place, therefore, with the exception of the open-ended survey questions, all qualitative data was captured using basic note-taking. The quality of data was ensured by the use of member-checking. For formal faculty debriefs, I took hand-written, non-

verbatim notes that were verbally summarized at the end of the debrief for the faculty member to verify my interpretation of our conversation. In most instances, these notes were later typed up and sent via email to the specific faculty member to verify my interpretation of our conversation. For all informal faculty/senior resident debriefs, data quality was ensured by presenting a verbalized overview of information at the department meetings or written summary via email. For the trainee group debriefs, I took hand-written, non-verbatim notes on a whiteboard during the debrief so they could verify my interpretation of the conversation in real-time.

3.11.4 QUALITATIVE DATA HANDLING

In Phase 1, transcriptions and observations were uploaded into qualitative analysis software (NVivo for Mac – Version 11©) for data organization purposes. In Phase 3, due to the relatively small data corpus, I was able to organize using Microsoft Word© and cutting and pasting into the preliminary coding framework, and did not need to utilize formal software to organize data.

3.11.5 SURVEYS

Survey data were used for piloting and descriptive purposes only, not causality; therefore, there was no set sample size requirement and the participants were not given a unique alphanumeric code for pre-post intervention purposes. All surveys were paper-based.

3.11.5.1 TRAINEE SURVEYS

Surveys were distributed to consented participants by me after the department daily morning report meeting. On a few occasions, based on available space and convenience for trainees, we used the student workroom to distribute and collect data. Participants were given the option to complete them in the morning report/student work room, or to take them home and return the surveys the following morning. No surveys were distributed or collected outside of the morning report room or student workroom. For participants who chose to complete the surveys in the morning report/student work

room, it was observed that it took participants approximately 10-20 minutes to complete the relevant surveys.

Completed surveys had no identifying information included, except for level of training: 'medical student' or 'paediatric resident' – resident participants were not asked to quantify year of training (i.e. PGY status) due to the potential small numbers which would have made level of training an indefinable characterization.

Surveys were collected at varying intervals and timeframes based on the needs of the Phase and/or the design of the survey. For instance, some surveys were designed to be captured at the end of the rotation for students or quarterly for residents. Other surveys were designed to be captured during ongoing rotation activity and therefore were distributed weekly.

3.11.5.2 FACULTY/SENIOR RESIDENT SURVEYS

Surveys were distributed to consented participants by me after the Department of Paediatrics daily morning report meeting. Participants were given the option to complete them in the morning report room, the staff lounge, or to take them home and return the surveys the following morning. For participants who chose to complete the surveys in the morning report room, it was observed that it took participants approximately 10 minutes to complete the relevant surveys. Completed surveys had no identifying information. Surveys were collected at varying intervals and timeframes based on the needs of the Phase and/or the design of the survey.

3.12 DATA ANALYSIS

Four consecutive types of data analysis occurred for almost every Phase of the project: qualitative data analysis, quantitative data analysis, mixed methods integration, and critical reflection. In Phase 3, quality improvement data analysis was also used. Any variation of data analysis will be described separately in the Phase/cycle chapters.

3.12.1 QUALITATIVE DATA ANALYSIS

For all qualitative data analysis throughout this study, we used *thematic analysis* as described by Braun and Clark.[166] Prior to any data analysis, we compiled all of the relevant qualitative data types and ensured its quality based on how it was collected.

3.12.1.1 THEMATIC ANALYSIS

Braun and Clarke divide qualitative analytic methods into two groups: "those tied to . . . a particular theoretical or epistemological position," and those "methods that are essentially independent of theory and epistemology, and can be applied *across* a range of theoretical and epistemological approaches."[166] They assert that thematic analysis falls into the second group and "provides a flexible and useful research tool, which can potentially provide a rich and detailed, yet complex account of data."[166]

To analyse the qualitative data, we used the principles of thematic analysis as a "method for identifying, analysing, and reporting patterns within data."[166] We chose thematic analysis based on its "theoretical freedom" and accessibility as a qualitative analytic method; meaning that we could gain a "rich and detailed, yet complex account of the data" without the method being overly burdensome.[166] While Braun and Clarke's original guidelines for using thematic analysis for qualitative research was written for psychology-related research, its application and relevance to HPE qualitative research is widely recognized.[167-170]

In their paper, Braun and Clarke outline a 6-step guide to conducing thematic analysis. 1) Familiarising yourself with your data, 2) Generating initial codes, 3) Searching for themes, 4) Reviewing themes, 5) Defining and naming themes, and 6) Producing the report. *Note*: while the description provides a "linear" account, the actual thematic analyses were "recursive" processes, often requiring me to 'jump' between steps.[166] *(Appendix C.1)* *Note*: for Phase 1, the inductive coding, searching, reviewing, and defining of themes was done independently by two researchers (TA & SM) and discussed for any discrepancies until consensus was met.

Beyond the steps of thematic analysis, there are a number of factors which need to be considered when conducting thematic analysis. They are briefly described below.

3.12.1.1.1 - THEORETICAL FRAMEWORK

Throughout this study, we chose to conduct our thematic analysis using an essentialist/realist epistemological approach. Meaning that we chose to theorize meaning based on the reported experiences from the participants, not potential influences of society on participant discourse (i.e. verses constructionist method). This allowed us to theorize and report the "experiences, meanings and reality" of the participants in a "straight-forward way" based on the assumption that there exists a "unidirectional relationship between meaning and experience and language."[166]

3.12.1.1.2 - SEMANTIC VS LATENT THEMES

We identified the themes at the semantic (explicit) level; no attempt was made to draw meaning or to look for "anything *beyond* what a participant said."[166] This allowed the data analysis to progress from an initial stage of "description" into a later stage of "interpretation."[166]

3.12.1.1.3 - INDUCTIVE VS DEDUCTIVE THEMATIC ANALYSIS

We used an inductive approach; i.e. there were no pre-existing themes or coding framework prior to collecting qualitative data. Of note, over time, the study progressed from exploratory (Phase 1) to testing and implementation (Phase 3). Specifically, in Phase 3-Cycle 1, focus was on the feasibility of SNAPPS; we wanted to look at how faculty and trainees understood and interpreted SNAPPS, and to identify any barriers to using SNAPPS. Our hope was to better understand if the didactic sessions were effective and if SNAPPS was considered to be a useful model to enhance learning and teaching from both the perspective of the faculty and trainees. Whereas in Phase 3-Cycle 2, our focus was on the uptake, acceptance and use of SNAPPS, while simultaneously looking at any persistent barriers to using SNAPPS on ward rounds. While the focus of the qualitative data became more explicit, there were no pre-coded frameworks used and collected data continued to be inclusive of all types of

responses and reflections, so as to provide opportunity for other non-queried related themes to develop.

3.12.1.1.4 - Researcher bias

While the thematic analysis was inductive in nature and "data-driven", I acknowledge that my prior HPE literature review and interests are likely to have resulted in some influence. To counterbalance this possible influence, in Phase 1 and where available in Phase 3, we used investigator-triangulation during the thematic analysis. Additional biases as they developed are discussed in the Phase/cycle chapters.

3.12.1.1.5 - Influences of theory during analysis

In accordance with the inductive approach, for Phase 1, while I had previously done an HPE literature review related to topics of discussion in the FGDs and interviews, I did not continue to access relevant literature until later stages of the thematic analysis. This process of being familiar with the "phenomena under investigation" while simultaneously avoiding "engage[ment] with literature in the early stages of analysis" is a commonly used approach in inductive qualitative research.[162,166] For Phase 3, an important component was to continue to actively engage the literature, but this was generally done after thematic analysis had been conducted and had limited influence on the specific cycle of analysis.

3.12.1.1.6 - A "rich description" vs a "detailed account"

We attempted to provide a rich description of the data corpus, with the identified themes representing an "accurate reflection of the content of the entire data set".[166] In this regard, the reader will be presented with all of the important themes discovered from the entire data set. We also attempted to provide a detailed account of specific aspects of the data set. For example, in Phase 1, we looked carefully at faculty responses to questions which elicited for intrinsic or extrinsic motivations that might be useful in future faculty development.

3.12.2 QUANTITATIVE DATA ANALYSIS

The surveys used throughout this study were scored according to their individual method as available; where indicated, negative items were scored in reverse. Each individual question, sub-category and overall survey responses were calculated for mean, standard deviation (SD), median and range values. After scoring the surveys, we looked at the results of the sub-categories and overall surveys for any identifiable trend in response that may highlight an area for improvement or current successes.

It is important to note that the quantitative data analysis was limited to *descriptive* analysis only. Due to the small sample size and collecting data from different groups of individuals over time, no statistical significance or causal effect was elicited. We did not use this data to generate pre/post or cause/effect comparison analysis, instead the data was intended to supplement the qualitative data we were gathering and provide a broader perspective of and feedback for the study's activities and initiatives.

3.12.3 MIXED METHODS DATA ANALYSIS

Mixed methods analysis "consists of analytic techniques applied to both the quantitative and the qualitative data as well as the integration of the two forms of data."[151]

3.12.3.1 CONVERGENT INTEGRATION OF DATABASES

For Phase 1 and Phase 3, we used convergent mixed methods data analysis as described by Creswell and Clark in their text *Designing and Conducting Mixed Methods Research*, which provides a four-step process for implementing a convergent mixed methods design.[151] *(Table 2)*

TABLE 2: PROCEDURE FOR IMPLEMENTING A CONVERGENT MIXED METHODS DESIGN[151]

Step 1:	Design the qualitative strands and collect qualitative data *AND* Design the quantitative strands and collect quantitative data
Step 2:	Analyse the quantitative data *AND* analyse the qualitative data
Step 3:	Use strategies to merge the two sets of results: identify content areas represented in both data sets and compare, contrast and/or synthesize the results in a discussion or table; or create a joint display diagram
Step 4:	Interpret the merged results

When using convergent integration data analysis, I began the merging of the quantitative and qualitative data by first identifying content areas represented in both databases. Since the results of each individual survey and sub-scales within each survey did not always obviously align with the qualitative thematic analysis results (e.g. DREEM's sub-scale 'Social self-perceptions' was not an obvious theme within the qualitative results), I needed to develop a more detailed criteria for inclusion to be able to make direct comparisons between the two databases. Therefore, in order to successfully merge the two databases, each individual question from all the surveys was re-reviewed in reference to the themes of the qualitative data to identify obvious overarching content areas.

For example, questions that directly asked about 'feedback' from all of the surveys were highlighted and grouped. All qualitative results related to 'feedback' was re-reviewed. If the stem of the survey questions appropriately corresponded to the content of the qualitative theme, then 'feedback' was identified as a common content area.

Only survey questions that directly corresponded with results from the qualitative thematic analysis were considered to meet inclusion criteria. Grouping of survey questions that corresponded to an identified qualitative theme were then determined to be a common content area between the databases. This process of directly comparing survey questions to the qualitative themes was repeated several times until all common content areas were identified. Through this process, the majority of all survey questions were represented under the identified common content areas. Several survey

questions did not meet inclusion criteria based on either not being relatable to the qualitative data or the overall research questions. Since the qualitative data was much broader in content compared to the surveys, much of the qualitative data was not included in the common content area and could not be further analysed through a mixed methods perspective.

For Phase 1, to ensure that the data being merged came from the same group of participants, only qualitative data from trainees (medical students and junior residents) was included for the comparative analysis. This is because the quantitative survey data was only gathered from the trainees, not the faculty or senior residents. So while the overall qualitative thematic analysis combined all data sources (students, residents and faculty), during the integrative analysis, the qualitative data used was limited to comments and themes from the junior trainees.

For Phase 3, while generally junior trainees completed more surveys than senior residents and faculty, to obtain a unified representation of the 'voice' of the department, we did not stratify the data sources based on position within the department, but maintained a 'collective' inclusion for comparative analysis.

Complete integration of the databases was achieved through the creation of joint display diagrams, whereby a 'table of pertinent results' was used for further representation and interpretation of the integrated results.[151,171] *(Appendix C.2)*

3.12.3.2 Exploratory mixed methods

For Phase 2 and Phase 3, we used exploratory sequential mixed methods data design and analysis. Specifically, we used findings from the previous phase or cycle to 1) create or modify a survey instrument, and/or 2) develop an intervention. The advantage of this sequential design which essentially "translates the previous findings into an approach" is that the developed instrument or intervention was "grounded in the views of the participants."[151] For our project, this type of exploration was particularly useful for two reasons. First, we needed to create study instruments that

aren't readily available in the existing literature. And second, we wanted our instruments and interventions to be "as specific to participants and culture as possible."[151]

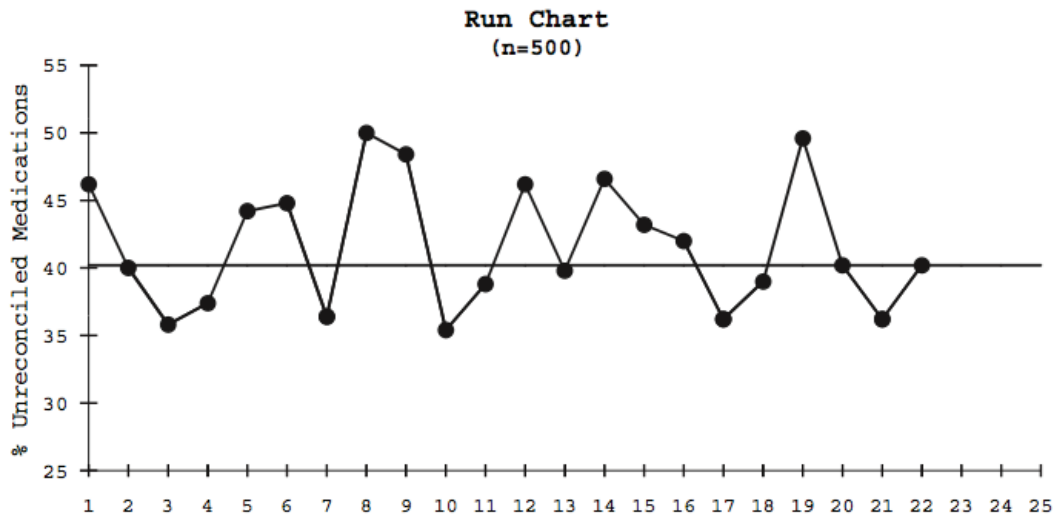
The actual integration and analysis of the exploration sequential design "involves using the qualitative results to build a new quantitative feature that is grounded in the culture and perspectives of participants."[151] The influences of the previous findings on the instruments and/or interventions will be explicitly stated within the Phase/cycle chapters.

3.12.4 QUALITY IMPROVEMENT DATA ANALYSIS

3.12.4.1 RUN CHARTS

In quality improvement (QI), baseline and interim data are collected and annotated on a 'run chart' to show whether improvement has occurred or not over time. *(Figure 10)* Measured data points are graphically displayed utilizing a 'run chart', where the x-axis displays time, the y-axis displays the "quality indicator being studied" and the centreline is the calculated median.[172] The median on a run chart is considered the "point at which half the observations are expected to be above and below" and is not "influenced by extreme values in the data".[172]

FIGURE 10: EXAMPLE RUN CHART[172]

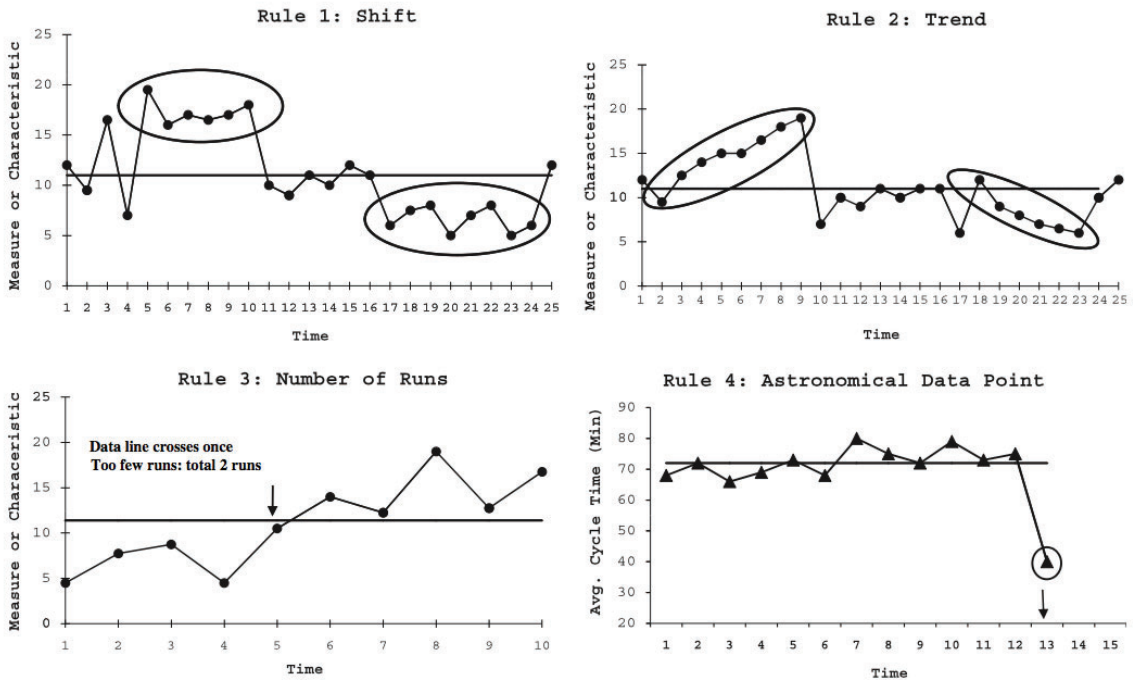


Interpretation of the run chart is based on four 'probability based rules' to determine if the data represents non-random change.[172] *(Figure 11)*

1. Shift: six or more consecutive data points above or below median may be a signal of non-randomness;
2. Trend: Five or more consecutive points going up or down (counting the lines between points) may be a signal of non-randomness;
3. Runs: Too few or too many runs (crossings of the median) may signal non-randomness.
4. Astronomical point: "used to detect unusually large or small numbers"[172]

Collected data must be captured frequently to allow for enough consecutive points to generate a meaningful run chart.

FIGURE 11: RUN CHART 'RULES'[172]



3.12.5 CRITICAL REFLECTION DATA ANALYSIS

As described above, critical reflection is the combination of '*reflexivity*' and '*dialectics*'. [138] This was achieved in our study through the use of the critical reflection handout provided in *A Handbook for Action Research in Health and Social Care* to stimulate the reflective and dialectic process during our ongoing data analysis.[138] *(Appendix C.3)* This handout provides four sets of questions aimed at generating innovative thinking to enable the researcher to consider the data in such a way that he/she can "learn from them something that we didn't' know beforehand."[138] When reviewing my data sources, I would often read and re-read these sets of questions to generate new thought processes about my data. I would record these new thought processes as types of 'critical reflection' which was later reviewed to look for overarching themes or tensions within the data and results.

3.12.6 CRITICAL REFLECTION THROUGH A CFIR LENS

The Consolidated Framework for Implementation Research (CFIR) is a menu of 26 constructs categorized into five domains that provides a "practical guide for systematically assessing potential barriers and facilitators" during implementation projects.[173] The five domains include: (i) Intervention characteristics, (ii) Outer Setting, (iii) Inner Setting, (iv) Characteristics of individuals, and (v) Process. *(Appendix C.4)* Utilizing the CFIR allowed us to categorize our critical reflection into meaningful implementation constructs to help us better understand our findings. This tool has been previously used in medical education research studies.[174]

3.13 VALIDITY & TRUSTWORTHINESS

3.13.1 VALIDITY

The purpose and methods of action research require different validity criteria than traditional research. For this study, we drew upon Anderson and Herr's five validity criteria: 1) *outcome* ("the extent to which action occurred"), 2) *process* ("to what extent problems are solved that permits ongoing learning"), 3) *democratic* ("extent research is done in collaboration with others"), 4) *catalytic* ("degree to which the research process focus on participants transforming reality"), and 5) *dialogic* ("degree of peer review/scrutiny that occurred").[137] Steps were taken throughout the study to achieve these validity criteria, and will be discussed in detail in the Limitations chapter.

3.13.1.1 REFLEXIVITY

Researcher self-reflection is a critical aspect of the validity and trustworthiness of action research. In order to ensure a rich reflexivity, I kept an ongoing narrative-style AR journal, which provided systematic records of the research process, including the choices made during the project and their consequences. It also captured all forms of peer review ("critical friend") conversations and highlighted different possible interpretations during the project. It documented ethical issues as they arose and how I reflected and responded to those issues.

To ensure the collaborative process of AR, it was important for me to describe my dynamic positionality during the project and its implications on the project. It was also important for me to include an ongoing description of the group members' involvement during the project. In addition, ongoing member checking from all participants was used to enhance trustworthiness.

3.13.2 TRUSTWORTHINESS

To improve the trustworthiness of our qualitative data, we considered the credibility, transferability, dependability, and confirmability of our data and data analysis. For *credibility* of our data and data analysis, we utilized member checking and triangulation (method, theoretical and researcher triangulation) methods. To ensure *transferability* of our data and analysis, we provided a "thick description of the context under study" including sampling strategy, and compared our findings to previous work in the literature.[165]

To ensure *dependability*, we conducted medical student FGDs and faculty interviews until saturation was met. For the junior and senior resident FGDs, department numbers limited our ability to continue to conduct FGDs until saturation was met, but we continually used additive data (questionnaires) to increase the dependability of our FGD data and analysis. For *confirmability*, we utilized an audit trail and reflexivity methods. We also referred to the literature for any contradictions to our findings and analysis.[165]

3.14 ASSUMPTIONS & LIMITATIONS

3.14.1 ASSUMPTIONS

Assumptions within the project include our realist epistemological approach. We assumed that all responses and feedback from the participants were a direct relationship from their experience to their meaning and no other external influence altered their meaning or language used. We assumed that

all responses were answered honestly and willingly, without external pressures that would influence participants' responses. We assumed that the methodology chosen was the most appropriate for our project.

3.14.2 LIMITATIONS

As described above, the use of traditional research instruments in AR is problematic. We used many forms of traditional research instruments, including FGD guides, interview guides, and questionnaires. Conversely, we recognize that many of our data types and sources were untraditional in nature, and that the type of data being classified as 'qualitative' or 'quantitative' definitely reached beyond traditional methods. For example, informal conversations and emails were combined under 'qualitative data' and attendance sheets or length of rounds was placed under 'quantitative data', which is not typical for mixed methods data analysis.

As described in the Literature Review, the complex constructs we were trying to capture (CLE, COP and PSE) in and of themselves was problematic. The literature reports very little success to adequality capture this type of data, which makes interpretation of our data challenging.

While our FGDs and interviews use audio recording and verbatim transcriptions, these did not include voice identification of individuals and are thus limited to the individual's role (i.e. faculty vs trainee) and does not portray the individual (i.e. trainee #1 or trainee #2) speaker, which weakens the dependability of our data.

Another limitations of our methods was our small and dynamic sample size, particularly for the quantitative data. This prevented generation of comparative analysis of our quantitative data. In addition, the use of unvalidated questionnaires in our Botswana setting (both from the literature and newly generated surveys) limited the potential credibility of our gathered data.

It is also important to note that literature has remarked on the use and potential weakness of evaluation feedback in health professional education.[175] For instance, it has been found that trainees may not completely understand health professional education terminology or concepts; and trainees' "ratings tended to be skewed toward the positive end of the scale," – both of which limits our ability to draw conclusions from the surveys alone.[175]

3.15 ETHICS

Ethical approval was obtained from the following review boards prior to the start of the study: (1) Republic of Botswana Ministry of Health and Wellness, Health Research and Development Division; (2) University of Botswana Office of Research and Development; (3) Princess Marina Hospital Research and Ethics Committee; (4) University of Cape Town Faculty of Health Sciences Human Research Ethics Committee; (5) The Children's Hospital of Philadelphia Institutional Review Board; and (6) University of Pennsylvania Institutional Review Board. These were renewed on an annual basis and remained valid for the duration of the project. *(Appendix D)*

3.16 CHAPTER SUMMARY

In this chapter, I introduced the methodology used and justification for its use for this project. I described my researcher positionality and the participatory population. I presented the overall research design, setting, population, recruitment, procedures, instruments, data collection, data analysis, validity, and ethics of this study. The next chapter will more deeply explore the iterative (Plan-Act-Observe-Reflect) process that occurred during Phase 1 project.

CHAPTER 4: PHASE 1 - EXAMINING THE PROBLEM

4.1 CHAPTER INTRODUCTION

This chapter serves to introduce the reader to the research design, methods, and results used and developed in Phase 1 of this study. *Note*: Our Phase 1 Reflections will be discussed in Chapter 5. Phase 1 was conducted as participatory action research from the perspective of an 'outsider' collaborating with 'insiders' within the Department of Paediatrics at Princess Marina Hospital in Gaborone, Botswana during 2016. Following the iterative Plan-Act-Observe-Reflect cycle of action research, Phase 1 focused on examining the problem through the perspective of department members. Utilizing mixed method design, we set out to achieve the first two objectives of the study and to answer the first four research questions.

In this phase, we developed an in-depth understanding of trainees' and faculty's perceptions of the clinical learning environment (CLE) and community of practice (COP) on paediatric ward rounds using qualitative and quantitative mixed methods research, (*Objective 1*). Thereafter, we evaluated trainees' perceived self-efficacy (PSE) beliefs with regards to providing adequate patient care and explored the potential influences of the clinical learning environment and community of practice on ward rounds on these beliefs, (*Objective 2*); the details of which will be presented in Chapter 5.

4.2 PHASE 1 - RESEARCHER POSITIONALITY

I entered into this project as a true 'outsider' – white, foreign, and English-only speaking. I was new to the continent, country, hospital and department. And entering as a member from an 'affiliate' university, I had no official hierarchy status within the department since I did not directly report to any UB faculty or to MOHW staff. Yet, despite this 'outsider on the fringe' perspective, "positionality occurs not only in terms of inside/outside, but also in terms of one's position in the organizational or social hierarchy," and clinical medicine has a very specific sense of hierarchy.[137]

So while I entered Botswana as an outsider without an official hierarchical rank, *clinically*, I had a very tangible and specific place on the hierarchy pole – I was a paediatrician. Clinically, I was responsible for all the medical student, intern, medical officer, and resident training on my rounds. If I had a clinical issue, I would take it up with the head of the department; if I had a training issue, I would take it up with the residency program director. The clinical status in medicine is so significant that even without having a departmental level of hierarchy, my clinical status gave me influence that I might not otherwise would have had. For example, I could request sessions to teach residents, I could ask to meet with other faculty, or I could make announcements at morning report with ease.

During the many months leading up to Phase 1, while I was slowly becoming an active member within the department, I was still an 'outsider' collaborating with 'insiders'. There had been three previous fellows, so my position was not new and I was often referred to as "the *new* Kate". Early on during my fellowship, the first group of UB senior residents arrived back to the department from their South African training. While my age and clinical experience were similar to theirs, I was technically 'higher' on the clinical hierarchy, which exacerbated the feeling of being apart from this tight-knit group. I was slow to make friends. So, I attended morning report meetings, journal clubs, protocol meetings, faculty retreats, resident orientations, split call shifts – essentially made myself present for all departmental level activity.

But despite these activities and efforts, I still felt like an outsider, until a chance opportunity came up in May 2016 which allowed me to volunteer to help out with the trainee department roster schedule. Becoming 'the scheduler' gave me a 'role' beyond my clinical duties in the department. Now I worked closely with all members of the department – leadership, rotation coordinators, residents, medical officers, and interns. I was consulted daily for scheduling issues and was even responsible for signing off on leave. This practical 'place' within the department was my first step toward feeling like an insider.

4.3 PHASE 1 - PARTICIPATORY POPULATION

The project team members all had a very active role in Phase 1. We met several times in the months leading up to Phase 1 and they provided valuable research services, including providing feedback of

the study instruments, coordinating the focus group discussions, and bringing awareness of the project to the department as a whole. All project team members were also active participants in the study itself.

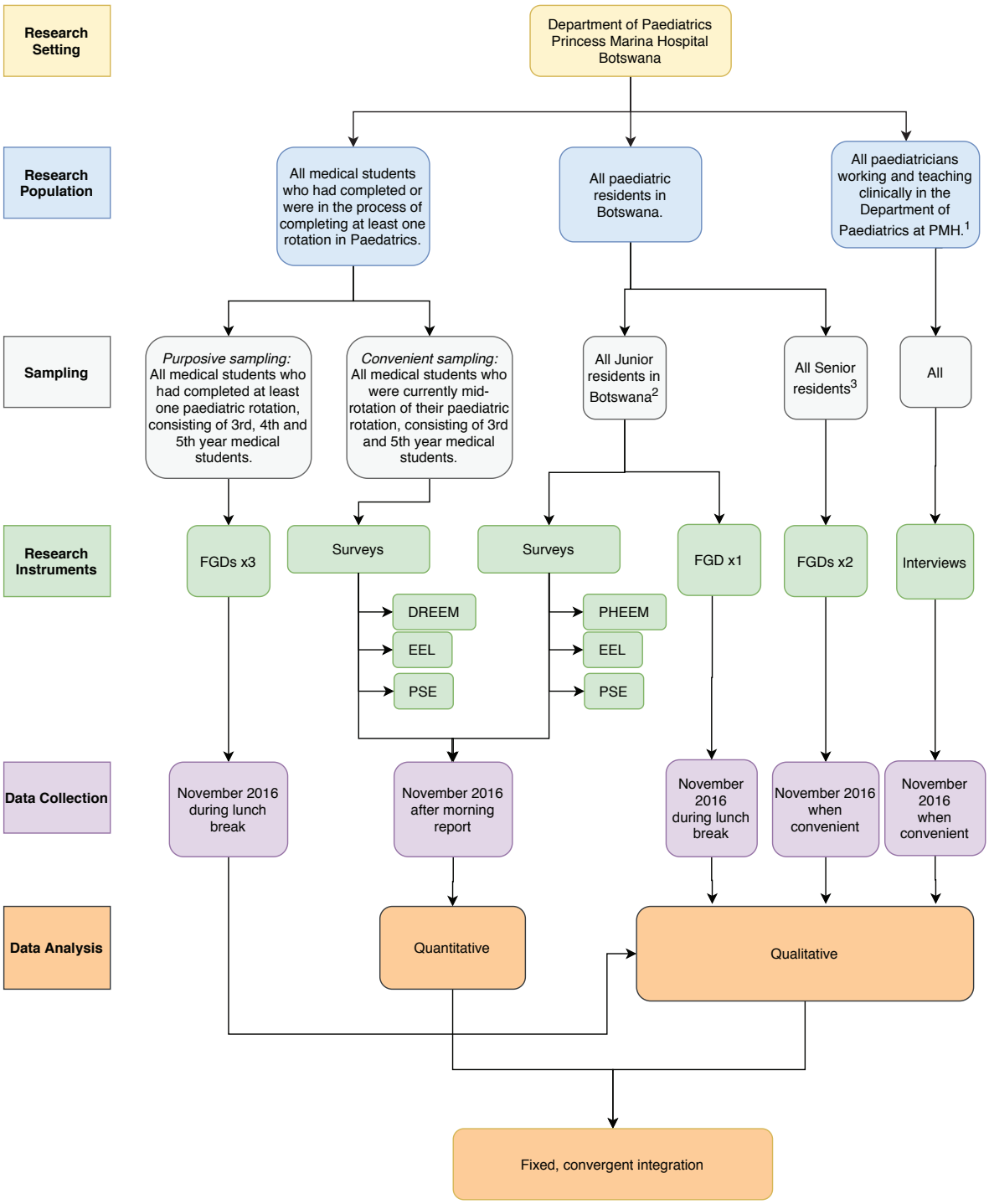
4.4 PLAN: PHASE 1

4.4.1 METHODS

Refer to *Chapter 3 – Methods* for more details.

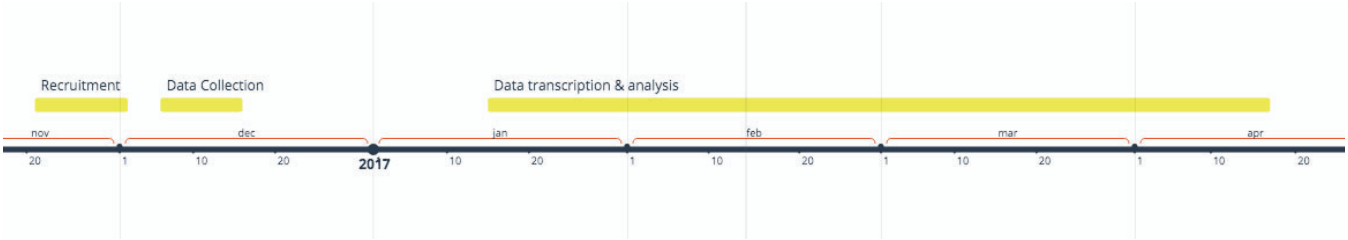
The first phase of the study was conducted as a cross sectional observational study using a mixed methods approach. In order to assess the trainees' prevailing perceptions of the clinical learning environment, level of social participation and self-efficacy beliefs we used four different quantitative survey instruments. Simultaneously, to obtain an in-depth understanding and rich appreciation of the trainees' and faculty's perspectives, focus group discussions and interviews were conducted. *(Figure 12)* Phase 1 took place from November 2016 through April 2017 in the Department of Paediatrics at Princess Marina Hospital. Data was collected from November to December 2016; this data was then transcribed and analysed from January through April 2017. *(Figure 13)*

FIGURE 12: PHASE 1 - RESEARCH DESIGN



Notes 1-3: See Chapter 3 Methods for details of research population and sampling.

FIGURE 13: PHASE 1 - TIMELINE



4.4.2 PHASE 1 - STUDY POPULATION

In addition to the 10 MBBS 3, 10 MBBS 5, 9 junior residents, 13 senior residents, and 14 paediatricians available to participate in the study, during Phase 1 there were also 20 MBBS 3, 50 MBBS 4, 20 MBBS 5, and 50 recently graduated MBBS 5 (interns) who had all completed their paediatric rotation within the last 12 months and were eligible to participate in the FGDs.

4.4.3 PHASE 1 - STUDY INSTRUMENTS

A combination of focus groups, interviews, and surveys were used for Phase 1 of the study.

4.4.3.1 FOCUS GROUP DISCUSSION GUIDE

The FGD guide was generated by drawing upon the seven elements of an effective learning environment as described by the Stanford Faculty Development Program.[96] *(Refer to Chapter 2)* *(Appendix B.1)* The purpose of these questions was to generate conversation about paediatric ward rounds as a means to gain the trainees' perspective of the prevailing CLE, but were broad enough to allow for other themes related to learning and teaching to develop. The sequence of questions for the FGDs were generated using common FGD templates, which includes an opening question, an introduction question, a transition question, two-to-five key questions, and an ending question.[165] Questions were ordered so that general questions came before specific, positive before negative; and un-cued before cued.[165] The phrasing of questions were "open-ended, simple and conversational in nature".[165]

Note: In light of the unique perspective of the senior residents being simultaneously fresh from the learner role and newly assigned to the teaching role within the department, their FGD guide was modified to create a combination of trainee FGD questions and paediatrician interview questions as a means to elicit their perspectives of both the learner *and* teacher role. *(Appendix B.2)*

4.4.3.2 Interview guide – Phase 1

Drawing upon Kumar's Behaviour Change Transaction model, the faculty interview questions were constructed to "address the fundamental determinants of behaviour change," which are: contextualized information, intrinsic motivation, extrinsic motivation, behaviour skills and self-efficacy, and environment.[101] *(Refer to Chapter 2)* The interviews followed a structured interview template, with a combination of closed-ended and open-ended questions; leading questions were avoided to prevent interviewer influence on subsequent responses.[176] *(Appendix B.3)*

4.4.3.3 Survey instruments

Four survey instruments were used in Phase 1.

4.4.3.3.1 - Dundee Ready Educational Environment Measure

The Dundee Ready Educational Environment Measure (DREEM) was used to determine medical students' perceptions of the CLE. The DREEM survey is a 50 item questionnaire that assesses an institution's learning and teaching environment using five sub-scales: Perceptions of learning (12 items), Perceptions of teaching (11 items), Academic self-perceptions (8 items), Perceptions of atmosphere (12 items), and Social self-perceptions (7 items).[118,120,121] Questions are scored using a 0 to 4 five-point Likert scale, with 0 = Strongly disagree, 1 = Disagree, 2 = Unsure, 3 = Agree, and 4 = Strongly agree. Negative questions are scored in reverse. The maximum possible score is 200 and the minimum score is 0.[118,120,121] We made minor modifications to the DREEM survey to make questions more relevant to the Department of Paediatrics and paediatric ward rounds instead of the traditional usage, which would assess the entire medical school's CLE. *(Appendix B.6)*

4.4.3.3.2 - Postgraduate Hospital Educational Environment Measure

The Postgraduate Hospital Educational Environment Measure (PHEEM) was used to determine paediatric residents' perceptions of the CLE.[119] The PHEEM is a 40 item questionnaire that assesses hospital-based clinical teaching and learning environments using three sub-scales: Perceptions of role autonomy (14 items), Perceptions of teaching (15 items), and Perceptions of social support (11 items).[119] Questions are scored using a 0 to 4 five-point Likert scale, with 0 = Strongly disagree, 1 = Disagree, 2 = Unsure, 3 = Agree, and 4 = Strongly agree. Negative questions are scored in reverse. The maximum possible score is 160 and the minimum score is 0.[119] We made only one modification to the PHEEM survey, which was the removal of Question 17, which was not locally relevant; all other questions remained the same. *(Appendix B.7)*

4.4.3.3.3 - Elements for Effective Learning on Ward Rounds Survey

A newly constructed, 36-item questionnaire based on the Stanford Faculty Development Program's (SFDP) seven elements for effective learning was used to assess trainees' prevailing perceptions of the CLE.[96] The questionnaire utilized six sub-scales: Establish a positive learning environment (10 items), Control of session (6 items), Communication of goals (6 items), Promotion of understanding and retention (8 items), Feedback (3 items), and Promotion of self-directed learning (3 items). *Note*: The SFDP learning domain 'Evaluation' was not incorporated into the survey, because in this context, 'evaluation' would have been difficult to assess from the learner's perspective. Embedded within the subscales are 24 questions that evaluate trainees' level of participation in, and sense of belonging to, a community of clinical practice. Specifically, the questions consider trainees' *participation* and *reification* as part of the work of engagement. *(Appendix B.8)* Questions are scored using a 0 to 5 six-point Likert scale, with 0 = Strongly disagree, 1 = Disagree, 2 = Somewhat disagree, 3 = Somewhat agree, 4 = Agree, and 5 = Strongly agree. Negative questions are scored in reverse. The maximum possible score is 180 and the minimum score is 0. *(Appendix B.9)*

4.4.3.3.4 - PERCEIVED SELF-EFFICACY SURVEY

A newly constructed, 21-item perceived self-efficacy questionnaire, was used to evaluate medical students' and junior residents' PSE in regards to their ability to provide paediatric patient care. The survey was designed according to the principles of self-efficacy scale development as described by Bandura, where participants were asked to rate their level of certainty to perform a specific task by recording their confidence level from 0 to 100.[128] (*Refer to Chapter 2 - Literature Review)*

The specific tasks participants were asked to rate was based on a combination of activities described in the SNAPPS bedside teaching model and the CanMEDS framework.[14,104] CanMEDS is a "physician competency framework" used in evaluating physicians in training.[104] The CanMEDS evaluation framework is currently used within the University of Botswana as a model of competency for medical students and as post-rotation evaluation for junior residents. The framework is divided into seven 'roles' that "lead to optimal physician performance, care delivery and health care outcomes."[104] The CanMEDS evaluation form assesses the trainees' competence to master each of these roles: Medical expert, Scholar, Communicator , Collaborator, Manager, Health advocate, and Professional.[104] *(Appendix B.10)*

Specifically, 13 questions from CanMEDS were used as a basis to construct the rated activity: Medical expert (6 items), Scholar (3 items), Communicator (2 items), Collaborator (1 item), and Professional (1 item) and then correlated with steps from the SNAPPS model. In some instances, minor modifications to the CanMEDS descriptions were made to make more relevant to paediatric activities. *(Appendix B.11)*

4.5 ACT: PHASE 1

4.5.1 PHASE 1 - DATA COLLECTION

4.5.1.1 FOCUS GROUP DISCUSSIONS

Our methods to conduct the FGDs were consistent with the standard definition of a focus group: a small group of people as the focus of the research, with a focused topic, an engaging moderator, and inclusion of the interaction between group members as part of the data collected.[165] The topic was not of a sensitive nature, making it ideal for FGDs. To prevent power differences among the participants, the FGDs were stratified into three groups: 1) medical students, 2) junior paediatric residents and 3) senior paediatric residents. Each FGD was approximately 1.5 hours in length, occurred over a one-week period at 1pm, (except one senior resident FGD which occurred at 9am), and occurred in the same room to prevent an environmental effect on the discussion.

Participants were asked a series of open-ended, semi-structured questions. I conducted all of the FGDs. I have prior experience in moderating FGDs and utilized a non-directive approach along with several moderator techniques to enhance the quality of the data collection. I followed the structured guide during the FGDs, but was also flexible and allowed the conversation to divert when relevant to the overall research question.

Ideally, we would have had one co-investigator per FGD to record observational aspects of the FGD, but due to scheduling issues, we were only able to have an observer in two of the FGDs. Observations, including group dynamics and other non-verbal features, were recorded via note taking. These were then typed up and included as part of the data analysis. *Note*: The observational member was not of the same level of those being interviewed - i.e. a resident co-investigator aided in the observation of one medical student FGD, and a member from the UB DME observed one senior resident FGD.

While good FGD practice recommends to conduct as many FGDs as needed to reach saturation of possible themes, due to the fixed number of paediatric residents within the department, we were limited in the number of FGDs we were able to conduct. To compensate for this limitation, two of the surveys conducted specifically addressed the CLE from a resident-in-training perspective, which were used to supplement FGD data. The medical student FGDs were conducted until saturation of themes were met.

4.5.1.2 Interviews

All interviews followed a structured interview guide and were generally non-leading in nature to prevent interviewer influence on subsequent responses.[176] All interviews were conducted by me, and occurred over a two-week period, and each lasted from 30 to 60 minutes. Each interview was conducted in a private office space as specified by the faculty participant; one interview was via Skype©. Interviews were conducted until saturation of themes was met.

4.5.1.3 Qualitative Data Collection Limitation

Of note, while our FGDs and interviews used audio recordings and professional services for verbatim transcriptions, these did not include voice identification of individuals and are thus our qualitative data collection is limited to the individual's role (i.e. faculty vs trainee) and did not portray the individual speaker (i.e. trainee #1 or trainee #2). While we could have gone back into the transcriptions, particularly for the faculty interviews, and try to retrospectively identify individual speakers, due to the very small department, in order to preserve confidentiality and anonymity, we chose not to go back and assign numbers to quotations in fear of individuals being identified by their statements alone. We recognize this as a significant methodological limitation.

4.5.1.4 Surveys

A total of four surveys were distributed to medical students and junior residents. All surveys were conducted over a one-week period.

Refer to *Chapter 3 – Methods* for more details about Data Collection and Data Analysis.

4.6 OBSERVE: PHASE 1

4.6.1 PHASE 1 - RESULTS

4.6.1.1 QUALITATIVE RESULTS

4.6.1.1.1 - STUDENT FOCUS GROUP COMPOSITION

Three medical student FGDs were conducted, including 23 total students (average 6-8 participants per group). The medical student FGDs were composed of a homogeneous group of participants who were known to each other and share a similar training experience and background. This increased the comfort level for the participants to speak freely. Yet, to avoid 'group think', each FGD was composed of a combination of 3rd, 4th, 5th year medical students and recent 5th year graduates. Only one of the participants was currently rotating in the Department of Paediatrics at the time the FGD was conducted; all others had completed either their 3rd or 3rd and 5th year paediatric rotations. This diverse range of when students had rotated through the department provided reflections from their experiences ranging over the past three years. The varied degree of training experience and timing of their paediatric rotation allowed for differing opinions to emerge within the FGDs.

4.6.1.1.2 - JUNIOR RESIDENT FOCUS GROUP COMPOSITION

Due to the fixed number of junior paediatric residents in the department, only one junior resident FGD was conducted. Of the 16 total paediatric residents ranging from post-graduate year (PGY) 1-4, seven were rotating in South Africa at the time of data collection, leaving nine available to participate in the FGD, of which six participated (three PGY1 residents and three PGY2 residents).

The participating junior residents within the FGD were homogenous in their paediatric residency training (all currently enrolled at UB) but heterogenous in their undergraduate medical training and previous paediatric experience prior to beginning residency. The familiarity of the group increased the comfort level for the participants to speak freely, while the varied degree of previous training and paediatric experience allowed for differing opinions to emerge within the FGD.

4.6.1.1.3 - SENIOR RESIDENT FOCUS GROUP COMPOSITION

Due to the fixed number of senior paediatric residents in the department, only two senior resident FGDs were conducted. Of the 12 potential participants, 10 participated (six in the first group and four in the second group). The decision to split the senior resident FGD into two groups, one with six and one with four, instead of one group of 10 was based on the unique perspective that these participants were likely to bring to the study. In that they were simultaneously fresh from the learner role and newly assigned to the teaching role within the department. Therefore, they were split into two groups to allow maximum participation by all.

The participating senior residents within the FGDs were homogenous in their paediatric residency training, but heterogeneous in their undergraduate medical training. The familiarity of the group increased the comfort level for the participants to speak freely, while the varied degree of previous undergraduate training allowed for differing experiences to emerge within the FGD.

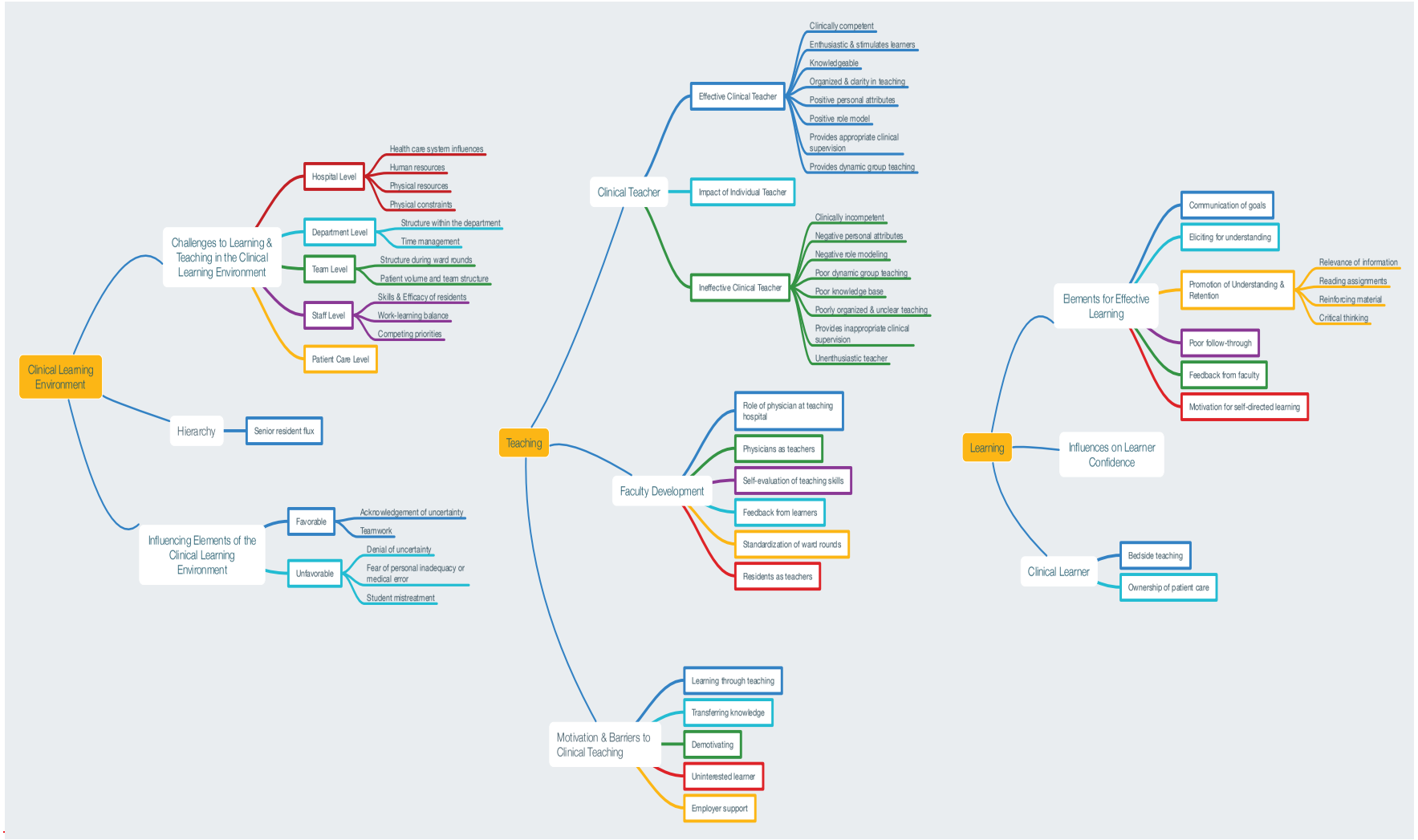
4.6.1.1.4 - FACULTY INTERVIEW COMPOSITION

A total of nine faculty interviews were conducted. Of the 13 eligible paediatricians invited, three declined and one was not interviewed because saturation of themes had been met prior. Of the nine faculty interviewed, five were UB faculty, one MOHW staff, and three from affiliate universities. While no formal demographic information was taken, field notes observed that those interviewed reflected the overall faculty demographic diversity within the department, but MOHW staff were under-represented in the collected interview data.

4.6.1.2 COMBINED RESULTS FROM THEMATIC ANALYSIS OF FOCUS GROUP DISCUSSIONS AND INTERVIEWS

The thematic analysis included all data sets from medical students, junior residents, senior residents and faculty. Since the senior residents were able to provide a unique dual perspective as both trainee and teacher, their comments were reflected as such. A total of 3 major themes, 9 sub themes, with 30 sub-themes and 36 sub-sub-sub-themes were described. *(Figure 14)*

FIGURE 14: PHASE 1 THEMATIC ANALYSIS RESULTS

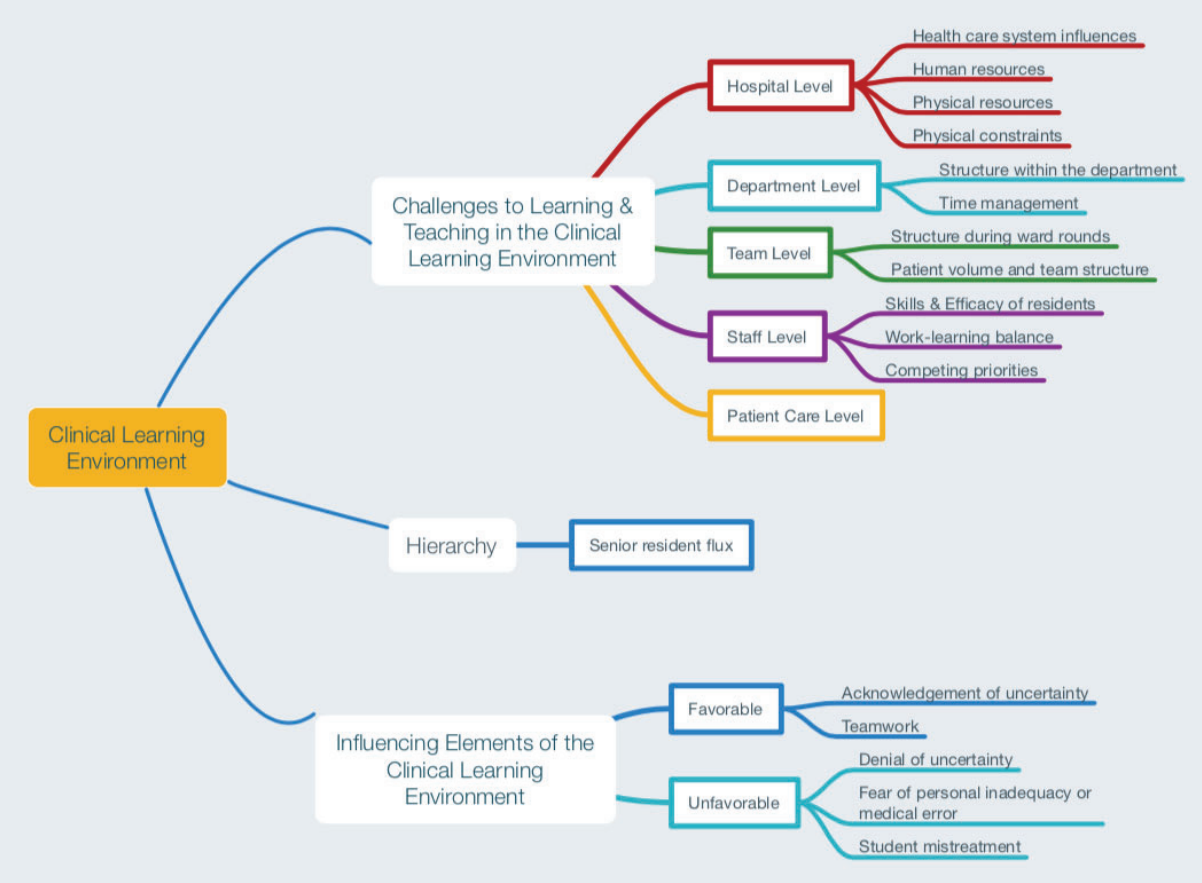


March 2023

4.6.1.2.1 - THEME 1: CLINICAL LEARNING ENVIRONMENT

Three major sub-themes developed under the theme 'Clinical Learning Environment': 1) Challenges to learning and teaching in the clinical environment, 2) Hierarchy, and 3) Influencing elements on a clinical learning environment. *(Figure 15)*

FIGURE 15: PHASE 1: THEME 1 - CLINICAL LEARNING ENVIRONMENT



4.6.1.2.1.1 - 1) CHALLENGES TO LEARNING & TEACHING IN THE CLINICAL ENVIRONMENT

Several themes relating to challenges to learning and teaching (L&T) in the clinical environment emerged at the hospital, department, team, staff, and patient levels.

4.6.1.2.1.1.1 - HOSPITAL LEVEL

At the hospital level, external influences of the healthcare system in which the trainees and faculty work were noted to provide challenges to L&T in the clinical environment.

"[There is a] system failure that leads to too much work for residents; hinders on teaching."

Faculty and trainees described examples of the healthcare system breakdowns, which negatively affect their ability to focus on L&T during ward rounds.

"Can't teach on an x-ray that hasn't been done . . . argue to get film for three days, then film lost."

"[There's an] issue of doctors having to do everything: [complete] x-ray form, make sure bloods reach lab, things other staff should be doing; end up focusing on those things and not learning as a resident."

The hospital-level challenges extended into the physical space of the hospital as well. Participants described the physical constraints of the wards where rounds are conducted as not conducive to L&T, particularly around the ability to hear what is being said on ward rounds.

"[The NNU is] hot, crowded, loud . . . bumping into mothers."

"Teams rounding at same time in small space, hard to focus."

Lack of resources – both human resources (e.g. clinical experts and supportive staff) and physical resources (e.g. equipment, printers, and internet) were noted to negatively impact the clinical learning environment. And trainees felt that their training suffered due to this lack of resources.

“Lack of expertise, so during your residency you feel like no one is able to advance you further.”

“Need diagnostic equipment: otoscopes, laryngoscopes, patella hammers, Denver kits, that type of thing.”

Some faculty described a discrepancy of access to resources based on their employer (i.e. MOHW vs UB).

“[MOHW physicians] don’t have internet in our offices.”

“UB faculty has good access to resources.”

In general, participants expressed an overall frustration about the lack of academic focus within the healthcare system in which they work.

“PMH wasn’t prepared to be a teaching hospital, just became because of UB program.”

4.6.1.2.1.1.2 - Department Level

At the departmental level, participants reflected on influences on L&T from the organization and structure within the department itself. Participants generally described that the faculty clinical schedule, the overall lack of accountability, and disorganization within the department limited the educational focus.

"Paeds is the biggest department in the whole school of medicine, but poor distribution of labour; little team work; least organized when it came to teaching."

Time management within the department was a considerable issue for many of the participants. The late start time and length of ward rounds was generally found to negatively impact both learning opportunities and ward work duties. In addition, participants expressed the counterproductive nature of a long round that often resulted in poor learning because of the inability to keep concentration over extended periods of time.

"Punctuality and time management were my biggest issues with Paeds."

"[In] Paeds, very long ward rounds, not even listening by the end."

"The other reason we start late is because you find work from the previous day hasn't been done, so you spend the morning chasing x-rays or labs."

4.6.1.2.1.1.3 - TEAM STRUCTURE LEVEL

Within the teams themselves, several factors were noted to influence L&T. The structure during the ward rounds was often described as haphazard; and frequent interruptions to the ward round were considered standard.

"[I] don't like disorderly rounds where people moving back and forth, being pulled away; someone examining while the other presenting; not everyone on the same boat."

"Constantly being pulled away on rounds makes it difficult to learn."

Participants described the effects on L&T based on the composition of the teams themselves - total number of teams, the number of students on each team, and the patient volume per team. At the time the study was conducted, the PMW had recently changed its structure from three teams to two; this was noted to be a disadvantage for teaching. Large groups were found to congest the ward rounds and make individual learning difficult; and large patient volumes forced faculty to rush through rounds.

"Two teams is not good for students because you're post-intake every other day and that's what they call 'business rounds', not much teaching on that day."

"When teams were a little bit smaller . . . you weren't getting lost in the system."

"The patient load, especially in NNU, are just so many, so patient load itself is barrier to teaching during rounds."

4.6.1.2.1.1.4 - Individual Staff Level

From an individual perspective, several factors were identified as influencing the L&T in the CLE. Lack of junior resident leadership and efficiency skills to prepare for ward rounds was noted as major obstruction to L&T. This led to some faculty feeling frustrated toward the residents, while others acknowledged that these skills should be taught to the residents. The residents also recognized their lack of efficiency but felt they needed more support.

"If the patient hasn't been taken care of, hard to go onto the teaching."

"Sometimes find you spend two or three hours going through things and patients because the resident has pre-rounded half-heartedly, knowing that the specialist will just come and make an addendum, even on basic, straightforward cases."

"May need to spend more time with our residents to get them to learn how to present, summarize, critically think, be efficient, etc. instead of just expecting them to know how."

"Specialist unhappy with you because we don't work efficiently, but maybe we don't know how to be efficient, so I think would be good if they showed us how to be more efficient."

Another major issue identified as negatively influencing L&T in the CLE was the basic tension between attending to patient care (i.e. 'ward work') and seizing opportunities to learn from or about the patient 'learning'. Residents generally described a state of overwhelming responsibility to attend to the ward work, to the point that they were distracted from learning opportunities. For some, this led to a sense of mental exhaustion and lack of motivation to engage in learning.

"Work is something difficult to describe because you're doing nothing, but you're doing something, and then you don't get to study."

"End up concentrating more on trying to get the ward work done than trying to understand what you are doing."

While the resident trainees tended to describe a more exacerbated responsibility toward ward work, the student trainees felt resentful of the perceived imbalance of prioritization of ward work over their learning. Students expressed a general sense of wanting to be taught why they are doing the ward work and its importance in patient management. This led to a description of the faculty's priorities on rounds being solely about ward work. Trainees expressed the learner role was jeopardized by the prioritization of ward work, and ward work itself was definitely not seen as a learning opportunity, but as interference to 'authentic' learning.

"On 'business rounds', you're expected to do the ward work but you learn nothing on rounds."

"Have you done the CT? Have you done this? That? – let them also be interested in our learning goals!"

"[For] some specialists, rounds isn't about teaching, but about being done with the patient."

"When we do business rounds, I become an assistant staff, not a student."

From a faculty perspective, competing priorities was identified as a challenge to teach in the clinical environment. Despite acknowledging the importance of teaching, faculty expressed the strain they felt balancing their competing priorities, and noted that of these priorities, teaching was likely the first to suffer.

"How much time should I spend on teaching? On admin? On patient care?"

"As clinicians, there's always so much pressure, [you] don't want patients to suffer because you're teaching."

"Teaching is important but gets pushed down on the priority list because of what we have to get done."

4.6.1.2.1.1.5 - Patient Care Level

There was considerable distinction between 'patient care' and 'teaching' – and it was specifically noted that these are not synonymous actions. At all levels of participation, the patient was felt to be the centre of importance and priority of the ward round, and there was noted concern that spending time teaching would negatively impact patient care.

"Patient care comes first, even before your logbook."

"Ward rounds are about patients and everything else is secondary to that; it's all in an effort to care for that patient."

Despite the distinction between 'patient care' and 'teaching' and the need to prioritize patient care above teaching, several faculty acknowledged that an academic environment may actually benefit patient care.

"When you're in a teaching environment, the standard of care goes up."

"*I think bedside teaching actually helps the teacher to think through things in a way that they wouldn't otherwise."*

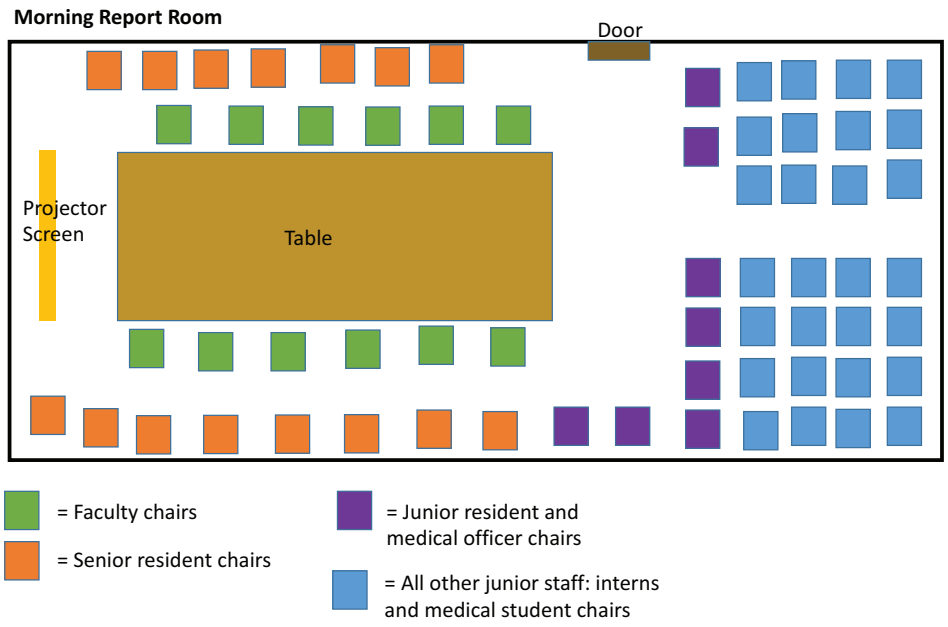
4.6.1.2.1.2 - 2) HIERARCHY

Hierarchy was described as being ubiquitous within the Department of Paediatrics. All levels of participants discussed the negative influences of hierarchy within the department on the CLE.

"I hate the hierarchy thing – making people who are learning feel less than – it just shuts me down."

The most obvious description of the hierarchy, and generally agreed upon by the participants, was the phrase "*the people around the big table"* to indicate the faculty members. This phrase was in reference to the physical structure of the daily departmental morning meeting where the overnight admissions and deaths are reported by the overnight on-call resident to the department. All members of the department and rotating students are required to attend these daily morning meetings. *(Figure 16)*

FIGURE 16: ILLUSTRATION OF PHRASE *"THE PEOPLE AROUND THE BIG TABLE"*



The implicit nature of hierarchy was described to persist from the morning meeting to the ward rounds. And like the morning report conversations, participants felt discouraged from participating on ward round discussions.

"Top table where the specialists just discuss things amongst themselves and leave the rest of the room out, and this discourages learners from wanting to be involved."

Several student references towards the description of hierarchy within the department began with the phrase *"in Paeds"*. This singling out of the department generated the impression that this degree of emphasis on hierarchy was unique to the Department of Paediatrics, or else is not as tangible in the other departments within Princess Marina Hospital.

"In Paeds because of the hierarchy, you know you're at the bottom and they make you feel like you're nothing – you're just at the bottom of the food chain."

"In Paeds, they mostly concentrate on the hierarchy thing that, 'I'm a specialist. You're a resident or a student and you're the least important person'."

4.6.1.2.1.2.1 - 'CHIEF' RESIDENT FLUX

During the twelve months prior to the collection of the qualitative data, the Department of Paediatrics had accepted back their first group of returning senior residents from South Africa. As part of the UB Paediatric Residency Program, paediatric residents are required to spend 18-months of their four-year program in South Africa to complete clinical course work not currently available in Botswana. Thus, '*senior residents'* refers to those residents who have completed the clinical and examination components of their residency, but have not yet completed the research component of the Masters in Medicine degree in paediatrics. Locally, the senior residents are referred to as "*Chiefs*".

In relation to the theme of 'hierarchy', the returning senior residents ('*Chiefs'*) added a layer of complexity to the hierarchy within the department. Generally, senior residents described a disconnect between the hierarchical level they felt entitled to versus the level they were received at by faculty. This in turn led to an overall sentiment that the senior resident's experience and capacity was not valued at the departmental level.

"When I came back from South Africa, the department was not ready for me."

"Feelings of having gone backwards after returning to Botswana."

Determining exactly where the senior resident fell on the department hierarchy scale was described as being in flux and felt to be a point of general contention. Specifically, the role of the senior residents was felt to be undefined. This nondescript role led to feelings of resentment for doing work which senior residents felt to be the responsibility of faculty.

"They [faculty] don't want to work as a team and treat you like juniors – you're expected to work like a paediatrician, but then you're treated like a medical student on rounds."

"The department didn't understand our roles – junior vs seniors; then the rest of the department gets confused, the juniors don't recognize you as seniors."

The junior residents also felt displaced by the return of the senior residents, since many of the leadership skills junior residents had been practicing were now removed. Participants described scenarios whereby the assignment of one faculty and one senior resident to a single team resulted into a *"clash of egos on rounds"*, which in turn created a sense of general confusion and negatively impacted the educational content of rounds.

"It was more political than educational, the [senior] resident and the consultant were always arguing between themselves and not involving the students, so we weren't learning."

4.6.1.2.1.3 - 3) Influencing elements on the clinical learning environment

The clinical learning environment was presented as a spectrum between favourable or unfavourable. Participants described both their general experiences with favourable and unfavourable learning environments and then spoke specifically of the current CLE within the Department of Paediatrics.

4.6.1.2.1.3.1 - Favourable

A favourable CLE was defined as a *"safe"* space where the learner was *"encouraged", "engaged"* and *"respected".* Where the session was *"focused", "interactive", "student driven",* and where learners could *"make contributions",* while simultaneously *"addressing everyone's needs: [the] patients' and learners'."*

A specific element of a favourable CLE was described as a learning space where *"students are free to ask questions,"* and the CLE holds a general tone toward *"tolerance of learning."* A favourable CLE creates a space in which there is a held understanding that as part of the learning process, *"learners will make mistakes;"* with the general feeling that it is *"ok to be corrected"* and the learner will *"not [be] embarrassed"* by the questioning, with *"room to learn and make mistakes"*.

Similarly, in a favourable CLE, when trainees are asked questions, the questioning is felt to be aimed at guiding the learner to the answer through respect and encouragement. This acknowledgement of uncertainty not only pertained to trainees, but was found to be positive when *"faculty admitting when they don't know something."*

Another specific element of a favourable CLE is one with a sense of team on the ward rounds, where *"everyone [is] learning from each other"* and the ward rounds brings a *"sense of belonging to a team for all levels"* and that rank within the team is less important - *"team, not hierarchal."*

4.6.1.2.1.3.2 - UNFAVOURABLE

In contrast, an unfavourable CLE was described as nearly the opposite of a favourable CLE. A key element of an unfavourable CLE was a space where trainees are *"afraid to ask questions."* Or in some cases, are *"not allowed to ask questions on rounds."* Instead, an unfavourable CLE is a space where the faculty asks trainees questions, but the results of the questioning lead to the trainee getting in trouble for not knowing the answer, described as a *"should-know environment versus learning environment."*

The unfavourable CLE was described to cause the trainee to have a general sense of being *"afraid on rounds", "nervous to present on rounds", "afraid to do something wrong"* and/or *"petrified to be asked a question,"* because it might result in a display of their knowledge gaps. For some participants, experiences within an unfavourable CLE led to a sense of personal inadequacy and a general sense of self-doubt.

4.6.1.2.1.3.2.1 - STUDENT MISTREATMENT

In the worst clinical learning environments, participants described a *"hostile environment"* where trainees felt *"belittled", "threatened",* and *"discriminated."* In these settings, the rule was to *"teach by intimidation"* where trainees were subjected to *"shouting", "public ridicule," "personal attack"* and *"feeling[s] of being harassed."*

In such a CLE, it was felt that the goal was to *"instil fear instead of inspire."* And in such a setting, participants reported that there was *"nothing constructive"* about the learning session, but indeed only resulted in trainees being *"fearful of teacher", "nervous the whole time",* and eventually led to a state of feeling overwhelmingly *"demoralized"* and *"demotivated"* to the point where for some trainees *"makes you want to shut down."* For some this was felt to be *"emotionally draining"* and *"effect[ed] students mentally"* and in the worst case, such environments could *"scar you for life."*

While the above was a broad description of favourable versus unfavourable clinical learning environments, specific to the Department of Paediatrics, there was a general sense from the trainees that being in the department was felt to be unfavourable. This was particularly noted in regards to the daily morning department meeting – *"in Paeds you're going to be crucified in that meeting!"* Specific to the ward rounds, trainees were able to describe both favourable and unfavourable experiences on the ward round, which was notably dependent on the individual clinical teacher. *(Table 3)*

TABLE 3: INFLUENCING ELEMENTS ON THE CLE - FAVOURABLE & UNFAVOURABLE

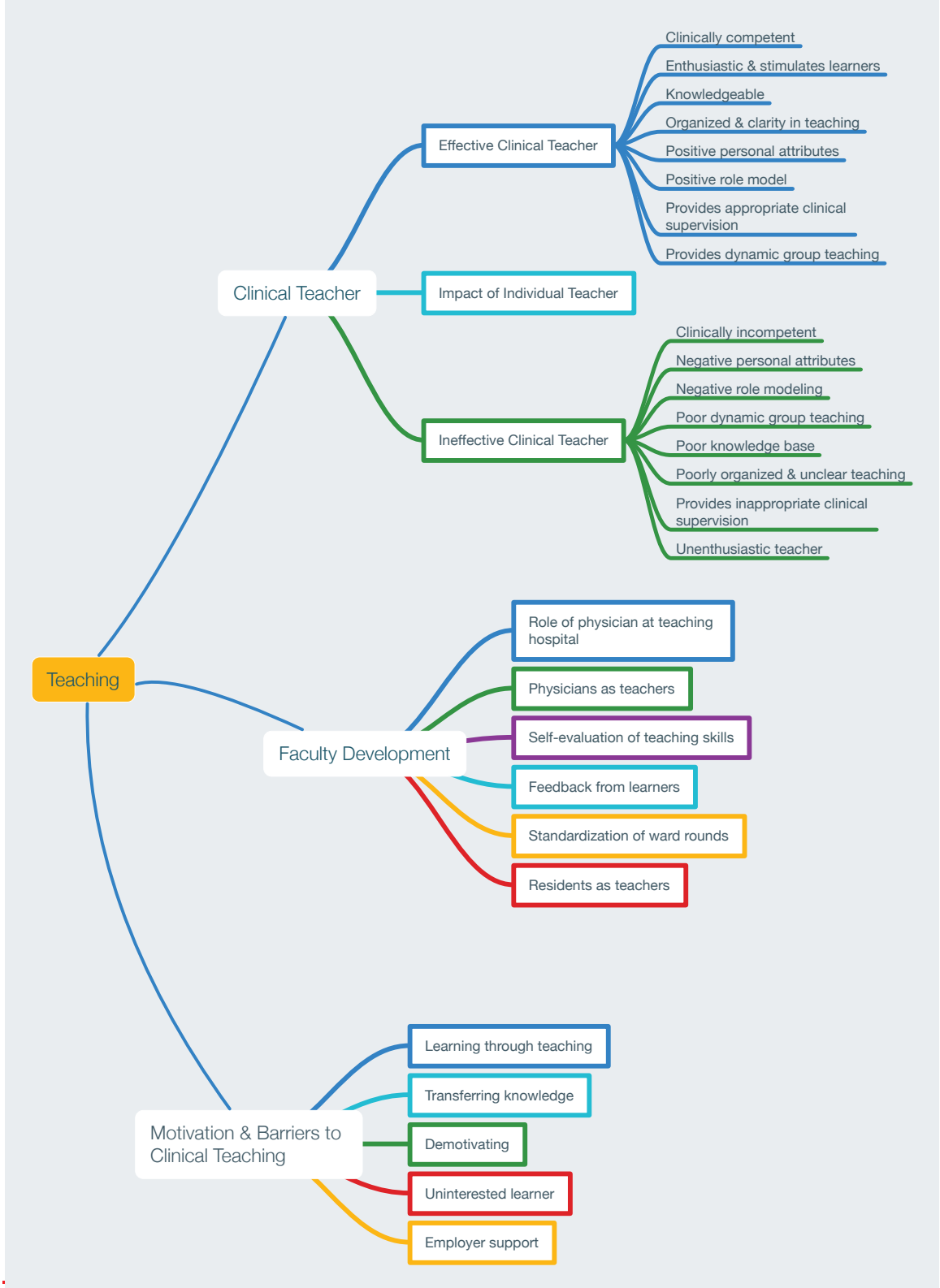
Sub-themes	Supportive Quotes
○ Acknowledgement of uncertainty	• *"When I didn't know an answer, it was ok."* • *"Corrected you, but gave you confidence."* • *"I was with a consultant that wasn't afraid to say they didn't know something – so we checked together."*
○ Denial of uncertainty	• *"Teacher angry when student doesn't know answer."* • *"Shouted at: 'You should know!'"* • *"Reprimanded in front of patients for not knowing an answer."*

○ Fear of personal inadequacy or medical errors	• *"Bad experience where feel inadequate."* • *"Knowing they'll find something you did wrong."* • *"Start doubting yourself."* • *"I'm nothing; I know nothing"* • *"Feeling not smart enough the whole day."* • *"Feeling incompetent in front of patients."*
○ Student mistreatment	• *"History of how we were treated makes us not want to come to next teaching session."*

4.6.1.2.2 - THEME 2: TEACHING

Three sub-themes were identified under the theme "Teaching": 1) Clinical teacher, 2) Faculty Development, and 3) Motivations and Barriers to Clinical Teaching. *(Figure 17)*

FIGURE 17: THEME 2 - TEACHING



4.6.1.2.2.1 - 1) The Clinical Teacher

4.6.1.2.2.1.1 - Impact of Individual Teacher

In response to the focus group question *"How do you feel on rounds?"* all four trainee focus groups responded with a very conclusive preface of *"it depends on who you're with."* While the question was first elicited to gain insight to the way trainees felt on ward rounds, the theme 'impact of the individual teacher' was found to be important in relation to the effects on learning, motivation to learn, the clinical learning environment, feedback and more. In essence, the impact of the individual faculty member influenced all other aspects of learning and teaching on ward rounds with the exception of the external influences of the health care system. Indeed, the sentiment of it all *"boils down to who the consultant is"* was one of the most aligned themes of all the trainee focus group discussions.

4.6.1.2.2.1.2 - The Effective & Ineffective Clinical Teacher

The descriptions of effective versus ineffective clinical teachers was much the opposite of one another. Participants described an effective clinical teacher as having positive personal attributes: *"approachable" "funny"* and *"reassuring."* Whereas an ineffective clinical teacher was described as possessing negative personal attributes - *"not approachable", "intimidating", "condescending", "impatient", "authoritarian"* and overall *"creates [a] threatening environment"* on the ward rounds.

Effective clinical teachers were described as providing well *"organized"* and *"pre-planned"* teaching. Using a *"systematic approach"* and *"focus on one thing each day",* trainees could feel that they were *"building on information"* and could have "*an idea of what was going to be discussed,"* allowing them to *"always learn something new."* Whereas, an ineffective clinical teacher was described as someone who was disorganized and ill-prepared to teach.

In addition, participants described effective clinical teachers as faculty who provided clarity in their teaching, through the use of *"simple language"* and *"simplified difficult concepts well."* Participants valued clinical teachers who *"break it down for you"* and *"takes time to explain concepts."* This *"guided step by step"* teaching allowed for a *"progression of learning"* whereby the trainees were *"helped to*

arrive at conclusion" and *"explain[ed] things in a way that were easy to remember."* In contrast, an ineffective clinical teacher was described as someone who provided poor clarity in his/her teaching - *"no explanation"* and lacked the ability to simplify concepts. And *"instead of explaining/walking learner thru procedure, says 'Do this!' 'Do that!'"* This unclear teaching strategy made it difficult for trainees to learn, resulting in trainees feeling unsure about the discussed topic: *"just focuses on the management, but students don't know the underlying pathology, so all gets jumbled."*

Participants described effective clinical teachers as individuals who were enthusiastic and stimulates learning - faculty who *"involved the learners"* and made rounds *"interactive"* and *"engaging"*. This involvement of the learners created a *"good student-teacher interaction"* and allowed trainees to *"feel part of a team."* Participants recognized effective clinical teachers as *"enthusiastic, passionate teacher[s]."* This stimulated teaching resulted in trainees to feel *"constantly motivating."* In contrast, an unenthusiastic teacher was a strong characteristic of an ineffective clinical teacher. Participants described the feeling of being *"rushed"* on rounds and that the faculty blatantly *"ignored"* trainees on rounds: *"students were just there."* Such faculty were described as being disengaged, without bidirectional communication: *"No interaction; one-way street without student involvement."* And that the purpose of rounds was not to engage with students, but for students to report on rounds. *"No interaction; just want to hear numbers spit back at them and sign off."*

Trainees felt particularly frustrated when they did not receive discussion or feedback about their patient management plan: *"Just recite what I wrote, no discussion about my assessment or plan,"* or *"Not involved in patient's plan; specialists makes their own plan – 'why did I even do this in the first place?'"* Participants described faculty that were not only uninterested in teaching *"didn't seem interested in teaching; felt forced to teach",* but also behaved or stated to the trainees that teaching was not part of their job-description. This left trainees with the impression that rounds was *"not about teaching, but about being done with the patient"* and an overall sense that learning was not an inherent part of the ward round: *"Just go around and not appreciating we're in a teaching environment."*

Participants described an effective clinical teacher as a source of positive role modelling for trainees. *"Handing the baton means teaching them the correct attitude about what they are doing."* Positive role modelling was discussed particularly in relationship to professionalism, humility, and

communication. *"Students learn non-verbal: manners, how things are done." "Admitted when [he] didn't know; learnt that being a paediatrician doesn't mean you're perfect."* Whereas, ineffective clinical teachers were described as being negative role models – particular in areas related to professionalism.

In addition, an effective clinical teacher was described as someone who had mastered the balance between micro versus macro managing to provide appropriate clinical supervision of trainees: *"Leave you with the responsibility, but support you as back-up."* Whereas, an ineffective clinical teacher was described as lacking the skills to provide appropriate clinical supervision. The two extremes were either micromanaging the trainee, *"have to run every little thing past consultant; feel like a secretary";* or macro-managing to the point where the trainee felt unsupported, *"with some consultants, you're the leader without back-up".*

An effective clinical teacher was also capable of providing dynamic group teaching. In a setting where there are multiple levels of trainees (from third year medical student to junior residents), participants acknowledged the difficulty in providing teaching that was inclusive of all learners: *"Different levels can make it challenging, need to accommodate all."* And yet found that effective clinical teachers were able to manage the task: *"Teacher is able to identify needs of learners within group."* In contrast, an ineffective clinical teacher was described as someone who provided poor dynamic group teaching and was unable to cater to the varying needs of the trainees or to involve the trainees in a group session.

Finally, an effective teacher was thought to be clinically competent and knowledgeable. While an ineffective clinical teacher was described as one who is clinically incompetent and has a poor knowledge base from the perspective of the trainee: *"Our knowledge is up to date; these consultants are old."* In addition, trainees felt that the ineffective clinical teacher created limitations to promote their own growth and training: *"When my teachers are confused, I get confused as well,"* with a description of an overall sense of lack of trust of the ineffective clinical teacher: *"Didn't trust their knowledge; took it with a grain of salt."*

4.6.1.2.2.2 - 2) FACULTY DEVELOPMENT

When discussing the role of the clinical teacher, participants described the tension of the dual responsibility of being the physician and the teacher.

4.6.1.2.2.2.1 - ROLE OF PHYSICIAN AT A TEACHING HOSPITAL

Historically a tertiary hospital without an attached medical school program, participants commented on the transition of Princess Marina Hospital becoming a teaching hospital over the last several years, and the resulting tensions from this new twofold function. *Note*: For the purposes of this study '*faculty*' refers to all paediatricians and clinical teaching staff who conduct clinical ward rounds, yet '*faculty'* within the Department of Paediatrics only refers to UB faculty; the remaining paediatricians conducting ward rounds (MOHW employees and ex-pat faculty from affiliate universities) are known as *'consultant'* or *'specialist'*.

"This teaching thing just came recently with the medical school . . . the old culture of just seeing patients and not teaching . . . new guys coming with academic teaching culture – causes a bit of tension."

"We have some employed by UB and some by MOHW, but all are teaching our students and residents."

Participants described a generalized differing approach toward teaching between those employed by the UB and those employed by the MOHW.

"The focus on rounds from a UB faculty vs MOHW staff is different."

"Chief [senior] residents are more inclined to teach, followed by UB faculty – hard to get MOHW staff to teach."

"A lot of non-UB staff who don't teach, maybe they don't want to or maybe they don't know how."

Some participants expressed their frustration with this perceived discrepancy, while others complained of the poorly defined expectations of a physician at an academic hospital and argued that the *"expectations on the teaching role need to be clear"*.

"It's nice to say 'go and teach' . . . but what does that mean? . . . What are my expectations?"

"We don't know the curriculum for students, just thrown into the ward round and expected to teach; don't know where to start."

From trainee participants, there was a held notion that non-UB paediatricians are not *"paid to teach"* and that any teaching received was considered a *"favour"* from the non-UB paediatrician.

"It's a favour, they will tell you 'I'm not paid to teach you'."

4.6.1.2.2.2.2 - PHYSICIANS AS TEACHERS

Another theme that developed while discussing the role of the clinical teacher was the distinction between the skills of a physician and the skills of a teacher. Participants readily acknowledged that being a doctor did not automatically translate into being able to teach others how to become doctors. Instead, participants agreed that teaching is a separately learned skill. None of the faculty or senior residents had received any formal training for clinical teaching.

"People think because you passed your exams you can share that knowledge with others, but that is not always the case."

"We know teaching is important, but do we know how to do it?"

There was a strong sense that in lieu of formalized teaching, clinical teaching skills were informally gained through clinical role models. In this way, teaching skills were gleaned from previous experiences as trainees.

"My style of teaching is from the way I was taught."

"Picked up bits along the way from folks."

Yet, despite participants' informal training, they still recommended that clinicians be taught how to teach. Trainee participants agreed that there ought to be more emphasis on faculty teaching skills and some argued that clinical teachers should undergo a selection process secondary to their clinical skills to ensure he/she also possesses teaching skills.

"Teachers should be selected; teachers should be taught to teach – if you give us bad doctors to teach us, we'll become bad doctors."

4.6.1.2.2.2.3 - SELF-EVALUATION OF TEACHING SKILLS

When faculty and senior resident participants were asked to self-evaluate their own teaching skills, most acknowledged that becoming a good teacher was a "*work in progress"* and *"something you learn as you grow".* With the exception of only two participants, most faculty and senior residents felt that their teaching efforts were *"ok"* or felt that their commitment to the students or their enjoyment of teaching would compensate for their lack of teaching skills.

"I'm not a good teacher . . . but I enjoy it."

“I think I am, I might be wrong, but I have the right attitude.”

4.6.1.2.2.2.4 - FEEDBACK FROM LEARNERS

The majority of faculty participants regarded trainee feedback to be a valuable evaluation of their teaching skills.

“Need feedback from the learners to know if you’ve been doing it well or not.”

Some faculty felt that trainee feedback was also a source of motivation for their clinical teaching.

“Getting feedback from the students makes me want to improve my teaching methods.”

Yet, the trainee participants described the paucity of opportunity to provide this feedback to the faculty. And there was general uncertainty from non-UB faculty participants as to whether trainees did or did not provide feedback.

“Feedback is one-sided, learners don’t get a chance to give feedback to faculty.”

4.6.1.2.2.2.5 - STANDARDIZATION OF WARD ROUNDS

As discussed under ‘Impact of Individual Teacher’, participants acknowledged the lack of standardization between faculty and its effects on rounds. And there was a general sense that faculty did indeed need to address the heterogeneity of their teaching within the department.

"The expectation of students on rounds isn't clear because we're taught by different people who expect different things, so confused on what to learn or not to learn."

"If we had a standard for teaching on ward rounds, that would improve rounds."

4.6.1.2.2.2.6 - Residents as Teachers

Trainees felt that senior residents had improved the L&T on ward rounds within the department.

"The Chiefs [senior residents] have improved the amount of teaching that goes on in the ward."

While senior residents acknowledged their contribution to ward round teaching, they also expressed feeling resentful of UB faculty's lack of teaching.

"We all like teaching and are capable of teaching, but don't find UB staff helping, so gets frustrating."

In addition, participants expressed the need for junior residents to also gain clinical teaching skills.

"I think [junior] residents should be learning how to teach."

4.6.1.2.2.3 - 3) Motivation & Barriers to Clinical Teaching

To gain a better appreciation of the motivating factors for faculty to provide clinical teaching, several key questions were asked of faculty and senior residents to help identify intrinsic and extrinsic motivators. Faculty and senior residents identified learner engagement, their own continued learning

through teaching, and transferring of knowledge as motivating factors for their clinical teaching efforts.

4.6.1.2.2.3.1 - LEARNING THROUGH TEACHING

Faculty readily agreed that through their clinical teaching, they also gained from the interaction, with an overall sense that clinical teaching *"helps me be a better physician"*. Faculty reported that their bedside teaching on ward rounds helps them to stay current on medical literature and to *"fill in gaps"* of their own knowledge. They felt that clinical teaching allows *"you [to] continuously improve your own knowledge"* by *"revising through students"*.

"The more you teach, the more you learn."

"When I give the student assignment, I'm also giving myself an assignment."

4.6.1.2.2.3.2 - TRANSFERRING KNOWLEDGE

Another motivating theme was the importance of and responsibility to transfer knowledge from the faculty to the trainee. Several faculty and senior residents felt that they had an obligation to share their own knowledge with trainees.

"I'm not the end of paediatrics, just as somebody handed the baton to me, I need to keep the profession going by handing over the knowledge to the next generation."

Faculty and senior residents felt motivated to see the success of their knowledge transfer in the form of trainee learning and growth. And that through this knowledge sharing, faculty and senior residents were in fact empowering and cultivating the next generation of physicians.

"I want them to be better paediatricians than I am."

"Essential to pass on the knowledge that we have to make sure future doctors are taking care of kids the way we'd like to see them cared for."

In turn, this seemed to provide faculty and senior residents with a sense of purpose to their clinical teaching efforts.

"There is satisfaction in teaching; you see that you brought a student from one level to another."

"See the moulding . . . a clinician developing; when this person is now your colleague – that's fulfilling."

4.6.1.2.2.3.3 - DEMOTIVATING

Contrary to the positive motivators, faculty described several demotivating factors that discouraged them from providing clinical teaching. While faculty admitted that *"clinically competing priorities", "patient load",* feeling *"tired"* and *"when trying to balance patient care and teaching"* could make teaching feel burdensome, the main demotivating factor was *"when students don't appear interested".* When confronted with the uninterested learner, faculty struggled to provide clinical teaching on ward rounds.

"Put so much effort in, but the learners aren't interested, it's demotivating."

"The learner needs to be interested, asking questions, for me to have the urge to teach."

Faculty and senior residents felt that the junior residents showed less enthusiasm for learning as compared to the medical students.

"[Junior] residents have this 'I've arrived syndrome' where they're not interested in learning at all."

"It's usually the students who bring up the questions and discussion learning points [not the junior residents]."

4.6.1.2.2.3.4 - EMPLOYER SUPPORT

In reference to employer or institutional support of clinical teaching, there was a mixed response from the faculty. Faculty from affiliate universities generally felt supported by their home intuitions to provide teaching as part of their role. While MOHW faculty questioned their employers value of teaching as part of their daily role.

"MOHW theoretically values bedside teaching – there's no way of not valuing bedside teaching – but can they prove this value? Are they recruiting teachers? Do they have a standard, they need an evaluation to improve teaching."

For UB faculty, there was debate on whether clinical teaching was valued. While some felt that teaching was valued, the majority did not feel that it was, instead they felt that research and publication was prioritized over clinical teaching.

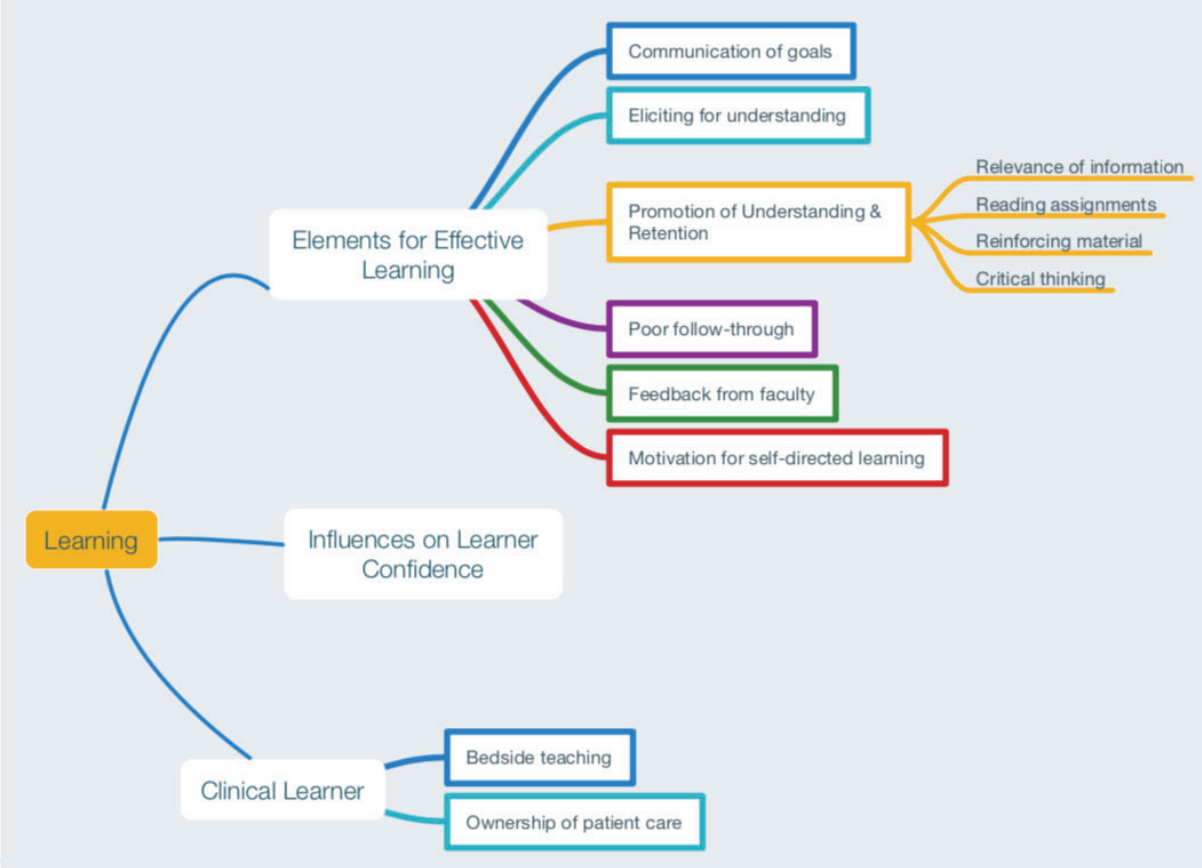
"UB values teaching because we have student evaluations that are part of the Performance Management System and rewarded accordingly with money and promotions – but this is also based on research and leadership."

"UB doesn't understand what we're doing at [Princess] Marina . . . they don't understand teaching outside of the classroom; the end of year assessment doesn't capture the bulk of the time spent at the bedside, so there's no recognition; the more you teach, the less time you spend publishing papers which is recognized by UB."

4.6.1.2.3 - THEME 3: LEARNING

Three sub-themes were identified under the theme "Learning": 1) Elements for Effective Learning, 2) Influences on Learner Confidence, and 3) the Clinical Learner. *(Figure 18)*

FIGURE 18: THEME 3 - LEARNING



4.6.1.2.3.1 - 1) Elements for Effective Learning

Six sub-themes related to effective learning were identified. In a broad sense, medical students felt that, *"After finishing the Paeds rotation, we felt we needed to rotate again because we hadn't learned much."*

4.6.1.2.3.1.1 - Communication of Goals

The first of these elements for effective learning was 'communication of goals'. These were discussed by participants in either a positive or negative reflection. From the trainee perspective, communication of goals for ward rounds was very much welcomed. Communication of goals assisted with effective learning, provided a sense of security to be prepared, and allowed trainees to feel more empowered to participate in the ward rounds.

On the other hand, when communication of goals had not occurred, the trainees felt this to be a significant deterrent to effective learning. Trainees described a sense of being generally *"confused about [the] worker-learner role"* and often felt *"just lost"* or questioning *"why are we there?"* Without communication of goals, trainees were left to *"just standing in the ward, we don't know what to do."*

There was an overall very strong description that no communication of goals for ward rounds had been presented to trainees, especially medical students.

"Expectations of students on ward rounds not clear; never know what's expected of us; different people bring different approach, so never sure what to do."

"Couldn't understand what they wanted from me."

This led to a description of disconnect between the trainees and the faculty. Particularly around what was known by the trainees and what was expected from the faculty. This disconnect led to descriptions of trainees feeling penalized for not understanding faculty expectations.

"My first call, I didn't know what I was supposed to do, then the specialist was unhappy with me."

"Leaves a lot of grey area where you're in trouble and you don't even know why."

Trainees strongly felt that the communication of goals would benefit them and allow them to function better as members of the team. And that the goals themselves needed to either be standardized between differing faculty, or at least each faculty needed to make clear his/her expectations.

"For the ward rounds to improve, we have to have clear expectations & standardization in all the teams."

"I like the diversity of teachers, but it'd be helpful if there were still clearly defined expectations."

From the faculty's and senior residents' perspective, communication of goals was also thought to be important to establish learner expectations and assisted in learning outcomes. Communication of goals was noted to have several benefits for trainees – to aid in *"understanding their responsibility",* provide a *"good learning environment"*, *"helps with their confidence"* and *"helps learners prioritize patient care".* Faculty also acknowledged the connection between expectations and feedback. With an overall shared sentiment that *"humans respond better with structure and expectations laid out."*

4.6.1.2.3.1.2 - ELICITING FOR UNDERSTANDING

Both faculty and trainees appreciated the approach of 'meeting the trainee where he/she is at'. Faculty described efforts aimed to this effect: *"I ask general questions just to see how much people know."* And trainees appreciated when faculty made the effort to *"recognize[d] what were my limits."* This approach allowed faculty to identify the needs of the learner. In turn, *"identifying different knowledge gaps"* of trainees helped to support and direct their teaching.

"When I teach, I try to tease out where the weak points are."

Faculty who made efforts to identify learners understanding and knowledge gaps led to focused teaching for the trainees.

"They didn't assume that I knew what I was doing and guided me through."

In contrast, faculty who did not make time to assess for and identify the learner's needs led to misconstrued assumptions. These uninformed assumptions led to an ineffective learning session, where learners were either confused about the material, or they were being taught on material they had already mastered.

"People expect that you already know without even trying to find out how much you know."

"Sometimes as students, it's all jumbled up, you don't know what it is, don't know the questions to ask."

"If you just ask one question, I don't follow, you ask another one, you ask another one . . . now I'm shattered."

4.6.1.2.3.1.3 - PROMOTION OF UNDERSTANDING & RETENTION

Participants reflected on the means by which information was understood and retained, and considered which aspects of effective learning promoted the understanding and retention of material. Four sub-themes were discussed in detail: (i) relevance of material, (ii) reading assignments, (iii) reinforcing material, and (iv) critical thinking.

4.6.1.2.3.1.3.1 - RELEVANCE OF INFORMATION

The relevance of information was noted to enhance the understanding and retention of material on ward rounds. Trainees often avoided learning material if they could not "*immediately see the relevance of it."* There was a general sense that information ought to be *"practical"* and not *"too technical"* or *"theoretical"*. Participants felt that the more practical or applicable the information, then the more relevant it was to their daily practice and worth learning.

"Relate to a case or something you know you've been thinking about, it's practical."

Others recognized the importance of bridging the theoretical concepts to practical application in order to make important connections from basic sciences to clinical care – not only as a means to make information more relevant, but also to help build on the knowledge trainees already possessed.

"Build on their knowledge that they think might not be relevant to clinical practice but actually is - e.g. chemistry or physics; fishing and hooking on basic sciences that make it relevant to clinical practice."

4.6.1.2.3.1.3.2 - READING ASSIGNMENTS

Participants described that being given reading assignments was seen as an important means to promote understanding and retention of material for trainees. The majority of the faculty reported

using reading assignments as part of their teaching strategy. Both faculty and trainees felt that it provided an opportunity for trainees to be better prepared for specific learning topics.

Yet an essential part of the reading assignments was the *pairing* of the reading assignment with the follow-up discussion the next day. For effective learning to occur, the reading assignments needed to be a two-step process: "*read and present"* (i.e. assign the reading, then provide a follow-up discussion). Trainees expressed frustration with and did not equally value the single-step reading assignment of *'Go read'* without the follow up discussion step.

"Worst thing is to tell somebody to 'Go read,' about something and then get no feedback."

A major advantage of the two-step assignment was that it created a space for a *"discussion"* on rounds, which promoted understanding and retention of the material, as opposed to the traditional question-answer *"drill session"*.

"Not a drill session about the things we'd read on, but a discussion; understood more on what we read up on."

Similarly, trainees often felt discouraged when their question was only answered with the response *'Go read.'* They felt that there was a fine line between the faculty appropriately answering a question on rounds versus providing the deflective statement *'Go read'*. For some, the response *'Go read'* led to a cessation of asking questions.

"Should not always give you assignments, should be a point where they actually teach you."

"Makes you not ask questions because you know that every question will come back to me; I'd rather read than ask."

Despite the positives of reading assignments, participants noted that too many reading assignments was not constructive and it was important not to *"overload students with assignments"* to prevent them from feeling *"overwhelmed".* Participants agreed that the amount of material was important for effective learning to occur. *"Too much to learn in a short time"* would lead to *"very little time to learn and understand it."*

To avoid an overabundance of material on the ward rounds, some faculty explained that *"my aim during bedside is not to teach you everything,"* but instead to provide *"precise, short and not too much"* material so as the learner is better able to effectively understand and learn the material.

4.6.1.2.3.1.3.3 - REINFORCING MATERIAL

Another element identified as important for effective learning to occur was providing opportunities to reinforce material. Participants described methods used by faculty which aided them in reinforcing the learned material. The most commonly sited of these strategies was *"repetition".* The process of having material *"emphasized over and over again",* described as *"revision"*, *"go back", "time to practice", "drive home points"* - was found to be a successful strategy for reinforcing material.

Another favoured strategy for reinforcing material to enhance effective learning was the use of *"mini tests".* Participants felt that frequent quizzing of trainees allowed faculty to *"make sure everyone understood",* and could be used as a tool to *"review things we had done over the week"* and was found to *"stimulates our learning."*

Participants also expressed the importance of building on prior knowledge as a means to reinforce new material. This strategy was found to also encourage trainees, *"learner feels like they're growing."*

A final reinforcement strategy was demonstration. Participants found demonstration to be a particularly useful tool to both show the trainee how to perform a specific task, and also to have the trainee demonstrate the task back to the faculty for feedback.

4.6.1.2.3.1.3.4 - CRITICAL THINKING

The application of critical thinking was described as a very important tool to promote the understanding and retention of material to enhance effective learning. Trainees described examples of when they had engaged in critical thinking and the profound effect it had on their learning. Critical thinking engagement was pointedly described as *"not a drill session"* but a *"discussion"* where trainees were *"asked, 'What did you think about the topic?'"* and allowed for *"better understand[ing]".*

They especially appreciated the opportunities to make their own conclusions or contemplate difficult clinical scenarios, which they described repeatedly as being *"allowed", "encouraged"* or *"given a chance"* to form their own *"thoughts"* or *"conclusions".* Trainees also reflected on the missed opportunities to engage in critical thinking.

"Sometimes, especially on business rounds, I just recite my plan and feel like a secretary."

From a faculty perspective, it was acknowledged that critical thinking is an important component of effective learning on ward rounds. But faculty also recognized that this required active guidance from the faculty themselves to *"allow the student to draw things out for themselves"* and to *"not rush"* the trainees. In order to provide room for critical thinking, the faculty needed to refrain from *"just giving them the answer".* Instead, the type of teaching that would engage trainees in critical thinking was described as an active *"guiding"* of trainees and providing them with *"encouraging questions"* to *"elicit information"* to ultimately get the trainees *"to think for themselves."*

"Ideal environment is where students can formulate their own thoughts about the patient, own assessment and plan."

4.6.1.2.3.1.2 - Poor Follow-Through

Trainees felt strongly that there were missed opportunities for learning when there was either a poor or no response from faculty. Specifically, trainees felt that there were missed opportunities to learn about patient care during rounds when the patient's plan was read on rounds, but then not discussed by the faculty. Trainees also expressed frustration when an asked question was not properly answered by faculty.

"Not just agree or make changes to plan, but to explain the reason why."

"When a question isn't answered correctly, no one actually gives you the correct answer; it's still floating somewhere in the air and we're supposed to get it from an unknown source."

4.6.1.2.3.1.3 - Feedback from faculty

Participants felt that constructive feedback from faculty was an effective element for trainee learning, but that the delivery, timing and frequency of the feedback was important as to whether the feedback would be constructive or destructive for the trainee.

Participants described feedback as an important part of the trainee's experience and added to learner growth.

"You need that feedback to gage where you are as a learner."

"Feedback makes learning more fruitful for the learner, without feedback, it's a disaster."

Participants acknowledged the importance of both positive and negative feedback, not siting one to be more important than the other.

"Positive feedback encourages you; constructive criticism can give you edge to improve."

But participants generally felt that positive feedback was infrequent.

"Very rarely do we get positive feedback."

"We just criticize the juniors and we should praise more often."

Constructive (negative) feedback was not unwelcomed and was still considered to be valuable by participants.

"They criticize you in a way that you'll be able to learn tomorrow; don't tell you you're wrong, but let you think how you could have done it differently."

But was felt to have the potential to be damaging if not given correctly.

"Negative feedback needs to be constructive, not demoralizing or hurtful."

"Scolded in front of the whole department that we were incompetent – that was a bad experience."

"Telling me what I've done wrong is more motivating than just screaming at me."

And could often lack any educational benefit and lead to a negative experience for the trainee.

"When the feedback feels like an embarrassment, then you don't learn."

"Being told 'you killed the baby', we weren't learning, just made to feel bad."

The consensus was that feedback was also unidirectional – feedback was given from faculty to trainees and there was no space for trainees to give faculty feedback.

"Sometimes we get feedback we don't agree with, but we can't give feedback to our seniors; the feedback is one-sided; our voices aren't heard."

"They'll just shout at you, no constructive feedback, and we can't give them feedback of 'This is how you could have helped me'."

The timing of feedback was thought to be important. Trainees felt that feedback was not built-in to the regular rotation structure, so feedback would come only after certain events, such as after a case presentation or post-call.

"Most feedback you get is on-call, especially when something went wrong."

It was also noted that feedback in the department seemed to be 'too little, too late'. Trainees felt that holding feedback until the end of the rotation did not allow them to incorporate the feedback into their work during their rotation.

"I got feedback on my MiniCx [clinical examination test] on the last day of my rotation and was told I'd omitted a lot of things, but no one had told me during the rotation, but if we got continuous feedback during the rotation we'd do better on our MiniCx."

But in general, trainees felt that feedback was deficient within the Department of Paediatrics and that there was an overall infrequency of any kind of feedback.

"Getting feedback is rare."

"We don't get enough feedback, so you're left wondering, 'Did I do a good job?'"

Trainees strongly felt that feedback should be a more regular occurrence within the department and during their rotation to enhance effective learning.

"I think I should be getting feedback on everything I've done for the patient, because then I can know what do to for the next patient, otherwise I don't know if what I did was good or if I omitted things."

4.6.1.2.3.1.4 - Motivation for Self-Directed Learning

Another identified element for effective learning was motivation for self-directed learning. Several extrinsic factors for trainees were noted to provide stimulation for self-directed learning. Positive stimuli included: stimulating teaching, the patient, questions on rounds, and reading assignments.

Yet, an effective clinical teacher on ward rounds was cited to be the most important positive stimuli to create motivation for self-directed learning. Trainees explained *". . . it depends on who you're working with,"* . . . *"a good specialist makes you motivated to read."* And *"You're more likely to read if you have an encouraging teacher instead of just being petrified."*

"If there isn't teaching on rounds, then there's not incentive to read; but if you're in a team where you know there's going to be teaching, then there's a greater focus on wanting to understand more about your patient."

"When you're tired, the only thing that can motivate you is your specialist and your team."

Negative stimuli was also found to be motivating in some instances, but in general, motivation waned without any external stimuli, and no intrinsic stimuli were mentioned.

4.6.1.2.3.2 - 2) Influences on learner confidence

An additional theme identified was differing influences on learner confidence. Confidence was described as an attribute that can either be *"built"* or *"eroded"* through interactions between faculty and trainees. And gaining positive self-confidence was seen to be important.

"I also want to teach them confidence, because when I give them confidence, I'm teaching them how to survive out there."

Several positive influences on learner self-confidence were described by participants. Such as creating opportunities for effective elements for learning, including reading assignments, repetition, and guided questioning was seen to help *"build"* trainee confidence. Providing a safe clinical learning environment where trainees *"feel secure"* and that their *"opinions are valued"* was noted to positively impact learner confidence. Laying out expectations for trainees and positive feedback was also felt to be important to establish the foundations of confidence.

"If you are with someone who makes learning conducive, it builds your confidence that you'll need to manage patients."

Trainees remarked on the positive impact successful experiences of patient management had on their self-confidence. Participants particularly valued the pre-round where trainees practice patient care and ownership. From this perspective, participants generally equated experience with confidence.

"Having patient ownership and thinking through a plan gave me more confidence in what I'm doing."

"Pre-rounds is a foundation for building student confidence, trust themselves that they can make good doctors."

"Seeing more cases builds experience, which in turn builds confidence."

In contrast, negative influences on learner self-confidence included: not preparing a trainee for the faculty expectations, 'drill sessions', and trainee humiliation.

"A drill sergeant on rounds makes you feel like you're not smart enough the whole day."

"How you handle when a student gets an answer wrong effects their confidence."

"If you ridicule a learner or make it personal, it'll effect their confidence."

4.6.1.2.3.3 - 3) CLINICAL LEARNER

4.6.1.2.3.3.1 - BEDSIDE TEACHING

The value of bedside teaching was described enthusiastically by all levels of participants. They unanimously agreed that *"the bedside is the best classroom for medicine"*. This was one of the strongest themes of all the qualitative data.

Several aspects of bedside teaching were praised to provide opportunities for successful learning. To begin, participants described bedside learning as providing context for their theoretic or *"textbook"* learning. This in turn offered the opportunity to solidify the textbook material, exposed learners to scenarios where the clinical course altered from the text, and made the patient the central learning focus. There was an overall sense that learning through clinical experiences was favoured and that *"practice"* and a *"hands on"* approach was a valuable form of learning.

"Experience is the best teacher; once you've seen it, you're not likely to forget."

"Makes students appreciate that medicine is not a textbook, but must apply to a particular person."

"Getting a feel for how the same disease can present differently in different patients."

In addition, bedside teaching was seen as platform to provide an *"opportunity to demonstrate"* clinical skills by the faculty for the trainees. Through demonstration and experience, participants felt that this positively drove learning for both reinforcing material and to be able to later recall and apply learned material to the next patient.

4.6.1.2.3.3.2 - OWNERSHIP OF PATIENT CARE

Another benefit of bedside teaching was described as its ability to offer trainees responsibilities and experiences which led to the sense of ownership of patient care and a sense of growth from that experience. Trainees particularly valued the pre-rounds as an *"opportunity"* to practice patient care and to develop their own plan for the patient prior to the rounds.

"A positive is that we get patients and pre-round and we get the chance to feel how it actually is to be a doctor."

"On ward rounds . . . it's like you own the patient. And then made you feel like you are the real doctor, not a student as we are."

"Being allowed to manage the team and given responsibilities, I saw myself growing."

While faculty reflected on the benefit of giving trainees clinical responsibility as a means to enhance learning, it was recognized that the reality of actually giving responsibility was more challenging. And while recognizing its importance, senior residents experienced tension in letting the junior trainees have more responsibility.

"We're crippling our juniors [by not giving them responsibility] and then they're always looking to us to solve problems."

4.6.1.2 QUANTITATIVE RESULTS

A total of four surveys were distributed to trainees.

4.6.1.2.1 - Dundee Ready Educational Environment Measure (DREEM)

Twelve third and fifth year medical students completed a paper-based, mid-rotation DREEM survey to assess the learning environment of the Department of Paediatrics. The mean score for the overall total DREEM survey from students was 55%. Seventeen questions scored a mean of 2.0 or below; based on the questionnaire developers' recommendation, these questions were highlighted for further review for potential areas of improvement.[119] *(Table 4)* *(Appendix E.1)*

4.6.1.2.2 - Postgraduate Hospital Educational Environment Measure (PHEEM)

Nine first and second year paediatric residents completed a paper-based PHEEM survey to assess the learning and teaching environment of the Department of Paediatrics. The mean score for the total PHEEM survey from these residents was 56%. Ten questions scored a mean of 2.0 or below; based on the questionnaire developers' recommendation, these questions were highlighted for further review for potential areas of improvement. Three questions scored a 3.5 or above, which is considered "real positive points."[161] *(Table 4)* *(Appendix E.2)*

TABLE 4: RESULTS OF DREEM AND PHEEM

DREEM	**Students (n=12)**		**PHEEM**	**Residents (n=9)**	
Perception of teaching (n=12) Max score 48	Mean SD Median Range	28.4 (59%) 9.5 28.5 14-41	**Perceptions of role autonomy* (n=13) Max score 52**	Mean SD Median Range	29.6 (57%) 6.6 31 18-38
Perceptions of teachers (n=11) Max score 44	Mean SD Median Range	25.4 (58%) 8.1 27 12-36	**Perceptions of teaching** (n=15) Max score 60**	Mean SD Median Range	34.9 (58%) 12.1 31 20-54
Academic self-perceptions (n=8) Max score 32	Mean SD Median Range	19.5 (61%) 5.0 20.5 9-27	**Perceptions of social support*** (n=11) Max score 44**	Mean SD Median Range	23.6 (54%) 5.2 25 17-31
Perceptions of atmosphere (n=12) Max score 48	Mean SD Median Range	22.5 (47%) 11.1 21.5 4-44	**Total (n=39) Max score 156**	Mean SD Median Range	88.0 (56%) 23.0 87 55-123
Social self-perceptions	Mean	13.8 (49%)			

(n=7) **Max score 28**	SD Median Range	5.3 13.5 6-22	***PHEEM Scoring Interpretation*** **29–42 a more positive perception of one's job* ***31–45 moving in the right direction* ****23-33 more pros than cons*
Total **(n=50)** **Max score 200**	Mean SD Median Range	109.6 (55%) 32.9 111 62-157	

4.6.1.2.3 - Elements for Effective Learning Survey

4.6.1.2.3.1 - Elements for Effective Learning Survey – Medical Students

Eleven third and fifth year medical students completed a mid-rotation Elements for Effective Learning survey. The mean score for the total survey from these students was 62%. *(Table 5)* *(Appendix E.3)* Of the 24 questions related to the trainees' *participation* and *reification* as part of the work of engagement, the students mean score was 64%. *(Table 6)* *(Appendix E.4)*

4.6.1.2.3.2 - Elements for Effective Learning Survey – Junior Residents

Nine first and second year paediatric residents completed the Elements for Effective Learning survey. The mean score for the total survey from the residents was 61%. *(Table 5)* *(Appendix E.5)* Of the 24 questions related to the trainees' *participation* and *reification* as part of the work of engagement, the residents' mean score was 66%. *(Table 6)* *(Appendix E.6)*

TABLE 5: ELEMENTS FOR EFFECTIVE LEARNING SURVEY

ELEMENTS FOR EFFECTIVE LEARNING	Students Dec 2016 (n=11)		Residents Dec 2016 (n=9)	
Establish a positive learning environment **(n=10)** **Max score 50**	Mean SD Median Range	35.0 (70%) 8.0 34 23-48	Mean SD Median Range	33.1 (66%) 10.7 32 14-46
Control of Session **(n=6)** **Max score 30**	Mean SD Median Range	17.0 (57%) 4.7 18 8-22	Mean SD Median Range	14.3 (48%) 7.2 14.0 7-29

Communication of Goals	Mean	14.8 (49%)	Mean	19.3 (64%)
(n=6)	SD	7.6	SD	7.8
Max score 30	Median	13	Median	20.0
	Range	1-25	Range	6-30
Promotion of understanding	Mean	26.0 (65%)	Mean	25.4 (64%)
and retention	SD	4.9	SD	6.3
(n=8)	Median	26	Median	23
Max score 40	Range	19-33	Range	18-37
Feedback	Mean	8.8 (59%)	Mean	6.7 (44%)
(n=3)	SD	3.9	SD	4.0
Max score 15	Median	9	Median	7.0
	Range	1-15	Range	0-13
Promotion of self-directed learning	Mean	10.1 (67%)	Mean	10.7 (71%)
(n=3)	SD	3.5	SD	3.4
Max score 15	Median	11	Median	10.0
	Range	3-15	Range	4-15
Total	Mean	111.7 (62%)	Mean	109.6 (61%)
(n=36)	SD	27.4	SD	33.2
Max score 180	Median	123	Median	104.0
	Range	73-149	Range	54-159

TABLE 6: ELEMENTS FOR EFFECTIVE LEARNING SURVEY - COMMUNITIES OF PRACTICE

ELEMENTS FOR EFFECTIVE LEARNING	**Students Dec 2016 (n=11)**		**Residents Dec 2016 (n=9)**	
Communities of Practice	Mean	63.4 (63%)	Mean	67.0 (67%)
Participation	SD	13.9	SD	18.4
(n=20)	Median	67.0	Median	66.0
Max score 100	Range	44-83	Range	32-93
Communities of Practice	Mean	12.8 (64%)	Mean	11.7 (58%)
Reification	SD	4.6	SD	3.8
(n=4)	Median	14.0	Median	11.0
Max score 20	Range	2-19	Range	5-18
Total	Mean	76.2 (64%)	Mean	78.7 (66%)
(n=24)	SD	17.7	SD	21.5
Max score 120	Median	82	Median	77.0
	Range	46-101	Range	40-111

4.6.1.2.4 - Perceived Self-Efficacy Survey

4.6.1.2.4.1 - PSE Survey – Medical Students

Twelve third and fifth year medical students completed a mid-rotation PSE survey. The mean score for the total survey from these students was 73%. Seven questions scored a mean 7.0 or below; these questions were highlighted for further review for potential areas of improvement. *(Table 7)* *(Appendix E.7)*

4.6.1.2.4.2 - PSE Survey – Paediatric Residents

Nine first and second year paediatric residents completed a PSE survey. The mean score for the total survey from these residents was 84%. No questions scored a 7.0 or below. *(Table 7)* *(Appendix E.8)*

TABLE 7: PERCEIVED SELF-EFFICACY SURVEY RESULTS

PSE	Students Dec 2016 (n=12)		Residents Dec 2016 (n=9)	
Medical Expert (n=13) Max score 130	Mean	92 (71%)	Mean	109.6 (84%)
	SD	11.5	SD	8.6
	Median	93.3	Median	108.0
	Range	67-109	Range	98-126
Communicator (n=3) Max score 30	Mean	20.6 (69%)	Mean	24.7 (82%)
	SD	3.2	SD	3.1
	Median	20.3	Median	24.0
	Range	16-26	Range	20-30
Collaborator (n=1) Max score 10	Mean	7.6 (76%)	Mean	8.7 (87%)
	SD	1.4	SD	1.7
	Median	8.0	Median	9.0
	Range	4-9	Range	6-10
Professionalism (n=1) Max score 10	Mean	8.6 (86%)	Mean	9.2 (92%)
	SD	1.7	SD	1.4
	Median	9.0	Median	10.0
	Range	4-10	Range	6-10
Scholar (n-3) Max score 30	Mean	23.7 (79%)	Mean	24.7 (82%)
	SD	4.5	SD	3.8
	Median	25.0	Median	24.0

	Range	14-30	Range	19-30
Total (n=21) Max score 210	Mean	152.5 (73%)	Mean	176.9 (84%)
	SD	18.7	SD	16.1
	Median	153.5	Median	173.0
	Range	108-183	Range	158.5-206

4.6.1.3 MIXED METHODS RESULTS

Ten common content areas were identified from the combined comparative analysis of the qualitative and quantitative data. *(Table 8)* The joint display diagrams illustrate the results of the convergent integration, with special consideration for congruent and divergent results. *(Appendix E.9)* Half of the common content areas are congruent, while the other half shows varying/mixed results between and within the data sets; none were found to be divergent.

TABLE 8: COMMON CONTENT AREAS IDENTIFIED FROM MIXED METHODS CONVERGENT INTEGRATION

Common content areas
1. Feedback
2. Communication of goals
3. Respect for uncertainty
4. Critical thinking
5. Control of session
6. Work-learning balance
7. Self-directed learning
8. Engagement of learner
9. Clinical learning environment
10. Effectiveness of clinical teacher

4.6.1.3.1 - COMMON CONTENT AREAS

4.6.1.3.1.1 - CONGRUENT

4.6.1.3.1.1.1 - FEEDBACK

Qualitative and quantitative data alike suggested a paucity of feedback from faculty to trainees. And in the instances feedback was provided, this feedback was not particularly constructive, with an overall sense that faculty lacked in feedback skills.

4.6.1.3.1.1.2 - COMMUNICATION OF GOALS

There was strong correlation between the data sets that learners were not provided with well-defined goals and objectives for their rotation and overall the department and clinical teachers lacked at providing clear expectations for trainees.

4.6.1.3.1.1.3 - RESPECT FOR UNCERTAINTY

Both data sets showed ambiguity in regards to overall respect for uncertainty during a ward round. Qualitative data provided examples of two opposing learning environments – those that respected uncertainty where learners were free to ask questions and make mistakes; and those where trainees were not allowed to ask questions and being wrong resulted in being reprimanded. Similarly, the quantitative data provided mixed results where trainees scored high their ability to ask question or seek help, but much lower in their feeling that the environment was supportive of questioning.

4.6.1.3.1.1.4 - WORK-LEARNING BALANCE

Both data sets strongly correlate with an imbalance between work and learning, indicating that work is considered a greater priority than learning within the department.

4.6.1.3.1.1.5 - SELF-DIRECTED LEARNING

Both data sets depict a neutral to positive perspective of trainee motivation and ability for self-directed learning, with more incentivization provided from the teacher rather than the general atmosphere to engage in self-directed learning.

4.6.1.3.1.2 - MIXED

4.6.1.3.1.2.1 - CRITICAL THINKING

The quantitative data set reported that trainees were stimulated and encouraged to participate in critical thinking activities on ward rounds. This data set also depicted high levels of trainee confidence to perform critical thinking activities. Yet, the qualitative data implied that opportunities to actually engage in critical thinking on ward rounds was limited, often describing it as being "*allowed*" or "*given the chance*" to engage in critical thinking. However, both data sets describe trainee role being limited to "reporting" on ward rounds and indeed not contributing to the critical thinking processes of patient management.

4.6.1.3.1.2.2 - CONTROL OF SESSION

While the qualitative data set strongly suggests that the DoP is poorly organized, particularly in relation to time management and frequent interruptions, the quantitative data set was more neutral in its report of the DoP's control of session with responses indicating "somewhat agree/disagree" or "unsure" in regards to specific questions related to time-management, organization and interruptions.

4.6.1.3.1.2.3 - ENGAGEMENT OF THE LEARNER

Interestingly, the DREEM and PHEEM results rated learner engagement poorly, whereas the EEL survey reported much higher rates of learner engagement. The qualitative data suggested that learner engagement was dependant on the individual clinical teacher conducting ward rounds.

4.6.1.3.1.2.4 - CLINICAL LEARNING ENVIRONMENT

Once again, there was discrepancy within the quantitative data set, where DREEM results portrayed a very poor clinical learning environment, but the PHEEM and EEL surveys depicted a much more positive learning environment. The qualitative data set broadly described the DoP as an unfavourable learning environment, but with more favourable experiences dependant on the paediatrician conducting ward rounds.

4.6.1.3.1.2.5 - EFFECTIVENESS OF CLINICAL TEACHER

Both data sets provide a neutral to somewhat negative trainee perspective of the effectiveness of their clinical teachers. While the qualitative data portrays both effective and ineffective teaching depending on the paediatrician attending rounds, the quantitative data suggests a mixed picture of teacher organization, focus and overall teaching skills.

4.7 CHAPTER SUMMARY

In this chapter, I presented the research design, methods, and results of Phase 1: 'Examining the Problem'. The next chapter will explore the reflections of these findings and their influences on subsequent phases of the project.

CHAPTER 5: PHASE 2 – GENERATING A SOLUTION

5.1 CHAPTER INTRODUCTION

This chapter serves to introduce the reader to the research design, methods, results and reflections used and developed in Phase 2 of this study. Phase 2 was conducted as an inquiry group from the perspective of an 'insider' collaborating with 'insiders' within the Department of Paediatrics at Princess Marina Hospital in Gaborone, Botswana from July 2017 – June 2018. Following the iterative Plan-Act-Observe-Reflect cycle of action research, Phase 2 focused on generating solutions to the issues identified in Phase 1 through ongoing departmental collaboration and literature review. Utilizing exploratory sequential mixed method design, we set out to achieve parts of two objectives of the study and to partly answer the fifth research question.

In this phase, we provided a reflective link between Phase 1 and Phase 3 of the ongoing action research project. Specifically, we conceptually analysed the findings from Phase 1 to explore the influences of the clinical learning environment and the departmental community of practice on ward rounds on trainees' self-efficacy beliefs about their ability to provide paediatric patient care, *(Objective 2.2).* Additionally, we utilized the findings from Phase 1 to determine and adapt a structured clinical teaching method to provide locally and contextually relevant bedside teaching on ward rounds at Princess Marina Hospital, *(Objective 3).*

Phase 2 was designed to be "problem-focused, reflective and action oriented,"[1] and was of paramount importance to the overall project because it allowed for a formal, collaborative 'reflection' of the Phase 1 findings.[2,138] We used the findings from Phase 1 to help generate and develop both future surveys and interventions to be used in Phase 3. It could be questioned, why not have Phase 1 as one study and then Phase 3 as a separate study drawing from Phase 1 – i.e. why the need for Phase 2? But Phase 2 was critical in describing *why* we did *what* we did in Phase 3. This inclusion of our collaborative reflection adheres to the validity criteria required for action research.

Note: in order to provide an account of the Phase 2 activities without overwhelming the reader, I have created a separate Phase 2 Appendix. The appendix will include a detailed description of Phase 2 activities and ongoing decision making processes. *(Appendix F – Phase 2 Activities & Reflections)*

5.2 PHASE 2 - RESEARCHER POSITIONALITY

It is important to note that Phase 2 of the project coincided with a fundamental positionality shift for me as the primary researcher. As described earlier, prior to Phase 2, I consider my role to have been very much an outsider with a slow transition toward insider within the Department of Paediatrics. This positionality required my AR to be more appropriately described as 'participatory' in nature. But the beginning of Phase 2 coincided with my positionality to now be fully insider within the Department. Three main events influenced this shift.

First, much of the shift was due to my return from maternity leave. Having left and then returned to the Department, I felt as if I was seen as 'coming back' and even 'coming home' to my position within the Department. While I have limited evidence to support this (there was no 'goodbye' or 'welcome back' party), there was a reunion between myself and others within the Department and alongside congratulation of my new baby was "welcome back" that referred to not only Botswana and work in general, but to Princess Marina Hospital and 'back in the trenches' as it were.

In addition, while I was away on maternity leave, a few new paediatricians had joined the department. This juxtaposition of my *return* compared with new staff *joining* the department allowed me to be more of an 'insider'. Knowing the members of the department and the Princess Marina Hospital system, meant I knew what it meant to take care of children in Botswana – I now had 'street cred' if you will.

Second, my return coincided with a new position. Previously, I was employed by the Children's Hospital of Philadelphia and was working as the Botswana-based Global Health Fellow through the Botswana-University of Pennsylvania Partnership, which was a well-described, temporary, two-year

position – which someone else was now fulfilling. When I returned, I returned into a newly created position as a paediatrician working in the Global Paediatric Haematology-Oncology Excellence Program though Texas Children's Hospital and long-time partnership with Botswana-Baylor College of Medicine. This new position did not have a temporary contract, but indeed preferred employees whose intention was to stay in a long-term capacity for program development and sustainability. My new position also considerably increased my clinical duties, making my physical presence in the department much more substantial than my previous role, from 16 weeks per year to now 32 weeks per year.

Since historically, the Paediatric Haematology-Oncology (PHO) service has been somewhat removed from the general paediatric and neonatal services (i.e. PHO physicians do not rotate through PMW or NNU and vice versa), I initially felt a great deal of tension with my new role and felt 'pulled' away from my previous department role. This new tension substantiated that my role was no longer merely outsider, but a true insider struggling with a new role and responsibilities.

Third, Phase 2 coincided with the upgrade of my project from an MPhil in HPE to a PhD in HPE. This had a huge impact on my own dedication to the project and the success of the department achieving the goals to truly optimizing the learning and teaching on ward rounds. The result of the above was that during Phase 2, I genuinely believe I was working with and for the Department of Paediatrics and myself simultaneously without distinct boundaries. Phase 2 reflects this shift from outsider participatory to insider action research.

Note, when I describe myself as an insider – it is very important that I am setting this as an active inside member of the department *only*. Somewhat common in action research, "we may occupy positions where we are included as insiders while simultaneously, in some dimensions, we identify as outsiders."[137] From this perspective, I was always an outsider in terms of working for an affiliate university; always an outsider in terms of race, nationality, and language; and sometimes it felt like my age and gender prevented me from being more influential. And despite the socioeconomic similarities I had with my fellow paediatricians - we drove similarly priced cars, wore similarly priced clothes, our kids went to the same schools, we lived in similarly priced neighbourhoods - as an American, you're always seen as wealthier, with more resources, more options, more access to funding, education, and so forth, so I was always an outsider in that respect. But now I was an insider

to the clinical and political landscape of Princess Marina Hospital and I was privy to the clinical challenges we faced every day. And I was embedded within a department so heterogeneous and diverse in background that I was welcomed as just another paediatrician.

5.3 PHASE 2 - PARTICIPATORY POPULATION

For Phase 2 of our study, we had the same participatory research team from Phase 1, with some changes, including: AK advanced into her internship role and was less available to support the project; TD graduated and moved away to pursue fellowship training and was thus no longer available to support the project; and SN was promoted to Superintendent Head of PMH and was no longer available to participate in the project. In preparation for Phase 2 and Phase 3, all group members were invited to attend a free Quality Improvement (QI) course. The course was held weekly for seven weeks (this occurred pre-Phase 1 from January – March 2016) and covered basic QI topics such as the history of QI science and its application in health care systems, the 'model of improvement', QI terminology and tools, and application of QI skills within the healthcare system.

The goal for project members was twofold: 1) for members to each gain knowledge, understanding and applicable skills in QI methodology as a means to enhance positive change within their health care system, and 2) to use these new skills to help conduct Phase 2 and 3 of our project to optimize the learning and teaching on ward rounds. I developed the QI curriculum and facilitated the course. Members who completed the QI course received a certificate of completion. Of note, this course continued to be offered to any member of the department from January 2016 through March 2019.

To ensure all project members had detailed (but anonymous) access to Phase 1 results, a copy of our thematic analysis with several direct quotes was distributed to each member of the project group. We referred to this document often as a way to quickly reference our Phase 1 data and ensure that decisions being made were aligned with the 'voice' of the whole department. In addition, to ensure that the project members were informed to generate educated decisions to best answer our question "*How best to optimize clinical learning and teaching on paediatric rounds?"* they received supplemental literature on relevant health professional education topics.

In Phase 2, the role of the project members included attending project group meetings, contributing thoughts and reflections to the Phase 1 data, supporting construction of the Phase 2 driver diagram (including creation of the aim statement, primary and secondary drivers, project measures and data collection tools), and contributing ideas and suggestions for Phase 3 interventions. This participation was done through attending project group meetings, receiving and replying to project group emails and text messages, one-on-one conversations, and representation at departmental update meetings. Project members also helped with the collection of pilot surveys and baseline data and interpretation of their results.

Due to other demanding clinical and administrative responsibilities, the role of the project members was limited to the above. The expanded literature review, finalization of the driver diagram, data collection tools, Phase 3 course materials, etc. was largely done by myself. But their feedback and input to what I brought to the group was invaluable since they had the opportunity to agree or disagree with my direction of the project. Also, because representation from the DME was part of the group, I was by no means the only "content expert" in the group, so it wasn't just the group agreeing with me since I "knew more about the topic" than they did. They helped provide contextualization for the literature that I shared with them, and often as we talked about what we found in the literature, we reflected on its relevance to PMH and Botswana.

The competing priorities for the project members meant that often they needed to miss meetings, so sometimes the same content of the meeting was held twice (some of the group would show up one week, and the next time we met other members showed and I'd just repeat the material that they'd missed). This made it hard for the momentum of the project, but the repetition allowed for consistent input to achieve our participatory aim.

Specifically, for TA, since she was also a co-supervisor on the PhD, her role included the above, but she also supported the ongoing project with more in-depth reflective conversations and one-on-one meetings with me, as well as development of the Phase 3 timeline.

5.4 Active Reflections on Phase 1

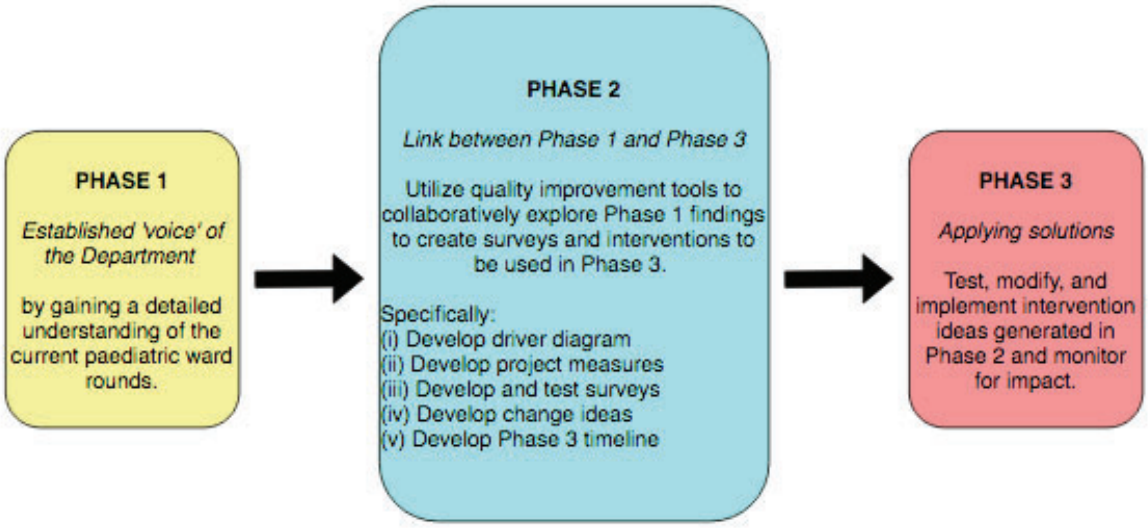
Prior to any discussion of generating a solution, the first step of Phase 2 was actually to reflect on the findings of Phase 1 as a group – essentially to answer our research questions 1 – 4 to help guide the next phases of the project. Phase 2 describes the methods and actions that allowed us to actively reflect on Phase 1 as a group, and describes how and what conclusions were drawn. A critical part of this was deciding how to limit our scope from all the insights gained during Phase 1, to pertinent aspects moving forward.

5.5 PLAN: Phase 2

5.5.1 Research design

Utilizing exploratory sequential mixed method design, the second phase of the study provided a collaborative, reflective link between Phase 1 and Phase 3 of the ongoing study. *(Figure 19)*

FIGURE 19: PHASE 2 RESEARCH DESIGN



5.5.2 QUALITY IMPROVEMENT SCIENCE

During Phase 2, we relied heavily on QI tools as a means to systematically collaborate together to evaluate the findings from Phase 1 to help generate and develop future surveys and interventions for Phase 3. We chose to use QI tools for several reasons. First, to enhance our collaborative process, we wanted to ensure that our meetings had elements of team work embedded within them. QI tools promote team work because they are graphically displayed, easily shared and modified as part of larger group discussions. They also provide creative ways to approach a problem; this 'thinking outside the box' added positively to the group dynamics and discussion.

Second, QI tools provide a shared organizational structure which helped keep the group focused and on the same page during discussions and helped to decrease miscommunication. It also facilitated the incorporation of individuals' feedback, hypothesis and ideas in a meaningful way because they could be easily added to the shared displayed structure.

Third, because of the graphically displayed models, we were able to easily communicate with the larger departmental members about our aims, thought processes and proposed solutions. Trainees and faculty were offered the chance to express their views, clarify their needs, and contribute to the project through general department forums to make comment on the graphically displayed data. This also created a space to enhance departmental leadership buy-in.

Finally, by utilizing QI tools and drawing on QI methods, we created a shared language between us as a group. This was important because a growing tension of Phase 2 was how to incorporate the language of educational theory into the project without creating a sense of alienation of those group members who were unfamiliar with such terminology. Since QI science has a growing presence in healthcare, this was a more readily accepted and translatable form of communication and collaboration during Phase 2 of the project. For this reason, despite adhering to more traditional forms of action research, often QI language and terminology will be found in Phase 2 and 3 as it became our "shared language" during the project.

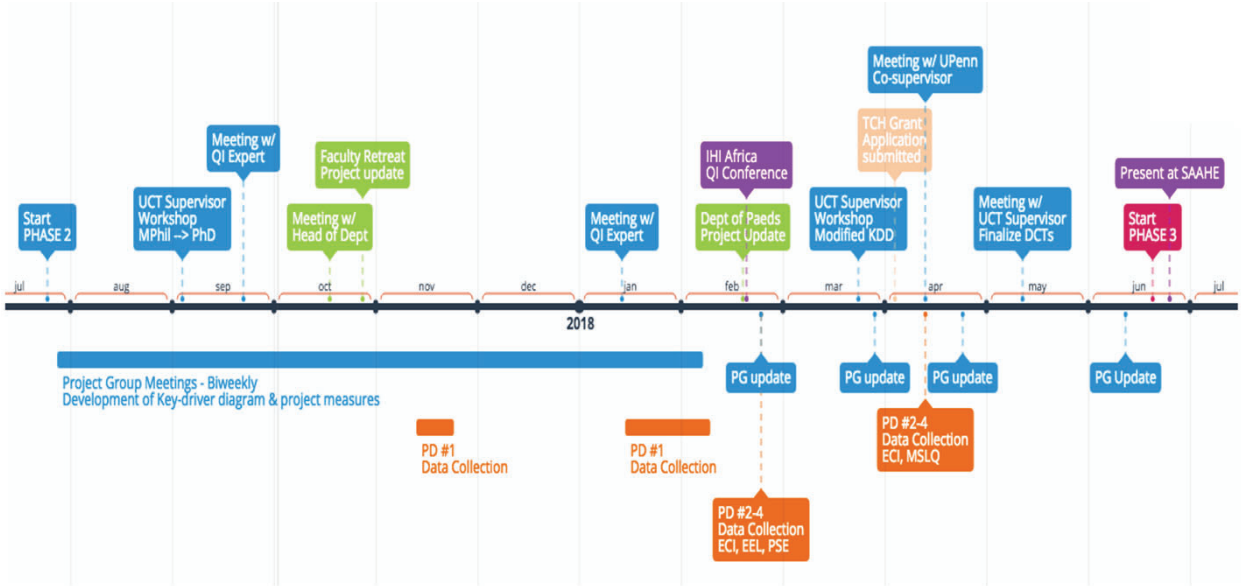
5.5.3 Data sources and analysis

Several data sources were used to capture the events, timeline and decision-making processes of Phase 2. These included project group meeting minutes, email updates, iterative and final versions of Phase 2 products, conference attendance, grant applications, PowerPoint presentations, notes from phone calls, PhD supervisor workshops notes, departmental meeting minutes, ongoing literature review notes, and my action research diary. During Phase 2 and again during the writing process, these data sources were extensively reviewed and subsequently re-reviewed through a critical reflection lens. *(Appendix C.3)*

5.5.4 Phase 2 Timeline

Below is the Phase 2, eleven-month timeline (July 2017 – June 2018), highlighting key events which provided the momentum for the evolving decision-making processes. *(Figure 20)*

FIGURE 20: PHASE 2 RESEARCH ACTIVITY TIMELINE



UCT = University of Cape Town
QI = quality improvement
IHI = Institute for Healthcare Improvement
KDD = Key driver diagram
PD = Primary Driver
EEL = Elements for Effective Learning survey
PSE = Perceived Self-Efficacy survey
MSLQ = Motivational Strategies for Learning survey
TCH = Texas Children's Hospital
DCTs = Data Collection Tools

5.6 ACT: PHASE 2

5.6.1 DEVELOPMENT OF PHASE 2 KEY ACTIVITIES

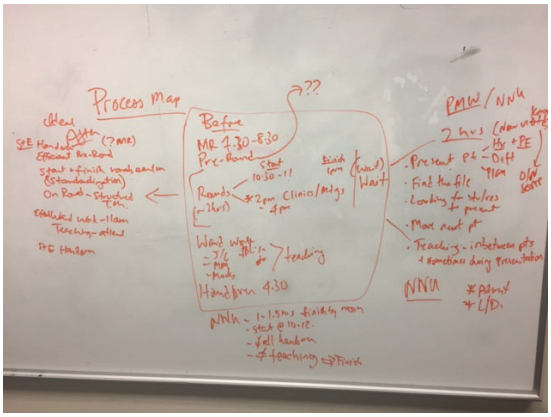
5.6.1.1 PROJECT GROUP MEETINGS

In order to reflect on the Phase 1 findings to generate a driver diagram, project measures, change ideas and timeline for Phase 3, our project group needed to meet frequently during Phase 2. The goal was to meet as a group at least biweekly, but due to competing priorities, this wasn't always feasible. In those cases, I would meet with individuals, or sometimes would hold a similar meeting twice for different members of the project group.

The meetings were initially conducted with the use of a PowerPoint presentation. I updated this presentation before each meeting to document our progress and to highlight our productivity from one meeting to the next. It was especially helpful to discuss the driver diagram and other visual aspects of the project. While there was a pre-determined agenda for each meeting, often the group conversation drove the events of the meetings.

During our project meetings, we reviewed several QI tools to help generate ideas and discussion. *(Figure 21)* The meetings were supplemented with my ongoing literature review. It was important that we considered the HPE literature as we tried to identify what and how we would define our project measures and generate change ideas. In certain instances, I would print copies of relevant articles and distribute to the group so that they could offer a more in-depth perspective on the topic.

FIGURE 21: GROUP USE OF QI TOOLS



Initially during Phase 2, we met quite frequently, but as the project progressed and our driver diagram, project measures, surveys, and change ideas had been developed, we met less frequently in person in order to carry out the testing activities of Phase 2. In the latter half of Phase 2, our face to face meetings were supplemented by emails and group text messages. While emails were not the most effective way for generating discourse, it was a practical way to engage all members of the project, including departmental leadership, and both in-country project members and out-of-country content experts.

5.6.1.2 CONTENT EXPERTS

To ensure that the progress within our project meetings continued to be aligned with the overarching HPE theories and QI methods we were developing, I regularly engaged with content experts in those areas. In all instances, the feedback from the content experts was reported back to the project group.

During Phase 2, I met on three separate occasions with my PhD supervisor to provide feedback on the progress on our project. While these meetings provided academic rigor to the project, it was important that this influence did not dictate the project group activities. Indeed, the guidance from these PhD supervisor workshops was limited to providing feedback and 'outsider' reflection to ideas previously generated by the group, not the creation or addition of new ideas.

As a means to ensure that our Phase 2 QI strategy was sound, I frequently kept in touch with a US-based QI expert. These phone call conversations and emails were there to assist me in QI methods – especially as we generated the driver diagram and project measures.

5.6.1.3 Leadership and department-wide engagement

In order to ensure that the ongoing project continued to include the wider department 'voice', we met regularly with the department head and the department as a whole, including both faculty and trainees. During these meetings, we updated the department on our activities. We also answered questions, addressed concerns, and elicited feedback for continued guidance from the larger group for the momentum of our project.

5.6.1.4 Other influences

Additional influences on the Phase 2 project activities included a grant application and my attendance at two conferences. During Phase 2, there was an opportunity for me to apply for an educational grant under my employer that would allow me to gain additional funding for Phase 3. While the grant was never submitted due to inter-departmental political issues at my home institution, it did influence the visual appeal of our driver diagram and added professional elements to make our project more appealing to the grant reviewers.

In addition, during Phase 2, I attended two regional conferences – one on quality improvement methodology and the other on health professional education. While neither had a direct influence on the Phase 2 project activities, they both indirectly effected my perspective of the ongoing project by reframing my thoughts on certain issues.

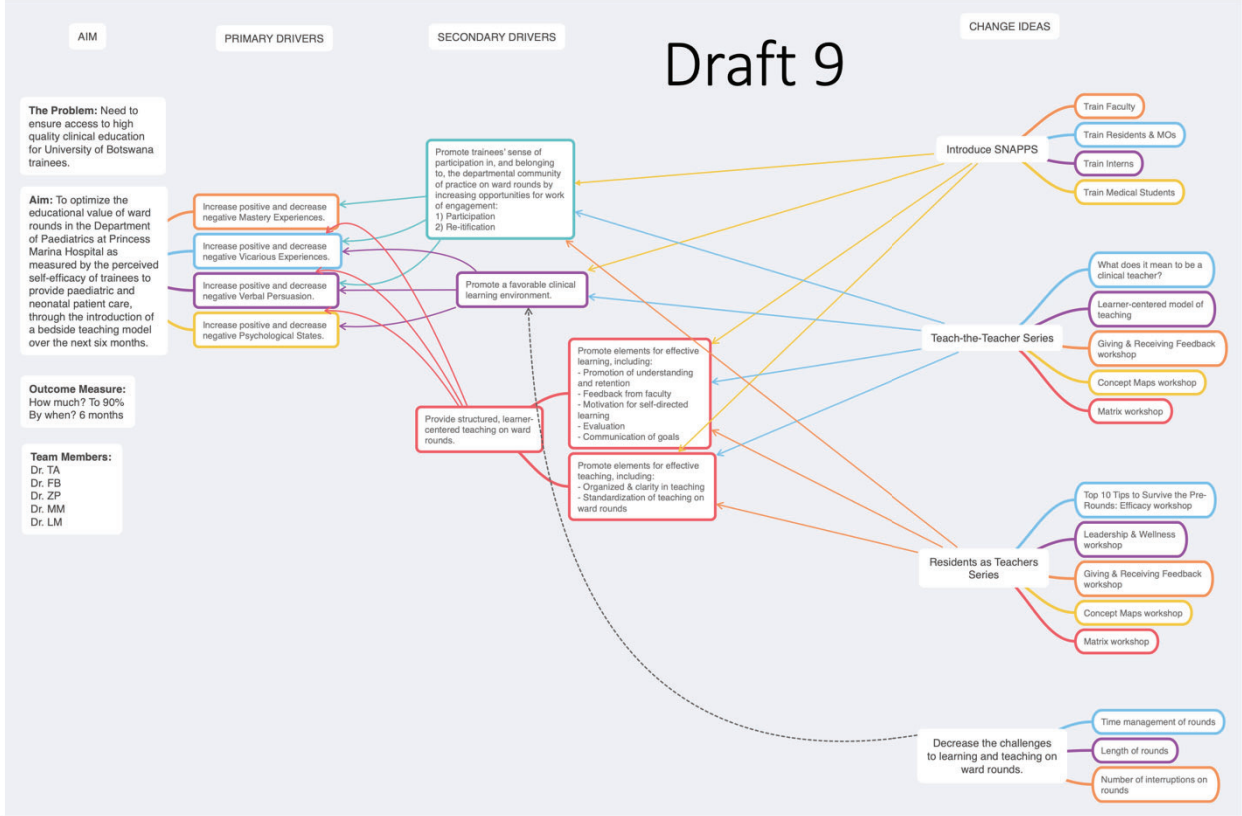
5.6.2 KEY-ACTIVITIES

The five main activities during Phase 2 were: 1) the evolution of the driver diagram, 2) evolution of project measures, data collection tools and surveys, 3) evolution of change ideas, 4) development of Phase 3 timeline, and 5) testing of the data collection tools and surveys and gathering of baseline data. These were developed through collaborative reflection of Phase 1 results in conjunction with ongoing relevant literature review, supplemented with content expert opinion, and ultimately discussed at length by the project group to contextualize the literature and ensure local relevance and practicality.

5.6.2.1 EVOLUTION OF DRIVER DIAGRAM

We set out to create a driver diagram that would incorporate the overall project's goals, the main influences on that goal, and provide insight to how we would achieve this. There were a total of nine drafts with several ongoing events that influenced the iterative and final version used in Phase 3 of the project. *Appendix F.1: Phase 2 – Evolution of the driver diagram* provides a detailed description of our eight-month dynamic process to develop our driver diagram during Phase 2. The main tension in the development process was trying to include complex educational theories within a simplified, graphic QI format that could be easily accessed by all project group members and the department. *(Figure 22)*

FIGURE 22: PHASE 2 GENERATED DRIVER DIAGRAM



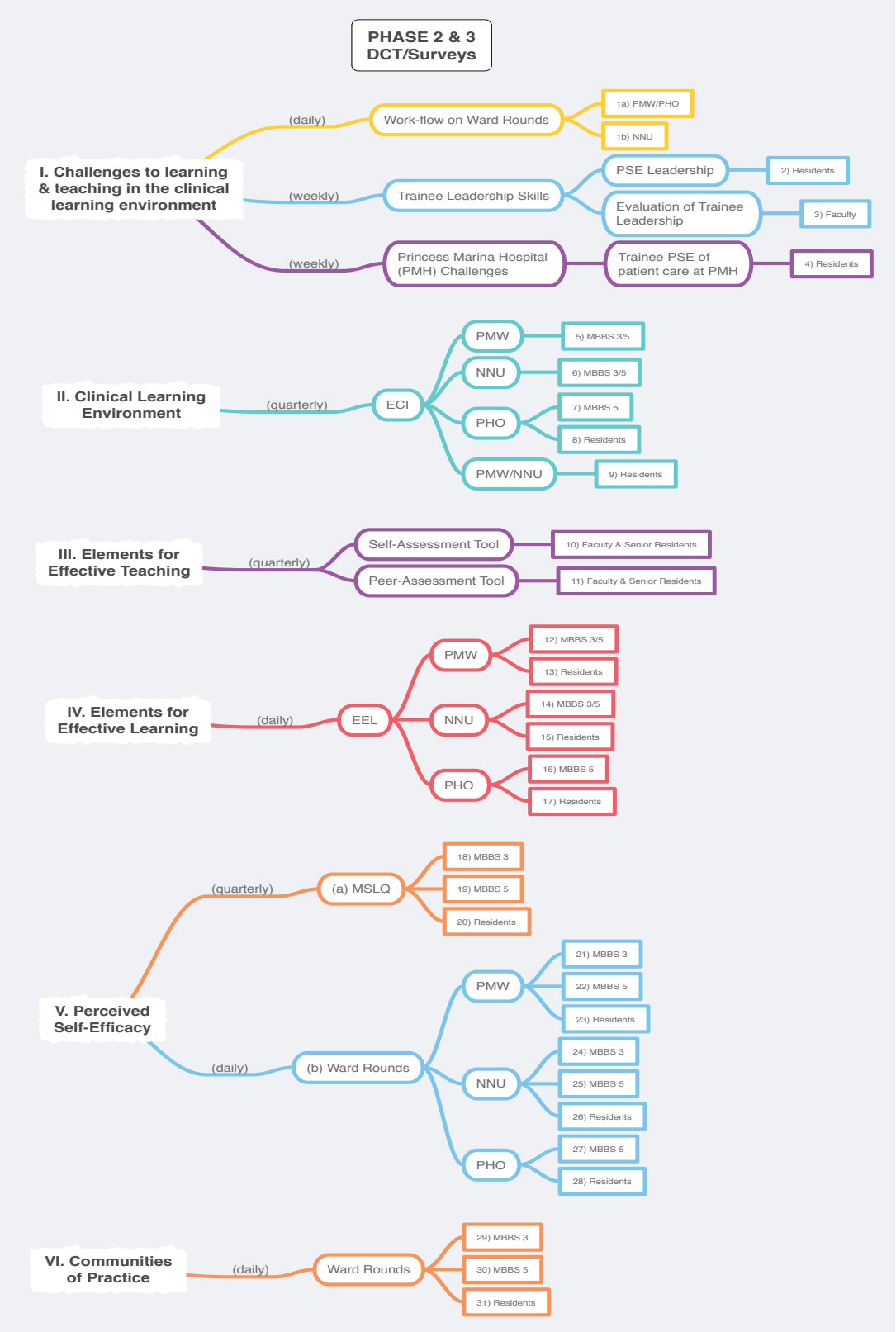
5.6.2.2 EVOLUTION AND DEVELOPMENT OF PROJECT MEASURES, DATA COLLECTION TOOLS & SURVEYS

Guided by our collectively created driver diagram and influenced by Phase 1 results and ongoing literature review, we set out to determine *what* and *how* we would measure our efforts in Phase 3. The main tension in the development process was trying to measure several complex concepts in a unified and locally relevant manner. *Appendix F.2: Phase 2 – Evolution of project measures and data collection tools & surveys* provides a detailed description of our eleven-month dynamic process to determine our Phase 3 project measures, data collection tools and surveys.

In order to identify and quantify the challenges to learning and teaching in the clinical learning environment, a work-flow on ward rounds data collection tool was generated and used to collect six weeks of baseline data during Phase 2 of the project. In order to assess the trainees' and faculty's prevailing perceptions of the challenges within the clinical learning environment, the atmosphere of

the clinical learning environment, effective clinical teaching, elements for effective learning, trainees' self-efficacy beliefs, and level of social participation - a total of 26 surveys were generated and piloted in this phase of the study. *(Figure 23)*

FIGURE 23: PHASE 2 GENERATED DCT AND SURVEYS



5.6.2.2.1 - I. Challenges to learning and teaching in the clinical learning environment

5.6.2.2.1.1 - Work-flow on a Ward Round DCT

This newly constructed, paper-based DCT was designed to capture the start and end times of rounds, the length of rounds, patient volume, team composition, and the type of and frequency of interruptions during the ward rounds. The DCT was stratified by PMW/PHO and NNU, creating 2 variations of the DCT. They were then further stratified by admitting or post-intake services, as well as specific wards: PMW or PHO, and finally by individual teams: (PMW: Team A, B, and C; NNU: NICU, premature, fully, isolation, fattening). The DCT was reviewed by project group members prior to its use. *(Appendix B.12 & B.13)*

5.6.2.2.1.2 - Resident perceived self-efficacy leadership survey

This newly constructed, 10-item, paper-based survey was designed to evaluate junior resident's perceptions of their self-efficacy to fulfil the CanMED physician roles related to management, supervision, delegation, and prioritization of a ward rounds.[88] This survey also elicited for other influences on trainee perceptions of their self-efficacy, including vicarious and psychological aspects of running a ward round. This survey was designed to capture the weekly perspective of the junior resident of their leadership skills. The first four questions were scored using a seven-point, unipolar response scale ('Never' to 'All the time'); the remaining six questions used a five-point, unipolar response scale ('Not like me at all' to 'Very much like me'). Negative questions were scored in reverse. The maximum possible score is 58 and the minimum score is 10. *(Appendix B.14)*

5.6.2.2.1.3 - Faculty perspective of resident leadership skills survey

This newly constructed, 4-item, paper-based survey was designed to obtain faculty's perspective on junior resident's capacity to fulfil the CanMEDS physician roles related to management, supervision, delegation, and prioritization of a ward rounds.[88] This survey was designed to capture faculty perspectives on a weekly basis. The first question was scored using a five-point, unipolar response scale from 'Not at all' to 'A great amount'; and the remaining three questions were scored using a

seven-point, unipolar response scale from 'Never' to 'All the time'. The maximum possible score is 26 and the minimum score is 4. *(Appendix B.15)*

5.6.2.2.1.4 - Resident perceived self-efficacy of patient care at PMH

This newly constructed, 5-item, paper-based, survey was designed to capture junior residents' perceptions of their self-efficacy to effectively provide patient care at Princess Marina Hospital, with the specific aim to determine the influence of the hospital system on the junior residents' self-efficacy beliefs of their patient management. This survey was designed to capture junior residents' perspectives weekly. Questions were scored using a 7-point, unipolar response scale from 'Never' to 'All the time'. Negative items were scored in reverse. The maximum possible score is 35 and the minimum score is 5. *(Appendix B.16)*

5.6.2.2.2 - II. Clinical learning environment

5.6.2.2.2.1 - Educational climate inventory

The Educational Climate Inventory (ECI) was used to determine medical students' and residents' perceptions of the learning climate.[72] The ECI survey is a 20 item questionnaire that assesses an institution's learning climate using three sub-scales: Centrality of learning and mutual respect (10 items), Competitiveness and stress (6 items), and Passive learning and memorization (4 items). The survey was stratified by medical student and resident, and then further stratified by ward, creating 5 variations of the survey. Questions are scored using a 1 to 4 four-point Likert scale, with 1 = Strongly disagree, 2 = Disagree, 3 = Agree, and 4 = Strongly agree. Negative questions are scored in reverse. The original ECI questionnaire's maximum score is 80 and minimum score of 20, but we removed questions #11, 13 and 14, which were related to competitiveness and per the Phase 1 data, was not found to be relevant to our study population. The possible maximum score for the modified ECI survey is 68 and the minimum score is 20. *(Appendix B.17, B.18, B.19, B.20, B.21)*

5.6.2.2.3 - III. Elements for effective teaching

5.6.2.2.3.1 - Observation & learning tool for clinical supervision: Self-assessment tool & Peer-assessment tool

The Observation and Learning Tool for Clinical Supervision was used to assess faculty and senior resident's elements for effective teaching skills.[84] This tool was developed by Sommer et al as a "descriptive tool for peer review of clinical teaching skills."[84] The tool was designed in accordance with skill sets which clinicians typically already have: 1) ability to provide patient-centred care, and 2) the ability to structure clinical encounters. For this design, they paired already possessed clinical skills to teaching skills: i.e. (i) patient-centred → learner-centred and (ii) the structure of the clinical encounter → the structure of a teaching session. The tool is composed of sixteen items with three steps: 1) Organizes the supervision, 2) Helps the learner to learn from the case, 3) Ends the supervision. This tool was modified to contain thirteen of the original items, but with all of the original steps. Responses are scaled using three levels of teaching skills: "weak", "good" and "very good". For the purposes of this study, minor modifications to the wordage of the original tool were made. In addition, a major modification was made to allow the tool to double as a 'self-assessment' tool, where phrases were modified to be in the first person. These modifications created two versions of the survey: a self- and peer-assessment version. This was planned to be collected from faculty and senior residents on a quarterly basis. The total maximum score for the modified tool was 39, and the minimum score was 13. *(Appendix B.22 & B.23)*

5.6.2.2.4 - IV. Elements for effective learning

5.6.2.2.4.1 - Elements for effective learning – modified

This survey was modified based on the previously newly constructed Elements for Effective Learning survey developed in Phase 1. *(Appendix B.8 & B.9)* It was originally designed to assess trainees' perceptions of effective elements of learning based on the seven elements described by the Stanford Faculty Development Program (SFDP).[78] For this modified version, only four of the seven elements of SFDP were used (communication of goals, promotion of understanding and retention, evaluation, and promotion of self-directed learning). Based on Phase 1 results, additional modifications were made,

including incorporation of certain aspects of the Observation and Learning Tool for Clinical Supervision to help elicit trainee feedback on the quality of the clinical teaching. This resulted in an 18-item, paper-based survey measuring five sub-themes: 1) Communication of goals, 2) Evaluation, 3) Promotion of understanding and retention, 4) Elements for effective teaching, and 5) Motivation for self-directed learning. The survey was stratified by medical student and resident, as well as ward, creating 6 variations of the survey. Questions were scored using a five-point, unipolar response scale, from 'Not at all' to 'A great amount'. Negative questions were scored in reverse. The possible maximum score for the survey is 90 and the minimum score is 18. This was designed to capture data on a weekly basis. *(Appendix B.24 & B.25)*

5.6.2.2.5 - V. Perceived self-efficacy

5.6.2.2.5.1 - Motivational strategies for learning questionnaire

The Motivational Strategies for Learning Questionnaire (MSLQ) is a widely recognized, 44-item, self-reported survey to evaluate academic self-efficacy in students, with subcategories including: self-regulation (9-items), text anxiety (4-items), self-efficacy (11-items), intrinsic value (9-items), and cognitive strategy (12-items).[112] For this project, the MSLQ was modified and used to evaluate the medical students' and junior residents' perceptions of their self-efficacy to perform as part of the paediatric ward rounds. The modified version included 36-items and covered the same sub-categories (although several questions were removed due to limited relevance in the clinical setting). The survey was stratified by MBBS 3, MBBS 5 and residents, creating 3 variations of the survey. Questions were scored using a 7-point scale (1 = not at all true of me; 7 = very true of me). Negative items were scored in reverse. The possible maximum score for the survey is 252, with a minimum score of 36. This was intended to be captured on a quarterly basis. *(Appendix B.26, B.27 & B.28)*

5.6.2.2.5.2 - Daily perceived self-efficacy on ward rounds survey

This newly constructed, paper-based survey was designed to obtain trainees' perceptions of their self-efficacy on a ward round, specifically eliciting for information related to trainees' mastery and vicarious experiences and psychological state when on the ward round. The survey was stratified by

trainee level, as well as by ward, for a total of 8 variations of the survey. The MBBS 3 surveys contain 7-item questions; the others contain 6-items. The first three (MBBS 3) and four (MBBS 5/resident) questions were based on the Phase 1 generated PSE survey. *(Appendix B.10 & B.11)* These questions were scored on a 5-point, unipolar scale from 'Much less confident' to 'Much more confident'. The last three questions were drawn from the modified MSLQ survey. These questions were also scored using a 5-point, unipolar response scale from 'Not like me at all/Never' to 'Very much like me/All the time'. Negative items were scored in reverse. The possible maximum score for the MBBS 3 version of the survey is 35, with a minimum score of 7; the possible maximum score for the MBBS 5 and resident versions of the survey is 30, with a minimum score of 6. This was intended to be captured on a weekly basis. *(Appendix B.29, B.30, B.31, B.32, B.33, B.34, B.35, & B.36)*

5.6.2.2.6 - VI. Communities of Practice

5.6.2.2.6.1 - Communities of Practice Survey

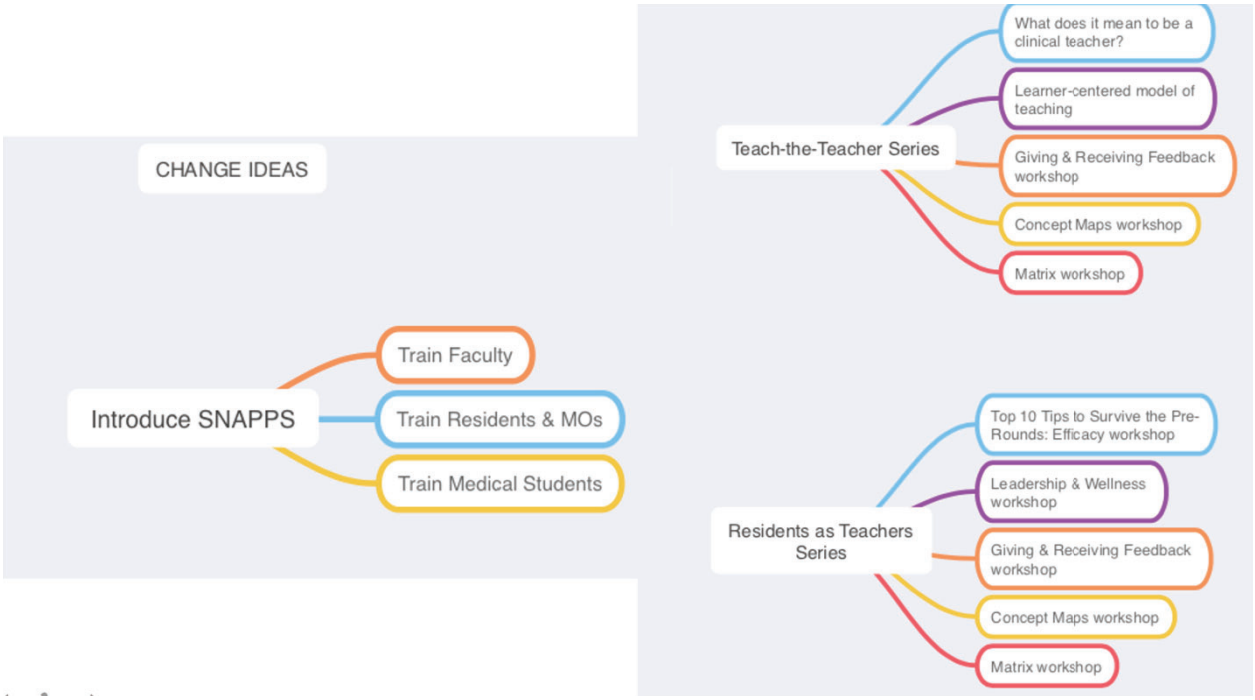
This newly constructed, 13-item, paper-based survey was designed to obtain trainees' sense of participation and belonging on a ward round. This survey partly drew on questions from the Phase 1 generated Elements for Effective Learning survey. *(Appendix B.9)* The survey was stratified by training level, creating 3 variations of the survey. Questions 1-12 were scored on a 5-point, unipolar scale from 'Not at all' to 'A great amount'. The last question was scored utilizing a horizontal line indicating a spectrum of clinical levels; trainees were to indicate with a mark on the line which best reflected their perceived clinical level. Negative items were scored in reverse. The possible maximum score for the survey is 95, with a minimum score of 19. This was intended to be captured on a weekly basis. *(Appendix B.37 & B.38)*

5.6.2.3 Evolution of Change Ideas

Guided by our collectively created driver diagram and influenced by Phase 1 results and ongoing literature review, we set out to determine and develop a set of activities that would have the most impact to optimize the learning and teaching on paediatric ward rounds during Phase 3 of our project. *Appendix F.3: Evolution and Development of Phase 2 Change Ideas* provides a detailed description of

our ten-month process to determine and develop our Phase 3 interventions ('change ideas'). The main tension in the development process was reviewing the literature for potential solutions to issues identified in Phase 1 and then ensuring department buy-in and contextualization of these literature-based solutions. *(Figure 24)*

FIGURE 24: PHASE 2 GENERATED CHANGE IDEAS



5.6.2.4 Development of Phase 3 timeline

Part of our Phase 2 activities was generating the Phase 3 timeline. The project group, in coordination with the department didactic scheduler, we developed two main timelines: 1) the educational series and other department project related activities, and 2) the data collection calendar. *(Figures 25 & 26)*

FIGURE 25: PLANNED TIMELINE FOR PHASE 3

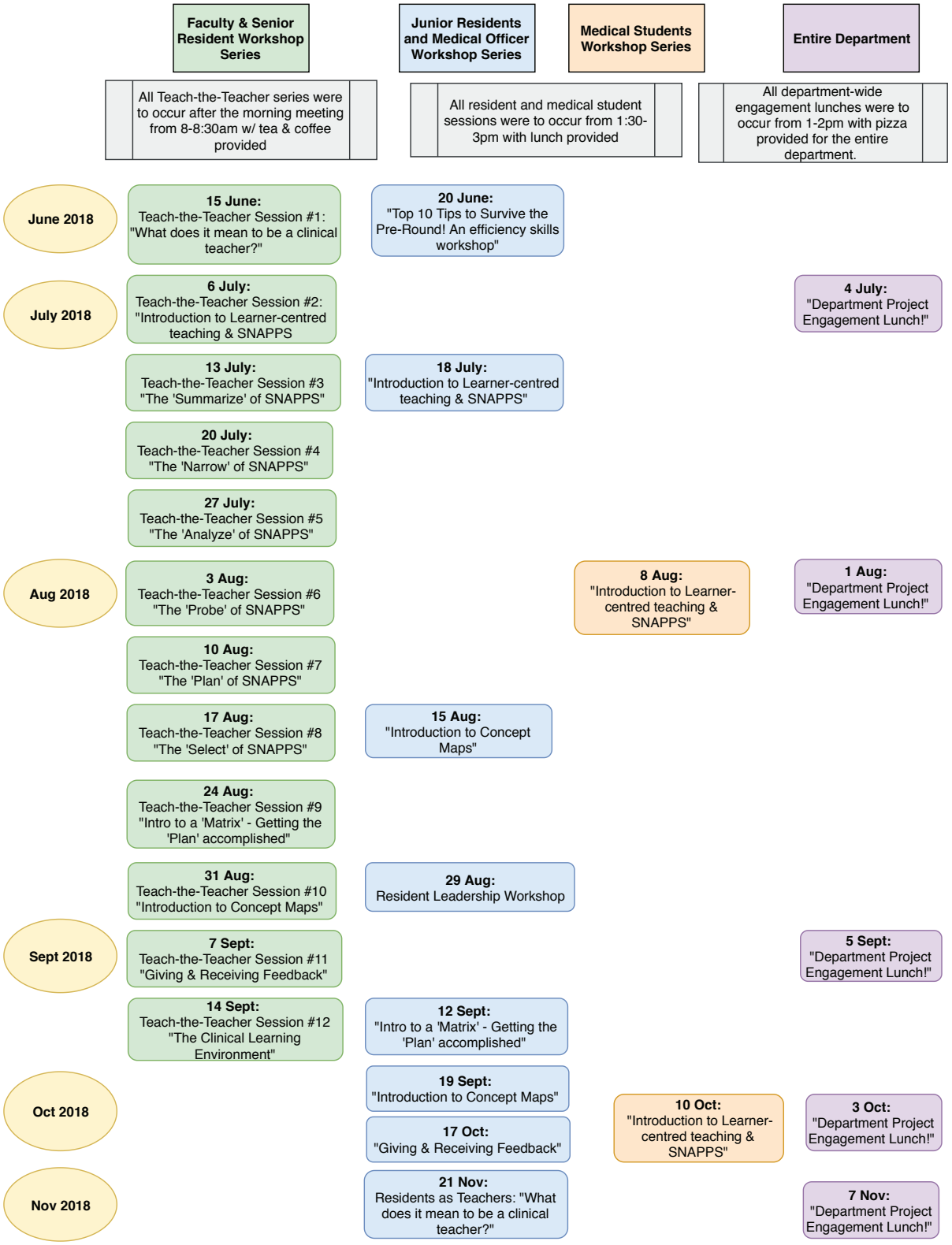
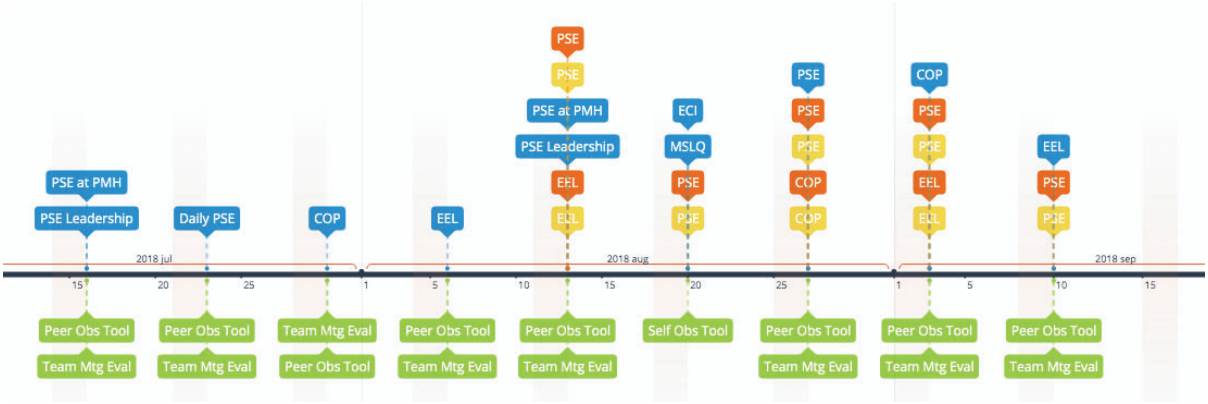


FIGURE 26: PLANNED PHASE 3 DATA COLLECTION CALENDAR



Yellow = MBBS 3
Orange = MBBS 5
Blue = junior residents

Green = senior residents/faculty
Pink = MBBS 3/5 combined
Purple = students, residents and faculty

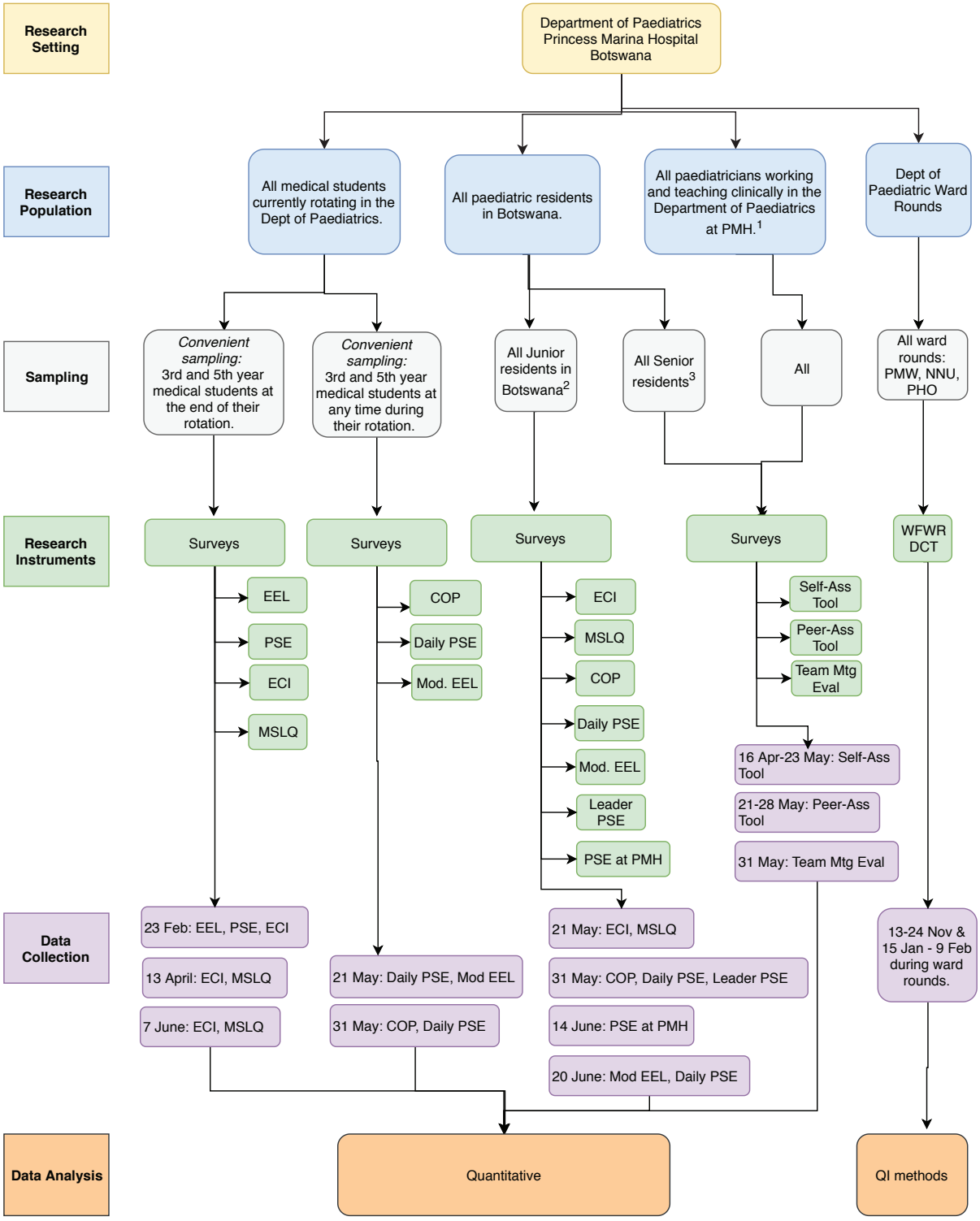
5.6.2.5 TESTING OF DATA COLLECTION TOOLS AND SURVEYS

A key activity of Phase 2 was the testing of the recently generated data collection tools and surveys. The goal was three-fold: 1) pilot the surveys, 2) test the feasibility of our data collection, and 3) collect baseline data prior to any Phase 3 interventions. Therefore, embedded within the other activities of Phase 2, was the piloting of surveys and collection of data. *(Figure 27: Phase 2 Research Design)*

5.6.2.5.1 - METHODS

Refer to *Chapter 3 – Methods* for more details.

FIGURE 27: PHASE 2 RESEARCH DESIGN



5.6.2.5.2 - Study Setting

The Phase 2 testing of data collection tools took place between November 2017 through January 2018; and the testing of surveys took place between February and June 2018.

5.6.2.5.3 - Phase 2 - Study Population

During Phase 2 of the study, approximately 120 medical students rotated through the department (roughly 10 of each MBBS 3 and MBBS 5 class for their 8-week rotations), but only 60 were invited to participate in the study from February to June 2018. In addition, 13 junior residents, 13 senior residents, and eighteen paediatricians were available to participate in the study. *Note*: I did not include myself as part of the faculty study population in Phase 2.

5.6.2.5.4 - Phase 2 - Study instruments

A combination of 2 data collection tools and 30 surveys and were used for Phase 2 of the study. *(Figure 23)* In addition, the original EEL and PSE surveys were conducted in early Phase 2 to ensure that during the 14 months in between trainee data collection in Phase 1 and Phase 2, that there did not appear to be significant changes in either the Department of Paediatrics' clinical learning environment or in trainees' perceived self-efficacy.

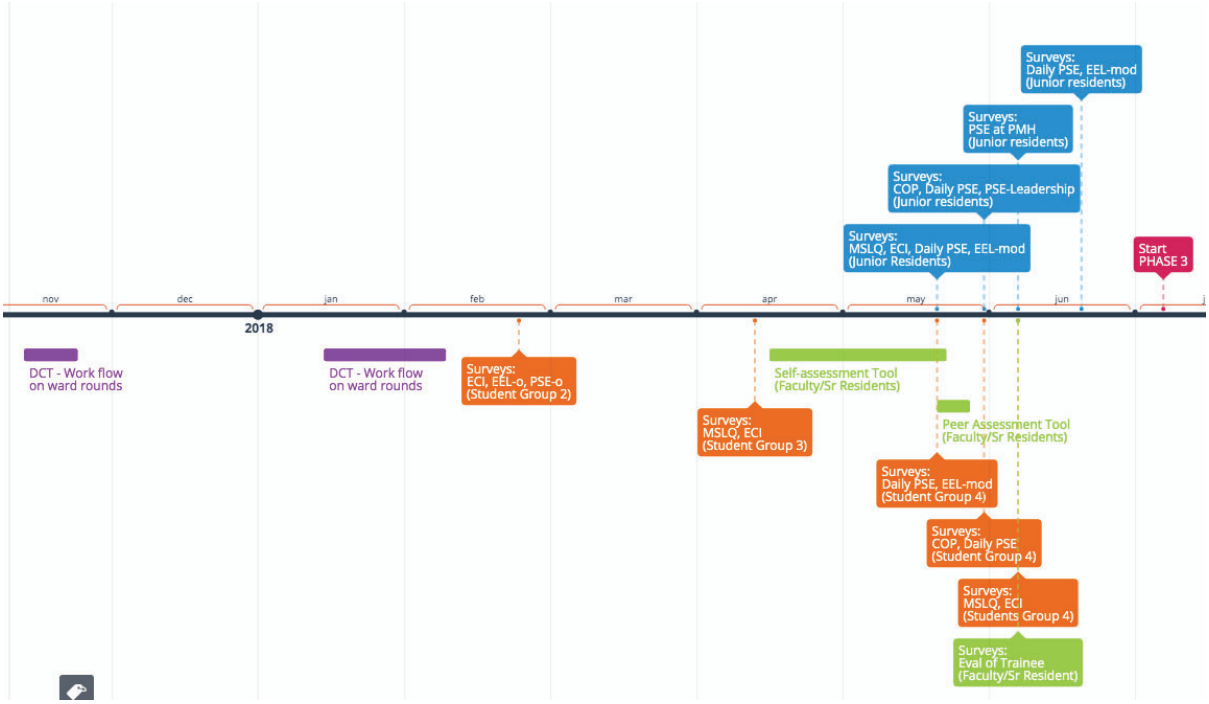
5.6.2.5.5- Recruitment

Refer to *Chapter 3 – Methods* for more details.

5.6.2.5.6 - DATA COLLECTION

A total of two data collection tools (DCTs) and 30 surveys were distributed during Phase 2. All DCTs and surveys were conducted over an eight-month period (November 2017 – June 2018). *(Figure 28)*

FIGURE 28: PHASE 2 – PILOTING AND BASELINE DATA COLLECTION TIMELINE



5.6.2.5.1.1 - DATA COLLECTION TOOLS

To collect data from all of the ward rounds, we needed to have one member of the rounding team collect the data. Since the data was purely objective without any subjective information captured on the form, the individual who captured the data was not considered a true 'participant' of the study and this data collection was purely voluntary. At the morning meeting, I presented the DCT and asked for one volunteer from each rounding team to help capture this data. The data collection volunteer was given five stapled half-page copies of the DCT for the week and were instructed to return it to me by the end of the week. Volunteers received a small piece of candy at the end of the week for

appreciation of their data collection efforts. The DCTs were completed daily (Monday thru Friday) for a total of six weeks, from 13 – 24 November 2017, and again from 15 January to 9 February 2018.

5.6.2.5.1.2 - Surveys

All surveys were collected as described in *Chapter 3 – Methods*, unless stated otherwise below.

5.6.2.5.1.2.1 - Trainee surveys

Four of the trainee surveys (PSE-original, EEL-original, ECI, and MSLQ) were designed to be captured at the end of the rotation for students or quarterly for residents. The remaining surveys were designed to be captured during ongoing rotation activity and therefore were distributed in an alternative fashion weekly for four weeks from 21 May – 20 June 2018.

5.6.2.5.1.2.1.1 - Faculty/Senior resident surveys

The Observation and Learning Tool for Clinical Supervision (Peer-Assessment) survey was collected via peer-observation. The consented faculty or senior resident invited myself or another member of the project team to attend their ward round. Three patient encounters per ward round were observed, and subsequently, the survey was completed based on the clinical teaching observed. No faculty identifying information was included.

5.6.2.5.2 - Data analysis

5.6.2.5.2.1 - Data Collection Tools

All data from the work-flow on ward rounds data collection tool was stratified by ward: PMW, PHO and NNU. Due to the differing nature of NICU patients compared to the general NNU population, the NNU was further stratified by NICU and all other NNU cubicles. All data points were plotted on a run

chart to use for future reference in Phase 3. Data was analysed for the median start time of rounds, length of rounds, and time per patient spent on rounds. Per quality improvement data analysis when creating run charts, we used the median instead of the average so that outliers would not influence the overall value of the collected data. In addition, the number and type of interruption of rounds was recorded.

5.6.2.5.2.2 - SURVEYS

The surveys were scored according to their individual method. Each individual question, sub-categories, and overall survey responses were calculated for mean, standard deviation, median and range values. Negative item questions were scored in reverse where appropriate. Note: For the Communities of Practice survey, it was noted that many trainees expressed they did not understand question 13, therefore, we omitted question 13 from the data analysis.

5.7 OBSERVE – PHASE 2

5.7.1 RESULTS

5.7.1.1 EEL & PSE – ORIGINAL RESULTS

The original EEL and PSE surveys were repeated in early Phase 2 to evaluate for any significant changes in trainee responses during the 14 month break between Phase 1 and Phase 2. Despite some variation between group answers within sub-categories and a generally lower score for the Phase 2 group of trainees for the EEL-original survey, we felt the two groups responses were generally similar enough that we could assume that not too much had changed in the department clinical learning environment or in the trainees' perceptions of their self-efficacy. *(Appendix E.10, E.11)*

5.7.1.2 - I. CHALLENGES TO LEARNING & TEACHING IN THE CLINICAL LEARNING ENVIRONMENT

5.7.1.2.1 - WORK-FLOW ON WARD ROUNDS DATA COLLECTION TOOL RESULTS

A total of six weeks of baseline data was collected from 13-24 November, 2017 and 15 Jan thru 9 Feb, 2018. Data was captured for all wards and teams/cubicles in PMW, PHO, NICU and NNU. All values are displayed in median values. *(Table 9)*

TABLE 9: WORK-FLOW ON WARD ROUNDS, DATA COLLECTION TOOL RESULTS

Ward	Start time of Rounds	Length of Rounds	Time per patient
PMW	10:42am	1hr 42 min	13 min
PHO	10:37am	1hr 33 min	12 min
NNU *(excluding NICU)*	10:53am	1hr 14 min	9 min
NICU	10:45am	1hr 15 min	15 min

The data collection tools also captured the number and reason of interruptions to ward rounds. This data was only collected for the first two weeks from 13-24 November, 2017. The results were stratified between PMW/PHO and NNU/NICU. For all ward rounds, it was reported that each roughly had 3 interruptions per rounds. Reasons for interruptions included: needing to look for patient file, nurse question, patient emergency, patient care (placing IV cannula, drug administration, etc.), faculty phone call, called by labour & delivery ward, outpatient visit, looking up lab results, and transporting patient.

5.7.1.2.2 - RESIDENT PERCEIVED SELF-EFFICACY LEADERSHIP SURVEY RESULTS

Five of 13 available junior residents completed this survey during Phase 2 on 31 May, 2018. Their total score for the survey showed a median of 38 (range 19-34) and a mean of 34 (SD 10.7), indicating a

59% for overall PSE of leadership skills to manage team for the ward round. By PSE sub-category, junior residents rated their mastery experiences to be the highest, with a median of 21 (range 17-27) and mean of 22 (SD 4.0), indicating 79% confidence to perform tasks directly related to effectively lead the team for ward rounds. Whereas for their vicarious and psychological experiences, they rated these lower with a 66% overall for each. *(Appendix E.12)*

5.7.1.2.3 - Faculty perspective of resident leadership skills survey results

Five faculty members completed the survey for the week of 14 June, 2018, just prior to the junior resident's "10 Tips to Surviving the Pre-Rounds" workshop. The survey was not stratified by ward. Overall, faculty found junior residents to be efficiently capable to manage ward rounds at 61% (median 16.5 (range 10-21), mean 15.8 (SD 3.7). *(Appendix E.13)*

5.7.1.2.4 - Resident perceived self-efficacy of patient care of PMH survey results

Nine junior residents completed the survey during Phase 2 on 14 June, 2018. Overall, junior residents exhibited the least efficacy in obtaining a chest x-ray or blood transfusion for their patient, and overall expressed that the system at PMH did exert influence over their ability to complete ward work as discussed on rounds. *(Appendix E.14)*

5.7.1.3 - II. Clinical learning environment

5.7.1.3.1 - Educational Climate Inventory survey results

A total of 90 ECI surveys were completed during Phase 2 by approximately 50 medical students and 11 residents. Note, since the ECI survey was stratified by ward, often the same trainee would complete an ECI for each ward: PMW, NNU, and PHO. Rotating students completed the survey at the end of their paediatric rotation in February, April and June 2018 and 11 junior residents completed the surveys once in May 2018. The mean score for the total survey for all surveys was 68%. From the three sub-scales, the trainees' mean for *Centrality of learning and mutual respect* scored 71%. The trainees'

mean score for *Competitiveness and stress* was 60%. And trainees' mean for *Passive learning and memorization* scored 69%. Medical students compared to junior residents generally scored the same for overall and sub-categories; MBBS 3 and 5 students also scored generally the same. There was no noted difference between scores for PMW and NNU, but in general, students scored higher in PHO in all sub-categories and overall compared to PMW and NNU; (only one resident completed the ECI for their PHO rotation). *(Appendix E.15)*

5.7.1.4 - III. Elements for effective teaching

5.7.1.4.1 - Observation & learning tool for clinical supervision survey results

A total of 17 faculty and senior residents completed the self-assessment tool between April and May 2018, and seven of the faculty and senior residents agreed to be peer-evaluated during their ward rounds for several case presentations. The overall mean score for the SAT survey for faculty/senior residents was 74%, while the overall mean score for the PAT survey was 52%. From the three steps of providing effective clinical supervision, *Step 1: Organizes the supervision*, the faculty/senior resident self-assessment score was 77%, while the peer-assessment was 50%. *Step 2: Helps the learner learn from the case* showed a self-assessment score of 83%, while the peer-assessment showed a 57% score. *Step 3: Ends the supervision* showed a self-assessment score of 76%, while peer-assessment scored 45%. *(Appendix E.18)*

5.7.1.5 - IV. Elements for effective learning

5.7.1.5.1 - Elements for effective learning (modified) survey results

A total of 21 Elements for Effective Learning - *modified* surveys were completed during Phase 2 (residents = 3; students = 18) in May and June 2018. The survey was stratified by ward: PMW n=15, NNU n=3, and PHO n=3. Note, since the survey was stratified by ward, a single student could have completed all three surveys. The total score for all surveys showed a median of 68 (range 49-83) and a mean of 67.2 (SD 9.9), indicating a 75% for overall perception of elements of effective learning. By

EEL-modified sub-categories, trainees rated all of them similarly (*Communication of Goals* to be 81%, *Evaluation* 79%, *Promotion of Understanding and Retention* 81%), except for *Elements for effective teaching* which was rated the lowest at 60%, and *Motivation for self-directed learning* which was rated the highest at 87%.

There was insufficient data to evaluate between resident and student scores. Per individual wards, while the total scores were generally the same with PHO having the highest overall score at 80%, within the subcategories, the wards ranked differently – i.e. PHO ranked highest for *Evaluation and Promotion of Understanding and Retention* sub-categories, but lowest in *Communication of Goals*. PMW showed the lowest score for *Elements of Effective Teaching*. *(Appendix E.19)*

5.7.1.6 - V. Perceived self-efficacy

5.7.1.6.1 - Motivated strategies for learning questionnaire results

A total of 49 trainees completed the MSLQ survey during Phase 2. Thirty-eight rotating students completed the survey at the end of their paediatric rotation in April and June 2018; 11 junior residents completed the survey once in May 2018. The total score for all trainees showed a median of 190 (range 97-228) and a mean of 185 (SD 25.9), indicating a mean score of 76% for overall perception trainee academic self-efficacy. By MSLQ sub-categories, trainees rated all of them similarly (*Self-regulation* at 71%, *Self-efficacy at* 72%, and *Cognitive strategy at* 75%), except for *Test anxiety* which was rated the lowest at 59%, and *Intrinsic value* which was rated the highest at 87%. In general, there was no obvious difference between student and residents scoring, except for sub-category *Test Anxiety* where students scored lower. *(Appendix E.21)*

5.7.1.6.2 - Daily Rounds: Perceived self-efficacy survey results

A total of 48 Daily PSE surveys were completed during Phase 2 in May and June 2018. The surveys were stratified by trainee level (20 MBBS 3 surveys, 17 MBBS 5 surveys, and 11 resident surveys) and ward (36 PMW surveys, 9 NNU surveys, and 3 PHO surveys). Note, since the survey was stratified by

ward, a single student could have completed all three surveys – one for each ward. Additionally, MBBS 3 only completed PMW and NNU surveys and the first four questions were different from MBBS 5 and resident Daily PSE surveys.

The total score for all MBBS 3 surveys showed a median of 26 (range 15-32) and a mean of 24.6 (SD 4.8), indicating a 70% for overall perception of perceived self-efficacy on ward rounds. MBBS 5 reported a total score of median 22 (range 16-28) and a mean of 21.6 (SD 2.8), with an overall score of 72% for PSE on ward rounds. Residents reported a total score of median 24 (range 8-28) with a mean of 23.3 (SD 3.3), with an overall score of 78% for PSE on ward rounds.

By Daily PSE survey sub-categories, all trainees rated their *Mastery experience* the highest (MBBS 3 75%, MBBS 5 76%, Residents 85%), followed by *Psychological experience* (MBBS 3 66%, MBBS 5 68%, Residents 80%), and finally *Vicarious experience* was rated the lowest (MBBS 3 59%, MBBS 5 67%, Residents 62%). For nearly all sub-categories, residents generally rated their Daily PSE higher than students, except for *Vicarious experiences*. Student *Psychological experiences* were particularly lower than resident scores. *(Appendix E.24)*

Per ward, MBBS 5 scored highest in PHO (83%), followed by PMW (73%), and then NNU (63%). *(Appendix E.26)* For residents, since there was only one incomplete survey filled in for PHO, it was difficult to compare, but in general, PMW and NNU were scored similarly by residents, expect for residents gave PMW a lower score in Vicarious experience (56% in PMW vs 70% in NNU). *(Appendix E.28)*

5.7.1.7 - VI. Communities of Practice

5.7.1.7.1 - Daily Rounds: Communities of Practice survey results

Nineteen trainees completed the COP survey during Phase 2 in May 2018. The survey was stratified by level of training (9 MBBS3, 8 MBBS 5, and 2 residents). The total score for all trainees showed a median of 68 (43-86) and a mean of 66.2 (SD 12), giving a 70% for overall sense of participation in and

belonging to the clinical community of practice on ward rounds. For students, they scored similar in both sub-categories and overall, with no obvious difference between MBBS 3 and MBBS 5. Residents scored lower than students in both sub-categories and overall (students total 71% vs resident total 58%). Residents scored particularly low in the sub-category *reitification* (52%). *(Appendix E.29)*

5.8 REFLECT - PHASE 2

To ensure ongoing validity of our collected data, throughout Phase 2, we remained responsive to all feedback about our surveys and survey responses and continued to adjust the surveys as needed. Three specific changes were made to instruments and data collection process based on the feedback we obtained from participants. These are highlighted below.

First, for the 'Daily Rounds: Communities of Practice' survey, it was noted that trainees did not understand question 13, therefore, we omitted question 13 from the data analysis. Second, for the 'Resident perceived self-efficacy of patient care of PMH' survey, initially residents did not understand the purpose of the survey, interpreting it as a self-evaluate of their own ward work skills. Upon further distribution, we emphasized that the survey was not meant to judge their ability to complete ward work, but to understand the influences of the PMH health care system on their ability to do their ward work. And third, feedback we got from trainees when piloting the surveys during Phase 2 was that they would prefer to complete longer or multiple surveys once a week instead of short, daily surveys. We therefore modified our Phase 3 data collection calendar to incorporate this feedback.

5.9 CHAPTER SUMMARY

In this chapter, I provided a description of the ongoing influences, reflections and activities that occurred during Phase 2 as a means to 'generate a solution' and provide a reflective link between Phase 1 and Phase 3 of the project, including the generation and piloting of surveys. The next chapter will explore the efficacy of our Phase 2 generated efforts.

PHASE 3 – ASSESSING THE EFFICACY OF OUR POTENTIAL SOLUTION

CHAPTER 6: PHASE 3 – CYCLE 1

6.1 CHAPTER INTRODUCTION

Phase 3 was conducted as both 1) self-practice reflection practitioner research, and 2) an inquiry group from the perspective of an 'insider' collaborating with 'insiders' within the Department of Paediatrics at Princess Marina Hospital in Gaborone, Botswana from June 2018 – March 2019. Following the iterative Plan-Act-Observe-Reflect (PAOR) cycle of action research, Phase 3 focused on testing, modifying and implementing intervention ideas generated in Phase 2. Utilizing convergent and exploratory sequential mixed method design, we set out to achieve the last two objectives of the study and to answer the last three research questions.

In this phase, we utilized the findings from Phase 1 and 2 to test, adapt and implement a structured clinical teaching method to provide locally and contextually relevant bedside teaching on ward rounds (*Objective 3*). Simultaneously, we serially evaluated trainees' perceptions of the clinical learning environment on ward rounds, and trainees' sense of participation in, and belonging to, the departmental community of practice on ward rounds, as well as trainees' self-efficacy beliefs about their ability to provide paediatric patient care (*Objective 4*).

Of all the phases within this project, Phase 3 resonates with the emergent design of action research the most. Phase 3 was about assessing the efficiency of our potential solutions, which required me to lean heavily on the PAOR framework. It was critical for me to be responsive and adaptive to the feedback (both formal and informal) to the interventions we were testing. While this may have felt like a 'fumbling' form of research, Elliot describes the benefits of allowing the researcher to be guided by the unknown: "It is clear that such problems would only emerge in the experience of teachers who were attempting to realise the kinds of principles specified by the project. They would not have emerged within the framework of assumptions which underpin customary practice."[1] Hence, it was

only through *doing the project* that I could discover the *issues of the project*. Due to the unique and dynamic nature of our setting, there was no alternative way for me to hypothesize or predict the issues of the project until I was actively engaged in the project and provided feedback from the trainees and faculty.

To capture this emergent design, Phase 3 will be described in what I have retrospectively describe as three distinct *cycles*. This chapter serves to introduce the reader to the overall approach to Phase 3, followed by details of the research design, methods used and results found in Phase 3 – Cycle 1 of this study.

6.2 PHASE 3 - RESEARCHER POSITIONALITY

While most of Phase 3 was still very much inquiry group research with me as an insider working in collaboration with other insiders, leading up to and during Phase 3, corresponded with another gradual shift of my positionality within the department and my relationship to the project. My shift in researcher positionality resulted from a change in my clinical area of focus and workload. This resulted in a change in my 'type' of insider role and eventually the type of action research I was conducting.

As described in Phase 2, at the beginning of July 2018, while I continued to be a paediatrician within the Department of Paediatrics, instead of my previous role working clinically on the PMW and NNU services, I was now working full time within the PHO service. The PHO service functions within the same physical space as the general paediatric ward – our inpatient service, outpatient clinic and procedure room are all physically located on the same ward. But despite the shared physical space, the PHO service is managed separately from the PMW and NNU services, with its own unique patient population, on-call schedule, patient handover, medical director, PHO-dedicated paediatricians, and trainee rotation. My new position considerably changed my clinical area of focus.

In addition, my PHO position doubled my clinical duties. Due to these increased clinical demands, I was no longer able to attended the morning report as often, my teaching duties in the afternoon were substituted with clinical duties, and I no longer rotated on the neonatal or general paediatric wards.

My change in clinical focus and duties resulted in a shift in my 'insider-ness,' in that while I was physically more engrained in the clinical context of the department, I was more detached from the everyday concerns of the general paediatric and neonatal services, creating a sense of 'separateness from within' - still a part of the Department of Paediatrics, but now classified as PHO-specific.

Simultaneously, my increased clinical duties made my physical presence on the ward much more substantial. At the beginning of Phase 3, after nearly four years of being at PMH, I felt very much a part of the ward – I knew the nurses, students, interns, medical officers, residents, faculty – everyone. Nothing was new or foreign to me anymore, and from this perspective, I felt completely saturated as an insider – this was now my clinical world.

This resulted in a fundamental (and unexpected!) shift in my positionality as a researcher. My increased clinical experiences allowed me to more deeply explore my own clinical teaching. So as I was collecting data from my colleagues about their experiences of using SNAPPS, I also began capturing my own experiences of testing and using the model. This unintentional but natural shift in focus toward a self-reflective perspective of the research we were conducting created a new space where I was actually conducting research on my own self-practice – i.e. practitioner research.

6.3 PHASE 3 - PARTICIPATORY POPULATION

For Phase 3 Cycle 1 and 2 of our study, we had the same participatory research team from Phase 2, with minor changes, including LD advanced in her residency to now rotate in RSA and was no longer available to participate in the project. The activities of the project members included: creating and facilitating lectures within the educational series, attending the educational sessions, collecting data, testing SNAPPS on their ward rounds, providing feedback from their testing, and contributing ideas and suggestions for ongoing Phase 3 activities. Due to other demanding clinical and administrative responsibilities, the role of the project members was limited to the above.

It's important to note that there was an obvious shift of the level of participation between Phase 2 and Phase 3 for the project group. Midway through Phase 2, as the project progressed from theoretical

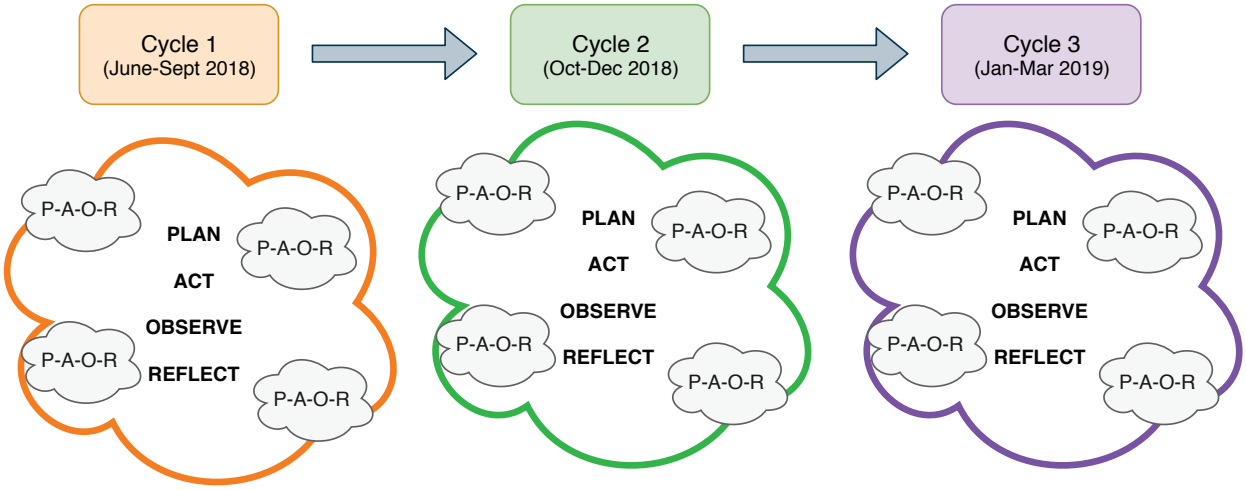
discussions to the actual generation of change ideas and collection of baseline data, the project group moved from biweekly meetings to as needed text messages and once a month email updates. This trend of less frequent in-person project group meetings extended into Phase 3. While project group members continued to be involved in meaningful ways to help facilitate and promote activities within Phase 3, the 'group' itself in some ways dissolved. We shifted from official group meetings to informal individual updates. This discouraged the group dynamic that we once had, but it allowed for all members of the team to be kept up to speed and engage in a more practical way. Specifically, for TA, my co-supervisor for the PhD, she continued to be a supportive sounding board for the feedback I was getting from the department during all cycles of Phase 3.

6.4 PHASE 3 - RESEARCH DESIGN

Phase 3 utilized a combination of convergent and exploratory sequential mixed methods design to determine the impact of the Phase 2 generated interventions, including conducting a department-wide educational series and the introduction of a bedside teaching model.

Per action research emergent design, Phase 3 was data driven and led to three cycles based on the PAOR model. The first cycle occurred between June and September 2018, cycle 2 occurred between October and December 2018, and cycle 3 occurred between January and March 2019. Within each cycle, many decisions were made to accommodate feedback in real time, so within the larger PAOR cycles, were embedded smaller PAOR cycles which occurred as responses to issues identified within each larger cycle. *(Figure 29)*

FIGURE 29: PHASE 3 CYCLES OF PLAN-ACT-OBSERVE-REFLECT



6.5 PHASE 3 - TIMELINE

Phase 3 occurred over nine-months between June 2018 and March 2019. *(Figure 30)* Note, there was overlap between each cycle.

FIGURE 30: PHASE 3 - RESEARCH ACTIVITY TIMELINE

6.6 PLAN: PHASE 3 – CYCLE 1

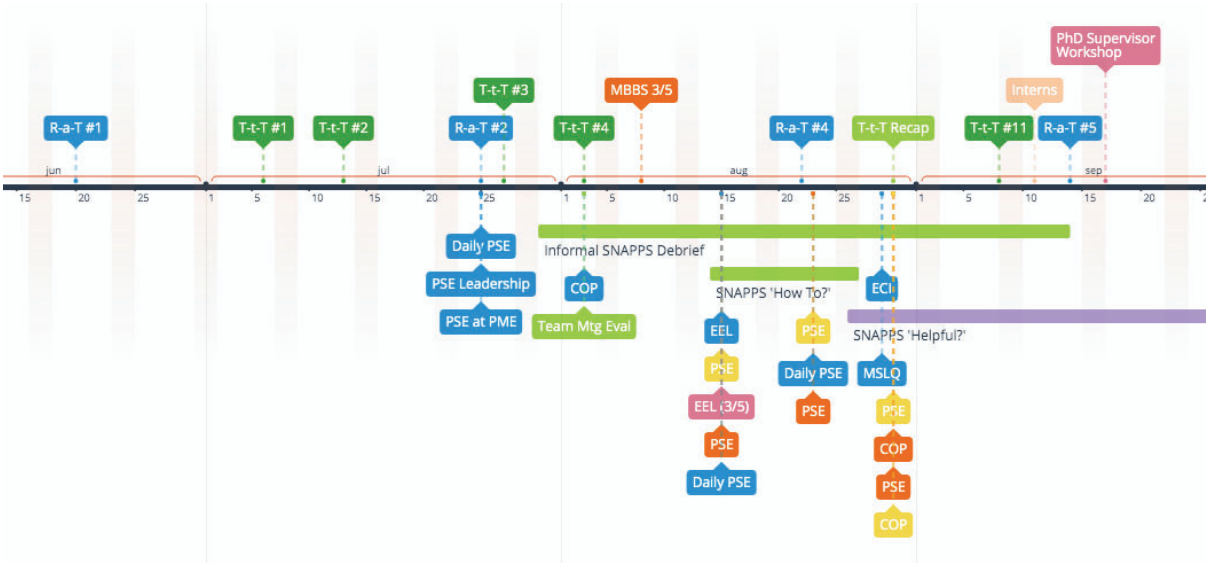
6.6.1 METHODS

Refer to *Chapter 3 – Methods* for more details.

6.6.2 CYCLE 1 - TIMELINE

Phase 3-Cycle 1 occurred between 20 June, 2018 through 14 September, 2018. *(Figure 31) Note*: As we reflected on Cycle 1, some data continued to be collected into the month of October.

FIGURE 31: CYCLE 1: RESEARCH ACTIVITY TIMELINE

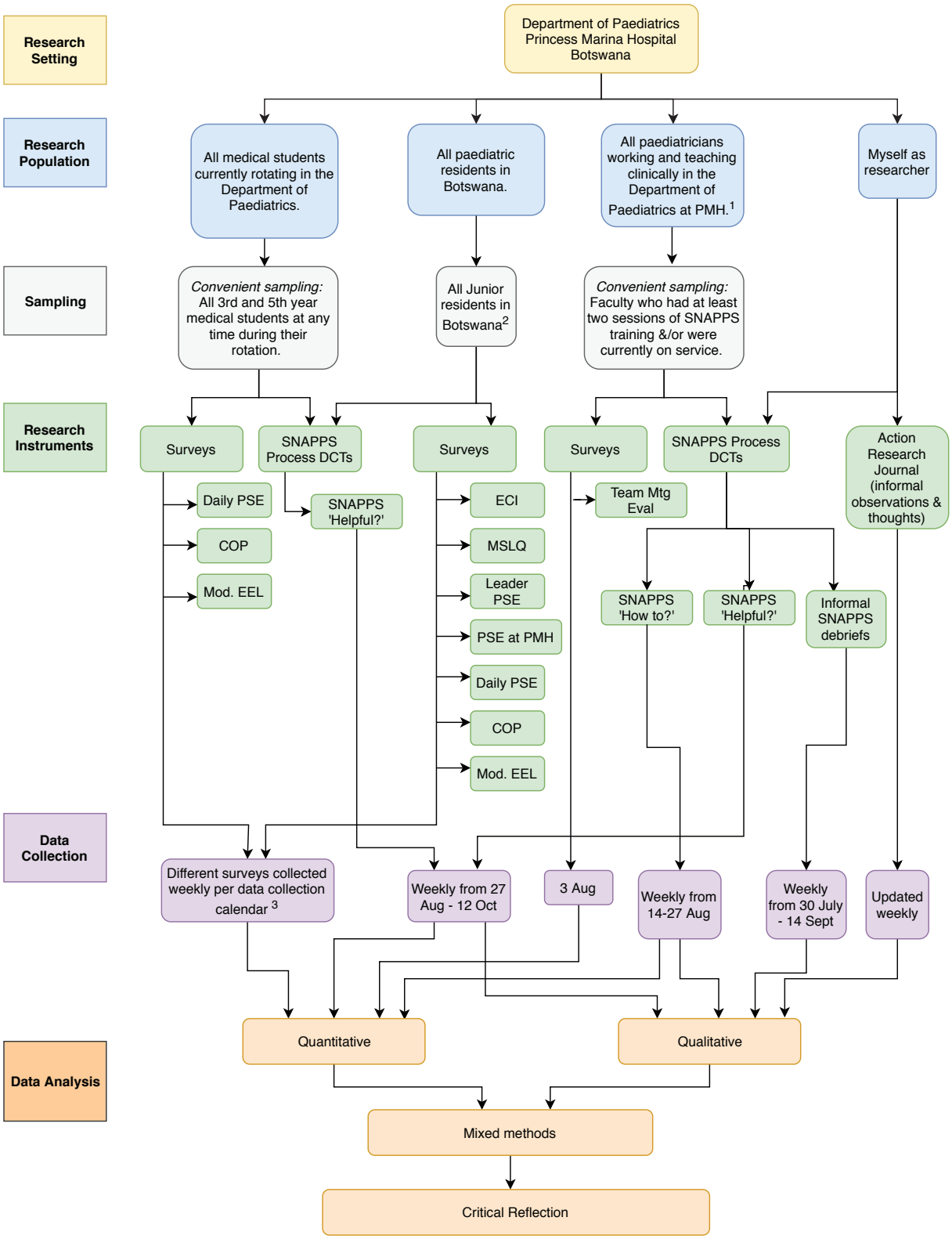


Top half of timeline: Educational Sessions
R-a-T = Residents as Teachers series
T-t-T = Teach the Teacher series
MBBS 3/5 = Medical student Intro to SNAPS
Interns = Intern Intro to SNAPPS

Bottom half of timeline: Data Collection
Blue = junior resident surveys
Light green = faculty surveys & feedback
Yellow = MBBS 3 surveys
Orange = MBBS 5 surveys
Pink = combined MBBS 3/5 surveys
Purple = faculty/training feedback

6.6.3 CYCLE 1 - RESEARCH DESIGN

FIGURE 32: CYCLE 1 RESEARCH DESIGN



Notes 1-2: See Chapter 3 Methods for details of research population and sampling.

6.6.4 Cycle 1 - Study population

During Cycle 1, 20 medical students rotated through the department (10 from each MBBS 3 and MBBS 5 class). This group of medical students coincided with the beginning of the academic year (August 2018), so for these MBBS 3, this was their first clinical rotation ever. In addition, 11 junior residents, 8 senior residents, and 17 paediatricians were available to participate in the study. *Note*: I included myself as part of the faculty study population in Phase 3.

6.6.5 Cycle 1 - Study instruments

6.6.5.1 Surveys

Cycle 1 used all the study instruments developed in Phase 2, with the exception of the WFWR data collection tool and the PAT and SAT surveys, which were omitted from Cycle 1. *(Refer to Cycle 1 – Reflections, below)* Two additional study instruments were developed during Cycle 1 based on the unanticipated needs to: 1) measure the effectiveness of the SNAPPS training, and 2) to measure the basic helpfulness of the SNAPPS model during initial testing of SNAPPS.

6.6.5.1.1 - SNAPPS – How to?

This was a paper-based survey designed to obtain information about the successfulness of the SNAPPS training provided for faculty and trainees within the department. The survey included 7 questions asking if participants knew how to use the six steps of SNAPPS, using a five-point, unidirectional Likert scale from “not at all” to “a great amount”. Under each question was room for open-ended responses about the specific step. The final question elicited for confidence to use SNAPPS during future rounds. These were distributed on a voluntary basis to on-service faculty who had attended at least two educational sessions. This was to be filled out by the faculty with input from the trainee based on the experience of using SNAPPS to present a single patient case. The possible maximum score for the survey is 35, with a minimum score of 7. *(Appendix B.39)*

6.6.5.1.2 - SNAPPS - HELPFUL?

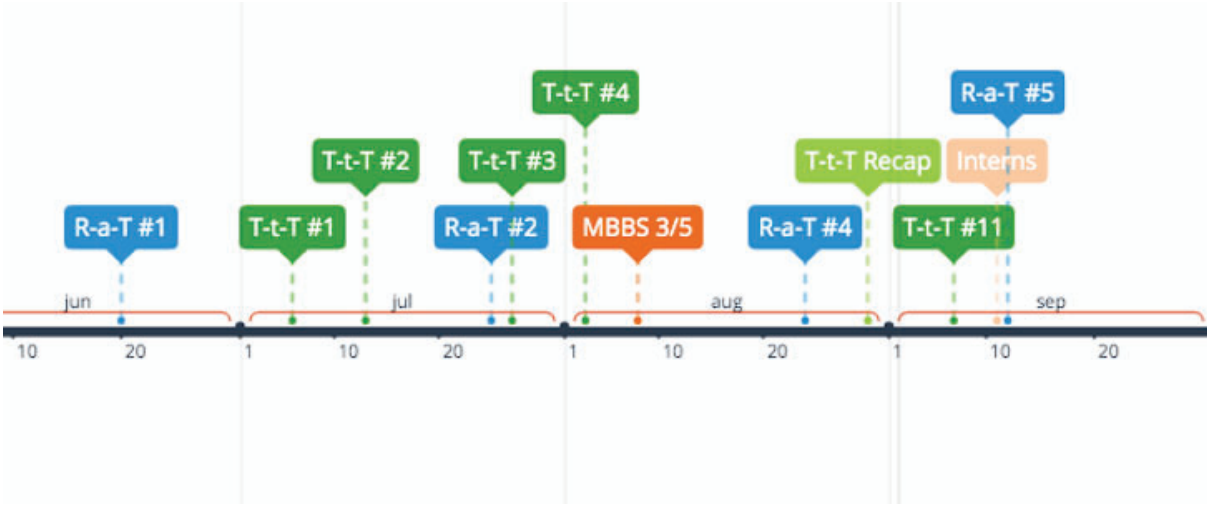
This was a paper-based survey designed to obtain the helpfulness of using SNAPPS on a ward round for learning and teaching purposes. There were two versions, one for faculty and one for trainees. Each included 7 questions, the first six which correlated to the six steps of SNAPPS, and the final question asked about the likelihood of using SNAPPS again for future patient presentations. These questions were ranked on a five-point, unipolar Likert scale from "not at all" to "a great amount", followed by an open-ended space for additional comments. The possible maximum score for the survey is 35, with a minimum score of 7. *(Appendix B.40, B.41)*

6.7 ACT: PHASE 3 – CYCLE 1

6.7.1 EDUCATIONAL SERIES

From 20 June – 14 September 2018, a total of 12 educational sessions were conducted for the Department of Paediatrics. *(Figure 33)* Each of the educational sessions was created using Merril's the First Principles of Instruction and was structured to be interactive with a variety of teaching mediums (e.g. videos, example scenarios, role playing, etc.) as a means to enhance and facilitate adult learning during each session.[177] The content itself was pulled from a combination of Sommer et. al's Observation and Learning Tool for Clinical Supervision, literature for learner-centred teaching, and literature about SNAPPS.[14,43,100] This was all then locally contextualized to make more relevant for the participants.*) Note*: all members of the department were invited to partake in the educational activities; this included medical officers and medical interns who were not part of the formal study population.

FIGURE 33: CYCLE 1 EDUCATIONAL ACTIVITIES



R-a-T = Residents as Teachers series
T-t-T = Teach the Teacher series

MBBS 3/5 = Medical student Intro to SNAPS
Interns = Intern Intro to SNAPPS

The educational sessions had a three-pronged focus: residents, faculty, and SNAPPS introduction. The 'Residents as Teachers' series focused on resident efficiency skills, leadership, wellness, and giving and receiving feedback. The 'Teach-the-Teacher' series covered topics such as effective clinical teaching, learner-centred teaching, and feedback skills. Finally, the 'Introduction to SNAPPS' series introduced faculty and trainees to the concept of a structured bedside teaching model. These sessions were created in Phase 2 through a combination of my own work in collaboration with local and partner resources for content development and presentation delivery. Each session was 30 – 90 minutes in duration, occurred in a shared classroom space, with refreshments offered during each session. *(Appendix G – Educational Series)*

6.7.2 Testing the feasibility of SNAPPS

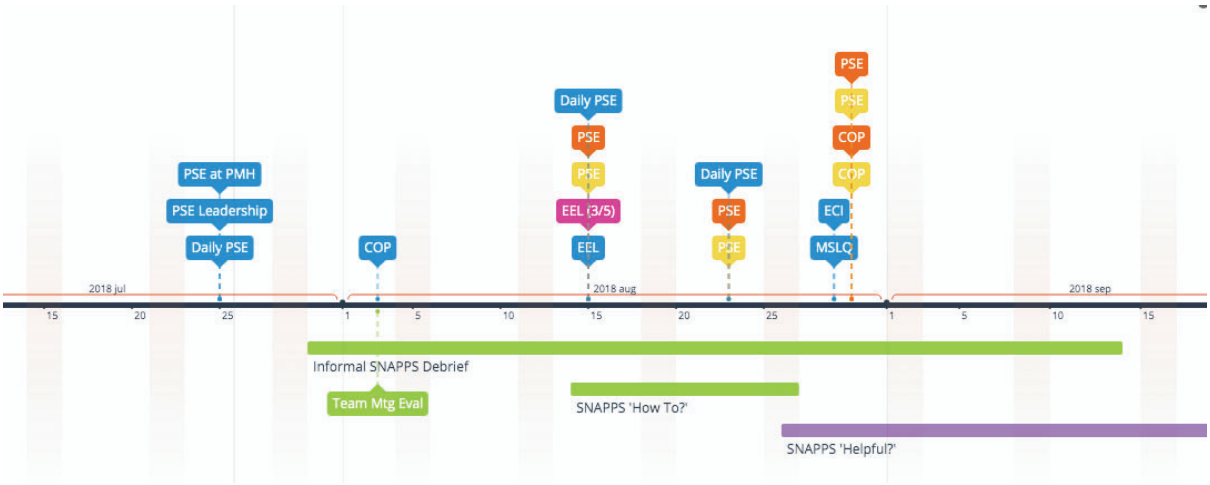
From 30 July – 14 September, a total of nine faculty members (including myself) trialled SNAPPS on our ward rounds. Testing faculty were chosen based on the service schedule, participation in the overall project, and level of interest determined either by attendance to educational sessions or general eagerness to trial SNAPPS. All departmental units were potentially trialled: PMW, NNU and PHO.

Note, during our Phase 2 planning, we neglected to determine exactly how, when and by whom SNAPPS would be tested. Therefore, there was no formal process of 'testing' SNAPPS, nor was there any initial process of formal feedback to the testing; faculty were merely asked to "trial SNAPPS on your ward round."

6.7.3 Cycle 1 - Data collection

Data was continuously collected throughout Cycle 1. *(Figure 34)*

FIGURE 34: CYCLE 1 DATA COLLECTION



Yellow = MBBS 3 surveys
Orange = MBBS 5 surveys
Blue = junior residents surveys

Green = senior residents/faculty surveys
Pink = MBBS 3/5 combined surveys
Purple = students, residents and faculty surveys

6.7.3.1 Surveys

Refer to *Chapter 3 – Methods* for details.

6.7.3.2 Informal faculty SNAPPS debrief

The informal faculty SNAPPS debrief conversation occurred at the same time I collected the *SNAPPS How To?* and *SNAPPS Helpful?* surveys. There was no formal SNAPPS debrief guide during Cycle 1.

6.7.4 Cycle 1 - Data analysis

6.7.4.1 Attendance of educational series data analysis

Attendance was taken at each educational session. For the trainee attendance, this was later stratified by resident and medical student average rate of attendance. For the faculty and senior resident educational sessions, this group was further stratified by group composition (UB faculty, MOHW staff, faculty from affiliate universities, and senior residents) and analysed for overall average attendance. Within each group category, the average percentage of those who participated was determined. We then looked at the overall invited department member numbers and looked at the number of sessions each individual attended.

6.7.4.2 Qualitative data analysis

Refer to *Chapter 3 – Methods* for details.

6.7.4.2.1 - Ongoing bias as the researcher

My own bias as the researcher conducting the thematic analysis was influenced by my desire for SNAPPS to succeed. To counterbalance this limitation, I also used quantitative methods to evaluate the testing of SNAPPS on rounds, and made sure to include both positive and negative reflections in the original data set. During my analysis, I was already well versed in the SNAPPS literature which may have influenced my analysis, but I still held a great deal of curiosity for how SNAPPS would work in my

department, which allowed me to analyse beyond the known literature. Also, most of the SNAPPS literature I was familiar with didn't describe implementation challenges, which was my main focus.

6.7.4.3 Quantitative data analysis

Refer to *Chapter 3 – Methods* for details.

6.7.4.4 Mixed Methods data analysis

Refer to *Chapter 3 – Methods* for details.

The intent of the mixed methods approach in Cycle 1 was to utilize the information from all data sources to create a complete picture of the impact of Cycle 1 activities and how best to move forward in Cycle 2. With particular emphasis on what changes needed to be made to the educational activities, and what/if any changes needed to be made to the data collection tools or methods. Several data sources were designed to generate information about the process of the Cycle 1 activities, while others aimed to measure outcome of these activities.

6.7.4.5 Critical Reflection data analysis

Refer to *Chapter 3 – Methods* for details.

6.8 OBSERVE: PHASE 3 – CYCLE 1

6.8.1 ATTENDANCE OF EDUCATIONAL SERIES RESULTS

The average rate of attendance from faculty and senior residents for the Teach-the-Teacher series was 28% (median 35%). *(Figure 35)* Of those who attended each session, the average group composition was 36% UB faculty, 25% MOHW staff, 30% faculty from affiliate universities and 9% senior residents. *(Figure 36)* Within each group category, the average percentage of those who participated was 38% UB faculty, 35% MOHW staff, 37% affiliate university faculty, and 8% senior residents. *(Figure 37)* Of those invited to participate in the Teach-the-Teacher workshop series, 26% did not attend any sessions, 17% attended one session, 26% attended two sessions, 17% attended three sessions, 9% attended four sessions, and only 4% (i.e. one faculty member) attended all five sessions. *(Figure 38)* Based on the limited number of attendees to attend the majority of the sessions, a 'Re-cap' session was offered which combined the first four sessions into one single session and was offered in the afternoon with lunch provided. (Box 3: PAOR – Invitation to Re-cap session)

The average rate of attendance from junior residents for the Residents-as-Teachers series was 70%. *(Figure 39)* All rotating medical students (100% attendance) received training in learner-centred teaching and SNAPPS.

FIGURE 35: EDUCATIONAL SERIES ATTENDANCE OF PAEDIATRICIANS AND SENIOR RESIDENTS

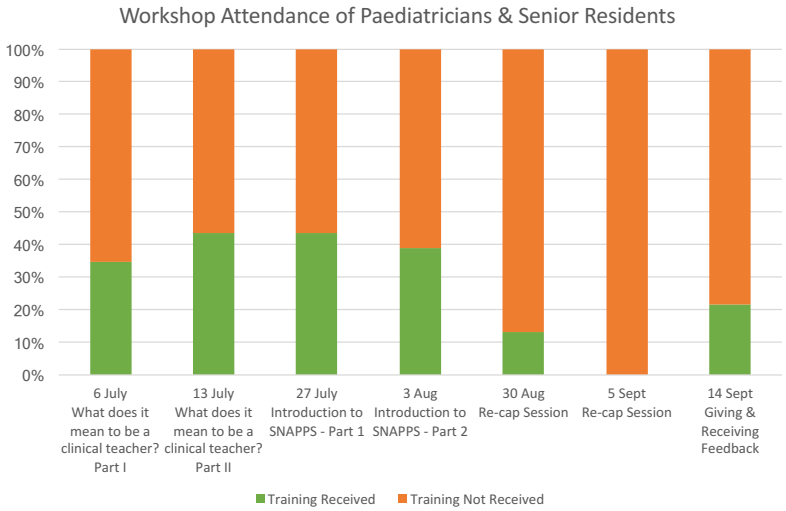


FIGURE 36: EDUCATIONAL SERIES ATTENDANCE CATEGORIZED BY GROUP

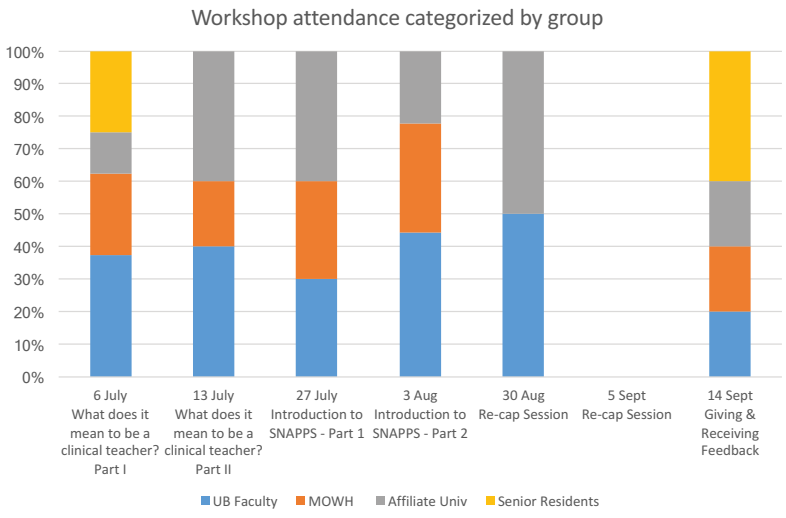


FIGURE 37: EDUCATIONAL SERIES PERCENTAGE OF ATTENDEES PER GROUP

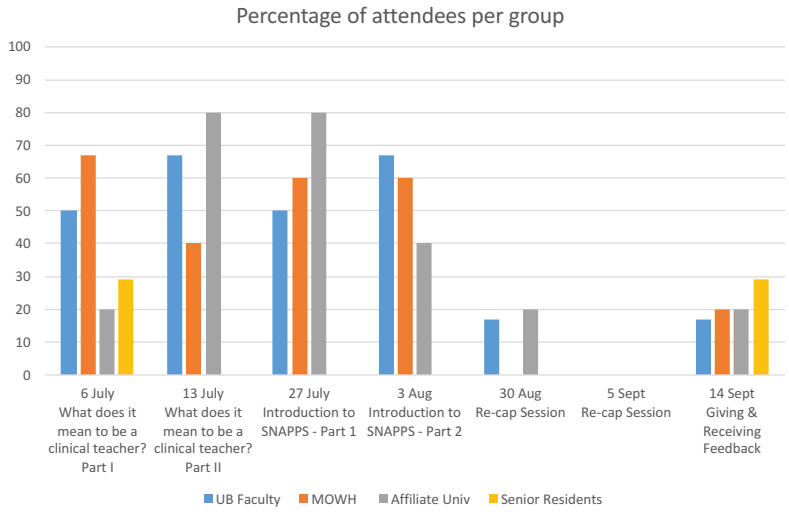


FIGURE 38: EDUCATIONAL SERIES NUMBER OF SESSIONS ATTENDED PER INDIVIDUAL

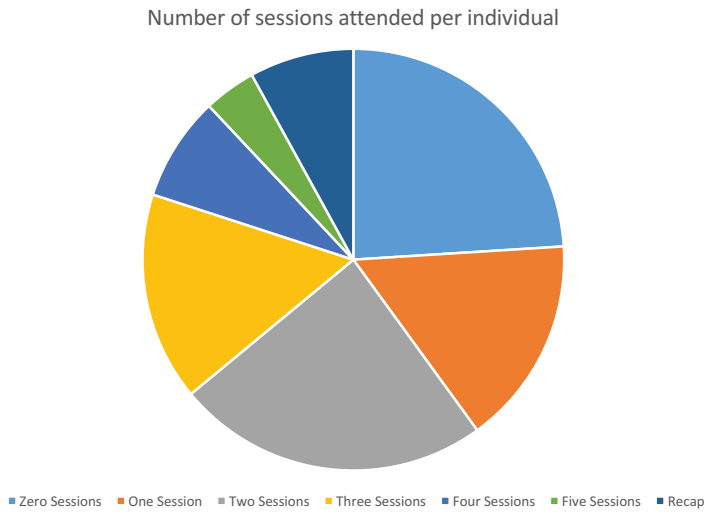


FIGURE 39: EDUCATIONAL SERIES ATTENDANCE BY JUNIOR RESIDENTS

BOX 3: PAOR – INVITATION TO RE-CAP SESSIONS

Reflect: Based on the number of faculty attendance, I considered this rate of attendance to be low. We chose to hold the Teach-the-Teacher sessions on Friday mornings so that it could be quickly integrated as part of the paediatricians' day without causing interruption to their workflow. While each session had several people attend, at an individual level, attendance was sporadic. This made it difficult to build from one session to the next, which is how the course was designed.

Plan: Therefore, I decided to create a new, stand-alone 'Re-cap' session which combined the first four sessions. As opposed to a 30-minute morning series, the re-cap session would be a single, two-hour session offered in the afternoon with lunch provided. I ensured that the timing of the re-cap session would not conflict with any previously scheduled departmental activity.

Act: I sent an updated email to the faculty and senior residents. Since the lowest rate of attendance was the senior residents, I met in person with several to encourage their attendance.

Observe: A total of three re-cap sessions were offered; attendance continued to be sparce.
Aug 30: x3 faculty, x0 senior residents
Sept 5: x0 faculty, x0 senior residents
Oct 17: x2 faculty; x3 senior residents

Reflect: I continued to feel quite disappointed by the lack of attendance for the re-cap sessions.

6.8.2 CYCLE 1 - QUALITATIVE RESULTS

All informal observations and comments about the educational series and the trial of SNAPPS were captured weekly in my action research journal. From 30 July to 14 September, a total of nine faculty members (including myself) trialled SNAPPS on ward rounds and contributed to the informal SNAPPS debrief. From 14 August through 5 October, I gathered input from 13 individuals, including paediatricians, residents and students in all wards (PMW, NNU, PHO) via open-ended responses to their testing of SNAPPS; these reflections capture a total of 37 individual patient encounters.

A total of 3 themes, 12 sub-themes, and 6 sub-sub themes were identified during the thematic analysis. *(Figure 40)*

FIGURE 40: CYCLE 1- RESULTS OF THEMATIC ANALYSIS

6.8.2.1 - 1) SNAPPS STEP-BY-STEP

6.8.2.1.1 - SUMMARIZE

Of all the steps in SNAPPS, 'Summarize' was the most debated during the educational series. Whereas some faculty did acknowledge that summarizing briefly the history and physical exam could save time during the ward rounds, several faculty had concerns about the trainees summarizing on rounds in lieu of reading the entire admission or daily SOAP note from the medical record, which was the current practice. The first concern raised was that third year medical students, new to their clinical rotations, would find summarizing the case difficult. *"Traditionally in the department, we allow the 3rd year students to present the entire case." [Faculty]*

The second concern raised was in regards to the student case presentation. During their rotation, students are required to present several case presentations which are evaluated by and marked in their logbook by faculty. While there is no specific guideline in the logbook which says that a student must read the entire admission note aloud to fulfil the requirement, the tradition in the department is that the student reads his/her entire admission note during the ward round to fulfil their rotation requirements. The concern was that if students Summarized on rounds, when would they present their case presentations? Likewise, trainees expressed hesitation to the 'Summarize' step, concerned that if they didn't present their case presentation on rounds, that faculty wouldn't avail themselves at a later time for them to present for their logbook. Other trainees felt, regardless of the case presentation, that some faculty wanted them to read the whole medical record aloud on rounds so it would be difficult to summarize.

The concerns raised during the educational sessions for adapting to a new model of summarizing briefly the history and physical exam were also seen during the initial testing of SNAPPS on the ward rounds, with faculty citing the difficultly trainees had transitioning from reading the medical record aloud to summarizing. *"Still a challenge with Summarizing the case without having to read the whole file." [Faculty]*

6.8.2.1.2 - NARROW

During the educational series, the introduction of the 'Narrow' step appeared to be quite straight forward, but during the practice portion of the session, trainees struggled to commit to a narrowed differential and often tried to skip ahead to the 'Plan' step. This difficulty translated to the actual testing of SNAPPS on the ward round. Both faculty and trainees alike found 'Narrow' to be a difficult step for patients with an already known primary diagnosis.

"Known patient, so skipped Narrow & Analysis." [Faculty]

"It's effective for new patients only who we do not know the diagnosis, but is a bit challenging for patients who come with known diagnosis." [Trainee]

6.8.2.1.3 - PROBE

During the educational series, while faculty did not have any discussion about the 'Probe' step, trainees expressed several apprehensions. Both medical students and junior residents alike asked a lot of questions during their SNAPPS training on what could their 'Probe' be about. *"What can we 'Probe' for?" [Trainee]* They considered Probes such as *'Could it be about making a differential? Could it be about the plan? Could it be about a physical exam finding? Could it be about a social issue?*'

Trainees also expressed nervousness that if they probed the consultant, that he/she would respond by saying *'Go read'* and not really answer. Indeed, 'Probe' appeared to be the hardest step for trainees to practice during the educational session.

The trainees' concerns about probing the consultant were noted by faculty during the initial testing of SNAPPS as well.

"Students said they are uncomfortable with this step [Probe] because it usually leads to the consultant then asking a lot of intimidating questions." [Faculty]

Despite the apparent reservations of the trainees to probe the consultant, when practiced, faculty found it very beneficial to the ward rounds.

"There was good discussion during Probe." [Faculty]

6.8.2.1.4 - PLAN

The 'Plan' step of SNAPPS was noted to be quite intuitive and straight forward during the educational sessions and from initial feedback of testing SNAPPS on rounds. One student was noted to having asked if the 'Probe' can come after the 'Plan' so students can ask *'why are we doing this or not doing this?'* Otherwise, the Plan seemed to be generally well received without issue.

6.8.2.1.5 - SELECT

While there was no discussion about the 'Select' step during the educational series, it was noted by faculty during the testing of SNAPPS on rounds that trainees found this step difficult.

"Student didn't know how to Select so I needed to guide them." [Faculty]

Through my own testing of SNAPPS on rounds, I found 'Select' to be very helpful for coming up with a meaningful differential for patients when the initial 'Narrow' was limited.

6.8.2.1.6 - PATIENT ASSESSMENT GOES WHERE?

One aspect of SNAPPS that continued to confuse faculty and trainees was where to place the patient's assessment. Should the patient assessment go after Summarize or after Probe?

"Our assessment seems similar to a summary because we haven't really been summarizing before, but now we are introducing summarizing with SNAPPS, so we now aren't sure where to make the assessment." [Trainee]

BOX 4: PAOR - CLARIFICATION OF 'ASSESSMENT' WITHIN SNAPPS

Observe: The absence of 'Assessment' in the SNAPPS mnemonic confused trainees and faculty for when/where it should occur during the presentation.

Reflect: Since 'Assessment' is such an important part of the traditional presentation of a patient on ward rounds, it was important to designate it a specific spot within SNAPPS.

Plan: Therefore, I wanted to make it more obvious during the teaching session where the patient Assessment should go, right at the end of Summarize.

Act: This addition was then included on the SNAPPS pocket-cards, which helped to settle the confusion.

6.8.2.2 - 2) SNAPPS INITIAL PILOT

6.8.2.2.1 - EARLY ADOPTERS

The attendance of the faculty educational series was somewhat inconsistent, which made it difficult for me to invite faculty to trial SNAPPS on their ward rounds. I was limited to faculty who had received at least some SNAPPS training and were currently on service. To look for faculty willing to test SNAPPS, I first started with faculty who were involved with the project or faculty who shared my PHO service. Later, I asked another faculty member who was neither part of the project or my PHO service, but who seemed eager to try.

Interesting, what I discovered was that there were two other faculty members who had started to use SNAPPS on their ward rounds based on the educational series alone, not per my request. When I had discovered they were using it, I then formally engaged them to provide feedback on their testing. Notably, these two individuals had the best attendance for the educational series.

6.8.2.2.2 - TESTING OF SNAPPS

When I engaged faculty in the department to practice SNAPPS on their rounds, there was no set protocol for how to actually implement it but was left to the discretion of each paediatrician. The informal feedback I received from faculty was that they were testing it in a step-wise manner: one patient per day, one student per day, or once a day three times a week, etc. I also initially tested SNAPPS on my rounds with one patient per day, followed by one trainee per day.

"I just wanted to get a sense of how it felt to use SNAPPS on rounds. I would usually just do one patient per day." [Faculty; SM]

This slow uptake of SNAPPS allowed for the newness not to be overwhelming.

"Initially felt a little forced, 'Ok, let's practice SNAPPS,' but by the end of the week, it had integrated well into our rounds." [Faculty; SM]

Despite the built-in similarities to a traditional ward round, using SNAPPS was obviously something that required a new set of skills from both faculty and trainees.

"I found it [using SNAPPS] more difficult than I'd anticipated because it required a new 'muscle memory' if you will – I had to really force myself to use SNAPPS at first." [Faculty; SM]

“Good to have the SNAPPS pneumonic at hand to know what to do.” [Faculty]

6.8.2.2.3 - Initial impressions of using SNAPPS on the ward round

The overall impression from trainees was that they were enthusiastic to use SNAPPS. Trainees appeared to pick it up quickly and even began to drive the use of SNAPPS on rounds.

“Would be ideal if SNAPPS [was] used across all departments, not just Paeds.” [Trainee]

“Doc, let’s do SNAPPS for this patient.” [Trainee]

Specifically, trainees felt that it improved their learning on ward rounds.

“It is very good and stimulates critical thinking. Also allows us to think broadly about differentials.” [Trainee]

“Great, it helps to think, and even quantify one's understanding.” [Trainee]

Whereas faculty feedback was a bit more guarded, but still optimistic about the use of SNAPPS on ward rounds with further practice.

“It is a good start, will soon be better.” [Faculty]

“Still need more time to master the flow. But ready for improvement.” [Faculty]

6.8.2.2.4 - CHALLENGES TO USING SNAPPS ON THE WARD ROUND

6.8.2.2.4.1 - TRAINING FOR ALL TRAINEES

The first obvious issue when trialling SNAPPS on the ward rounds was that trainees needed to be both physically present on the ward round *and* trained in SNAPPS.

"I couldn't use [SNAPPS] today because the students were not available during the pre-round." [Faculty]

Another faculty gave feedback that he had tried to use SNAPPS on his ward rounds, but he was paired only with an intern, and the interns had not been trained in SNAPPS.

BOX 5: PAOR - INCLUDING INTERNS IN THE EDUCATIONAL SERIES

Reflect: The inability to use SNAPPS secondary to lack of trainee education made me realize that I needed to train *all* trainees rotating through the department, including interns. *(Note: department assigned medical officers were trained in SNAPPS as part of the overall educational series simultaneously with the junior residents).*

Plan: I therefore added an Intern training session to the educational series.

Act: All currently rotating interns were trained in SNAPPS in early September 2018.

Observe: Interns welcomed and received the training well.

6.8.2.2.4.2 - THIRD YEAR MEDICAL STUDENTS

Several faculty reported an inability to use SNAPPS with the third year medical students. Issues cited included that MBBS 3 lacked basic history taking and bedside physical exam skills, were unable to summarize, and that they could not get past 'Narrow' when they presented.

"*The 3rd year students are really struggling with basic presentation skills, so they are not yet ready or prepared to try out SNAPPS." [Faculty]*

The time needed to prepare the MBBS 3 for the clinical ward rounds made it difficult to practice SNAPPS with the other trainees on the ward round. Of note, the testing of SNAPPS coincided with the new academic year, so for the MBBS 3 rotating during this time, it was their first clinical rotation ever.

"The 3rd year student just stared at me when I asked for a 'Narrow'." [Faculty]

BOX 6: PAOR - ADAPTING SNAPPS FOR MBBS 3

Reflect: Since the original SNAPPS model was generated for third year North American medical students, we did not anticipate an issue for MBBS 3 students to use SNAPPS. This unexpected issue made me reflect on the differences of training experiences for North American vs Botswana third year medical students. The difficulty faculty had with MBBS 3 using SNAPPS made me consider in which ways we could modify SNAPPS for third year trainees in our Botswana setting.

Plan/Act: The SNAPPS literature didn't offer any modification for different levels of trainees, so I therefore came up with my own recommendation for faculty rounding with MBBS 3 to focus only on the S-N and later S-N-A steps of SNAPPS as a way to better prepare them for the presentation.

Observe: Unfortunately, I did not get a chance to directly observe this modification for MBBS 3, but did use it myself with MBBS 5 who also struggled getting past Summarize and found it very helpful to build on their SNAPPS presentations incrementally.

6.8.2.2.4.3 - RESIDENTS AS TEAM LEADERS

The MBBS 3s' inability to use SNAPPS on ward rounds brought up the issue of junior residents as team leaders – i.e. where were they in assisting the 3rd years with their presentation skills and helping them to come up with a differential for their patients? Faculty complained that the junior residents were not supporting the students during the pre-round.

6.8.2.2.5 - INFLUENCES ON THE TEACHER AND TEACHING

After a couple of weeks of testing SNAPPS on my ward rounds, my own reflections of teaching using SNAPPS began to show unexpected benefits to my teaching practice.

6.8.2.2.5.1 - BUILT-IN TEACHING

The first unexpected benefit was how easy teaching became when using SNAPPS. Previously, when preparing for rounds, I would try to prepare my teaching topics for the day, but with SNAPPS, the learner-centred approach forced the learner into the active role and my role changed to that of a facilitator, which then changed how much I needed to prepare for my teaching rounds.

"I was surprised how easily it [SNAPPS] set us up for teaching without having to prepare for teaching rounds – it was even exciting!" [Faculty; SM]

In addition, by having the trainee present using SNAPPS, it created built-in teaching moments. This was particularly noted in situations where teaching generally would not have occurred, for example weekend rounds, or rounds where the students were away.

"I'm pretty certain, because it was just us [MO and me] and it was such a quiet week, if we hadn't done SNAPPS and forced ourselves to do the Probe and Select, we wouldn't have done much teaching that week at all." [Faculty; SM]

At the same time, despite the new learner-focused rounds, SNAPPS didn't interfere with traditional rotation learning goals and objectives.

"I usually start with a PHO related teaching topic each day before we start to see the patients – SNAPPS didn't interfere with that at all, which was good because it still gave me a chance to keep my "teacher-centred" learning agenda." [Faculty; SM]

6.8.2.2.5.2 - GUIDED TEACHING

A second unexpected benefit was how SNAPPS naturally guided the teaching encounter. During the educational sessions and while practicing SNAPPS on the ward rounds, one of the main things I began to discover was the unique educational insight the 'Narrow, Analyse, and Probe' (N-A-P) steps added to the clinical teaching encounter. I began to describe it to trainees during their SNAPPS training that the N-A-P creates a small educational pause from the traditional rounds, where the goal is to create a safe space for the learner to think aloud, this in turn allows the teacher to hear what the learner is thinking and provide guidance. I began to refer to it as the "learning pause" on ward rounds.

This became even more apparent when providing the SNAPPS training to trainees and how difficult it was for them to come up with a narrowed differential from the example case I used during the teaching session. Allowing the trainee to 'think aloud' using N-A-P allowed me to gain better insight of where the learner was at in their knowledge fund and their understanding of the patient, which guided my teaching to address those gaps and support ongoing learning. Other faculty noted similar experiences.

"Good analysis, helped guide teaching." [Faculty]

6.8.2.2.5.3 - MY OWN LEARNING

The third unexpected benefit was the influence of SNAPPS on my own learning during the ward rounds.

"What I was surprised about with SNAPPS is how much I learned using it! The student's questions were generally not related to a topic I had envisioned teaching about – it's as if my old rounds were set up so I was controlling the type of questions I'd get asked, so I always knew the answer to them. But with SNAPPS – it was the trainee who brought the questions, so I often wasn't prepared with an answer which was a refreshing experience for me to learn, too!" [Faculty; SM]

6.8.2.2.6 - Influences on patients

During the educational series, while discussing the transition to learner-centred teaching, some faculty were concerned about the influence learner-centred rounds would have on patient care.

"If we're so focused on the learner, what about the patient? Are we compromising patient care by focusing on teaching?" [Faculty]

But in fact, when SNAPPS was tested on the ward rounds, trainees felt this improved patient care.

"This is the best way in that it benefits both the student and the patient." [Trainee]

And I, myself, had an experience where the trainee's 'Probe' caused me to rethink the patient case and influenced my management. *(Appendix: Examples of how use of SNAPPS influenced patient care)*

6.8.2.3 - 3) Data collection issues

Early on in Phase 3, it became apparent that there were data collection issues. The first issue noted for the initial testing of SNAPPS on ward rounds was *who* was going to be collecting the data? Due to the inconsistent attendance during the faculty education series, I was limited to faculty who had at least some SNAPPS training and were currently on service.

BOX 7: PAOR - GETTING FEEDBACK ON THE USE OF SNAPPS

Reflect: During our Phase 2 planning, we neglected to determine exactly how, when and by whom SNAPPS would be tested. There was no formal process of 'testing' SNAPPS, nor was there any initial process of formal feedback to the testing, faculty were merely asked to "trial SNAPPS on your ward round."

Plan: Therefore, we set out to create surveys designed to obtain information about the successfulness of the SNAPPS training provided for both faculty and trainees within the department; and to evaluate the helpfulness of using SNAPPS on a ward round for learning and teaching purposes.

Act: I quickly generated 'SNAPPS How To?' and later 'SNAPPS Helpful?' surveys to use on my own rounds and to share with other faculty and trainees willing to practice SNAPPS on their ward rounds.

Observe: This provided us with great 'real time' feedback of the SNAPPS educational sessions and the introduction to SNAPPS on the ward rounds.

Unfortunately, despite the creation of these surveys, they were very difficult to get back from faculty. My ARJ was littered with phrases indicating the difficulty with getting data collection surveys back from trainees and faculty.

"Difficulty getting the forms back from any of the faculty. Even for myself, so on my rounds, we started to fill out the SNAPPS forms right after the presentation." [Faculty; SM]

Since no official piloting had been done on the surveys, in some instances where the forms were collected, there was confusion for how to fill out. In other instances, the faculty member reported that the surveys were too narrow and not practical to provide feedback for the testing process.

"She reported that she couldn't even use the survey to report on her SNAPPS usage because she had such a hard time with her MBBS 3 students to use it." [Faculty; SM]

BOX 8: PAOR - GETTING INFORMAL VERBAL FEEDBACK ON THE USE OF SNAPPS

Reflect: Based on the difficulty collecting the *SNAPPS How To?* and *Helpful?* surveys and the feedback from the faculty, I wanted to find other practical means to continue to collect meaningful feedback on a regular basis.

Plan: This prompted me to incorporate informal verbal feedback from faculty.

Act: Each week, I made an effort to just 'touch base' with the faculty who were using SNAPPS on their ward rounds for verbal feedback.

Observe: These informal SNAPPS debriefs later became the impetus behind creating a more formal SNAPPS Debrief used in Cycle 2.

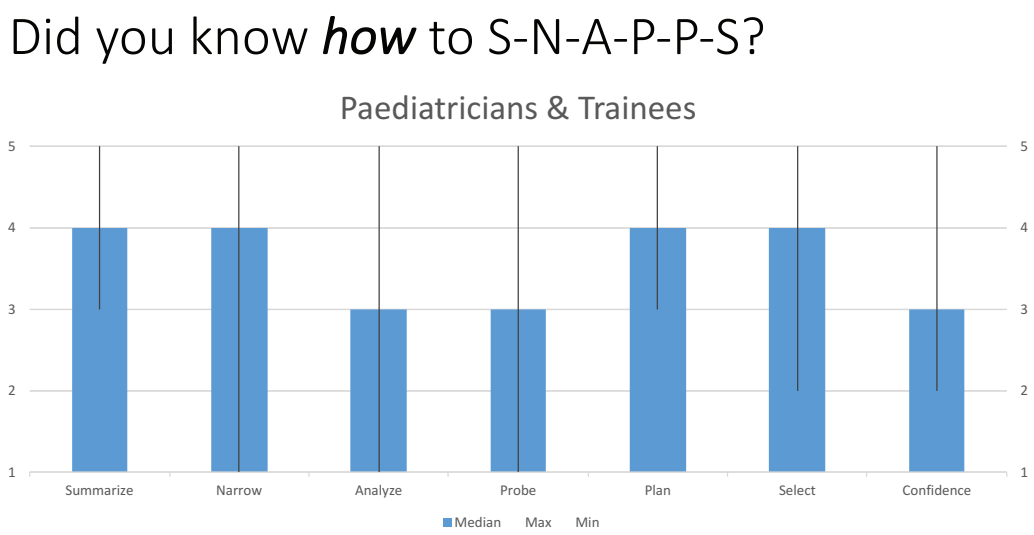
6.8.3 CYCLE 1 – QUANTITATIVE (SNAPPS TESTING SURVEYS) RESULTS

6.8.3.1 - SNAPPS - 'HOW TO?'

For two weeks, from 14 – 27 August, I collected surveys assessing for faculty and trainee knowledge of how to use SNAPPS as a means to assess the successfulness of our SNAPPS training. Nine specific patient encounters from 9 individuals, with input from faculty, junior residents and medical students from all wards (PMW, NNU, PHO) were captured.

Overall, participants responded that they 'Somewhat' knew how to 'Analyse' and 'Probe', but for all other steps, they felt they knew 'Quite a bit' how to use the SNAPPS steps; with an overall 'Somewhat' confidence to use SNAPPS for other patients in the future. *(Figure 41)*

FIGURE 41: RESULTS: SNAPPS 'HOW TO?'



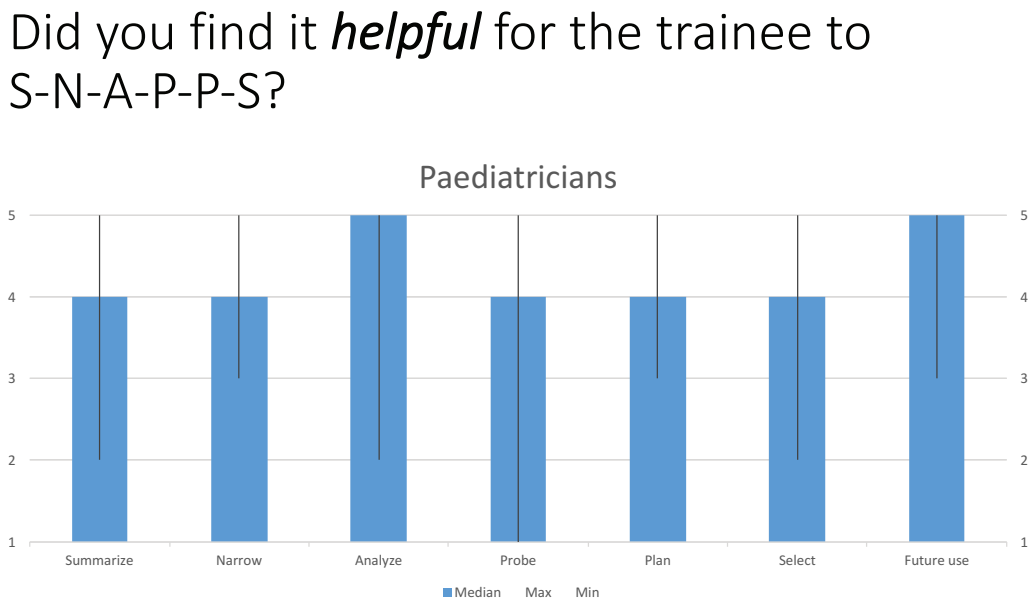
6.8.3.2 - SNAPPS - 'HELPFUL?'

For seven weeks, from 27 August – 12 October, we collected surveys examining faculty and trainees' perspective on the helpfulness of using SNAPPS for learning and teaching on ward rounds. Note, while Phase 3-Cycle 1 'ended' on the 14 Sept, data continued to be captured during the reflection part of Cycle 1 and the initial planning parts of Cycle 2 before new changes had been implemented.

6.8.3.2.1 - FACULTY'S PERSPECTIVE

Thirty-two specific patient encounters were captured from 5 paediatricians from both PMW and PHO. Overall, they reported that 'Analyse' was helpful to 'A great amount', while all other steps of SNAPPS were found to be 'Quite a bit' helpful. Overall, faculty reported the likelihood of their future use of SNAPPS to be 'A great amount'. *(Figure 42)*

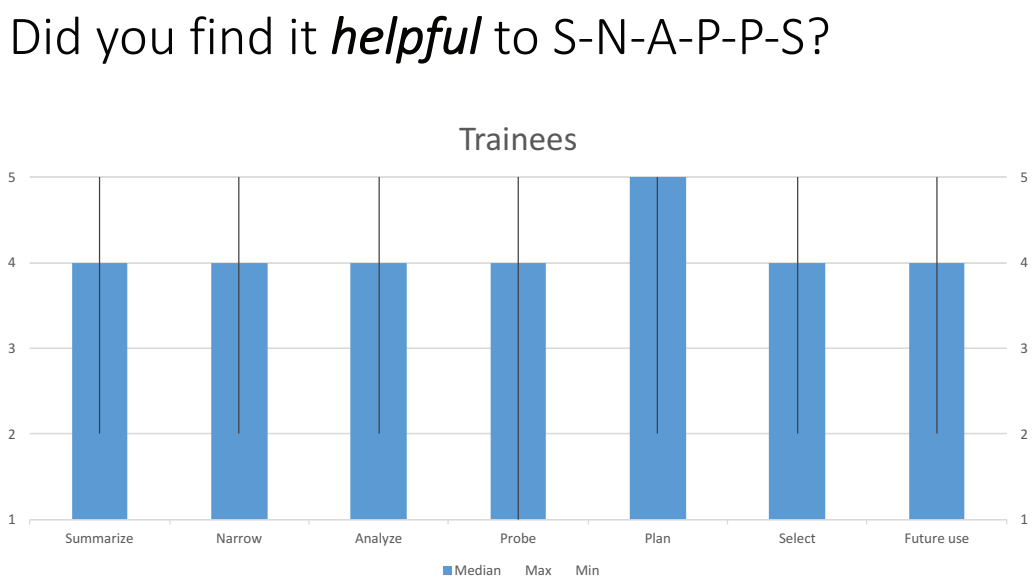
FIGURE 42: RESULTS TO SNAPPS 'HELPFUL?' - FACULTY



6.8.3.2.2 - TRAINEES' PERSPECTIVE

From the trainees' perspective, 23 specific patient encounters were captured from both PMW and PHO. Overall, they reported that 'Plan' was helpful to 'A great amount', while all other steps of SNAPPS were found to be 'Quite a bit' helpful. Overall, trainees reported the likelihood of their future use of SNAPPS to be 'Quite a bit'. *(Figure 43)*

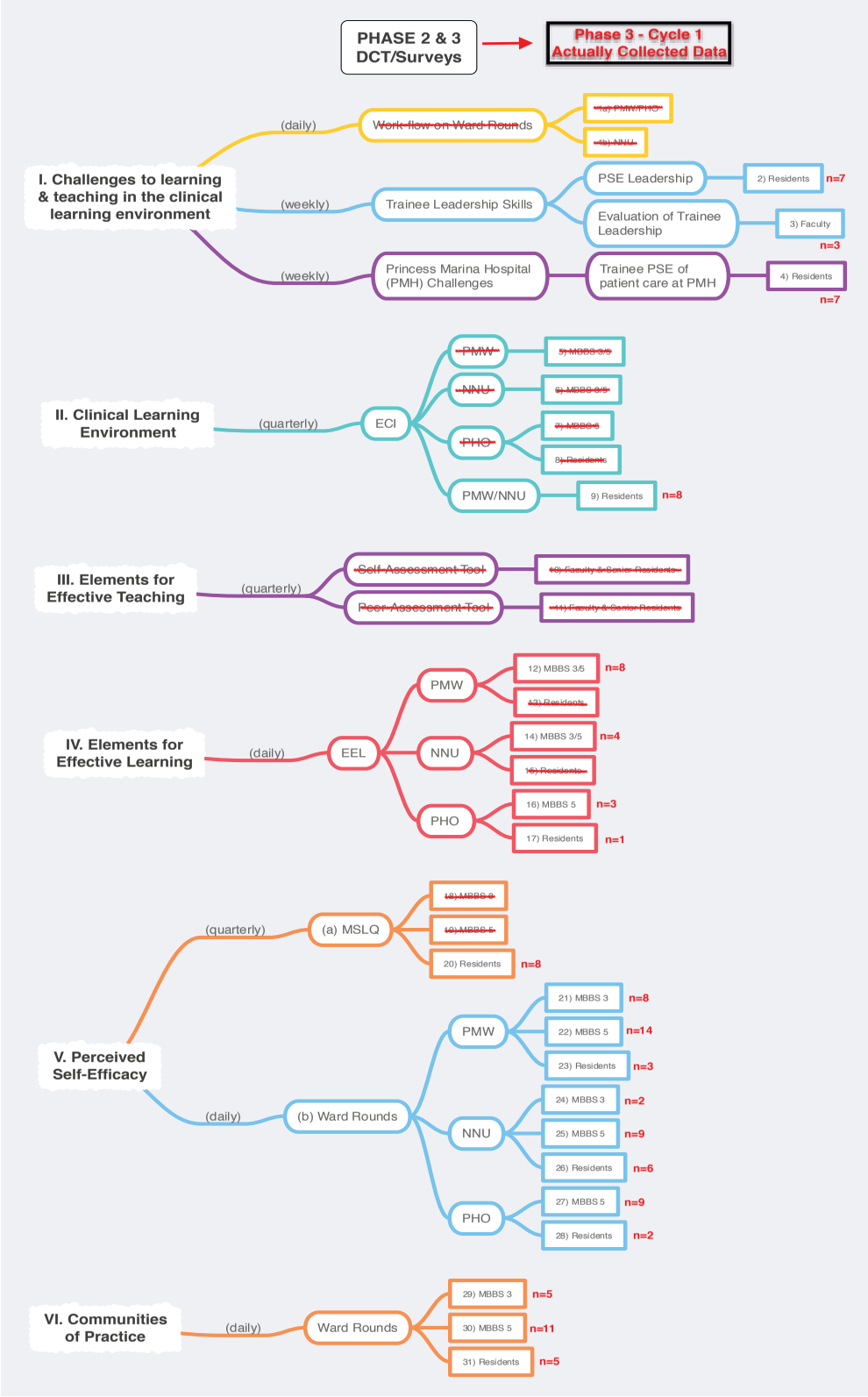
FIGURE 43: RESULTS TO SNAPPS 'HELPFUL?' - TRAINEE



6.8.4 CYCLE 1 – QUANTITATIVE (SURVEY) RESULTS

While we generated a total of 31 surveys during Phase 2, covering six main outcomes measurements, only 20 surveys were completed during Phase 3. *(Figure 44)*

FIGURE 44: CYCLE 1: ACTUALLY COLLECTED SURVEY DATA



6.8.4.1 - I. Challenges to learning & teaching in the clinical learning environment, Phase 3-Cycle 1

Seven junior residents indicated an average of 63% (median of 38; range 27-43) for overall PSE of their leadership skills to manage a team for the ward round. By PSE sub-category, they rated their mastery experiences to be the highest (77%), and scored lowest in their psychological experiences (56%). *(Appendix E.12)* In addition, residents expressed that the system at PMH did exert negative influence over their ability to complete ward work as discussed on rounds. *(Appendix E.14)* Similarly, faculty found junior residents to be efficiently capable to manage ward rounds with an average of 63% (median 18; range 16-19). *(Appendix E.13)*

6.8.4.2 - II. Clinical learning environment, Phase 3-Cycle 1

Eight junior residents rated the PMW and NNU environmental climate with an overall average of 58% (median 39.5; range 34-44). *(Appendix E.16)*

6.8.4.3 - III. Elements for effective teaching, Phase 3-Cycle 1

Data not obtained; refer to Cycle 1 – Reflections below.

6.8.4.4 - IV. Elements for effective learning, Phase 3-Cycle 1

One resident and fifteen medical student surveys indicated an average of 69% (median of 66; range 36-89) for overall perception of elements of effective learning. By sub-categories, trainees rated them similarly (70-75%), except for Elements for effective teaching which was rated the lowest at 63%. By ward, PMW (67%) and NNU (63%) scored similarly in all sub-categories, while PHO (81%) scored higher in all sub-categories, with an overall highest total score. *(Appendix E.20)*

6.8.4.5 - V. Perceived Self-efficacy, Phase 3-Cycle 1

Per the MSLQ, eight junior residents indicated an average of 84% (median of 211; range 150-235) for overall perception of their academic self-efficacy. *(Appendix E.22)*

In addition, a total of 53 Daily PSE surveys were completed during Phase 3-Cycle 1. The total score for all MBBS 3 surveys indicated an average 60% (median of 21.5; range 14-25) for their overall perception of perceived self-efficacy on ward rounds; whereas MBBS 5 reported a total average score of 70% (median 21.5; range 14-28) and residents reported a total average score of 80% (median 24; range 20-28).

By sub-category, residents rated their Mastery experience the highest (Residents 87%), followed by Psychological experience (Residents 77%), and finally Vicarious experience was rated the lowest (Residents 72%). For students, by sub-category, they rated their Psychological experiences highest (MBBS 3 65%, MBBS 5 77%), followed by Mastery experiences (MBBS 3 61%, MBBS 5 71%), and finally Vicarious experience was rated the lowest (MBBS 3 48%, MBBS 5 50%). *(Appendix E.25)*

Per ward, MBBS 5 scored highest in PHO (73%), followed by PMW (70%), and then NNU (66%); there were too few surveys completed by MBBS 3 and residents to compare wards for those trainee levels. *(Appendix E.27)*

6.8.4.6 - VI. Communities of Practice, Phase 3-Cycle 1

Twenty-one trainees indicated an average score of 64% (median of 66; range 20-86) for overall sense of participation in and belonging to the clinical community of practice on ward rounds. There was no obvious difference between sub-categories (trainees overall participation 65%, reitification 63%). MBBS 3 scored the lowest in both sub-categories and overall, whereas MBBS 5 scored highest within sub-categories and overall (MBBS 3 50%, MBBS 5 69%, resident 63%). *(Appendix E.30)*

6.8.5 CYCLE 1 – MIXED METHODS RESULTS

Twelve common content areas were identified from the combined comparative analysis of the qualitative and quantitative data. *(Table 9)* The joint display diagrams illustrate the results of the convergent integration, with special consideration for congruent and divergent results. *(Appendix E.31)*

TABLE 10: COMMON CONTENT AREAS IDENTIFIED FROM MIXED METHODS CONVERGENT INTEGRATION

Common content areas
1. Summarize
2. Narrow
3. Probe
4. Plan
5. Select
6. Early adopters
7. Testing SNAPPS
8. First impressions
9. MBBS 3 Clinical naivety
10. Residents as team leaders
11. Built-in teaching
12. Guided teaching

6.8.5.1 - COMMON CONTENT AREAS

Of the twelve common content areas identified, six showed congruent results between the quantitative and qualitative results; three showed divergent results; and the remaining three were mixed.

6.8.5.1.1 - Congruent

6.8.5.1.1.1 - Probe

Survey questions that elicited for trainees comfort, encouragement and ability to 'probe' the consultant and overall respect for uncertainty on ward rounds were generally scored low. Likewise, the qualitative data reflected an overall hesitance and difficulty of trainees to Probe during rounds. But when Probing did occur using SNAPPS, both quantitative and qualitative data suggested that it was found to it be helpful to the learning experience.

6.8.5.1.1.2 - Early adopters, Testing SNAPPS & first impressions

Both quantitative and qualitative data seemed to suggested that without adequate participation in the SNAPPS educational sessions, the faculty uptake and understanding of SNAPPS was lower. Likewise, both data sets suggested that SNAPPS was indeed different than traditional rounds, and required faculty/trainee practice in order to use it effectively. Yet, despite these new challenges to learn and practice SNAPPS, both data sets suggested that faculty and trainees alike found SNAPPS to be overall 'helpful' to the learning and teaching on ward rounds and even enthusiastic to use it.

6.8.5.1.1.3 - MBBS 3 clinical naivety

Quantitative data obtained in regards to MBBS 3's perceived self-efficacy to obtain/conduct and summarize a patient history and physical exam findings were generally guarded. This was in keeping with the qualitative data which reflected faculty frustration and concern that SNAPPS was too difficult for MBBS 3 to use on ward rounds.

6.8.5.1.1.4 - Residents as team leaders

Both data sets from faculty and residents supported the limited skills and leadership capability of junior residents to prepare for and run a ward round. Interesting, compared to other resident PSE

surveys, this one generally scored lower, indicating that residents acknowledged their limitations in terms of their ward round leadership capabilities.

6.8.5.1.2 - Divergent

6.8.5.1.2.1 - Summarize

While the qualitative data suggested that 'Summarize' was a difficult step for trainees and faculty to conduct and commit to for a variety of reasons, the quantitative data suggested that trainees were actually confident to Summarize and found this step 'quite a bit' helpful.

6.8.5.1.2.2 - Built-in & Guided teaching

Quantitative survey questions directly related to perceptions of learning, teaching and trainee engagement on ward rounds were generally equivocal, with most questions answered with 'Somewhat' suggesting that the learning, teaching and trainee engagement on ward rounds was just 'ok'. In contrast, faculty that used SNAPPS qualitatively described the direct benefits of SNAPPS to the teaching encounter on ward rounds. This divergence is likely secondary to the fact that the quantitative questions were surveying *all* ward rounds (the majority of which did not use SNAPPS) whereas the qualitative data was *only* capturing the reflections of ward rounds where SNAPPS was actively being used.

6.8.5.1.3 - Mixed

6.8.5.1.3.1 - Narrow

The Daily PSE and COP survey responses in regards to generating or encouraged to discuss a differential on ward rounds were consistent with the qualitative data which suggested that this was not always an intuitive step and faculty and trainees had difficulty with this step. Versus the MSLQ and

SNAPPS testing survey responses which were divergent from the qualitative data; here the survey data reflected a confidence to Narrow a differential.

6.8.5.1.3.2 - PLAN

The qualitative data suggested that generating a Plan was a straight forward and intuitive step of SNAPPS. And while most of the quantitative data responses aligned with this (i.e. trainees were encouraged to and confident to generate to their own Plan for a patient), some of the quantitative data was divergent, particularly in regards to eliciting for trainees' thought process or including trainees in the addendum Plan.

6.8.5.1.3.3 - SELECT

While both data sets were largely congruent, the qualitative findings that trainees had difficulty with the Select step was not captured in the quantitative data.

6.9 REFLECT: PHASE 3 – CYCLE 1

6.9.1 PHASE 3 - CYCLE 1 DIVERGENCES FROM PLANNED PHASE 2 ACTIVITIES

Our research design, educational activities, and data collection calendar for Phase 3 were all previously determined and generated during Phase 2. By the end of Phase 2, all educational activities had been included on the department calendar, funds had been secured, and the Phase 3 educational intervention materials, timeline, data collection calendar was planned, printed, and ready to start.

Despite these meticulous efforts, very early on during Phase 3, as we set out to follow the Phase 2 generated plans, I realized we needed to diverge from them. The following section describes these divergences of Phase 3 *planned* verses *actual* events as a reflection of the unpredictable nature of

action research; “As these cycles of research spiral over time, new questions, new literature, and new methods emerge.”[137]

6.9.1.1 - DIVERGENCES IN RESEARCH DESIGN

Subtle but crucial differences from the planned to the actual research design occurred during the early part of Phase 3. Note, the original planned research design was intended to capture the research activities from June – December; the actual research design only captures research activities from June – Sept. This is because by mid-September, the research design dramatically changed. *(Figures 45 & 46)* Subsequently, Cycles 2 & 3 had their own modified and updated research designs; the details of which will be discussed in later chapters.

FIGURE 45: PLANNED PHASE 3 RESEARCH DESIGN

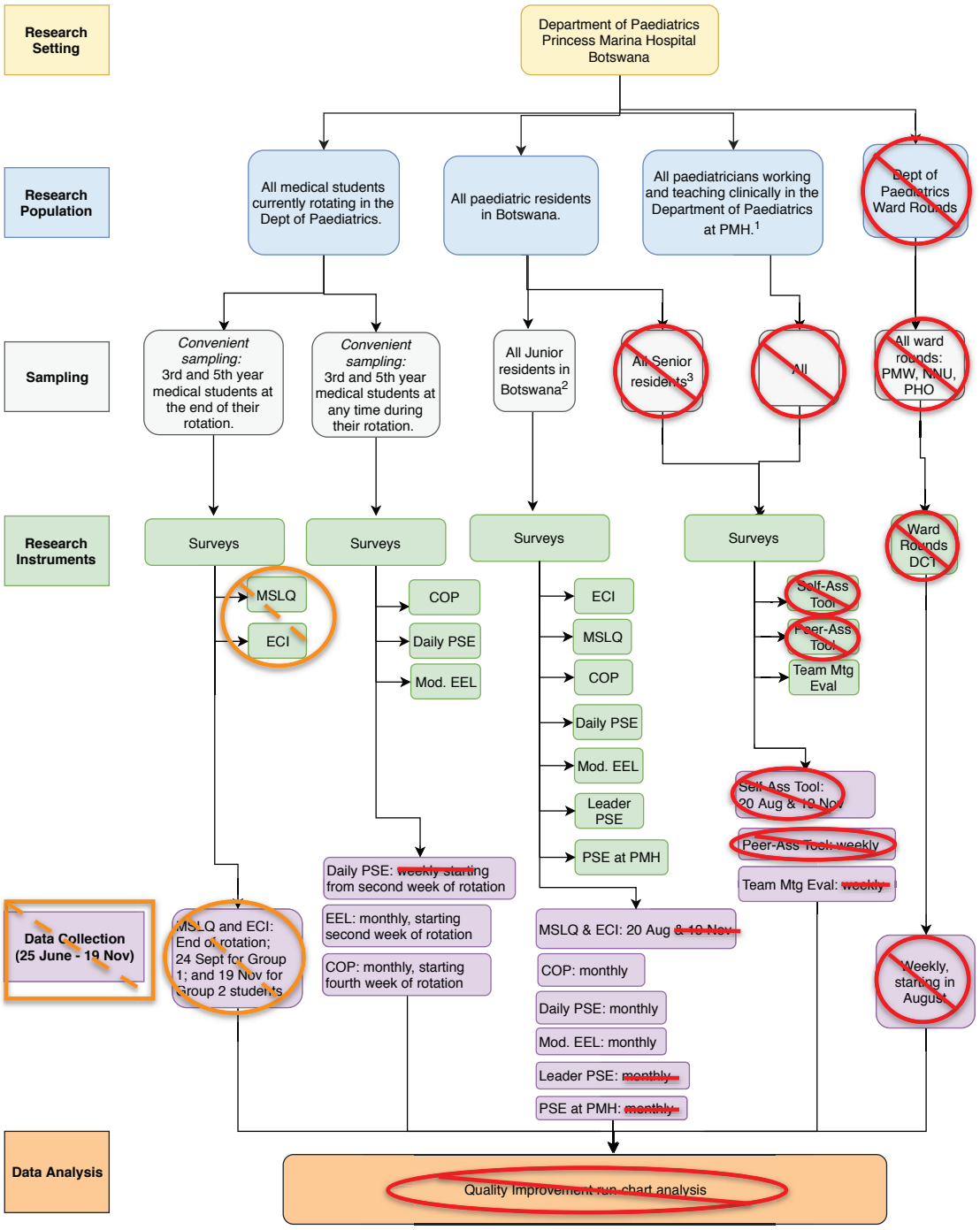
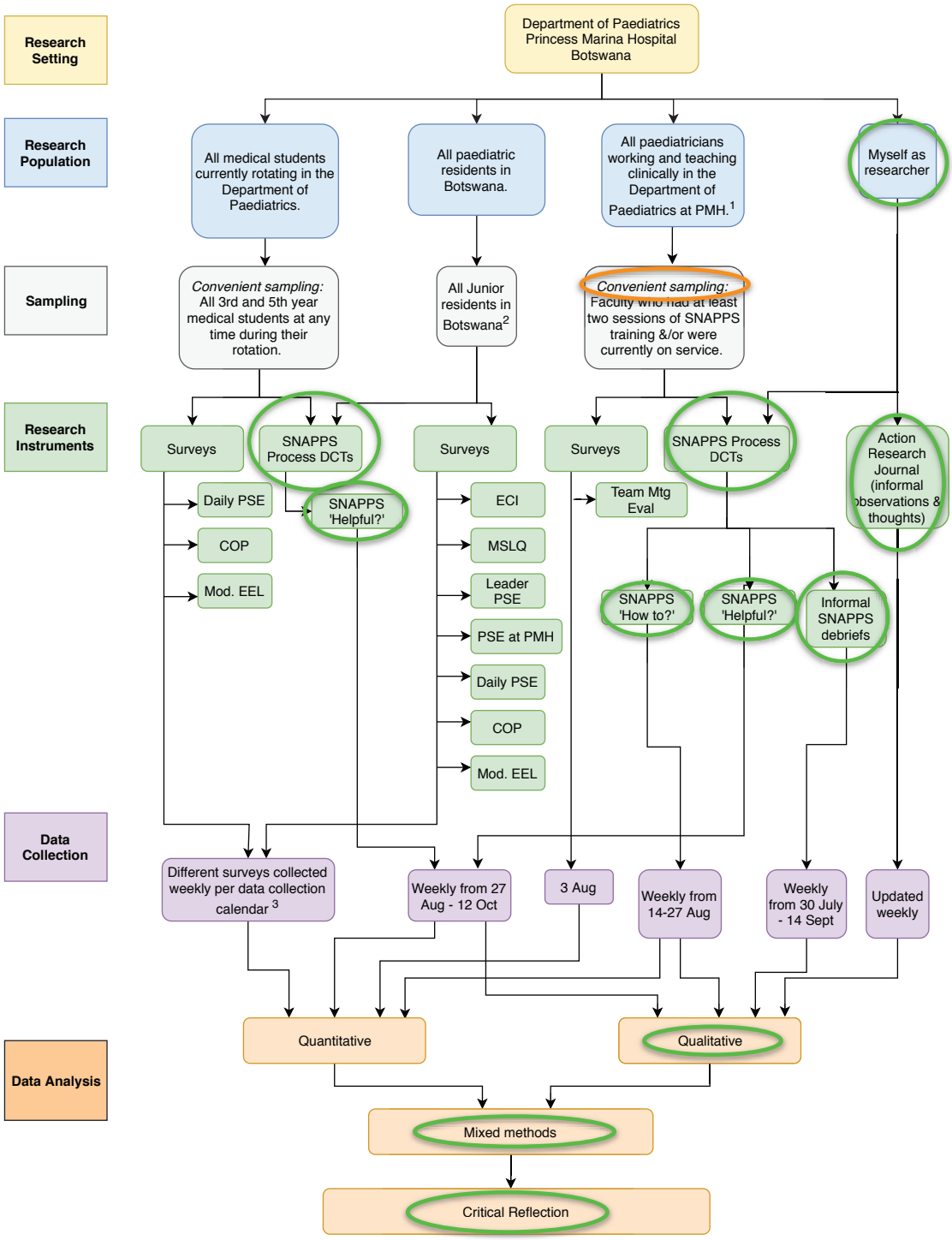


FIGURE 46: ACTUAL PHASE 3 - CYCLE 1 RESEARCH DESIGN



Notes 1-3: See Chapter 3 Methods for details of research population and sampling.

6.9.1.1.1 - Changes in research population

The original Phase 3 research design had not consciously included my own insider researcher perspective, which became an important part of ongoing data collection and analysis during Phase 3.

6.9.1.1.2 - Changes in sampling

Per sampling, in the original design, all faculty and senior residents had been included. But in Cycle 1, we observed limited attendance from many faculty and senior residents to the educational series, thus it would not have been beneficial to include all faculty/senior residents' responses. Instead we used convenient sampling – only those faculty and senior residents who had completed at least two educational sessions were included in the sample for data collection of surveys.

6.9.1.1.3 - Changes in research instruments

Of the research instruments used in Phase 3-Cycle 1, some that had been intended to use were not, and some new additional research instruments and data sources were generated. Specifically, we had intended to use the Work-flow on ward rounds (WFWR) data collection tool as a means to consider the work-flow on all rounds within the DoP. The intention was that this data would serve as both process and balancing measures during Phase 3. Yet the uptake of SNAPPS was so low that we did not use the WFWR data collection tool during Phase 3, because it would not have served as a balancing measure, but merely more baseline data. For the same reason of low SNAPPS uptake, we were not able to capture the self-assessment and peer-assessment Observation and Learning Tool for Clinical Supervision surveys as planned. In addition, student MSLQ and ECI surveys were not conducted in Cycle 1, only residents versions were captured, but were later obtained in Cycle 2.

During Phase 3-Cycle 1, obtaining real-time feedback as we tested SNAPPS became important, so two process measurement instruments were quickly drafted (SNAPPS Process Surveys: SNAPPS 'How To?' and SNAPPS 'Helpful?'). In addition, while the Phase 2 research instruments all relied heavily on quantitative measures that could be easily captured and tracked, it became apparent that quantitative

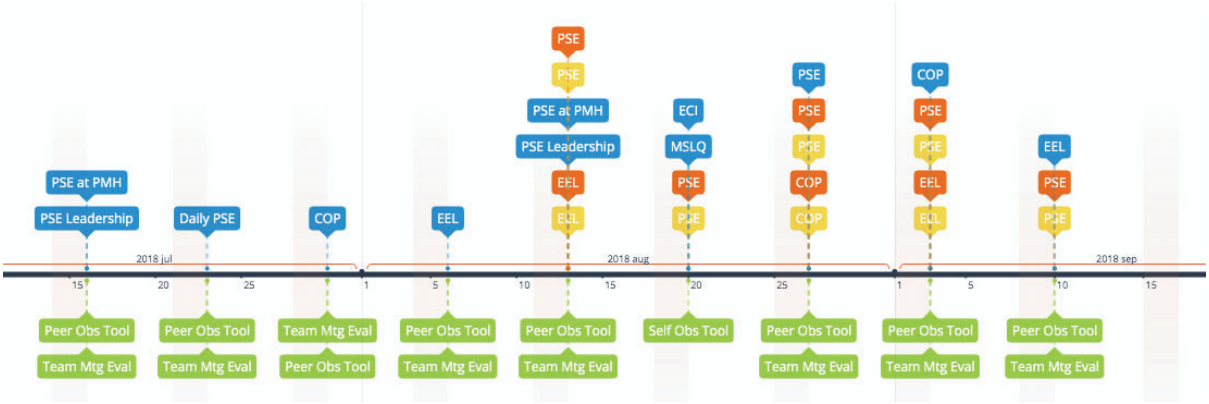
data alone provided limited perspectives and a variety of challenges, so a qualitative method in the form of an 'Informal SNAPPS Debrief' became an increasingly used form of data capture during Cycle 1. In addition, our Phase 2 generated research design neglected the value of my action research journal as a means to capture data.

6.9.1.1.4 - CHANGES IN DATA COLLECTION

When we created the data collection tools and surveys, it was with the intent to collect on a daily or at least weekly basis as a means to generate frequent, 'real time' feedback of our activities. But the feedback we got from trainees when piloting the surveys during Phase 2 was that they would prefer to complete longer or multiple surveys once a week instead of short, daily surveys. We therefore modified our data collection calendar to incorporate this feedback. *(Figure 47)*

I assumed that it would be possible to collect frequent, small sets of data on a weekly basis during Phase 3, allowing me to obtain sufficient data points to generate meaningful run charts. But in actuality, the data collected was too stratified and the trainee numbers too variable to generate meaningful data. *(Figure 48)* This occurred because during the weekly data collection, trainees were frequently missing from the morning report (some were post-call, some were attending a patient emergency, on leave, sick, etc.) So while I was gathering several surveys weekly, the number of stratifications and variations of the surveys meant that instead of capturing 'topic X' weekly, by the time that particular trainee level happened to be rounding in that particular ward, and happened to be at the morning report meeting, and had consented to the project, I was only collecting data on 'topic X' at best, once a month, or at worse, not at all. This infrequent data collection of 'topic X' prevented me from generating meaningful run charts, which we had planned on using for our data analysis.

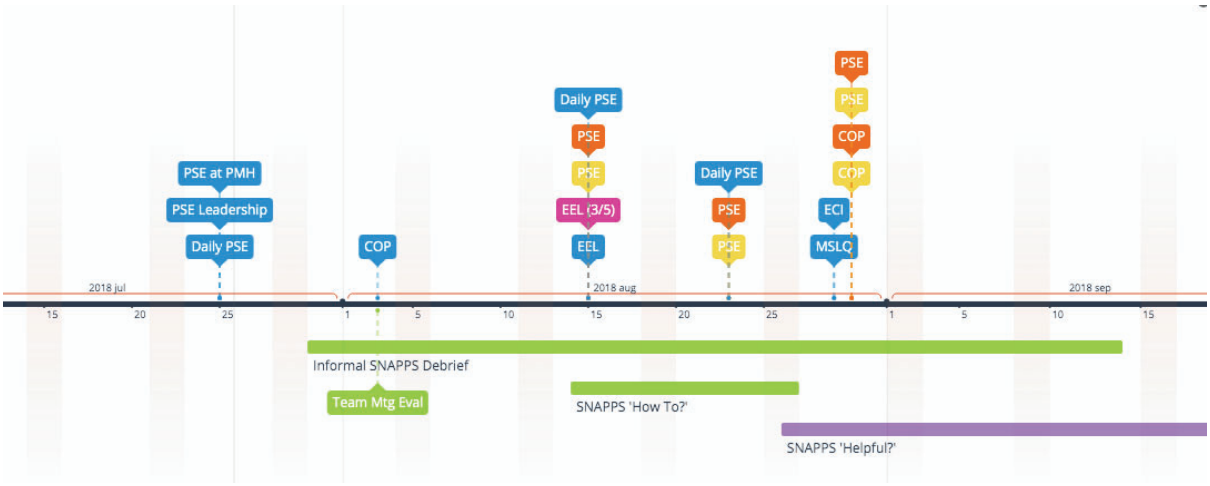
FIGURE 47: PLANNED DATA COLLECTION FOR PHASE 3



Yellow = MBBS 3
Orange = MBBS 5
Blue = junior residents

Green = senior residents/faculty

FIGURE 48: ACTUAL DATA COLLECTION FOR PHASE 3 - CYCLE 1



Yellow = MBBS 3
Orange = MBBS 5
Blue = junior residents

Green = senior residents/faculty
Pink = MBBS 3/5 combined
Purple = students, residents and faculty

6.9.1.1.5 - CHANGES IN DATA ANALYSIS

Thus, the most striking deviation from our Phase 3 planned vs actual research design was the data analysis itself. We recognized early on during the initial project planning that based on our small, dynamic population, pure quantitative data analysis methods would not be feasible for our project; nor was it the intent of the study to create generalizable data. Due to the several confounding factors

of our clinical training environment, in combination with an inappropriate sample size for true statistical procedures, we never intended to establish a causal relationship within this study.[162] Rather, our intent was to understand enough about our local system of clinical learning to generate meaningful and practical solutions to improve our bedside teaching.

But, simultaneously, we recognized the value of having some form of quantitative data within the study to augment our other methods. Questionnaires are a simple and convenient means of collecting data that would allow us to capture the larger voice of the department. And while qualitative methods had the potential to provide us with a richer description of the local system, we didn't want to rely solely on qualitative methods because we were concerned that with the clinical schedule, trainees would be too busy to be interviewed on a regular basis and we also wanted to offer trainees the opportunity to contribute via anonymous survey feedback.

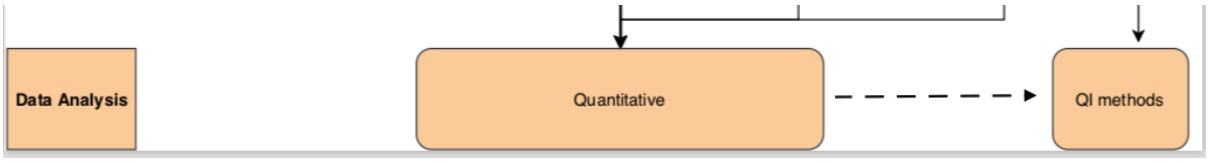
So the question remained, 'how best to analyse the quantitative data we did collect?' when we knew it was not particularly suited to standard quantitative data analysis. In Phase 1, we used a mixed methods approach to our data analysis – essentially we relied heavily on our qualitative data and used the quantitative data to provide additional descriptors to augment this data. But for Phase 3, we wanted something that would be faster than a full qualitative-quantitative mixed methods data analysis so that we could create 'real time' changes as needed. It was this need for unencumbered data analysis that we sought to look at the tools and methods offered by quality improvement science, specifically the run chart.

From this perspective, quality improvement methods for data analysis were appealing – we could continue to gather quantitative data (surveys) frequently and place them on a dynamic run chart without having to hold to the rigorous standards of quantitative data analysis, since our purpose was not to discover new knowledge, but to "bring new knowledge into daily practice."[178] The run chart analysis would provide us with up to date 'snap shots' of our 'system' (in this case, our clinical learning and teaching on ward rounds) and the potential influences of our educational activities and introduction of the bedside teaching model on our system. A run chart would also provide us with a graphical, contextualized, and readily accepted form of data analysis that could be shared with the entire department on a regular basis to get more participatory feedback on our activities.

Therefore, in the same vein that we had used QI tools and methods in Phase 2 to generate our driver diagram, project measures and change ideas, we had hoped to use QI run charts to analyse our data in Phase 3. *(Figure 49)* Indeed, in addition to piloting our surveys, the reasoning behind Phase 2 data collection was to establish 'baseline data' that could be used on run charts prior to Phase 3 activities. *(Figure 50)*

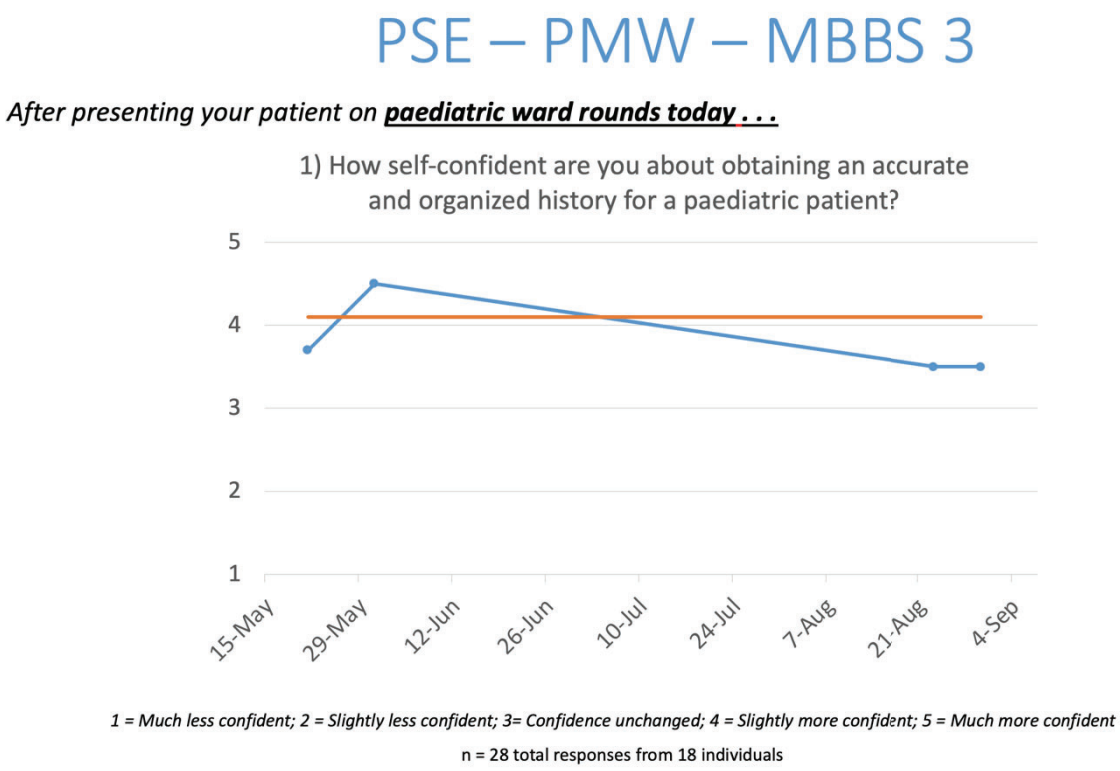
FIGURE 49: PHASE 3 - *PLANNED* DATA ANALYSIS

FIGURE 50: PHASE 2 - BASELINE-DATA DATA ANALYSIS



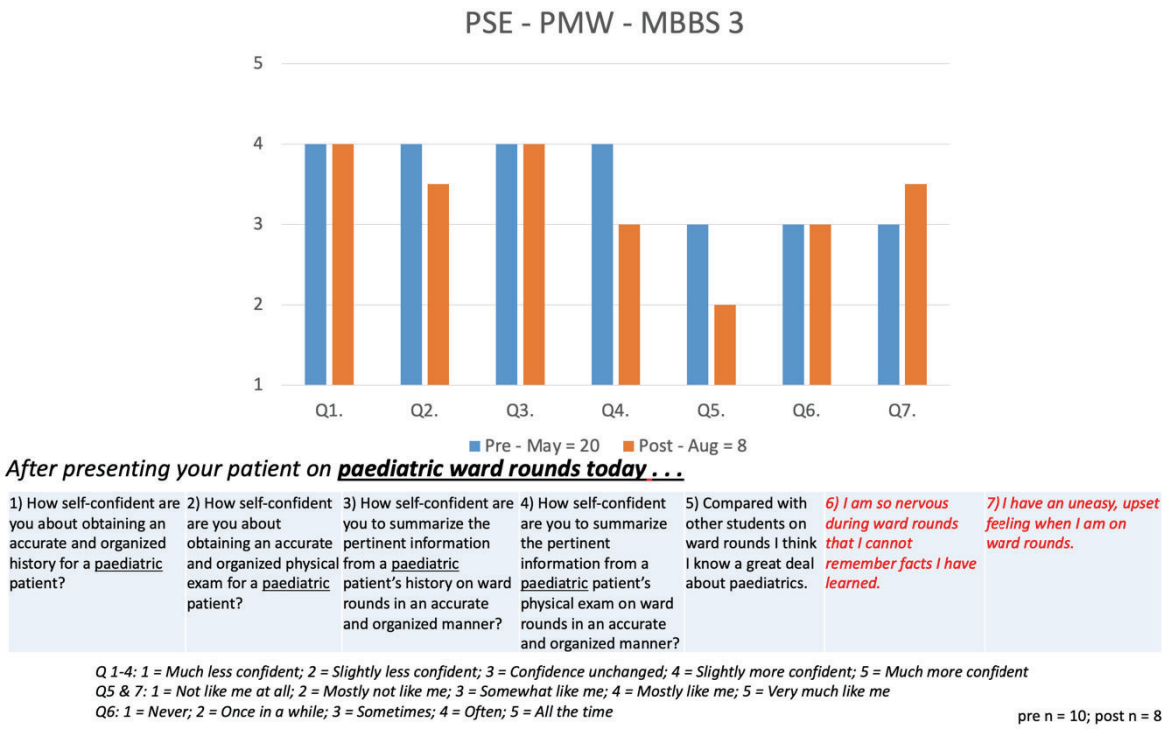
Interpretation of run charts are based on four 'probability based rules' to determine if the data represents non-random change, and require at least six data points to 'read' a run chart. (*Refer to Chapter 3*) But based on over stratification of surveys and other data collection issues described above, even after three months into Phase 3, I was still unable to create meaningful run charts. By September, most surveys only had one data point since they had only been collected once. For example, the Daily PSE survey had been collected the most frequently and had the most data points available, but even then, the average run chart only had three to five data points available, which included the baseline data collected from Phase 2. *(Figure 51)*

FIGURE 51: EXAMPLE RUN CHART DURING PHASE 3 - CYCLE 1



Once I realized we were unable to continue our run chart data analysis with our current data collection strategies as planned, I looked to see if there was any value of analysing the data in a pre-Phase 2 vs post-Phase 3 manner, but the sample size was too small to compare for any statistical significance. *(Figure 52)*

FIGURE 52: EXAMPLE PRE/POST ANALYSIS DURING PHASE 3 - CYCLE 1



*After presenting your patient on **paediatric ward rounds today . . .***

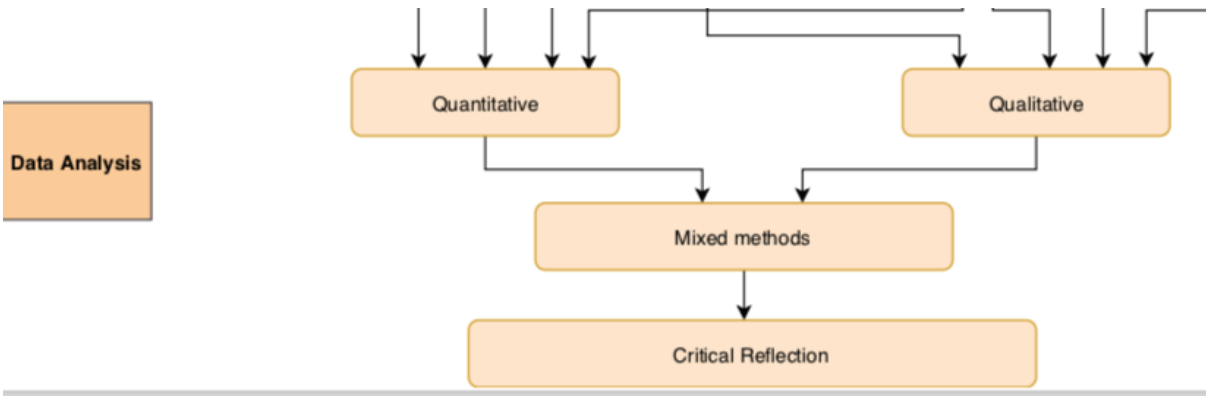
1) How self-confident are you about obtaining an accurate and organized history for a paediatric patient?	2) How self-confident are you about obtaining an accurate and organized physical exam for a paediatric patient?	3) How self-confident are you to summarize the pertinent information from a paediatric patient's history on ward rounds in an accurate and organized manner?	4) How self-confident are you to summarize the pertinent information from a paediatric patient's physical exam on ward rounds in an accurate and organized manner?	5) Compared with other students on ward rounds I think I know a great deal about paediatrics.	*6) I am so nervous during ward rounds that I cannot remember facts I have learned.*	*7) I have an uneasy, upset feeling when I am on ward rounds.*

Q 1-4: 1 = Much less confident; 2 = Slightly less confident; 3 = Confidence unchanged; 4 = Slightly more confident; 5 = Much more confident
Q5 & 7: 1 = Not like me at all; 2 = Mostly not like me; 3 = Somewhat like me; 4 = Mostly like me; 5 = Very much like me
Q6: 1 = Never; 2 = Once in a while; 3 = Sometimes; 4 = Often; 5 = All the time

pre n = 10; post n = 8

Therefore, because I couldn't manage to create and update run charts at the rate that I had hoped, I reverted back to the data analysis used in Phase 1 (convergent mixed methods) to properly analyse the data we had collected in Cycle 1 to be able to provide further guidance to the project moving forward. *(Figure 53)* Yet it is important to note that the quantitative data we collected was never intended for traditional forms of quantitative data analysis, so this continued to be a limitation in our overall mixed data analysis.

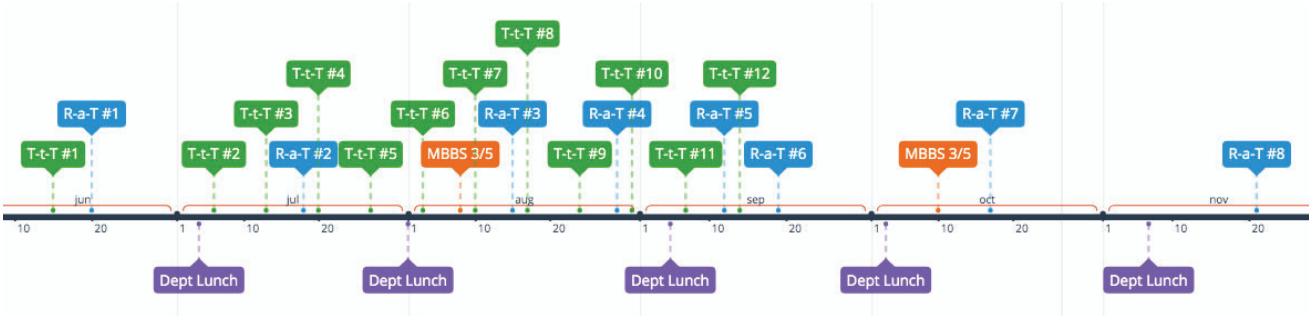
FIGURE 53: PHASE 3 - CYCLE 1 - *ACTUAL* DATA ANALYSIS



6.9.1.2 - DIVERGENCES IN PLANNED EDUCATIONAL ACTIVITIES

In addition to the dramatic changes to our Phase 2 generated research design, we also had divergences in our planned educational and department engagement activities. *(Figures 54 & 55)* Of the original 22 educational activities and the 5 department engagement lunches, only 11 of the original educational activities occurred and none of the department engagement lunches occurred. Instead, a truncated department curriculum occurred, and Cycle 1 only held 15 educational activities – four of these being repeat faculty and trainee sessions.

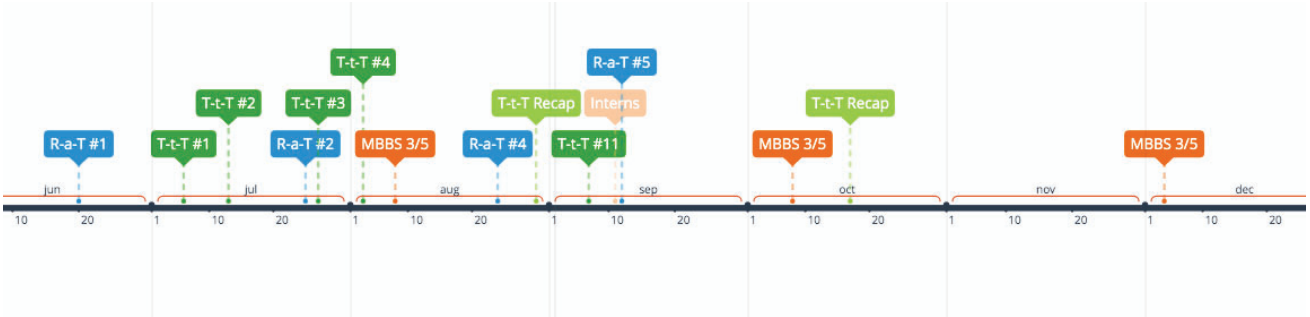
FIGURE 54: *PLANNED* PHASE 3 ACTIVITIES



T-t-T = Teach the Teacher series
R-a-T = Residents as Teachers series
Purple = Department of Paediatrics lunch

MBBS 3/5 = Medical student Intro to SNAPS

FIGURE 55: *ACTUAL* PHASE 3 ACTIVITIES



T-t-T = Teach the Teacher series
R-a-T = Residents as Teachers series
Purple = Department of Paediatrics lunch

MBBS 3/5 = Medical student Intro to SNAPS
T-t-T Recap = Repeat Teach the Teacher sessions
Interns = Intern Intro to SNAPPS

The reason for this divergence was threefold. First, without significant run chart data to share, it was difficult to hold department update lunches. Second, due to the inconsistent faculty and senior resident participation, it was difficult to continue to build on the teach-the-teacher educational series and introduce more topics while the initial topics hadn't been fully learned and/or incorporated. And third, limited participatory group support led to my own inability to keep up with simultaneous data collection and educational activities as planned.

6.10 CHAPTER SUMMARY

In this chapter, I introduced the overall approach to Phase 3 as a means to assess the efficacy of our potential solutions, followed by a detailed description of the research activities, results and reflections that occurred during Cycle 1. The next chapter will describe the research design, methods used and results found in Phase 3 - Cycle 2 of this study.

CHAPTER 7: PHASE 3 – CYCLE 2

7.1 CHAPTER INTRODUCTION

This chapter serves as a continuation of Phase 3 project activity, with an ongoing description of the research design, methods, results and reflections used and developed within this phase of the study. This chapter will describe the activities of Phase 3 - Cycle 2, which was conducted as ongoing inquiry group action research and practitioner research within the Department of Paediatrics at Princess Marina Hospital from mid-September thru mid-December 2018. We continued to utilize a convergent and exploratory sequential mixed method design in an ongoing effort to achieve the last two objectives of the study and to answer the last three research questions.

7.2 PHASE 3 – CYCLE 2: RESEARCHER POSITIONALITY AND PARTICIPATORY POPULATION

Note: there were no major changes from Cycle 1 to Cycle 2 in regards to researcher positionality or project group members.

7.3 PLAN: PHASE 3 – CYCLE 2

7.3.1 INFLUENCES FROM CYCLE 1

7.3.1.1 UPDATE OF STUDY INSTRUMENTS AND DATA COLLECTION PROCESSES

During Phase 3 – Cycle 1, in order to assess the impact of the educational series and the introduction of a structured approach to bedside teaching (i.e. SNAPPS) – specifically on the influence on trainees' and faculty's perceptions of the clinical learning environment, level of social participation, elements

of effective teaching and learning, and self-efficacy beliefs pertaining to different aspects of clinical care, a total of 20 surveys were used over a three-month period. During data collection and analysis, five issues were identified when using these surveys.

First, the over stratification of the surveys to account for level of trainee, ward, and type of outcome measurement led to the collection of very small amounts of data for each specific survey. This led to the second issue - I was unable to collect enough data points to generate run charts, and therefore was unable to see the effects of our interventions. Third, of the data collected, there was no method in place to distinguish between trainees reporting on a 'traditional rounds' versus a 'SNAPPS rounds'. The objective of the data was to determine the impact of the introduction to SNAPPS to the department. But since there wasn't department-wide uptake of SNAPPS, it was difficult to see if the data collected was based on the influences of SNAPPS or of the traditional rounds. The fourth issue was that because the Daily PSE survey was not being reported on and collected 'daily', that the results likely reflected a more generalized evaluation of the ward round experience and did not pertain to specific patient-encounters of self-efficacy. Fifth, during Cycle 1, it was difficult to collect survey data from faculty; several faculty reported that they preferred to verbally report their experiences.

The five issues identified in Cycle 1 highlighted that we needed a feasible, practical and meaningful data collection method moving forward; a tool that could condense all of our primary project measurements into a specific, short, single survey that could be used frequently and easily captured whether or not SNAPPS had been used. In addition to our outcome measures, we also wanted to be sure to have means to collect ongoing process and balancing measures to determine challenges faculty or trainees faced in using SNAPPS, as well as an opportunity for faculty and trainee verbal feedback. The results of my detailed discussions with our project content experts led to the consolidation of all previous surveys into three new data collection tools: the Faculty Rounding Log (FRL), the Trainee Rounding Log (TRL), and the SNAPPS Debrief guide.

7.3.1.2 Development of Faculty Rounding Log (FRL)

Cycle 1 results of the SNAPPS 'How to?' and SNAPPS 'Helpful?' surveys showed that, in general, most faculty reported understanding the steps of SNAPPS and found it useful for their clinical teaching. If

the faculty both understood and found SNAPPS useful, then we could assume an increased *use* in SNAPPS each week from those faculty would be evident. We therefore wanted to measure *'How often are faculty using SNAPPS?'*

Hence, the faculty frequency usage of SNAPPS on a weekly basis would be an outcome measure of a successful implementation of SNAPPS. If it was used more frequently by faculty each week, this would support our first two survey findings. But if it wasn't, then it might indicate that despite being a helpful teaching tool, it wasn't helpful enough to change faculty's everyday practice; or that the first two surveys were not as reflective of the understanding and usefulness of SNAPPS as we first thought. If either of the latter scenarios was the case, then we needed to make sure that we were also capturing any barriers to faculty use of SNAPPS. In turn, this feedback could lead to interventions to modify our educational series and/or SNAPPS itself to make it a more accessible tool and increase usage. *(Appendix B.42)*

7.3.1.3 Development of Trainee Rounding Log (TRL)

Once we recognized that a new study instrument was required, we sought to maintain focus on the primary project measures, specifically, trainees' perceived self-efficacy to manage paediatric patients. Up until this point of the project, most of the PSE we tried to measure was not a self-evaluation of an event, but a sense of confidence in general or a change in confidence based on an experience. The reasoning is that, as Bandura describes, PSE is not an evaluation of how you *did*, or what you think you '*will do'*, but about your perceived capability '*can do'*.[128] This is an important point when considering how to create a survey to measure PSE because a self-evaluation survey would be worded in the past-tense, whereas PSE ought to be placed in the present or future tense.

Also, up until this point in the project, trainee PSE was measured in *general* terms of paediatric patient management, not *specific* patient encounters. We were concerned that while this 'lumped' evaluation of patient evaluation and management could provide us an overall sense of trainee confidence and PSE, it would not provide us with insight into the PSE experienced with a specific patient encounter. In medicine, the specific patient encounter is very important and could potentially influence the perceived self-efficacy in evaluating and managing the patient.[129] For example, seeing a 2-month-old

female with gastroenteritis is a very different encounter than seeing a 5-year-old male with a neck mass.

From this perspective, even the specific steps of SNAPPS are influenced by the individual patient's chief complaint – per familiarity, previous experience and readily available knowledge - some cases are easier to summarize than others, some cases are easier to narrow and analyse than others, and so on. Therefore, we wanted the PSE measurement to be as specific as possible to the event as a means to evaluate the effects of different clinical encounters and see how SNAPPS could assist with the variation of these clinical encounters.

But from the surveys used in the previous phases and cycles, we continued to struggle with how to measure a present or future capability *and* simultaneously make the question relate to a specific event (i.e. a single patient encounter). In that, despite the same steps of SNAPPS used for each case presentation, the *specificity* of the case would make it difficult to obtain prospective measurements. Therefore, based on the unpredictable nature of the clinical environment and the influence of the case specificity on PSE, to evaluate the influence of SNAPPS on PSE, we decided to use a proxy measurement of PSE.

For our proxy PSE measurement, we chose to use a retrospective self-evaluation of a specific case presentation to identify whether or not a positive PSE experience occurred; i.e. 'Did a mastery experience occur?' 'Yes or no?'. For example, *"I did an excellent job of Summarizing my patient on rounds today";* if they rated highly that they did, then that relates to a positive mastery experience, if they rated low, then that relates to a negative mastery experience. In this way, we hoped to indirectly measure trainee PSE based on the number and type (positive or negative) of mastery, vicarious, verbal and psychological experiences they had on rounds. This would allow us to consider the question, 'does SNAPPS influence the number of positive mastery experiences trainees experience on ward rounds?', which directly correlated with our final study question. *(Appendix B.43, B.44)*

7.3.1.4 Development of SNAPPS Debrief Guides

During Cycle 1, I began to capture my use of SNAPPS in a very informal manner, writing purely about the experience of trying to use SNAPPS on my ward rounds, without any distinct construct to measure. I took note of things I observed when using SNAPPS – challenges, benefits, and surprises, for both myself and the trainees. I journaled about SNAPPS influences on my own style of teaching, my learning, and even my patient care in my action research journal.

Simultaneously, a natural metamorphosis of conversation between myself and other faculty testing SNAPPS on their ward rounds occurred about the shared experiences using SNAPPS. General reflection from these informal conversations and my own journal entries became the premise of a more formal 'debrief'. As a way to simultaneously address the data collection issues and provide a more formal way to capture the content of these informal conversations, I created a 'SNAPPS Debrief' guide for faculty and trainees. *(Appendix B.45, B.46)*

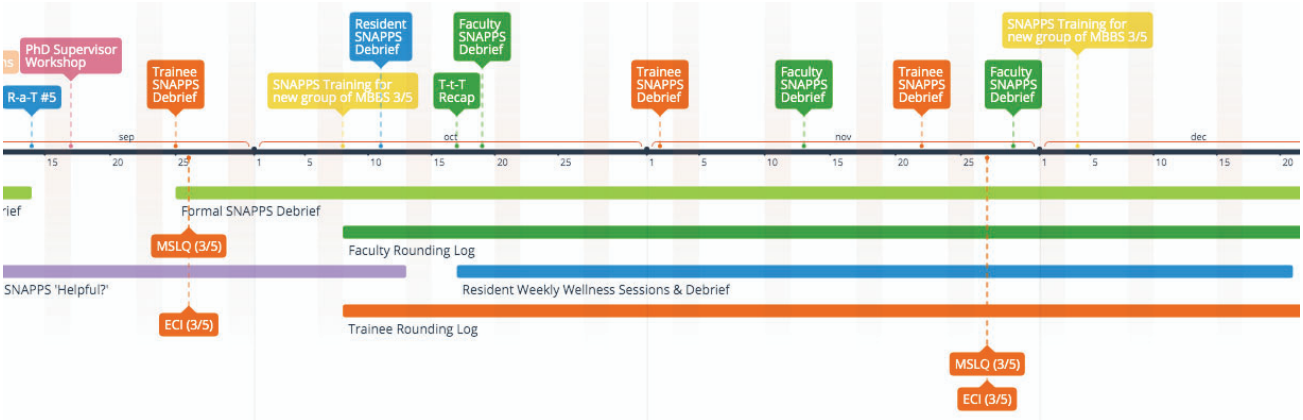
7.3.2 Methods

Refer to *Chapter 3 – Methods* for more details.

7.3.2.1 Cycle 2 - Timeline

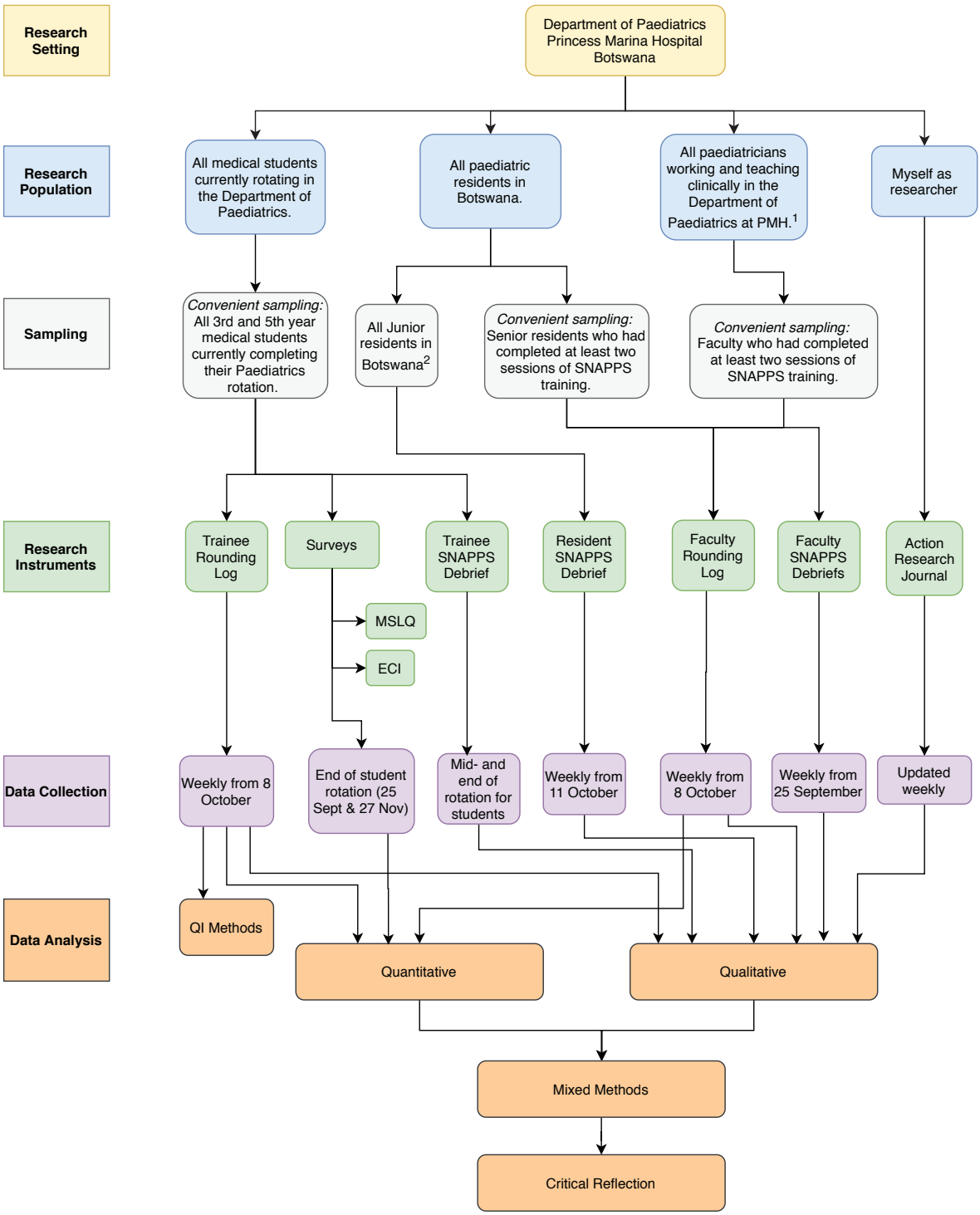
Phase 3-Cycle 2 occurred between mid-September thru mid-December 2018. *(Figure 56)*

FIGURE 56: CYCLE 2: RESEARCH ACTIVITY TIMELINE



7.3.2.2 CYCLE 2 – RESEARCH DESIGN

FIGURE 57: CYCLE 2 - RESEARCH DESIGN



Notes 1-2: See Chapter 3 Methods for details of research population and sampling.

7.3.2.3 Cycle 2 - Study population

During Cycle 2, two groups of MBBS 3 and MBBS 5, approximately 40 medical students, rotated through the department. There was one less senior resident in the department for Cycle 2, otherwise there were no changes in study population from Cycle 1 to 2 during Phase 3.

7.3.2.4 Cycle 2 - Study instruments

7.3.2.4.1 - Surveys

7.3.2.4.1.1 - Faculty Rounding Log (FRL)

This paper-based, half-page survey was designed to capture faculty frequency of use of SNAPPS. The survey aimed to capture a ratio of SNAPPS usage to number of total patients seen during the ward round per day. Documenting the length of rounds was included as a balancing measure. This was followed by an open-ended question to comment on any barriers faced using the SNAPPS model, and then an additional space for general comments or questions. The survey was reviewed by faculty for feedback. *(Appendix B.42)*

7.3.2.4.1.2 - Trainee Rounding Log (TRL)

This paper-based rounding log was composed of four stapled half-sheets of paper. The first page included instructions and my contact information; the following pages were three identical copies of the survey, intended to capture three different patient presentations over the course of a week. The presentations could be the same patient presentation on three different days or they could be three different patient presentations on the same day, or three different cases on three different days, as long as each was reflective of a specific presentation on rounds and not a generalized ('lumped together') assessment of presenting patient cases on rounds.

The survey was designed to capture our key outcomes: 1) trainees' perceived self-efficacy to manage paediatric patients, 2) sense of participation in and belonging to a clinical community of practice on rounds, 3) extent of elements of effective learning and teaching experienced on the ward round, and 4) the nature of the learning climate.

Trainees were asked to record the date, the ward, and a brief one-sentence case description. The one-sentence case description was captured to ensure that the trainee was only reporting on a single presentation. The survey then asked students to report whether or not they had used SNAPPS to present their case. If they had used SNAPPS, they would be asked to complete all 13 questions on the survey. If they had not used SNAPPS, then they were asked to only answer question 4 and questions 7-13.

Questions 1-6 elicited for trainees' perceived success of using the six steps of SNAPPS to present their patient case. These six questions aimed to measure the mastery experiences of the trainee when using SNAPPS. Questions 7-13 were aimed to capture all aspects of PSE (mastery, vicarious, verbal and psychological) and could be recorded whether or not the trainee had used SNAPPS on the ward round. Questions 7-13 also correlated to our other key-outcomes, including trainees' sense of participation in and belonging to a clinical community of practice on rounds, extent of elements of effective learning and teaching experienced on the ward round, and the nature of the learning climate.

Questions 1-3 and 5-6 were scored on a five-point unipolar Likert scale from "Not at all successful" to "Extremely successful". Question 4 asked trainees to tally the number of Probes they had asked on rounds. Question 7-11 and 13 were scored on a five-point unipolar Likert scale ranging from "Not at all" to "A great amount". Question 12 was scored on a five-point bipolar Likert scale from "Not well at all" to "Much better". The close-ended questions were followed by a space for open-ended comments. Excluding question 4, the possible maximum score for the survey if SNAPPS had been used was 60, with a minimum score of 12; if SNAPPS had not been used, the maximum score was 35, with a minimum score of 7. The survey was reviewed by trainees for feedback. *(Appendix B.44)*

7.3.2.4.1.3 - Educational Climate Inventory (ECI)

Refer to Chapter 5; (Appendix B.17, B.18, B.19, B.20, B.21)

7.3.2.4.1.4 - Motivational Strategies for Learning Questionnaire (MSLQ)

Refer to Chapter 5; (Appendix B.26, B.27, B.28)

7.3.2.4.2 - Debrief Guides

7.3.2.4.2.1 - SNAPPS Debrief - Faculty

To supplement the Faculty Rounding Log, the SNAPPS Debrief guide was created. The SNAPPS Debrief guide was not a true 'interview' guide in the traditional sense, but a less formal template to provide guidance for weekly debriefs which could obtain feedback from faculty about their use of SNAPPS on ward rounds. The questions were generated from my personal reflections of using SNAPPS and previous conversations with other faculty also using SNAPPS. The questions were all open-ended, conversational in nature, and with the aim to provide practical feedback of the experience of using SNAPPS. Based on the direction of the conversation, additional questions were added or excluded. *(Appendix B.45)*

7.3.2.4.2.2 - SNAPPS Debrief - Trainees

To supplement the Trainee Rounding Log, the SNAPPS Debrief guide was created. For students, we used group debriefs for trainee convenience, to generate discussion between trainees, and to be mindful of the hierarchy status in one-on-one interview setting. The SNAPPS Debrief guide was not a true 'focus group discussion' guide in the traditional sense, instead it was a less formal template to provide guidance for mid-rotation and end-of-rotation trainee debriefs which could provide feedback about the use of SNAPPS on ward rounds. The questions were generated from my personal reflections of using SNAPPS and previous conversations with trainees using SNAPPS. The questions were all open-

ended, conversational in nature, and with the aim to provide practical feedback of the experience of using SNAPPS. Based on the direction of the conversation, additional questions were added or excluded. *(Appendix B.46)*

7.4 ACT: PHASE 3 – CYCLE 2

7.4.1 CONTINUED EDUCATIONAL SERIES

From October to December 2018, a total of three ongoing educational sessions were conducted. These were repeat sessions offered to new incoming rotating students and interns as well as a 're-cap' session offered for faculty and senior residents who were unable to come to previous educational sessions offered during Cycle 1. Based on Cycle 1 and ongoing Cycle 2 feedback, the "Introduction to SNAPPS" educational session was updated to include additional slides to help with areas requiring ongoing support or clarification, and included more 'real life' examples. *(Refer to Chapter 6; Appendix G)*

7.4.2 MONITORING THE USAGE OF SNAPPS

From 8 October, 2018 thru 16 January, 2019, a total of six faculty members (including myself) continued to use SNAPPS on our ward rounds. Faculty were chosen based on their previous attendance in the educational sessions, service schedule, participation in the overall project, and those faculty who shared the PHO service with me. All departmental units were potentially trialled: PMW, NNU and PHO.

7.4.3 CYCLE 2 - DATA COLLECTION

Data was continuously collected throughout Cycle 2. *(Figure 56)*

7.4.3.1 SNAPPS Debriefs

7.4.3.1.1 - Faculty Debriefs

The faculty SNAPPS Debrief was captured weekly at the end of the faculty's clinical service. For faculty and senior residents not using SNAPPS, informal conversations to elicit for motivation or barriers to use SNAPPS were captured in my AR journal (ARJ). Faculty debriefs were conducted in the staff lounge, and took approximately 5 to 10 minutes. My own SNAPPS Debrief was initially captured at the end of my clinical service week, but later became more integrated into my daily rounds as I jotting down notes on my rounding sheet, which I would review at the end of the week to provide more detail to my SNAPPS Debrief.

7.4.3.1.2 - Trainee Debriefs

The resident SNAPPS Debrief was conducted only once early in Cycle 2. The medical student SNAPPS Debrief was captured twice: mid-rotation and again at the end of their rotation. The debrief conversations were held in either the morning report meeting room or the student workroom. Each trainee group debrief took approximately 15 minutes.

7.4.3.2 Surveys

7.4.3.2.1 - Trainee surveys

The Trainee Rounding Logs were initially distributed to consented participants after the morning report on Monday morning. On Friday afternoon, I would make myself available near the student room to collect any completed rounding logs. I would review the log briefly to ensure that no clarification was needed, and then distribute the following week's TRL. To mitigate survey fatigue, for students who submitted their rounding log, small appreciation tokens were distributed (i.e. a small piece of candy or pen, etc. – but nothing that would unfairly discriminate against those who did not

either complete their form for the week or those who had not consented to the project). The ECI and MSLQ trainee surveys were captured at the end of the student's rotation.

7.4.3.2.2 - Faculty/Senior resident surveys

The Faculty Rounding Logs were distributed to consented participants by me after the daily morning report meeting or in the staff lounge. These were collected on a weekly basis.

7.4.4 Cycle 2 - Data analysis

7.4.4.1 Qualitative data analysis

Refer to *Chapter 3 – Methods* for details.

7.4.4.1.1 - Ongoing bias as the researcher

My greatest bias during Cycle 2 was that as I was using SNAPPS more and more on my own clinical service and gradually watching it transform and improve my clinical teaching, I could not help but feel those who were not using SNAPPS were missing out on an opportunity to improve their clinical teaching. This judgement may have inadvertently placed too much of my focus on *'why aren't other faculty using it?'* instead of looking at broader context of other events or activities within the department at that time.

7.4.4.2 Quantitative data analysis

7.4.4.2.1 - Faculty Rounding Log

The FRL data was analysed for overall percent of SNAPPS-used presentations (i.e. total number of times SNAPPS used over total number of patients rounded on). The average percentage of SNAPPS use by individual faculty was calculated. The data was then stratified by my personal use of SNAPPS versus the other faculty's use. Length of rounds and minutes spent per patient were also determined.

7.4.4.2.2 - Trainee Rounding Log

The TRL data was analysed using two different methods: run chart data analysis, and basic descriptive comparative statistics.

7.4.4.2.2.1 - Run chart analysis

All TRL data for the two groups of students who rotated during Cycle 2 was stratified by 'SNAPPS Use – Yes' versus 'SNAPPS Use – No'. Since we were looking at the overall research question: *Does the introduction of a structured approach to bedside teaching enhance the CLE on ward rounds, improve trainee participation in, and sense of belonging to, the departmental community of practice on ward rounds, and/or improve trainees' self-efficacy beliefs about the ability to provide clinical care?* - for the run chart analysis, we only plotted the SNAPPS-Yes TRL data. A separate run chart was generated for each of the 13 TRL questions; questions 9 and 13 were *not* reverse scored. For case presentations that occurred on the same day, the mean of those case presentations was calculated for the data point on that day; (i.e. 37 case presentations resulted in 19 data points on the run chart). The median for the combined data points was created and graphed on a run chart. Run chart data analysis was then performed to look for signs of non-random vs random variation following run chart rules. Due to limited data, further stratification by trainee level or ward was not created into additional run charts.

Note: Since the TRLs were collected *after* the introduction of SNAPPS, technically, there was no non-SNAPPS baseline data. In lieu of this, since the qualitative and FRL data sources are highly suggestive of misinterpretation, varied, and/or inconsistent use of SNAPPS, for the purposes of these run charts, we used responses prior to 26 Oct as "baseline data" since the majority of these were from PMW with varying faculty members conducting rounds; whereas the majority of responses collected after 26 Oct were from PHO, the bulk of which were from SNAPPS-used rounds.

7.4.4.2.2.2 - Descriptive analysis

A basic comparative descriptive analysis of the TRL data was conducted. The TRL data was stratified by 'SNAPPS Use – Yes' vs 'SNAPPS Use – No'. A SNAPPS-Yes use TRL resulted in 13 completed questions, and a SNAPPS-No use TRL resulted in eight completed questions (Q. 4 and 7-13), of which Q.4 could not be added to the total survey results since there was no set limit to the value. Therefore, for a descriptive comparative analysis, only seven questions were analysed (Q7-13). Questions 9 and 13 were negatively worded and therefore were reverse scored. For all 13 SNAPPS-Yes and the 7 SNAPPS-No questions, relevant sub-categories and total score were assessed for mean, standard deviation, median and range. Questions were then further stratified by level of training (MBBS 3 and 5) and by ward (PMW, PHO, and NNU); these stratified questions were again assessed for mean, standard deviation, median and range.

7.4.4.2.3 - Trainee Surveys (MSLQ & ECI)

The MSLQ and ECI trainee surveys were each scored according to its individual method as available; where applicable, negative items were scored in reverse. Each individual question, sub-category and overall survey responses were calculated for mean, standard deviation, median and range values.

7.4.4.3 Mixed methods data analysis

Refer to *Chapter 3 – Methods* for details.

7.4.4.4 CRITICAL REFLECTION DATA ANALYSIS

Refer to *Chapter 3 – Methods* for details.

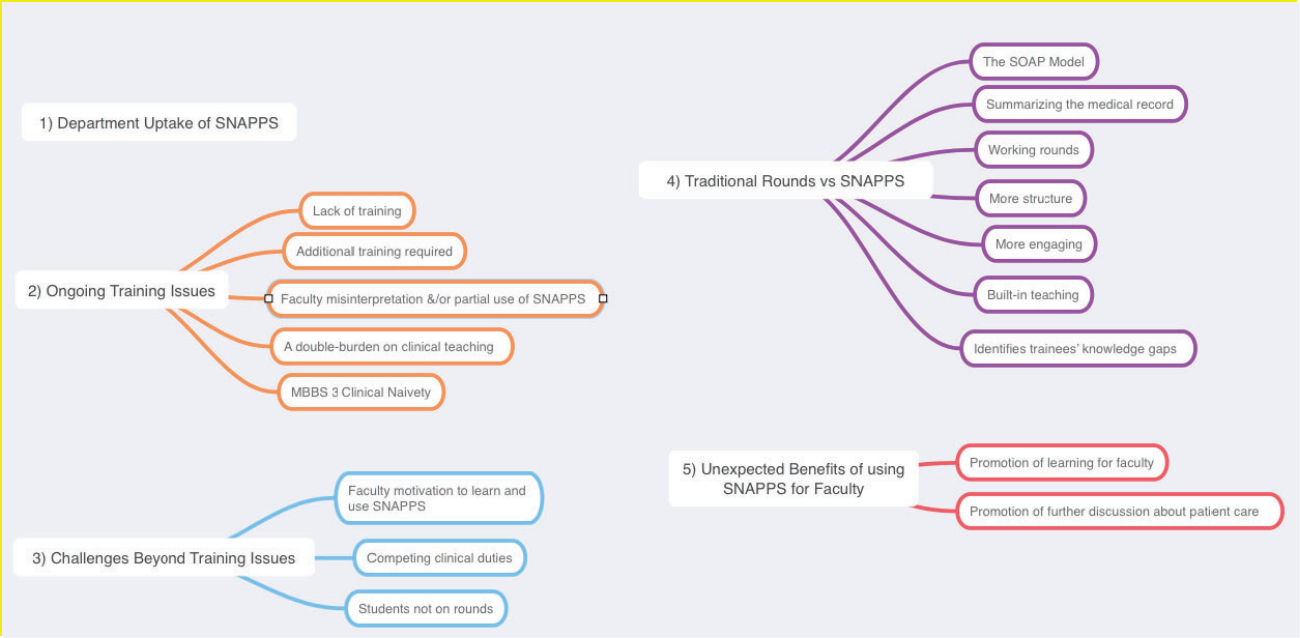
7.5 OBSERVE: PHASE 3 - CYCLE 2

7.5.1 CYCLE 2 – QUALITATIVE RESULTS

During Cycle 2, all informal observations and comments about the uptake and acceptance of SNAPPS was captured in my action research journal weekly. A total of nine faculty members (not including myself) formally contributed to the ongoing SNAPPS Debrief dialogue; I captured five weeks of my own clinical service using the SNAPPS Debrief guide. In addition, three department meetings attended by faculty and senior residents were held; the feedback from these meetings was supplemented by informal SNAPPS debrief conversations capturing feedback from a total of 10 faculty and senior residents. And a total of 4 trainee SNAPPS Debriefs were held, capturing junior residents and two different groups of rotating medical students. FRL and TRL open-ended responses from faculty (n=6) and trainees (n=30) were also included in the qualitative thematic analysis.

From the above data sources, two separate qualitative analysis emerged: the first reflected the uptake of SNAPPS for the entire department. *(Figure 58)* And the second reflected my own personal story of using SNAPPS. *(Figure 59)* For the first qualitative analysis, a total of five themes and 17 sub-themes were identified during the thematic analysis. For the second qualitative analysis, a total of three themes and six sub-themes were identified during thematic analysis.

FIGURE 58: A) CYCLE 2 - RESULTS OF THEMATIC ANALYSIS



7.5.1.1 A) CYCLE 2 – RESULTS OF THEMATIC ANALYSIS

7.5.1.1.1 - 1) DEPARTMENT UPTAKE OF SNAPPS

After three months of introducing SNAPPS to the department, by mid-October all of the initial training had been completed. Passing comments from trainees and faculty captured the level of impact this training campaign had made within the department.

"I heard a resident say to a 3rd year student – 'Ok, SNAPPS!' and looked over and saw that the student was holding the SNAPPS trainee rounding log as a guide while he was doing his pre-round. . . . I had not worked with either the resident or the student with SNAPPS before - it was amazing – starting to hear 'SNAPPS' on the ward as a common term!" (ARJ; SM)

Examples of faculty taking the initiative to use SNAPPS on their ward rounds and a general sense of students wanting to partake in SNAPPS was slowly becoming apparent.

"I wanted to try to use it [SNAPPS] today, so even though this group of students hasn't been trained yet, [I gave them] an introduction to SNAPPS yesterday." (Faculty)

And ongoing general reflection from students using SNAPPS continued to be positive –describing it as *"a good thing"*, and *"a useful and helpful tool for learning about patients". (Group 2 student debrief)*

Most encouraging was the inclusion of SNAPPS training as part of the student rotation bedside teaching schedule.

"I'm on the roster!!! They actually put SNAPPS training as part of the Paeds rotation for medical students to be trained in SNAPPS!!" (ARJ, SM)

Yet, despite the apparent infusion of SNAPPS into the ward culture, it was also evident that most faculty were not using SNAPPS on their ward rounds.

"Our attending did not know about SNAPPS so it was difficult to use it." (MBBS 5)

And overtime, there was a waning exposure to SNAPPS for trainees. For the first group of SNAPPS-trained students, all but two had practiced SNAPPS at least once during their Paediatric rotation, but by mid-rotation for the second group, many students hadn't had the opportunity to practice SNAPPS at all, and of all the residents, only a handful of them had ever used it. *(Student & Resident debriefs)*

"The students reported that they like SNAPPS, but don't get a chance to use it much." (Group 2 student debrief)

And at the leadership level, the SNAPPS project was still not fully understood.

"[Dept Leader] referred to SNAPPS as an 'audit' of the Department." (ARJ; SM)

And it was not considered a department priority as no mention of the educational series or SNAPPS was included on the Faculty Retreat agenda.

7.5.1.1.2 - 2) Ongoing Training Issues

7.5.1.1.2.1 - Lack of training

Part of the poor faculty uptake of SNAPPS was due to low attendance during the initial training sessions. When probed during a department meeting why more faculty weren't using SNAPPS, several sited that they had never been trained in SNAPPS due to scheduling conflicts.

"I haven't been trained in SNAPPS. I've always had scheduling conflicts, even for the re-cap sessions." (Faculty)

7.5.1.1.2.2 - Additional training required

But even faculty trained in SNAPPS were reluctant to use it on their ward rounds.

"I felt I needed more training to do SNAPPS." (Faculty)

"He said that he'd had SNAPPS training, but didn't feel confident to use it on real rounds yet." (Senior Resident)

For the trainees and faculty who had received SNAPPS training and had tried to use on their rounds, they expressed that the didactic training was insufficient for them to be prepared to use on rounds. Both faculty and trainees indicated that bedside training was needed to supplement the didactic course.

"A session for teaching SNAPPS should not be once off thing." (MBBS3)

"It'd be great if you joined my rounds to help me teach/do SNAPPS." (Faculty)

In addition, many trainees expressed that the use of SNAPPS reflected an ongoing learning curve.

"Still learning how to use SNAPPS." (MBBS 5)

7.5.1.1.2.3 - Faculty misinterpretation and/or partial use of SNAPPS

More worrisome, trainees expressed that some faculty were inconsistent with their use of SNAPPS and may not be doing it 'correctly'.

"Some [faculty] call it SNAPPS, but it's really just a normal ward rounds and not 'SNAPP-y'." (Group 1 student debrief)

"The students suggested that I join the other faculty's rounds and watch how they conduct SNAPPS and help to train them better, because different faculty have interpreted it differently." (Group 1 student debrief)

"I'm worried [Faculty X] might be using SNAPPS wrong somehow." (ARJ, SM)

Faculty and trainees described scenarios where only parts of SNAPPS were being used on rounds; generally only Summarize and Plan steps were being used and the Narrow-Analyse-Probe and Select steps were being excluded.

"It became apparent very quickly during the debrief that he basically is just using the Summarize & Plan steps of SNAPPS." (Faculty debrief; SM)

"Sometimes because of time we just give a Summary of the case especially if the patient is known." (MBBS 5)

7.5.1.1.2.4 - A DOUBLE-BURDEN ON CLINICAL TEACHING

Faculty who tried using SNAPPS also expressed concern that it added an additional responsibility to the faculty role on rounds – now they weren't only obligated to teach about clinical issues, but also needed to direct and train students how to use SNAPPS during the ward round.

". . . when they struggle, I struggle. The struggle is having to walk them through SNAPPS and *then teach to their medical questions. So it's a double layer of teaching to 1) get them to use SNAPPS correctly,* and *2) teach the clinical issue." (Faculty)*

7.5.1.1.2.5 - MBBS 3 CLINICAL NAIVETY

As was found in Cycle 1, several faculty continued to express that MBBS 3 students had challenges using SNAPPS and required more training.

"MBBS 3 still struggle, but MBBS 5 and residents are good." (Faculty)

In response, some faculty chose to modify SNAPPS for the MBBS 3.

" 'Plan' – 5th years, Interns, and Residents use this fine, but 3rd years just stop and leave it blank until the end of rounds, so for 3rd years, I used just S-N-A." (Faculty)

Despite these apparent challenges, one aspect of SNAPPS that MBBS 3 seemed to engage quite well with the Probe step of SNAPPS.

" 'Probe' . . . that's when the 3rd years were really engaged and asked a lot of questions." (Faculty)

BOX 9: PAOR - RESPONSE TO ONGOING TRAINING ISSUES

Plan: In response to the above feedback, I wrote an email to the department outlining my plan to address their identified needs, including offering 'real time' SNAPPS training (by either going to their rounds or them coming to my rounds), and an additional SNAPPS re-cap session.

Act: Over the next couple of weeks I continued to send emails and make myself available for additional SNAPPS training and/or to have people join my rounds. I attended the ward rounds of one faculty member, and two different clinic days of another faculty member.

Observe:
"[Faculty X] used SNAPPS this week. I went on her rounds for two patients. She did a good job – still needs to prompt team to use the steps properly, but I think she's doing a good job using SNAPPS." (ARJ)

"I went to [Faculty Y's] clinic today. I was there during four patient encounters but only one was used as a teaching case. The teaching did not use the SNAPPS model of teaching, but instead was very 'teacher-centred' – with specific questions directed at the resident without her having the opportunity to Summarize, Narrow or Analyse the case." (ARJ)

Other than the above, no other faculty invited me to attend their rounds, no one came to my rounds, and no one RSVP-ed for the re-cap session.

Reflect: The persistent lack of faculty interest in SNAPPS training despite the previous meetings whereby the faculty needs had been identified and solutions to address those problems were not utilized made me come to the conclusion that there might be other underlying issues resulting in a lack of faculty motivation.

Plan/Act: To try to determine the persistent lack of involvement and interest in the project, I went to individual faculty (instead of a group forum) to get their feedback about their motivation to learn or use SNAPPS.

BOX 10: PAOR - SNAPPS POCKET CARD

Observe: Feedback from faculty suggested that having the SNAPPS steps outlined and accessible for trainees improved SNAPPS usage on ward rounds.

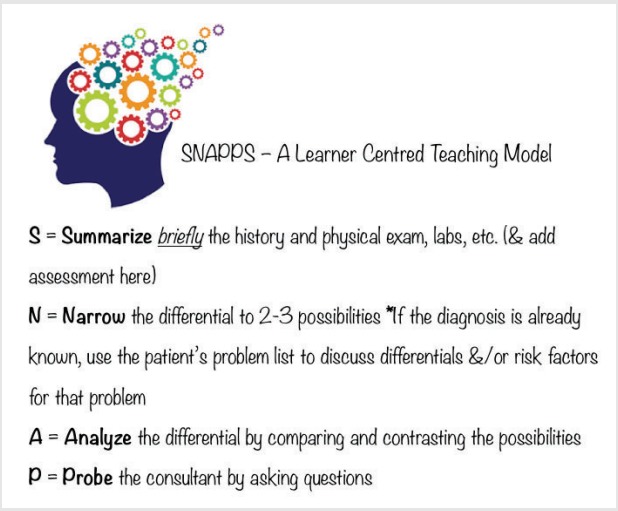
"Really helpful if schematic in front of students; difficult for students to 'train their brains' to new style." (Faculty)

Reflect: Based on this feedback, I wanted to create a pocket-sized SNAPPS aid for faculty and trainees to use while on rounds.

Plan: During my initial literature review, I had seen an online video of "SNAPPS training" and saw the faculty member use a SNAPPS pocket card to discuss SNAPPS with the residents. The card had a small brain in the corner to emphasise "critical thinking". I replicated this idea for our project.

Act: I made several versions of the card and shared with the project team and trainees for feedback prior to printing. The end result was a colour, laminated, two-sided pocket-sized SNAPPS card with a hole punch to easily place onto a lanyard. As part of future SNAPPS training sessions, the SNAPPS card with a lanyard was distributed.

(Front)



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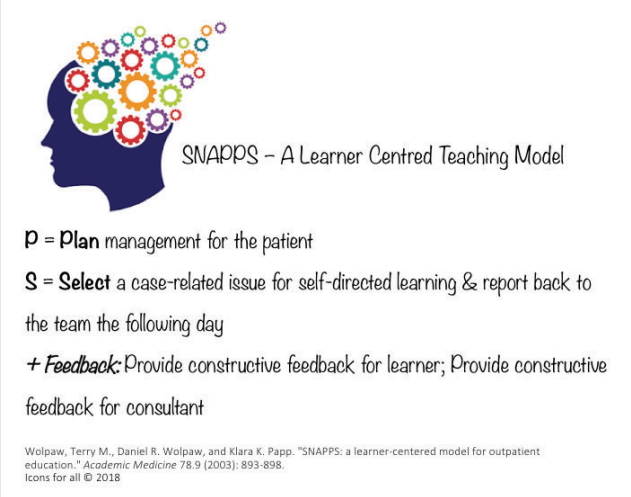


Observe: Trainees were seen wearing these during their ward rotations, and were frequently used during ward rounds to remind trainees of the SNAPPS steps.

7.5.1.1.3 - 3) Challenges Beyond Training Issues

7.5.1.1.3.1 - Faculty motivation to learn and use SNAPPS

Of the faculty members not trained in and/or not using SNAPPS, the most commonly cited reason for their lack of motivation to either learn or use SNAPPS was competing priorities.

"My motivation to learn SNAPPS is 0 out of scale of 1-10 since my MMed deadline was moved up. I want to do it when I have all my energy and see what it's all about. Maybe next year I'll be interested and give it a go." (Senior resident)

For some faculty, this lack of motivation extended beyond SNAPPS training, but included other aspects of the work place indicating possible faculty burnout.

"A lot of competing priorities . . . so finding time to get into SNAPPS has been very difficult. My motivation is only a 4/10, but this isn't just for SNAPPS, but for anything because of feeling burned out." (Faculty)

Whereas the other faculty who were more consistently using SNAPPS had much higher levels of motivation.

"I'm still motivated to learn and use SNAPPS – I've found it efficient in time management and teaching, I think it's a good thing." (Faculty)

7.5.1.1.3.2 - COMPETING CLINICAL DUTIES

"Time", "large census", "procedures", "interruptions" and generally being *"busy"* were frequently cited as barriers to using SNAPPS, reverting the ward round into a *"working* [or] *business rounds". (Faculty)*

"This was a very difficult week to use SNAPPS. The service was incredibly busy. We did use SNAPPS, but it was hard to do for every patient. Especially when we needed to move rounds along and I just wanted to make the plan and get to the next patient." (Faculty, SM)

7.5.1.1.3.3 - STUDENTS NOT ON ROUNDS

An unexpected but obvious hindrance to practicing SNAPPS on the ward round was students not being available for the pre-round or ward round secondary to didactic sessions being conducted in the morning or being pulled for outpatient clinic duties.

"Still wasn't able to use it [SNAPPS] at all this week, because the students were still being pulled so much away from the pre-round and rounds for clinic, PBL [problem based learning], post-call, etc." (Faculty)

BOX 11: PAOR - RESPONSE TO STUDENTS MISSING THE WARD ROUND

Observe: The lack of student attendance to the pre-round and rounds became an ongoing issue, not just for SNAPPS use, but for their participation in ward rounds in general.

Plan/Act: In response, I sent an email to the MBBS 5 Coordinator to address the matter.

Observe: This email led to a department meeting to discuss the issue of lack of 5th years on the pre-round and rounds. It was determined that in addition to not scheduling didactic sessions in the morning (which was already department policy), changes were made in the MBBS 5 schedule to allow students to attend the pre-round and ward rounds.

7.5.1.1.4 - 4) TRADITIONAL ROUNDS VS SNAPPS

Despite the built-in similarities to a traditional ward round, using SNAPPS was obviously something new that required a new set of skills from both faculty and trainees. During Cycle 2, several comments and reflections began to paint a more detailed description of the 'traditional' rounds within the department, and how this differed from the SNAPPS model of ward rounds. Three main features of the 'traditional' round were identified: 1) use of the 'SOAP' model, 2) reading of the entire medical record, and 3) conducting working rounds.

7.5.1.1.4.1 - THE S-O-A-P MODEL

It became apparent that the traditional format of rounds used in the department followed the SOAP model.

"Since we traditionally use the SOAP method of teaching, how does SNAPPS fit into that?" (Faculty)

The comfort with the SOAP method as the traditional format of conducting the ward rounds was further illustrated by the fact that often faculty only used the Summarize and Plan steps of SNAPPS, skipping the NAP-S steps which were new additions from the traditional format.

"We use it . . . but only parts of SNAPPS – the Summarize and Plan. (Group 2 student debrief)

7.5.1.1.4.2 - SUMMARIZING THE MEDICAL RECORD

Another noted aspect of the traditional style of rounds was that traditionally trainees read the entire medical record during the ward round. Adapting to this alternative method from reading the entire medical record to summarizing the medical record was challenging for both faculty and trainees.

For faculty, there seemed to be a fear that if the medical record was summarized, then they would miss out on important patient information.

"I don't have the students or residents Summarize for new admissions because I want to hear everything for all new admissions, . . . but the next time we round on the patient, then I ask them to use SNAPPS. (Faculty)

"A bit different, I'm used to the traditional style. I had to adjust my teaching and I found I didn't trust the students fully to Summarize for new patients." (Faculty)

This lack of trust in the trainees to Summarize the medical record revealed a deficiency in the trainees' skill set to appropriately summarize pertinent clinical positives and negatives.

"Students, especially 3rd years, are learning how to triage information; sometimes when I chart review later in the day or week, I find pieces of missing information that was important." (Faculty)

"I found that if I used it too often, it would actually slow my rounds down because often the students would Summarize too much and would miss important information, so I'd have to ask for more information." (Faculty)

"Summary was too short, I still wanted a bit more relevant details. I asked for 'the headline' but still getting too much irrelevant details included in the Summary and missing the relevant ones." (Faculty)

Trainees expressed that Summary was faculty-dependent and that a different level of summary was wanted by different specialists.

"It was difficult to tell if my specialist wanted me to Summarize or to tell the whole history and exam." (MBBS 5)

"The success of Summary of SNAPPS depends on the specialist; sometimes they say its ok, sometimes they think it's not enough." (MBBS 5)

For some faculty, they felt that the 90-minute SNAPPS training alone should have been sufficient to teach this important skill set.

"My assumption is that if they had SNAPPS training, then they should know how to use SNAPPS and know how to Summarize the known patients." (Faculty)

7.5.1.1.4.3 - Working Rounds

Additionally, what became more apparent over time is how often the 'traditional' style of rounds is indeed a non-teaching or 'working-only' style of rounds.

"He reported using SNAPPS and really likes SNAPPS and thinks it's a good thing, but hard to use in NNU due to working rounds." (Dept Meeting)

BOX 12: PAOR - RESPONSE TO TRADITIONAL ROUNDS VS SNAPPS

Plan: Based on the feedback that SNAPPS diverged from the traditional ward rounds, I tried to provide context and additional information to help reconcile these issues.

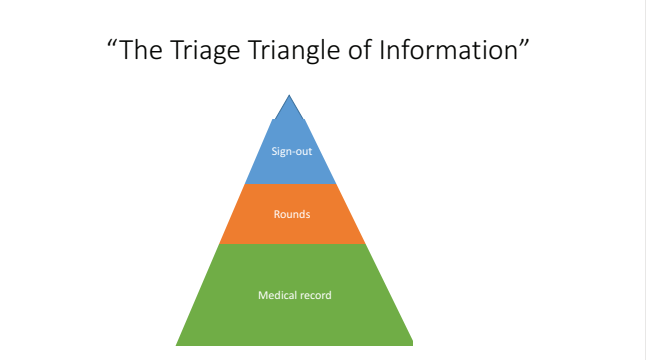
Act:

1) To the question: *"Since we traditionally use the SOAP method of teaching, how does SNAPPS fit into that?" (Faculty)*

My reply was,

"The Summarize of SNAPPS is essentially the S-O-A of SOAP (Summarize the history, physical exam; present new labs/imaging, give an assessment), but before moving directly to the Plan of SOAP, we pause to conduct learner-centred teaching: N-A-P is a space for the learner to apply high-level, cognitive thinking strategies to the case, followed by a bonus S – Select to ensure self-directed learning." (Faculty Retreat, SM)

2) In order to help clarify what is expected during a patient Summary, I used a "Triage Triangle of Information". I explained that the type and amount of information changes based on purpose of the information and the receiving audience. I.e. the medical record is to provide information to a physician who is not at the bedside with you and should document as much information as possible; is also used for nurse orders and is the medical-legal document for the patient. Versus the presentation on rounds is to present the pertinent positive and negative information to the attending paediatrician (who is physically at the bedside) to allow for teaching and patient care to occur. Versus the sign-out is to provide specific instructions and 'what if' scenarios to the on-call physician so that they can safely manage the patient overnight.



Observe/Reflect: I was able to explain this to incoming trainees for their SNAPPS training, but not the whole department.

7.5.1.1.4.4 - MORE STRUCTURE

Despite the offered structure of the traditionally used SOAP model, several faculty commented on the benefit of added structure to the ward round when using the SNAPPS model.

"It is something good to replace the past – more organized & all speaking same language on ward rounds." (Faculty)

"In the past, you feel rounds is a bit haphazard, but with the new format that you follow is helpful." (Faculty)

Trainees also felt that the SNAPPS model provided more direction and structure to the ward rounds.

"[SNAPPS] was a really good thing and that it was somehow faster than regular rounds, . . . and gave direction to the learning and was much better than the standard rounds." (Group 2 student debrief)

7.5.1.1.4.5 - More engaging

Additionally, as compared with the traditional format of rounds, SNAPPS appeared to be more engaging for faculty and trainees.

"Seemed less boring when students were presenting using SNAPPS." (Faculty)

"I think having the students Summarize forces them to be more focused; usually, if they haven't Summarized, then they will just be reading from the file and not looking at anyone, but when they have to Summarize, then they are not reading from the file and they are now looking around." (Faculty)

"I find it [SNAPPS] engages me more with the students, usually I kind of gloss over things because I have a good grasp of my service and what needs to be done, but when they pull me back into the specific Narrow or Probe of the patient, then I'm more engaged." (Faculty, SM)

7.5.1.1.4.6 - BUILT-IN TEACHING

Furthermore, as compared with the traditional rounds, faculty and trainees felt that SNAPPS offered more built-in teaching.

"It forced me to provide some teaching I wouldn't have otherwise. (Faculty, SM)

"I found it easy to do and I could see if you got into a rhythm of using SNAPPS, wouldn't delay rounds and would make you feel like you were teaching more on rounds." (Faculty)

"It is helpful, helps you narrow and think about your differential and gives you a chance to Probe." (Group 2 students debrief)

7.5.1.1.4.7 - IDENTIFIES TRAINEES' KNOWLEDGE GAPS

The SNAPPS model also helped to identify learners' knowledge gaps more readily.

"Has been helpful to identify that the students don't know what's being said on rounds, we wouldn't have known otherwise without SNAPPS." (Faculty)

"The Summary also helps me better understand where the student is and how much he/she is understanding the patient." (Faculty)

7.5.1.1.5 - 5) Unexpected benefits of using SNAPPS for faculty

Although SNAPPS was developed as a learner-centred model of bedside teaching, some unexpected benefits for faculty were identified with continued use of SNAPPS. Specifically, the use of SNAPPS promoted faculty learning and further discussion about patient care.

7.5.1.1.5.1 - Promotion of learning for faculty

The Probe and Select steps of SNAPPS were considered by faculty to be influential in their own learning. For Probe, sometimes the question asked was either unexpected or was unknown to the faculty, requiring him/her to look up the answer.

"I'm still learning a ton from the Probe." (Faculty, SM)

"I'm learning because the 3rd years would ask weird questions." (Faculty)

". . . we [faculty] laughed that we were doing our 'Probe homework'." (Faculty, SM)

In addition, the Select step encouraged ongoing faculty learning through reading.

"The system makes the attending read, too." (Faculty)

"This is why I love SNAPPS – you can give the consultant Select homework!" (Trainee)

7.5.1.1.5.2 - PROMOTION OF FURTHER DISCUSSION ABOUT PATIENT CARE

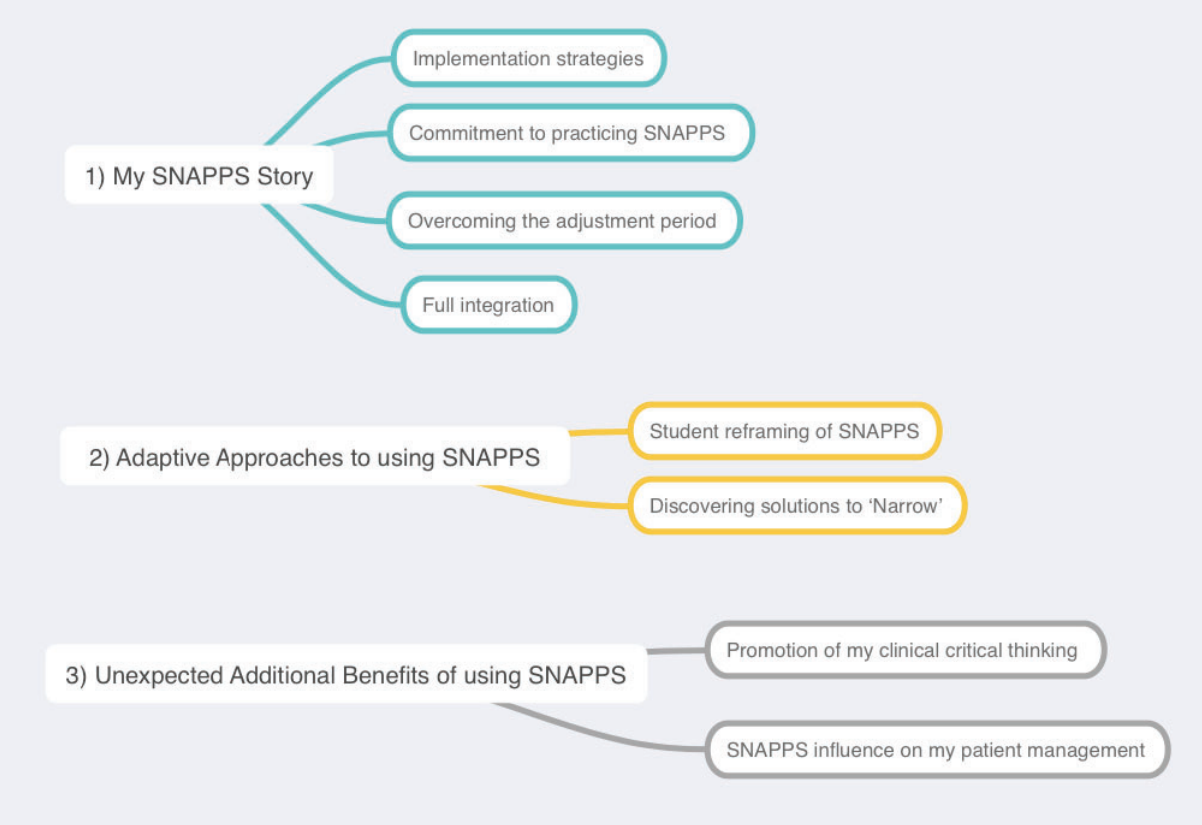
When prompted, several faculty described scenarios where the use of SNAPPS stimulated either further thought or discussion about their patient care.

"There was one patient with . . . a lot of Probing questions about him, of what we should use to treat, etc. So we looked at the case studies and literature, even asked Dr. X's thoughts and tried the patient on it [treatment] for a bit." (Faculty)

"We had a patient with pneumonia and we were discussing the differential [Narrow] of pneumonia, and talked about when you need to think about it being something else. So after rounds, [the Senior Resident] and I then had a further discussion of how long we'll let things go before considering working up or doing something else for this patient." (Faculty)

7.5.1.2 B) Cycle 2 – Results of thematic analysis

FIGURE 59: B) CYCLE 2 - RESULTS OF THEMATIC ANALYSIS



7.5.1.2.1 - 1) My SNAPPS Story

Initially in Cycle 1 and early Cycle 2, my own SNAPPS debriefs were similar to the debriefs provided by other faculty who were also testing SNAPPS. But with time, my SNAPPS debriefs began to diverge from the other faculty's debriefs. Toward the end of Cycle 2, many faculty debriefs began to focus on persistent challenges or waning motivation to use SNAPPS.

"I'm feeling a bit burnt out from SNAPPS. Initially, my motivation was about 8, but now is down to 5. There are a lot of competing priorities." (Faculty)

Whereas my debriefs became more descriptive of how SNAPPS was used for specific cases and consisted of deeper reflections of how SNAPPS facilitated and positively influenced my own clinical teaching and practice.

"Using the basic Narrow, Analyse, Probe – really helped me manage my patients on a 'non-teaching' service week. But because we still had to actually manage the patients, it turned into teaching just by using the tool. It was great!" (Faculty, SM)

7.5.1.2.1.1 - Implementation strategies

Part of this divergence may have been explained by differing testing and implementation strategies. Some faculty used a very slow implementation strategy – only using SNAPPS once or twice per week.

"I haven't implemented all the time – only partial. We used it once for one presentation per week." (Faculty)

Whereas I had tried to integrate it into my rounds at a much quicker rate with at least once per day.

7.5.1.2.1.2 - Commitment to practicing SNAPPS

Since SNAPPS is a model, it is likely that more practice led to more frequent use and integration into ward rounds.

"We used SNAPPS on a few patients each day – but it started to be a flow by the end of the week." (Faculty; SM)

But as described in Cycle 1, using SNAPPS was a new skill set for both faculty and the trainees, which meant that practicing SNAPPS required an initial increased effort during rounds. Unlike other faculty in the department, I had additional internal and external motivations to push through the increased effort required in order to practice SNAPPS on a more regular basis.

"I was sick, tired and wanted to do simple working rounds, but because I wanted to use SNAPPS, it forced me to provide some teaching I wouldn't have otherwise." (Faculty; SM)

"It was honestly such a busy week on rounds, if I hadn't wanted to use SNAPPS, we wouldn't have done much teaching that week." (Faculty; SM)

"This week using SNAPPS was a bit tricky because we had a very busy service – that said, we still used SNAPPS for at least one patient each day." (Faculty; SM)

7.5.1.2.1.3 - Overcoming the adjustment period

My continued efforts to practice SNAPPS on a regular basis resulted in a completion of the 'adjustment period', where now I was able to use SNAPPS without feeling the additional effort of using the new model. Additionally, it mitigated some of those common previously cited challenges.

"I felt SNAPPS went really quick this week and I was able to use it for all patients the entire week." (Faculty; SM)

"[SNAPPS] became a really nice way to go through a busy rounds." (Faculty; SM)

7.5.1.2.1.4 - Full integration

My persistent efforts to push through the SNAPPS' adjustment period resulted in a new level of comfort using SNAPPS and a full integration into my ward rounds.

"I'm back on service this week and have already used SNAPPS for every patient on rounds." (Faculty; SM)

The full integration was made further evident by the shared enthusiasm by my team for using SNAPPS.

"When we got to Probe, my MO said 'My favourite part of SNAPPS, Probe!'" (Faculty; SM)

"SNAPPS got to be such a routine and part of our discourse on rounds that when one student hadn't heard of the term 'pun' before (as in a double meaning for a word), we laughed and told him that was his Select for the day – 'Go look up 'pun'!'" (Faculty; SM)

7.5.1.2.2 - 2) Adaptive approaches of using SNAPPS

My new-found confidence in using SNAPPS opened the door for further adaptation and introduction of novel uses of SNAPPS to better accommodate our learning and teaching on ward rounds. This occurred at both a faculty and trainee level.

7.5.1.2.2.1 - Student reframing of SNAPPS

Students frequently using SNAPPS were noted to begin to reframe and modify SNAPPS to suit their learning needs.

"A student asked, 'Can the Probe come after the Plan? So we can ask why are we doing this or not doing that?'" (ARJ; SM)

"One student reframed Probe by stating 'My curiosities about the patient'. I loved it! Rather than 'Probe the consultant' . . . it's about 'what questions did the student have when pre-rounding this patient' – I thought it was a brilliant way to describe Probe." (ARJ; SM)

7.5.1.2.2.2 - DISCOVERING SOLUTIONS TO 'NARROW'

As was noted in Cycle 1, one of the most commonly cited issues with using SNAPPS from both trainees and faculty was how to Narrow a patient with an already known diagnosis. Often, this would result in abandoning the SNAPPS model for that patient presentation.

"It was difficult to do SNAPPS because it was a known patient." (MBBS 5)

With continued use of SNAPPS with real clinical scenarios, several solutions were developed. *(See PAOR Boxes)*

BOX 13: PAOR - SOLUTIONS TO 'NARROW' I) NARROW THE CAUSE OF A SECONDARY DIAGNOSIS FROM THE PATIENT'S PROBLEM LIST

Plan: In the situations when the primary diagnosis of the patient was already known (which is very common on our paediatric haematology-oncology service), I referred to a SNAPPS article that encouraged trainees to consider issues related to secondary diagnoses.[51]

Act: For example, '4-year-old male with Wilms tumour and hypertension' – since we already know his Wilms tumour is responsible for his presenting signs and symptoms, let's narrow the cause of his secondary diagnosis: hypertension.

"We used it for a 11yo male with newly diagnosed lymphoma and worsening headaches. We narrowed his headaches." (Faculty; SM)

Observe: This technique helped me to discuss and teach about the problem list and how it's important to address all aspects of the patient's issues during the admission, not to just focus on the primary diagnosis.

"*Some help needed to Narrow - we knew the main diagnosis, so we listed his problems and then picked one to Narrow." (Faculty; SM)*

Reflect: Overtime, this technique to 'pick something to Narrow' beyond the possible primary diagnosis developed into a more focused learner-centred teaching tool 'what do *you* want to learn about this patient today?'

BOX 14: PAOR - SOLUTIONS TO 'NARROW' II) NARROW THE INITIAL PRESENTING SIGNS & SYMPTOMS

Plan: Another solution to 'Narrow' was developed by my colleague. During her rounds, in the situations when the primary diagnosis of the patient was already known, she would have the trainees reflect back on the patient's initial presentation and ask them to narrow a specific finding.

Act: For example, '4-year-old male with abdominal mass caused by Wilms tumour' – since we already know his Wilms tumour is responsible for his presenting signs and symptoms, let's narrow other aetiologies of 'abdominal masses'.

"Narrowing was helpful. It would help us find other things to teach about - e.g. patient with known retinoblastoma, but what could be the differential for strabismus?" (Faculty)

Observe: This technique was very helpful in generating more meaningful differentials.

BOX 15: PAOR SOLUTIONS TO 'NARROW' III) NARROW RISK FACTORS THAT A PATIENT MIGHT HAVE FROM OR FOR A PRIMARY/SECONDARY DIAGNOSIS

Plan: We also considered the risk factors that a patient might have for a primary or secondary diagnosis.

Act: For example, '14-year-old female with spinal sarcoma complicated by paraplegia, now admitted with urosepsis' – what are her risk factors for urosepsis? Or 'What other pathologies might she be at risk for secondary to her paraplegia?'

"Since we already knew the patient's diagnosis, today we focused on the risk factors that could have caused her secondary diagnoses." (Faculty; SM)

Reflect: Not only did it allow the trainee to come up with a topic to focus on for the Narrow, but it allowed faculty to teach on the importance of anticipatory management in patient care.

"During the Analyse step, discussing patient risk factors was actually a great way to show how some of the patient's acute problems were actually related to our interventions (i.e. iatrogenic) – e.g. he developed pleural effusions after a transfusion volume overload; he developed hypertension secondary to steroids, etc." (Faculty; SM)

"Encouraged me to know some of complications that we have to watch out for." (Trainee)

BOX 16: PAOR SOLUTIONS TO 'NARROW' IV) NARROW THE NARROW

Plan: Another identified solution to Narrow was when, unprompted, a student narrowed his Narrow from the day before.

Act: *"The student Narrowed 'causes of hypokalaemia' as the problem: 1) vomiting 2) renal 3) diuretics, then the next day Narrowed 'vomiting': 1) acute gastroenteritis 2) medications, 3) pancreatitis, etc." (Faculty; SM)*

Observe: *"This was helpful to show how you can continue to analyse and critically think about issues going on with patients and not just stop short." (Faculty; SM)*

BOX 17: PAOR SOLUTIONS TO 'NARROW' V) NARROW THE PHYSICAL EXAM FINDINGS ONLY

Plan: Another solution was to focus the Narrow only on a physical exam finding.

Act: For example, '5-year-old male with brain tumour' – let's narrow other aetiologies of his physical exam finding of ataxia.

"We had a clinically stable patient with rhabdomyosarcoma admitted for social issues - we had been rounding on him for a couple of weeks, so today we just Narrowed his café au lait macules." (Faculty; SM)

"He described using a shortened version of SNAPPS (just the SNAP) in his clinic. Since the focus of the clinic is for the students to become skilled at doing a cardiac physical exam, he modified SNAPPS so that the students are only Summarizing the physical exam (not patient history) and coming up with a differential (Narrow) just based on the physical exam alone. This is then followed by Analyse and Probe." (Faculty Debrief)

Reflect: Not only did this help focus the importance of a good physical exam, this also led to the Probe or Select being about how to properly conduct or practice specific physical exam skills.

BOX 18: PAOR SOLUTIONS TO 'NARROW' VI) START WITH A PROBE, THEN NARROW

Plan: Sometimes we would use a Probe to help set us up for the Narrow.

Act: For example, "Why does a patient with relapsed acute lymphoblastic leukaemia (ALL) have pancytopenia when she hasn't had chemotherapy in months?" Is it relapse itself? acute infectious bone marrow suppression?, etc." "What could cause acute arm swelling in this ALL patient on treatment?: hematoma? abscess? malignant mass?"

"Sometimes I'd bring questions I had about patients, e.g. 'How should I manage this?' and then as a team we'd N-A together." (Faculty; SM)

Observe: "*The use of having a Probe (or basic question about a patient) set us up nicely to use SNAPPS, N-A, and then Probe again – became a really nice way to go through a busy rounds." (Faculty; SM)*

BOX 19: PAOR SOLUTIONS TO 'NARROW' VII) USING SELECT TO BROADEN THE NARROW & DEEPEN THE ANALYSIS

Observe: Sometimes I'd find the students would give a 'generic' narrow, e.g. "microcytic anaemia: sideroblastic anaemia, lead poisoning, iron deficiency anaemia," but were unable to really analyse their differential.

"I've noticed that the students are often good at reciting a differential but the Analyse in SNAPPS forces them to expand and shows their weakness of understanding the diagnoses they've just listed." (Faculty; SM)

Plan: In these cases, I would suggest that the trainee use their Select to deepen their understanding of their Narrow. Other times, if they weren't able to come up with a differential at all, I'd suggest that they use their Select to find a list of differentials to broaden their Narrow.

Act: *"They had to report on what exactly was "sideroblastic anaemia" or "lead poisoning" etc. and how it caused anaemia. Some of these things I hadn't reviewed in a while so it was a nice review for me as well." (Faculty; SM)*

"The student listed 'leukaemia' in her differential, but since she was unsure about leukaemia in general, I used her Select to be our teaching topic the following day. After we'd read and discussed an article, we then used SNAPPS again to Narrow, Analyse and Probe several of the patient's issues and management (e.g. why is she on hyper-hydration? why is she on allopurinol?, etc.)" (Faculty; SM)

Observe: *"This technique allowed us to Narrow and Analyse patient issues in a more in-depth way." (Faculty; SM)*

"We'd say 'so let's discuss yesterday's Select in more detail and see how that might change our Narrow from the day before'." (Faculty; SM)

BOX 20: PAOR SOLUTIONS TO 'NARROW' VIII) NARROW ON THE SPOT WITH ONLINE RESOURCES

Observe: Often with difficult and complex patient cases, I would find myself using online resources at the bedside to broaden our differential.

"Each day I would say aloud to the MO – it's not obvious, we need to broaden our differential so let's look up what else it could be. During rounds, we would use Up-to-date to help us generate a broader Narrow and then we Analysed the for/against in his case for each." (Faculty; SM)

Plan/Act: I started to use this technique of looking up differentials at the bedside quite frequently – depending on the case and clinical scenario.

7.5.1.2.3 - 3) UNEXPECTED ADDITIONAL BENEFITS OF USING SNAPPS

Overtime, my reflections of using SNAPPS during my clinical teaching service began to describe additional unexpected benefits for me as both a teacher and a clinician – particularly in relationship to my critical thinking and patient management – in many ways, SNAPPS went beyond a teaching tool, but also became a clinical tool.

7.5.1.2.3.1 - PROMOTION OF MY CRITICAL CLINICAL THINKING

Using SNAPPS on rounds became a more integrated part of my clinical thought processes.

"I found myself even using it [SNAPPS] at home, alone, while thinking about my patients – Narrow – Analyse – Probe (what questions do I still have and who do I need to ask?)" (Faculty; SM)

"SNAPPS has become a 'go to' tool for me to structure my thought process – I'm using it as a technique for challenging patients, not just for teaching." (Faculty; SM)

7.5.1.2.3.2 - SNAPPS INFLUENCE ON MY PATIENT MANAGEMENT

My continued use of SNAPPS led to more in-depth discussions and questions about patients which I believe ultimately positively influenced my patient care.

"Even though it was a non-teaching holiday week, because I was feeling very overwhelmed by the patient . . . I found myself using SNAPPS each day when I rounded on him to help me get through his acute problems and walk my way through his broader bigger issues as well." (Faculty; SM)

"Clinically, SNAPPS was very useful to me this week. I had one very complex patient . . . so I used SNAPPS to walk through this very difficult case . . . And because we stood around walking ourselves through these questions: Probe – Narrow – Analyse, this definitely changed my management plan." (Faculty; SM)

7.5.2 CYCLE 2 – QUANTITATIVE RESULTS

7.5.2.1 FACULTY ROUNDING LOG

A total of six faculty (including myself) completed the faculty rounding log from 8 October thru 16 January, capturing a total of 77 ward rounds. (*Note*: while Cycle 2 was retrospectively determined to have "ended" in mid-December, reflection of Cycle 2 continued into January, and therefore, Cycle 2 data collection continued to occur into Cycle 3). The non-teaching holiday weeks (Christmas and New Year's) were removed from the data analysis, leaving us with a total of 67 ward rounds for analysis.

Each ward round lasted an average of 1hr 39min, with an average of 16 min per patient. When stratifying by 'No SNAPPS use' or 'Some SNAPPS use', the length of rounds and the time spent per patient was very similar: 'No SNAPPS Use' (1hr 47min, with 16 minutes per patient); 'Some SNAPPS Use' (1hr 36min, with 17 minutes per patient). (*Figure 60)*

The average number of patients rounded on per day was 6.7 (SD 3.0). Of those patients rounded on, the average use of SNAPPS to present a case was 33%, (mean 2.1; SD 2.7). *(Figure 61)* Data was then stratified to remove my personal FRL results from the other five faculty members.

My FRL accounted for 17 of the 67 ward rounds captured, (F6 = 17 ward rounds). My average length of rounds was 1hr and 39min, with an average of 16 minutes spent per patient. Of these 17 ward rounds, I rounded on an average of 6.5 patients per day (SD 2.6). My overall average percent of presentations using SNAPPS was 86% (median 5, range 3-11). (*Figure 62)*

The remaining five faculty FRLs accounted for 50 of the 67 ward rounds captured, (F1 = 5, F2 = 10, F3 = 5, F4 = 10, F5 = 20 ward rounds). The average length of rounds was 1hr 40min, with an average of 17 minutes spent per patient. Of the 50 ward rounds, the average number of patients rounded on were 6.7 per rounds (SD 3.1). Their overall average percent of presentations using SNAPPS was 15% (mean 0.9, SD 1.7). (*Figure 63 & Figure 64)*

FIGURE 60: FRL LENGTH OF ROUNDS & TIME PER PATIENT

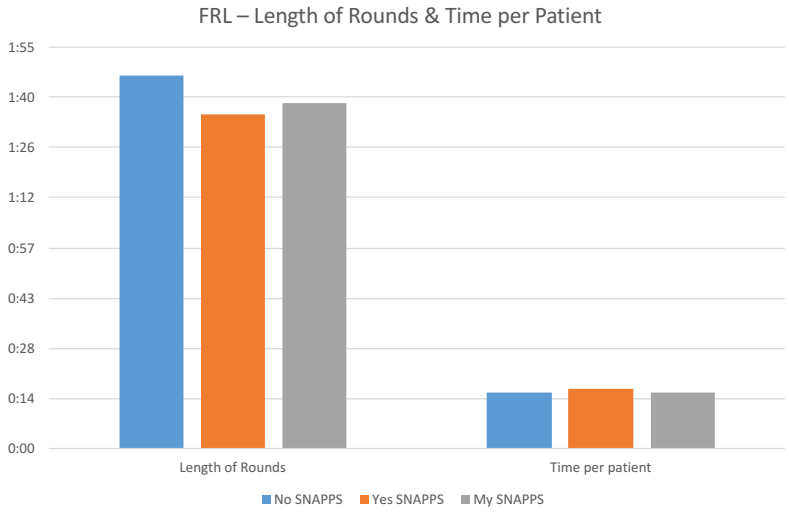


FIGURE 61: OVERALL FACULTY SNAPPS USE

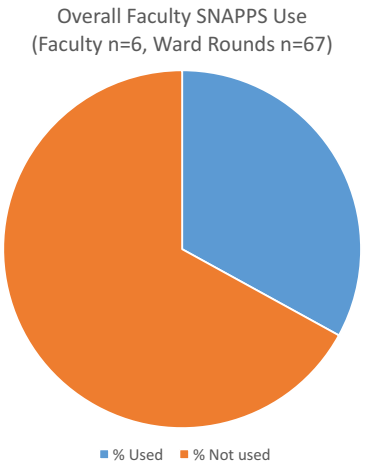


FIGURE 62: MY SNAPPS USE

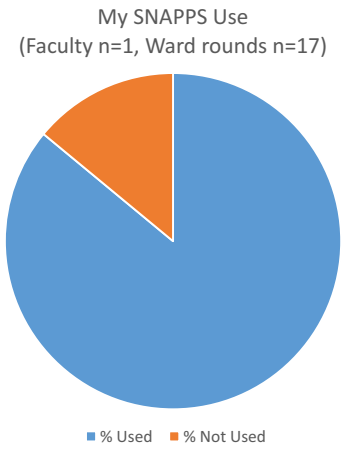


FIGURE 63: FACULTY SNAPPS USE (NOT INCLUDING MY RESULTS)

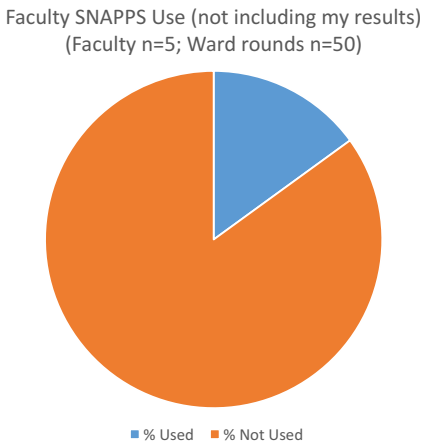
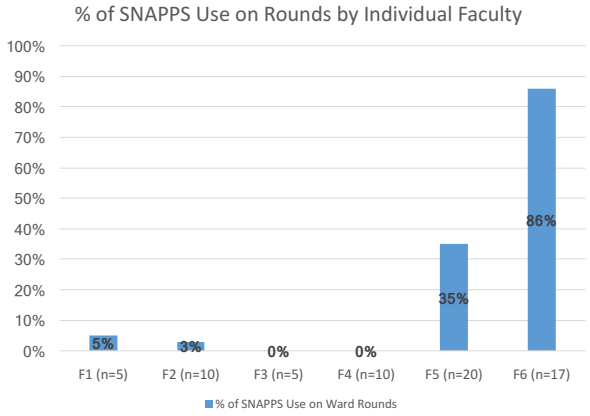


FIGURE 64: PERCENTAGE OF SNAPPS USE ON ROUNDS BY INDIVIDUAL FACULTY



7.5.2.2 Trainee Rounding Log Results

Two groups of medical students rotated through the department during Cycle 2. For the first group, TRL data was captured weekly from 8 Oct – 15 Nov from 15 MBBS 3 and MBBS 5 students. This data resulted in an account of 139 patient presentations, of these 37 were presentations where SNAPPS had been used.

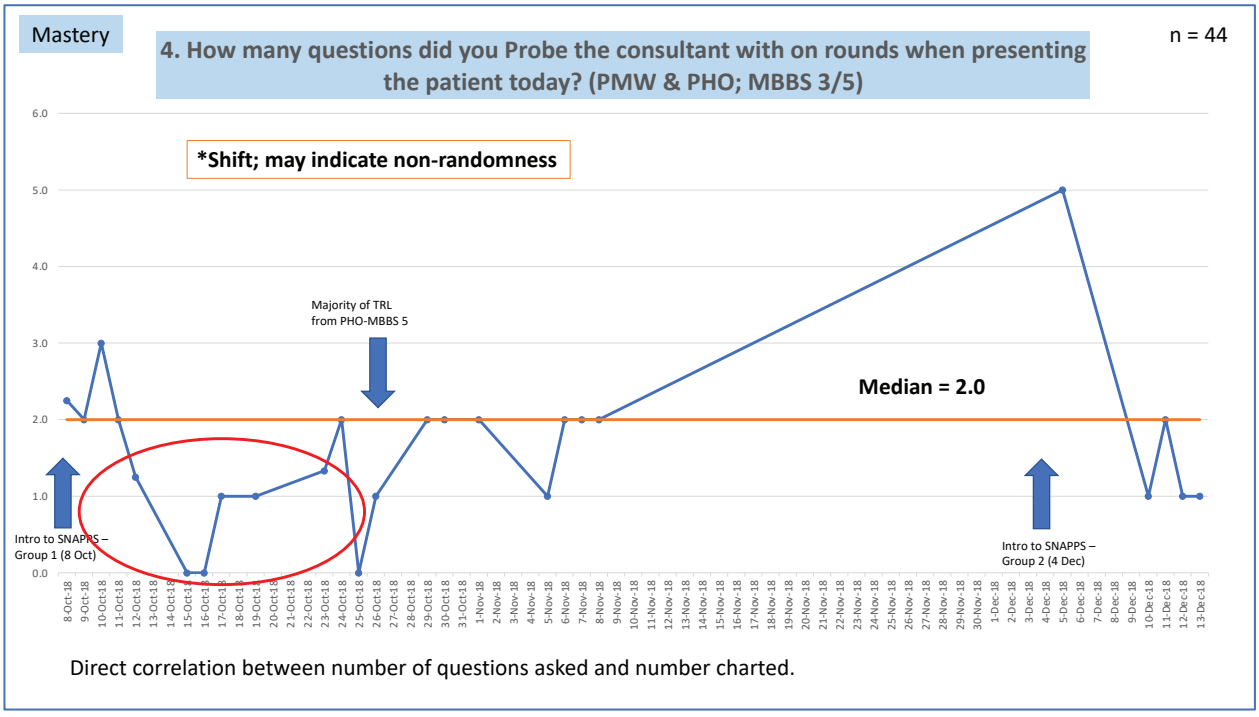
For the second group, TRL data was collected weekly from 28 November thru 20 December, from 19 MBBS 3 and MBBS 5 students, accounting for a total of 34 patient presentations, of which only 7 were reported to have used the SNAPPS model.

7.5.2.2.1 - RUN CHART ANALYSIS RESULTS

Of the 13 run charts created based on the TRL results, five questions (Q. 4, 8, 9, 10 and 11) showed shifts within the data which may indicate a possible sign of non-randomness; the remaining did not show evidence of non-randomness. *(Appendix E.32)*

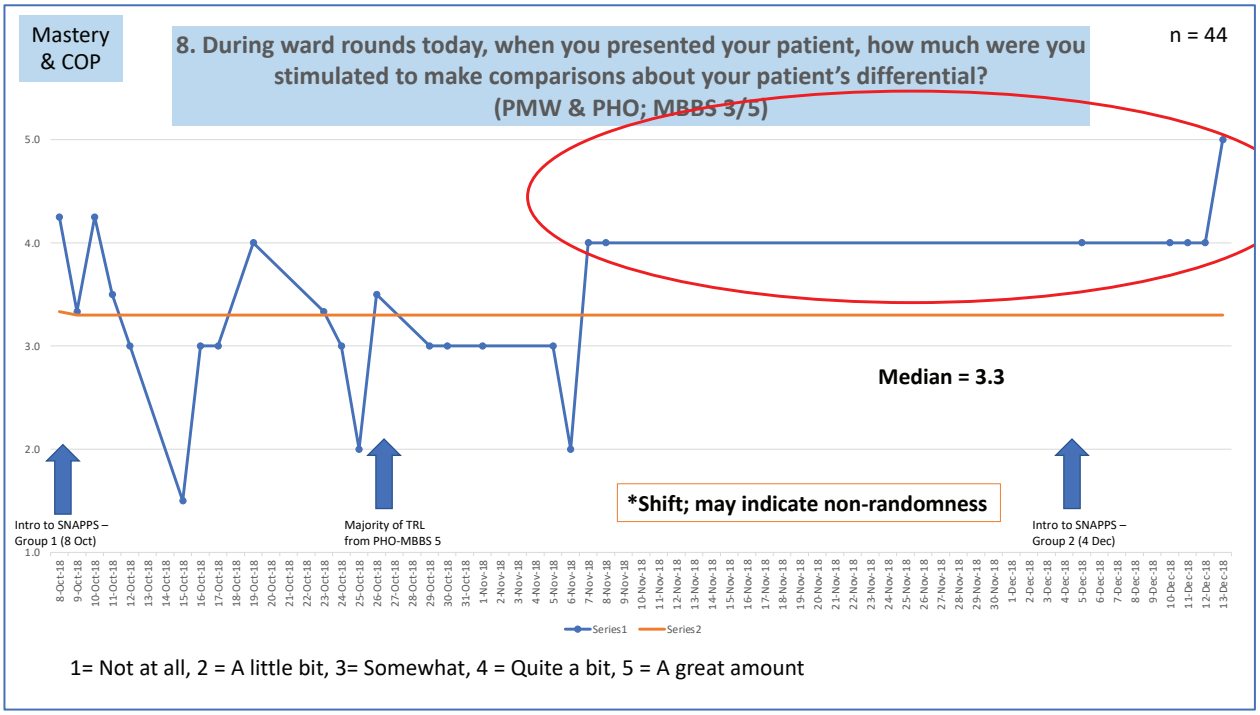
Question 4 showed an early decrease in number of Probe questions asked, but then returned to a random state. This suggests that the Probe step of SNAPPS was not consistently being used within the SNAPPS model, particularly during the early stages of SNAPPS introduction. *(Figure 65)*

FIGURE 65: TRL QUESTION 4 RESULTS



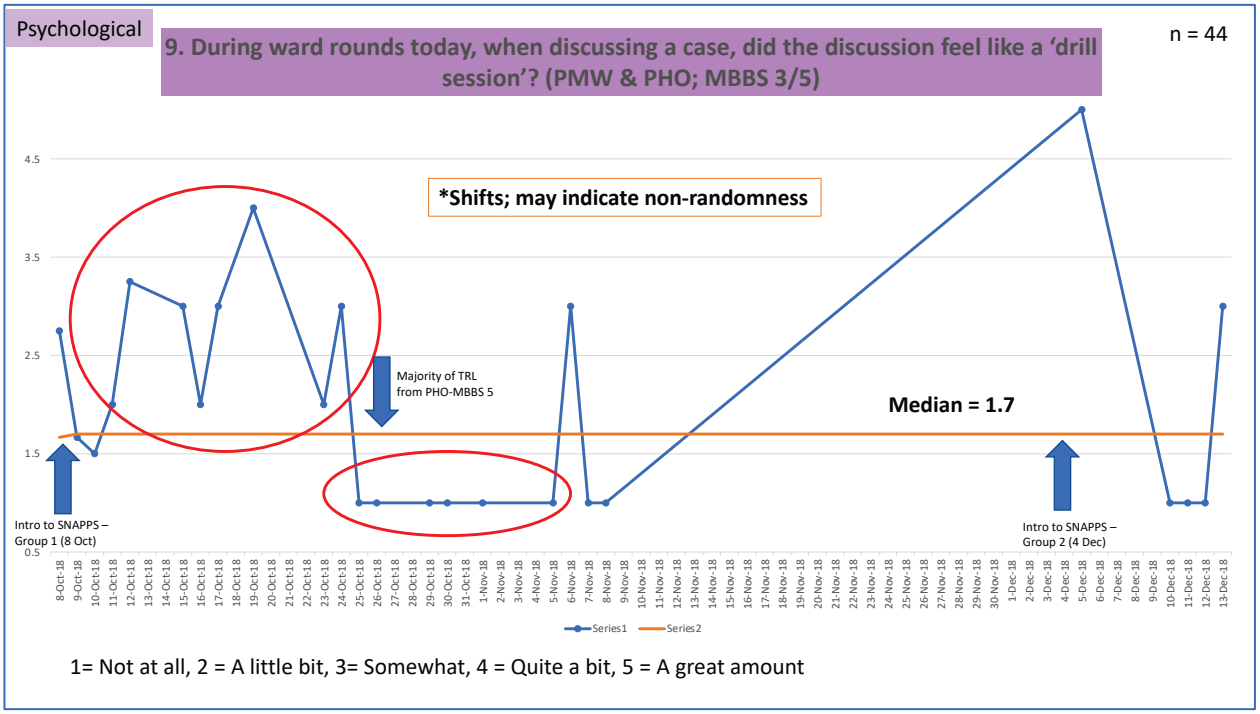
Question 8 shows an upward shift in increased trainee stimulation to make comparisons about patient's differential diagnosis (i.e. Analyse step of SNAPPS). This shift may indicate that with more consistent use of SNAPPS, trainee stimulation for critical thinking improved. *(Figure 66)*

FIGURE 66: TRL QUESTION 8 RESULTS



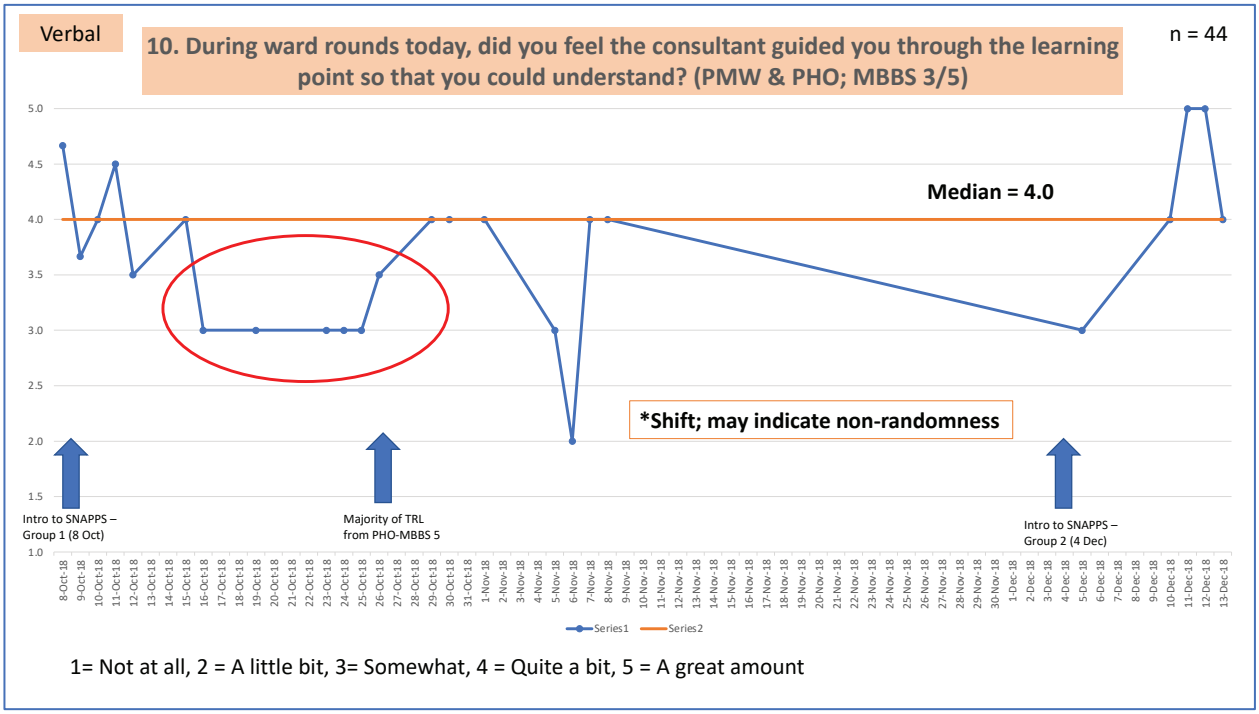
Question 9 shows two shifts. The first was a negative upward shift of rounds more consistently feeling like a 'drill session', and then was subsequently followed by a downward positive shift of rounds feeling less like a 'drill session'. The upward to downward shift corresponded with the majority of TRL responses being from PHO-MBB5 on my ward rounds, which may indicate that the consistent use of SNAPPS improved the psychological experience of rounds, but this positive downward shift was not sustained. *(Figure 67)*

FIGURE 67: TRL QUESTION 9 RESULTS



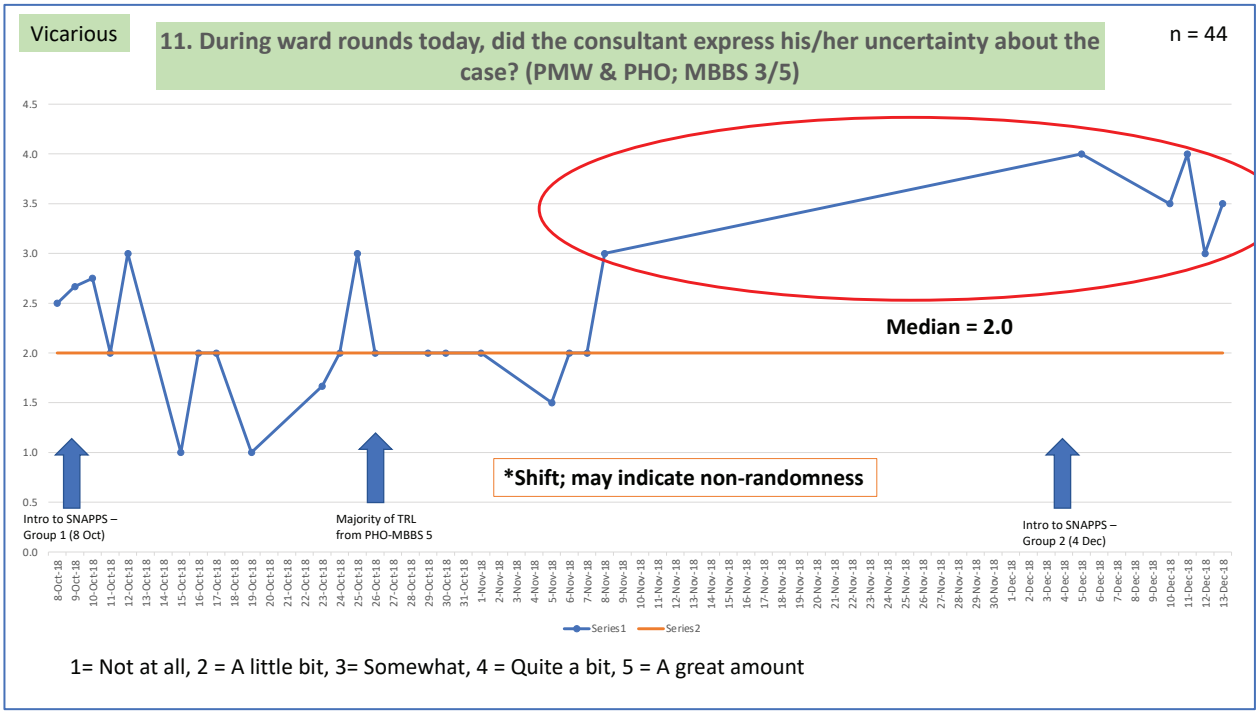
Question 10, similar to Question 4, shows an early downward shift in lower trainee perceptions of being guided by consultant through learning points, followed by a random state. This suggests in the early usage of SNAPPS, faculty guidance was not high. *(Figure 68)*

FIGURE 68: TRL QUESTION 10 RESULTS



Question 11, similar to Question 8, shows a later upward positive shift in faculty expression of uncertainty. This corresponds with majority of TRL responses being from PHO-MBBS 5 on my ward rounds, which may indicate that with consistent use of SNAPPS, faculty expression of uncertainty improved. *(Figure 69)*

FIGURE 69: TRL QUESTION 11 RESULTS



7.5.2.2.2 - DESCRIPTIVE ANALYSIS RESULTS

7.5.2.2.2.1 - 'SNAPPS-YES'

For the first group of students who completed the TRL, there was a total of 37 patient presentations which used SNAPPS (27% of all submitted TRL presentations). Of those, 62% occurred on PMW (n=23), 38% occurred on PHO (n=14) and 0% on NNU (n=0). Thirty-five percent were submitted by MBBS 3 students (n=13), and 65% were submitted by MBBS 5 (n=24). *(Appendix E.33)*

Excluding Q.4 (which was a blank value range limit), the max score for the TRL is 60. For the 37 case presentations from both MBBS 3 and 5 in all wards, there was a 67% mean score for overall PSE. On average, MBBS 3 students scored lower than MBBS 5 (MBBS 3 = 62% total score vs MBBS 5 = 70% total score). And students presenting their cases on PMW overall scored lower than those students presenting their patients on PHO (PMW = 64% vs PHO = 73%). But since only MBBS 5 rotate on PHO, it is difficult to make direct comparisons between PMW and PHO. *(Table 11)*

TABLE 11: TRAINEE ROUNDING LOG RESULTS - GROUP 1 (SNAPPS-YES)

Group 1 Students *(8 Oct – 15 Nov 2018)* *x15 total MBBS3/5* *n=# of patient presentations*	**SNAPPS, Yes ALL (n=37)**	**MBBS 3, Yes (n=13)**	**MBBS 5, Yes (n=24)**	**PMW, Yes (n=23)**	**PHO, Yes (n=14)**
Total PSE Score ***(n=12 questions; excluded Q.4)*** ***Q.9 & 13 reverse scored for total*** ***Max possible score = 60***	Median 40 Range 29-51 Mean 40.4 SD 5.6 *67%*	Median 38 Range 29-48 Mean 37.3 SD 5.8 *62%*	Median 43 Range 35-51 Mean 42.0 SD 4.8 *70%*	Median 39 Range 29-48 Mean 38.4 SD 5.1 *64%*	Median 44.5 Range 35-51 Mean 43.6 SD 5.0 *73%*

7.5.2.2.2.2 - 'SNAPPS-NO'

For the first group of students, of the 139 patient presentations captured, 73% did not use SNAPPS (n=98). Of these, 67% occurred on PMW (n=68), 26% occurred in NNU (n=27), and less than one percent occurred on PHO (n=3). Four of the patient presentations were submitted from an outpatient clinic setting, but these were excluded from the overall analysis since we had not prepared to capture data from outpatient clinics. Forty-seven percent were submitted by MBBS 3 (n=48) and 53% were submitted by MBBS 5 (n=54) students.

Excluding Q.4 (which was a blank value range limit), the max score for the TRL when SNAPPS is *not* used is 35. For the 98 case presentations from both MBBS 3 and 5 in all wards, there was a 62% mean score for overall PSE. On average, MBBS 3 students scored the same as MBBS 5 (MBBS 3 = 61% total score vs MBBS 5 = 62% total score). In general, students presenting their cases on PMW and NNU scored similar, but lower than PHO (PMW = 60%, NNU = 64% PHO = 70%). But since only MBBS 5 rotate on PHO and there were only three patient presentations submitted for PHO, it is difficult to make direct comparisons between PMW/NNU and PHO. *(Table 12)*

TABLE 12: TRAINEE ROUNDING LOG RESULTS - GROUP 1 (SNAPPS-NO)

Group 1 Students *(8 Oct – 15 Nov 2018)* *x15 total MBBS3/5* *n=# of patient presentations*	**SNAPPS, No (n=98)**	**MBBS 3, No (n=44)**	**MBBS 5, No (n=54)**	**PMW, No (n=68)**	**NNU, No (n=27)**	**PHO, No (n=3)**

Total PSE Score ***(n=7 questions; excluded Q.4)*** ***Q.9 & 13 reverse scored for total*** ***Max possible score = 35***	Median 21 Range 12-32 Mean 21.6 SD 4.6 *62%*	Median 20 Range 12-32 Mean 21.3 SD 5.3 *61%*	Median 23 Range 14-30 Mean 21.8 SD 4.0 *62%*	Median 20 Range 12-32 Mean 21.1 SD 4.8 *60%*	Median 23 Range 14-28 Mean 22.3 SD 4.1 *64%*	Median 25 Range 23-26 Mean 24.7 SD 1.5 *70%*

7.5.2.2.2.3 - 'SNAPPS-YES' VS 'SNAPPS-NO'

For the first group of students, no overall notable difference of PSE was seen between presentations that used SNAPPS versus those that did not. No notable difference was seen for the total, or when stratified by level of training or ward. As was seen in previous tables, PHO tended to score higher than PMW with or without the use of SNAPPS. *(Table 13)*

When stratifying for sub-category overall, there did appear to be some gained mastery experiences (questions 7 and 8) for the SNAPPS-Yes group compared to the SNAPPS-No group (SNAPPS-Yes 68%; SNAPPS-No 54%). There also appeared to be improved verbal experience (question 10) for those trainees who used SNAPPS to present their patient than those who did not (SNAPPS-Yes 73%; SNAPPS-No 61%). *(Table 14)*

TABLE 13: TRAINING ROUNDING LOG - GROUP 1: SNAPPS YES VS NO

Group 1 Students *(8 Oct – 15 Nov 2018)* *x15 total MBBS3/5* *n=# of patient presentations*	**MBBS 3, Yes (n=13)**	**MBBS 3, No (n=44)**	**MBBS 5, Yes (n=24)**	**MBBS 5, No (n=54)**	**PMW, Yes (n=23)**	**PMW, No (n=68)**	**PHO, Yes (n=14)**	**PHO, No (n=3)**
Total Score (n=7 questions) Max possible score = 35	Median 22 Range 16-31 Mean 22.2 SD 4.2 63%	Median 20 Range 12-32 Mean 21.3 SD 5.3 61%	Median 24 Range 17-31 Mean 24.2 SD 3.5 69%	Median 23 Range 14-30 Mean 21.8 SD 4.0 62%	Median 22 Range 16-31 Mean 22.0 SD 3.5 63%	Median 20 Range 12-32 Mean 21.1 SD 4.8 60%	Median 26 Range 20-31 Mean 25.9 SD 3.0 74%	Median 25 Range 23-26 Mean 24.7 SD 1.5 70%

TABLE 14: TRAINEE ROUNDING LOG - GROUP 1: SNAPPS YES VS NO, BY SUB-CATEGORY

Group 1 Students *(8 Oct – 15 Nov 2018)* *x15 total MBBS3/5* *n=# of patient presentations*	**SNAPPS Yes** **n=37**	**SNAPPS No** **n=95**
Mastery/COP **(n=2 questions)**	Median 7 Range 2-10 Mean 6.8 SD 2.0 68%	Median 5 Range 2-10 Mean 5.4 SD 2.4 54%
Vicarious **(n=2 questions)**	Median 5 Range 3-10 Mean 5.5 SD 1.4 55%	Median 5 Range 0-8 Mean 5.2 SD 1.4 52%
Verbal **(n=1 questions)**	Median 4 Range 1-5 Mean 3.7 SD 0.9 73%	Median 3 Range 1-5 Mean 3.1 SD 1.3 61%
Psychological/CLE **(n=2 questions)**	Median 8 Range 4-10 Mean 7.8 SD 1.8 78%	Median 9 Range 3-10 Mean 8.0 SD 2.1 80%
Total Score **(n=7 questions)** **Max possible score = 35**	Median 23 Range 16-31 Mean 23.5 SD 3.8 67%	Median 21 Range 12-32 Mean 21.6 SD 4.6 62%
EEL **(n=3 questions)**	Median 10 Range 5-14 Mean 9.6 SD 2.2 64%	Median 9 Range 3-14 Mean 8.9 SD 2.4 59%

For the second group of students, there were a total of 34 TRL patient presentations submitted. Of these, only 21% of the presentations used SNAPPS (n=7), while the remaining presentations were done without the use of SNAPPS (n=27). Of the total TRL submitted, 45% were from PMW (PMW-Yes n=1; PMW-No n=14); 1% from NNU (NNU-Yes n=0; NNU-No n=4); and 44% from PHO (PHO-Yes n=6; PHO-No n=9). Thirty-five percent were submitted from MBBS 3 (MBBS 3-Yes n=1; MBBS 3-No n=11) and 65% were from MBBS 5 students (MBBS 5-Yes n=6, MBBS 5-No n=16). For the second group of students, due to limited SNAPPS-Yes submitted forms (only 7; 21%), only SNAPPS-Yes vs SNAPPS-No analysis was completed. *(Table 15)*

TABLE 15: TRAINEE ROUNDING LOG - GROUP 2: SNAPPS YES VS NO

Group 2 Students *(28 Nov – 20 Dec 2018)* *x15 total MBBS3/5* *n=# of patient presentations*	**SNAPPS Yes** **n=7**	**SNAPPS No** **n=27**
Mastery/COP **(n=2 questions)**	Median 8 Range 6-10 Mean 8.4 SD 1.4 84%	Median 5 Range 2-9 Mean 5.8 SD 2.3 58%
Vicarious **(n=2 questions)**	Median 7 Range 6-9 Mean 7.3 SD 1.1 73%	Median 6 Range 3-9 Mean 5.5 SD 1.5 55%
Verbal **(n=1 questions)**	Median 4 Range 3-5 Mean 4.1 SD 0.9 83%	Median 4 Range 2-5 Mean 4.0 SD 0.9 79%
Psychological/CLE **(n=2 questions)**	Median 8 Range 4-10 Mean 7.6 SD 2.4 76%	Median 9 Range 3-10 Mean 8.0 SD 2.5 80%
Total Score **(n=7 questions)** **Max possible score = 35**	Median 28 Range 21-32 Mean 27.4 SD 3.4 78%	Median 23 Range 14-32 Mean 23.1 SD 4.9 66%
EEL **(n=3 questions)**	Median 11 Range 8-14 Mean 10.9 SD 2.3 72%	Median 8 Range 3-10 Mean 7.7 SD 2.0 52%

Unlike the first group of students, there did appear to be some overall improved PSE from the patient presentations that used SNAPPS to present their rounds (SNAPPS-Yes 78%, SNAPPS-No 66%). Per sub-category, specifically mastery and vicarious experiences rated higher, as did elements for effective learning (Mastery SNAPPS-Yes 84% vs SNAPPS-No 58%; Vicarious SNAPPS-Yes 73% vs SNAPPS-No 55%; EEL SNAPPS-Yes 72% vs SNAPPS-No 52%).

Previously we've seen that PHO tends to rate higher than PMW, and since six of the seven SNAPPS-Yes completed occurred on PHO, it may have been that this accounted for the more variation than what was observed in the first group (as opposed to the use of SNAPPS itself), but even within those who did and those who did not use SNAPPS on PHO, there was still a small improvement in PSE for those who used SNAPPS. *(Table 16)*

TABLE 16: TRAINEE ROUNDING LOG - GROUP 2: PHO SNAPPS-YES VS SNAPPS-NO

Group 2 Students *(28 Nov – 20 Dec 2018)* *x15 total MBBS3/5* *n=# of patient presentations*	**PHO, Yes** **(n=6)**	**PHO, No** **(n=9)**
Total Score **(n=7 questions)** **Max possible score = 35**	Median 28.5 Range 26-32 Mean 28.5 SD 2.1 81%	Median 27 Range 21-31 Mean 26.4 SD 3.1 76%

7.5.2.3 Educational Climate Inventory (ECI) results

A total of 52 ECI surveys were completed during Cycle 2 by 25 medical students. Note, since the ECI survey was stratified by ward, often the same trainee would complete an ECI survey for each ward: PMW, NNU, and/or PHO. Students rated all wards' environmental climate with an overall average of 68% (median 47.5; range 30-64). There was no noted difference between scores for PMW and NNU, but students scored higher in PHO for all sub-categories and overall compared to PMW and NNU, (PMW/NNU mean total score 63% and PHO 78%). *(Appendix E.17)*

7.5.2.4 Motivational Strategies for Learning Questionnaire (MSLQ) results

Twenty-five medical students completed the MSLQ survey during Cycle 2. The total score indicated an average of 73% (median 183; range 130-221) for overall perception of their academic self-efficacy. There was no obvious difference between Phase 2 and Phase 3 student total scores. *(Appendix E. 23)*

7.5.3 Cycle 2 – Mixed methods results

Four common content areas were identified from the combined comparative analysis of the qualitative and quantitative data. *(Table 17)* The joint display diagrams illustrate the results of the convergent integration, with special consideration for congruent and divergent results. *(Appendix E.35)*

TABLE 17: COMMON CONTENT AREAS IDENTIFIED FROM MIXED METHODS CONVERGENT INTEGRATION

Common content areas
1. Variation in use of SNAPPS
2. Encouraging trainee critical thinking
3. Faculty uptake of SNAPPS
4. Faculty expression of uncertainty on rounds

7.5.3.1 Common Content Areas

Of the four common content areas identified, two showed congruent results and two were mixed between quantitative and qualitative results.

7.5.3.1.1 - Congruent

7.5.3.1.1.1 - Variation in the use of SNAPPS

The qualitative data suggested that there existed several faculty misinterpretations about what constituted a true 'SNAPPS' vs 'traditional' round. The lack of difference in overall TRL PSE for the first

group of students could be explained by this misinterpretation or improper conduction of SNAPPS by other faculty.

Relatedly, the second group of trainees *did* show some difference in their TRL level of PSE when using SNAPPS and not using SNAPPS. This could possibly be explained by the fact that the second group of students were *not* exposed to the variation of faculty technique to use SNAPPS, because their SNAPPS use was only with two faculty, both of whom were well versed in SNAPPS (i.e. myself and one other colleague). In the same vein, negative shifts in the run charts were only found prior to 26 Oct, while positive shifts were only found after 26 Oct, which again could suggest an inconsistent use of SNAPPS between faculty.

7.5.3.1.1.2 - ENCOURAGING TRAINEE CRITICAL THINKING

Qualitative data suggested that the use of SNAPPS led to more opportunities to engage trainees in critical thinking. TRL survey data supported this finding where those trainees who had used SNAPPS to present their patient case scored higher in related questions. *(Table 18)* And Question 8 run chart analysis also suggested that proper and consistent use of SNAPPS resulted in improved trainee thought process stimulation.

TABLE 18: TRL QUESTIONS 7 & 8

TRL Question	Group 1: SNAPPS – Yes (n=37)	Group 1: SNAPPS – No (n=98)	Group 2: SNAPPS – Yes (n=7)	Group 2: SNAPPS – No (n=27)
7. During ward rounds today, when you presented your patient, how much were you encouraged to discuss your differential diagnosis?	Mean: 3.4 (68%) SD: 1.2 Median: 4.0 Range: 1-5 *'Quite a bit'*	Mean: 2.7 (54%) SD: 1.3 Median: 3.0 Range: 1-5 *'Somewhat'*	Mean: 4.1 (82%) SD: 0.7 Median: 4.0 Range: 3-5 *'Quite a bit'*	Mean: 3.1 (62%) SD: 1.3 Median: 4.0 Range: 1-5 *'Somewhat'*

8. During ward rounds today, when you presented your patient, how much were you <u>stimulated to make comparisons</u> about your patient's differential?	Mean: 3.3 (66%) SD: 1.0 Median: 3.0 Range: 1-5 *'Somewhat'*	Mean: 2.7 (54%) SD: 1.2 Median: 3.0 Range: 1-5 *'Somewhat'*	Mean: 4.3 (86%) SD: 0.8 Median: 4.0 Range: 3-5 *'A great amount'*	Mean: 2.7 (54%) SD: 1.2 Median: 3.0 Range: 1-4 *'Somewhat'*

7.5.3.1.2 - MIXED

7.5.3.1.2.1 - FACULTY UPTAKE OF SNAPPS

The qualitative data suggested that despite the educational series offered, faculty continued to have limited uptake of SNAPPS use on ward rounds. Results from the FRL and TRL were congruent with this data, indicating much smaller percentage of SNAPPS use as compared to the traditional rounds.

Somewhat divergent was the reasons given for poor uptake. The qualitative data from faculty suggested that SNAPPS rounds took longer, but the FRL data showed no difference in length of rounds or time spent per patient when SNAPPS was used or not used. This suggests that the perception of time was a limiting factor, but not necessarily an accurate perception.

7.5.3.1.2.2 - FACULTY EXPRESSION OF UNCERTAINTY ON ROUNDS

The qualitative data suggested that the use of SNAPPS created opportunities for faculty to express their uncertainty on rounds and led to increased learning for faculty. The Group 2 TRL was consistent with this data, showing a higher rate of faculty expressed uncertainty for presentations when SNAPPS was used versus not used. Question 11 run chart analysis also showed positive shift when consistent usage of SNAPPS was in place. But the Group 1 TRL data was not consistent with these findings. *(Table 19)*

TABLE 19: TRL QUESTION 11

TRL Question	Group 1: SNAPPS – Yes (n=37)	Group 1: SNAPPS – No (n=98)	Group 2: SNAPPS – Yes (n=7)	Group 2: SNAPPS – No (n=27)
11. During ward rounds today, did the consultant express his/her uncertainty about the case?	Mean 2.3 (46%) SD 1.2 Median 2.0 Range 1-5 *'A little bit'*	Mean 2.0 (40%) SD 1.1 Median 2.0 Range 1-4 *'A little bit'*	Mean 3.6 (72%) SD 0.5 Median 4.0 Range 3-4 *'Quite a bit'*	Mean 2.2 (44%) SD 1.0 Median 2.5 Range 1-4 *'A little bit'*

7.6 REFLECT: PHASE 3 – CYCLE 2

By the end of Cycle 2, several things start to become apparent. First, we continue to see persistent barriers to the introduction of SNAPPS beyond just attendance for the educational series. Even for those trained in SNAPPS, there continued to be ongoing training issues, lack of faculty motivation and/or misinterpretation of SNAPPS use, and persistent tensions between the 'traditional' rounds verses SNAPPS rounds.

Simultaneously, we start to see benefits of using SNAPPS for both faculty and trainees: more structure, more engaging, built-in teaching, promotion of critical thinking, opportunities for faculty engagement and learning, and even positive influences on patient management. We begin to see examples of faculty and trainees discovering flexible solutions to make SNAPPS a more practical tool in our setting. And most encouraging, we begin to see some indication that proper and consistent use of SNAPPS may potentially lead to improved trainee PSE.

Additionally, we saw continued limitations of our study instruments and data collection methods. Specifically, for the run charts, the hope was that as students used SNAPPS over the course of their rotation, we could use the run chart to see if there was any influence (positive, negative or none) on

their PSE, COP, CLE, etc. But in reality, since there was poor overall uptake of SNAPPS, the timeline was somewhat misleading – a later date could actually reflect a trainees' first attempt at using SNAPPS - not their gradual use of SNAPPS over 8 weeks. Based on limitations of our quantitative data, paired with the practical and informative SNAPPS Debriefs, we made the decision that for Cycle 3, we would focus our data collection on predominately qualitative methods.

7.7 CHAPTER SUMMARY

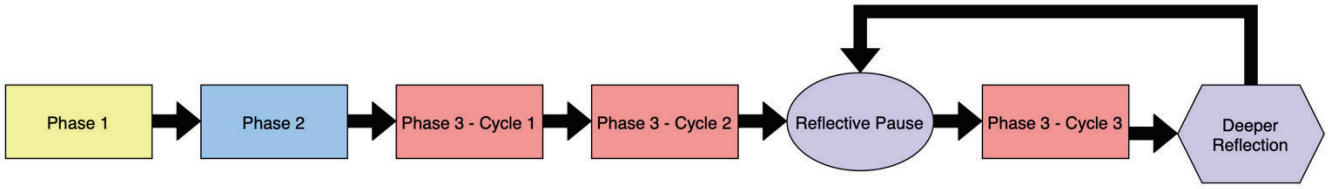
In this chapter, I provided a detailed description of the research activities, results and reflections that occurred during Phase 3 - Cycle 2. The next chapter will provide a 'reflective pause' of the research to date. Specifically, the reflection will aim to gain better understanding of our challenges to implement SNAPPS within the department.

CHAPTER 8: PHASE 3 - REFLECTIVE PAUSE

8.1 CHAPTER INTRODUCTION

By the end of Cycle 2, we began to see a discrepancy emerge: that despite the published observed benefits of SNAPPS on teaching and learning for faculty and trainees, we continued to see an overall poor uptake of its use and a lack of motivation to learn about and/or use SNAPPS by faculty. This chapter serves as a deeper exploration to understand why (in contrast to the literature) we faced these unexpected barriers to the introduction of SNAPPS at a department-wide level. While extensive reflection occurred at the end of Cycle 2, a more robust reflection only occurred at the end of Cycle 3. For documentation purposes, the complete retrospective reflection that took place at the end of Phase 3 is placed here. *(Figure 70)*

FIGURE 70: TIMELINE OF PHASE 3 ONGOING REFLECTION



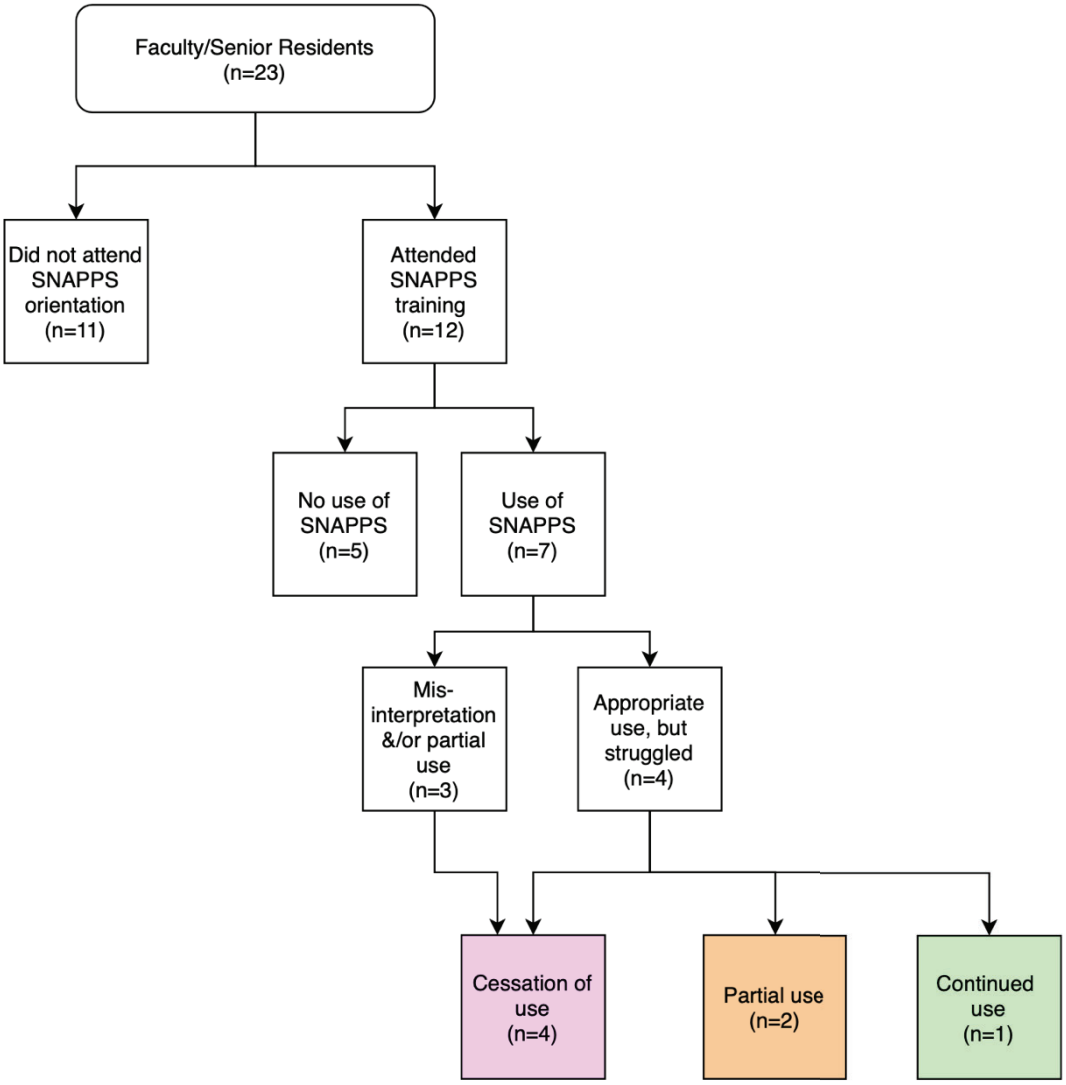
8.2 SNAPPS, AN EASY UPTAKE?

The literature describes SNAPPS as relatively easy to learn, requiring only a "brief", "simple", "single" training session – requiring as little as 30 to 90-minutes.[45,46,65] The original authors recommended sensitization prior to clinical encounters, highlighting the need for *both* preceptor and learner engagement in training.[14] They cautioned that preceptors may need to "coach" the learner until the technique has been mastered, but while training for learners may be more extensive, the training for faculty was brief.[14,45] Subsequent authors also stressed the importance of both faculty and trainees to be adequately trained, and noted that "preceptors require a deep understanding of the teaching

method,"[59] but that in general, "teaching SNAPPS to students appears to be simple, efficient, and time effective."[65] Only one article cautioned that SNAPPS sensitization within other cultural settings may require more extensive training,[56] but no articles mentioned any difficulty or resistance to SNAPPS training or uptake.

To our surprise, introducing SNAPPS in our department was not as simple as the literature description. Faculty and trainees continued to request additional SNAPPS training and coaching, feeling that the didactic sessions alone did not prepare them to use the model during a busy ward round. Faculty experienced a new *"double burden"* of teaching on their ward rounds, and sited difficulty using it with the most junior trainees. There was also ongoing tension between "traditional rounds" and SNAPPS rounds, with overall poor uptake of SNAPPS within our department. *(Figure 71)*

FIGURE 71: FACULTY & SENIOR RESIDENT USE OF SNAPPS



This outcome left us with the question: *why?* Why was I successful introducing SNAPPS on my ward rounds? Why were we unable to introduce SNAPPS at departmental level? Where did our understanding of the department or planning for the introduction of SNAPPS fall short? We queried these questions through ongoing dialectic reflection, described below.

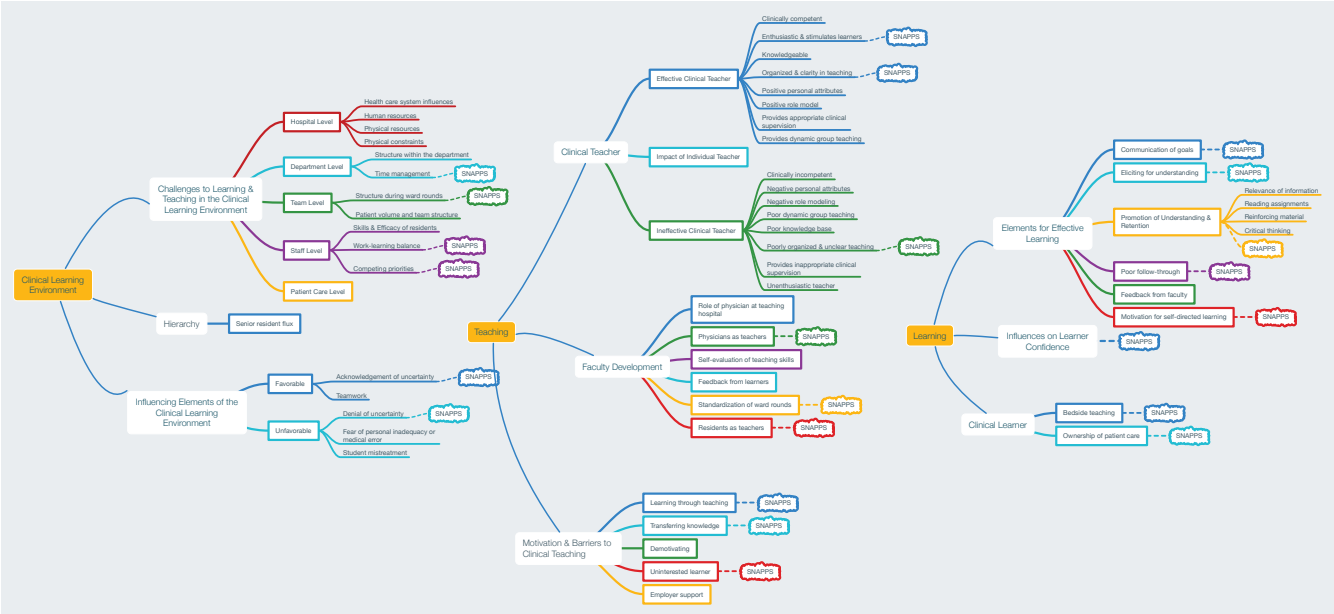
8.3 WHY SNAPPS?

The first step of this reflection was to remind ourselves why we chose SNAPPS in the first place. As described in Phase 2, after reviewing the results from Phase 1, several items were identified as

potential areas for change, including the need to promote: effective clinical teaching, standardized ward rounds, communication of goals, and structure during rounds. To develop plausible solutions or 'change ideas' for these identified areas for improvement, we reviewed topic-specific HPE literature and continued to meet with department members for their input.

Our literature review supported a learner-centred teaching framework to maximize the educational value of the bedside teaching encounter. Simultaneously, continued department feedback helped to provide additional focus for several of our change ideas, including the encouragement to develop interventions that promoted clinically relevant bedside teaching, shift from 'worker-centred' to 'learner-centred' rounds, and create a unified teaching model with embedded goals and objectives for a general 'standard' on ward rounds. To that end, we chose SNAPPS because of its potential ability to address many of our Phase 1 identified issues. *(Figure 72)* *(Appendix F.3)*

FIGURE 72: SNAPPS POTENTIAL AREAS OF INFLUENCE



We were encouraged that SNAPPS could positively influence several identified department challenges to learning and teaching on ward rounds. Yet despite our hypothesized pairing of our Phase 1 identified values and needs with the SNAPPS literature, we did not find that same level of department compatibility as we anticipated. When reflecting on the intersection of merging SNAPPS into the

Department, we saw several ways in which SNAPPS did and did not provide these advantages as anticipated.

8.4 The Consolidated Framework for Implementation Research

To better understand the compatibility of SNAPPS within the Department of Paediatrics, we chose to critically reflect on the intersection between the process of introducing SNAPPS into the department and in which ways the SNAPPS model did and did not 'fit' the norms, values, risks, needs, and workflow of the DoP. To help organize our dialogic reflection, we used the Consolidated Framework for Implementation Research (CFIR).[173] The CFIR is a menu of 26 constructs organised into five domains that provides a "practical guide for systematically assessing potential barrier and facilitators" during implementation projects.[173] The five domains include: (i) Intervention Characteristics, (ii) Outer Setting, (iii) Inner Setting, (iv) Characteristics of individuals, and (v) Process. *(Appendix C.4)* This tool has been previously used in medical education research studies.[174]

Utilizing the CFIR allowed us to organize our thoughts into meaningful constructs to help us better understand our situation. While we undertook a full interpretive review using a deductive coding process using two independent researchers, a detailed description of both the process and the findings are beyond the scope of this project. This unexpected outcome of the project did not form part of the initial research proposal and so a full analysis using the CRIF was not included in the Methods chapter. For the purpose of this thesis, an interpretive overview of our SNAPPS introduction, including a mixed methods convergent integration of all our data to provide further interpretation of our integrated results, is provided.[151] Through the utilization of this framework we discovered several key constructs that negatively impacted the success of our SNAPPS implementation, which will be discussed below.

8.4.1 (I) Intervention characteristics

Per CFIR literature, the 'intervention characteristics' domain considers constructs directly related to SNAPPS in terms of its perceived advantages, adaptability, trial-ability, complexity, and cost.[173] We

found that while SNAPPS was favourable in terms of its cost effectiveness, relative advantages, adaptability, and 'trialability', it was somewhat problematic in terms of its complexity: i.e. (1) level of difficultly to learn, and (2) level of centrality to and potential disruptiveness of the department workflow.

8.4.1.1 DIFFICULT TO LEARN?

Despite literature descriptions of SNAPPS being relatively easy to learn and introduce into the clinical setting,[45,46,65] our study found SNAPPS to be an ongoing learning challenge for both faculty and trainees. While the initial concepts appeared to be quite straight forward during the educational sessions, and indeed, at first glance the quantitative measurement of *How to use SNAPPS* questionnaires appeared positive, the large ranges of answers likely indicated that the knowledge of SNAPPS was not as concrete as we expected. The qualitative feedback supported these findings, with faculty and trainees describing difficulties with each step of SNAPPS.

Our SNAPPS orientation was designed to provide all the necessary knowledge to use SNAPPS on the ward round. Yet, participants felt additional training was required, particularly to bridge the gap between the didactic sessions and the actual use of SNAPPS on ward rounds. This was made further evident by the misinterpretation and partial use of SNAPPS, highlighting that the didactic sessions alone were insufficient to teach faculty and trainees how to incorporate SNAPPS into their ward rounds.

From this feedback, I realized that despite the built-in similarities and outward compatibility of SNAPPS to a traditional ward round, using SNAPPS was obviously something new that required a new set of skills from both faculty and trainees. The unexpected gap between SNAPPS theoretical knowledge to actual bedside skills resulted in nearly all faculty reverting back to the traditional SOAP model. *(Figure 71)*

From an educational perspective, acquiring a new skill often requires the linking of theoretical knowledge to practical skills through experience-based learning, thus it is not surprising the same is

true of *clinical teaching* skills.[127] There was no mention in the SNAPPS literature of the need for experiential learning at the bedside or how to trouble-shoot SNAPPS implementation, so I was unprepared to offer this additional practical support. Once these challenges were discovered, in late Cycle 2, I tried to bridge the theoretical and applicable skills gap with hands-on teaching and updated SNAPPS videos, but I lacked the time and resources to successfully facilitate this theoretical skills gap identified. Without additional allocated protected time, these efforts were slow to come to fruition.

8.4.1.2 CENTRALITY

We found that the most complex aspect of SNAPPS was its centrality to the department workflow. In that, in an academic clinical setting, ward rounds are *the* central component of the department workflow where patient care and teaching occur simultaneously. Thus the introduction of SNAPPS necessitates a direct change to that central component (i.e. how rounds are conducted) and requires a profound behaviour change of all staff members. This has significant potential to disrupt the entire workflow of the department, and indeed likely contributed to the lack of uptake of SNAPPS.

8.4.2 (II) OUTER SETTING

The 'outer setting' domain considers constructs related to the aspects of the broader setting in which the intervention is occurring. In our case, the 'outer setting' included Princess Marina Hospital and the University of Botswana. This domain specifically reflects on external prioritization, incentives, and pressures to assist in making an intervention successful. We found that from the 'outer setting' perspective, there was a limitation with regards to understanding and prioritization of learners' needs. In addition, while administrative staff and leadership at PMH and UB were made aware of our SNAPPS project, and there was no deliberate resistance to the project, it was also not identified as an area of priority requiring improvement.

8.4.2.1 LEARNERS' NEEDS & RESOURCES

Understanding to what extent "[learners'] needs, as well as barriers and facilitators to meet those needs, are accurately known and prioritized by the organization" is important for implementation success.[173] As we saw from our Phase 1 and 3 results, several 'outer setting' impediments existed which created challenges to learning and teaching within the clinical environment, and therefore contributed negatively to the success of SNAPPS implementation in several ways.

First, the relatively new transition of PMH into a teaching hospital created tension for faculty and learners to navigate within the terrain of PMH's new twofold function: patient care *and* academic practice. Reflections of this experience suggested that there were ongoing challenges to develop an understanding and prioritization of trainees' clinical learning needs within these larger and more historic institutions. Trainees described feeling an overwhelming responsibility to attend to ward work, which led to a sense of mental exhaustion and distracted them from engaging in learning opportunities. Systemic healthcare challenges interfered with clinical teaching and exerted a negative influence on residents' perceived self-efficacy to provide adequate patient management.

Another significant aspect of this transition was the dual responsibility for physicians to care for patients and simultaneously provide clinical teaching. Clinical teaching became the assumed role of the practicing physician. This assumption created tensions and discrepancies between perceptions of UB and MOWH physicians as clinical teachers and resulted in physicians feeling unsupported in their new dual role. Participants felt that there ought to be more emphasis on faculty teaching skills and recommended that clinicians be taught how to teach. It is possible that assumptions were made at the 'outer setting' level that with the introduction of trainees into a clinical space, this space would organically integrate practice and teaching into a clinical academic environment. But in reality this translated into an academically challenging space filled with tensions between the priorities of *practicing* medicine versus *teaching* medicine.

8.4.3 (III) INNER SETTING

The 'inner setting' domain considers constructs related to the setting in which the intervention is directly being applied – in our case, the Department of Paediatrics. Understanding the (i) social architect, (ii) degree of teamwork, (iii) effectiveness of communication, (iv) implementation climate, and (v) overall culture at a department level are all central aspects when reflecting on the success and limitations of implementation.

8.4.3.1 SOCIAL ARCHITECT

Centralization "has been shown to be negatively associated with innovation"[173] and the centralized social architect of the DoP had significant negative influence on the success of our SNAPPS implementation in two important ways.

First, in order for SNAPPS to be effective, ***all*** members of the ward round needed to be oriented to the model. Thus our SNAPPS implementation depended on the attendance of both faculty and trainees. But as is evident from the limited faculty attendance rates for the educational series, without direct department leadership intervention, I alone lacked the hierarchical rank to get higher attendance rates from faculty and senior residents. Whereas for the junior residents and students, while the initial orientation sessions were not *technically* mandatory, there was still a 100% attendance rate, likely because they were invited to attend by me, a 'superior' in the context of the department. In this regard, my limited hierarchical leverage was an advantage with the juniors, but a barrier with the seniors.

Second, how junior staff and senior staff interact with each other on rounds is very much influenced by the existing hierarchy within the department. Thus, making a change on rounds can only be successful if the change aligns with the current centralized hierarchical structure. The social architect of the department was found to be a strictly centralized, vertical hierarchy. Yet a major focus of action research is understanding *how* the status quo developed in the first place to provide insight into how to solve the problem and to understand how we helped create the problem.[139] While our data cannot

directly provide evidence for the aetiology of the department architect, we know from our Phase 1 data that in lieu of a formalized faculty development program, the faculty's clinical teaching skills were informally gained through their previous clinical role models. And historically, the field of medicine is a very centralized practice, so it is not surprising that our faculty taught using a teacher-centred (i.e. more traditionally centralized) approach to ward rounds.[21] But SNAPPS is inherently a learner-centred and learner-facilitated teaching model, deviating from the centralized norm of the department. From this perspective, the SNAPPS learner-centred approach flies in the face of longstanding traditions within medicine, upheld at the bedside – the senior physician rounding on the patient and the learner role limited to "shadowing".

Despite our efforts to highlight the importance of learner-centred teaching during the SNAPPS educational sessions, this emphasis was not enough to gain buy-in from faculty or to combat decades-long traditions of providing teacher-centred rounds. Shifting the learner from *"the bottom of the food chain"* to now the central driver and facilitator of the ward round teaching encounter was just too large of a leap. Instead, the success of SNAPPS, in terms of social architect, could only be achieved at the level of the faculty and gaining their commitment was critical.

From this, we discovered that making a change on rounds could only be successful if the change aligns with the current social architect of the clinical space. Since historically most medical spaces conform to vertical hierarchy, it is likely that the introduction of SNAPPS in most clinical settings will meet similar challenges as to what we experienced – that the success of SNAPPS within a department is largely dependent on the commitment of faculty and senior ranking individuals. This has not been previously described in the SNAPPS literature. To explain this divergence, it is possible that some of the previously published SNAPPS randomized controlled trials were unable to fully replicate the structural characteristics of a ward round. For example, the use of simulated or paper-based patient encounters, while useful to study the model, may not have been particularly realistic for an everyday ward round.[57, 58, 63]

8.4.3.2 TEAMWORK

We knew from Phase 1 data, that beyond basic patient care, there was a limited unifying bond within the Department of Paediatrics, leading to an overall weak sense of 'team' among the faculty. Composed of a mixture of UB, MOHW, and overseas affiliate university paediatricians, there existed a sense of ambiguity in regard to a shared vision.

While diversity is often an advantage through bringing together different perspectives and experiences, without a unifying theme or shared vision, this led to a somewhat non-cohesive group. In turn, this fragmented heterogeneity led to role confusion and minor tensions between paediatrician groups. Examples of discrepancies included access to resources, teaching responsibilities, and even conducting of patient care. At an individual level, unanchored beyond the physical space and the basic clinical role, this led to an overall lack of standardization, which further confused roles and expectations.

Teamwork has been described as "an essential 'core property' for successful implementation."[173] From this perspective, the department's overall limited shared vision and sense of team among faculty likely hindered the introduction of SNAPPS. In that, without an existing unity or shared vision within the department, trying to generate unifying momentum around a specific topic such as to improve clinical teaching was difficult.

8.4.3.3 COMMUNICATION

Based on our Phase 1 results, we knew that at all levels, communication of goals and clearly defined roles and responsibilities were deficient within the department, especially with regard to the ward round and clinical teaching. Despite our efforts to use the OLTCS to deliver a standardized clinical teaching strategy to provide clear expectations and a common goal for faculty, this did not ensue for two reasons.

First, limited attendance at our educational sessions made it difficult to build on the foundation from one session to the next. Second, we were unable to convey this message to the larger group. Anecdotally, emails within the department were not always read, and announcements at the morning report room depended on who happened to be in attendance on that given day. Thus, it wasn't just the lack of communication and clear roles in general, but also a lack of formal communication channels to share this information. Without the prior establishment of clear and formally endorsed communication routes, we could not effectively communicate with the platform for clear roles, common goals and standardization.

8.4.3.4 Implementation climate

'Implementation climate' encompasses the "absorptive capacity for change" and "shared receptivity" to an intervention within an organization.[173] Specifically, we considered the department's (a) tension for change, (b) overall compatibility with SNAPPS, and (c) relative priority to implement SNAPPS.

8.4.3.4.1 - Tension for change

The tension for change, or the "degree to which stakeholders perceive the current situation as intolerable or needing change"[173] varied between faculty and trainees. From a faculty perspective, while there was a general sense that rounds should be more academically focused and have a more standardized approach to teaching, the level of tension was not particularly high. This was made evident in Phase 2 when faculty and senior residents were asked to self-evaluate their own teaching skills. Most faculty and senior residents felt that their teaching efforts were "ok" or felt that their enjoyment of teaching would compensate for their lack of teaching skills. And just being "ok" didn't seem to be a problem needing to be improved; there was no evidence of feeling inadequate for not being a 'good' or 'great' clinical teacher.

This lack of tension to change was further demonstrated with the use of the self and peer assessment tools; with the self-evaluation assessment generated nearly 25% higher scores than the peer observed assessments. This discrepancy between self and peer-evaluation highlighted that from the faculty perspective, they perceived that they were doing a better job at providing clinical teaching than what

others observed. Thus faculty "intolerability" was low, which and helped explain the poor faculty educational session attendance rates.[173]

Gaining faculty buy-in and commitment was crucial for the implementation of SNAPPS, and while the educational series spent considerable efforts to focus on the performance gap of teacher-centred verses learner-centred rounds, and tried to create dissatisfaction with the status quo, literature shows that it is "difficult to create a tension for change when none actually exists".[173]

Faculty frustration with existing ward wards and their tension to change seemed to derive from the pressures of the ward round itself: *"time", "large census", "procedures", "interruptions.*" In this sense, the tension for change did not come from wanting to necessarily improve the learning and teaching on ward rounds, but to create a streamlined, efficient process whereby teaching could be more readily integrated into the working ward round and not interfere with patient care. In this respect, the faculty perceptions of the focal issue was not the same as the proposed solution; i.e. SNAPPS could not fix department stressors, so SNAPPS couldn't address faculty needs.

On the other hand, from a trainee perspective, there was much more evidence for "intolerability" of existing ward rounds and tension for change. From our Phase 1 and 2 quantitative results, we saw across the board trainees rating the effectiveness of learning and teaching around 60%, with obvious room for improvement. While trainees' tension for change was greater than that of faculty, unfortunately, trainees were not in a position to drive change on ward rounds, limiting their overall influence on the success of the SNAPPS implementation.

8.4.3.4.2 - COMPATIBILITY

Based on the department value of "bedside teaching", we felt SNAPPS was well suited for the department inner setting. SNAPPS, designed to be used in a real time clinical setting with actual patients, did not deviate from the department's traditional norm of teaching at the bedside. SNAPPS also directly conformed to the department-held value of "ownership of the patient" by encouraging

trainees to summarize their findings and have a chance to explore their own critical thinking and patient management prior to engaging with the attending physician.

Conversely, since the norm within the DoP was not always academically focused, and the 'traditional' style of rounds was indeed a non-teaching or 'working-only' style of rounds, the innate academic learner-focused aspect of SNAPPS was not readily compatible with the *"business"* style of rounds. From this perspective, while SNAPPS was compatible in some ways, it wasn't in all aspects.

8.4.3.4.3 - RELATIVE PRIORITY

Relative priority is a "significant predictor for implementation effectiveness."[173] While we saw that patient care was a department-held priority, notably, it was harder to find evidence that clinical teaching was valued in and of itself. Often, teaching was described in terms of patient care or faculty progression. Faculty acknowledged the importance and responsibility of knowledge sharing as a means to empower and cultivate the next generation of physicians. From this perspective, clinical teaching was valued for its potential to impact future care of patients.

Despite this conceptual understanding of the necessary integration of clinical teaching to foster future patient care, this did not always translate to *current* patient care. Instead, there was considerable distinction between 'patient care' and 'teaching' – and it was specifically noted that these are not synonymous actions. From this perspective, the day-to-day clinical teaching remained a 'competing' priority and a distraction from the 'real work' of patient care. Indeed, despite acknowledging the importance of teaching, faculty expressed concern that spending time teaching could negatively impact patient care, and that of the competing priorities, teaching was likely the first to suffer.

The pinning of 'patient care' and 'clinical teaching' as competing priorities created a work-versus-learning tension within the department. Thus, from a faculty perspective, the relative priority of the introduction of SNAPPS was viewed as optional, or even as potentially interfering with providing adequate patient care.

8.4.3.5 CULTURE

Culture can be defined as the "stable, socially constructed, and subconscious" norms, values and basic assumptions within an organization.[173] The intangible culture is shared by current members with new members, and influences how members "relate to one another and their work environment".[173] Culture has been shown to have "significant influence on implementation effectiveness."[173] In that, while most projects target tangible "work tasks, structures, and processes," these initiatives may fail due to lack of consideration of the "less tangible organizational assumptions, thinking, or culture."[173] Indeed, "theorists propose that organizational culture is among the most critical barriers" to implementation.[173] Therefore, understanding the culture of the Department of Paediatrics was critical for us to understand how it may have facilitated or hindered our project. In terms of implementation success, we discovered several departmental culture norms, values and assumptions that are important to discuss.

8.4.3.5.1 - CULTURE OF 'CARING FOR THE PATIENT'

To begin, *the* fundamental department value was *'caring for the patient'.* Feedback from all levels revealed that caring for the patient was the most important priority and value. Yet, while patient care was acknowledged as the most important value, other competing department values and norms interfered with this priority.

8.4.3.5.2 - CULTURE OF 'CENTRALIZED AUTHORITY'

Due to the heterogenicity of the faculty in terms of employer (UB, MOHW, and affiliate universities), each faculty member essentially had a different "boss" to whom they were accountable. This led to a binary staff structure within the department: "seniors" and "juniors", instead of a more traditional nuanced sequential hierarchical ladder of faculty. In turn, the 'pool' of seniors (a 'middle management' of sorts) did not have direct influence or rank over each other, and authority remained predominately with the most highly ranked senior (i.e. department head), resulting in a centralized authority.

The consequence of this was that making changes within the department was dependent on the department head approval and support. But even when department head support was obtained, because he could not realistically make these changes alone, and middle management held less influence to conduct these changes (due to lack of direct accountability among faculty), this created a system whereby change was difficult to implement in daily practice.

8.4.3.5.3 - CULTURE OF 'FRUSTRATION '

Trainees described feeling frustrated by frequent challenges and influences of the healthcare system that prevented them from carrying out patient management or making positive changes within the department. Trainees commented on the long-term consequences of working in a healthcare system with persistent challenges and how that would negatively influence them as paediatricians in the future. This feeling of frustration extended to faculty as well. They described low levels of motivation and feeling "burnt out" by their work in the department.

8.4.3.5.4 - CULTURE OF 'DISORDER'

Another important aspect of the culture of the DoP was a sense of disorder within the department. Specifically, time management in regard to late start time and length of ward rounds was found to negatively impact both learning opportunities and ward work duties. The fixed "late" start of daily rounds created a sense of being behind even before rounds had begun and an urgency to rush through rounds, forcing the rounds to become working rounds, without time for teaching.

In addition, the structure during the ward rounds was often described as "a bit hectic". Frequent interruptions to the ward round were considered standard - needing to look for a patient's file, attending to a patient emergency, placing an IV cannula, looking up lab results, etc. These frequent interruptions were cited as preventing opportunities for learning and teaching.

8.4.3.5.5 - CULTURAL INFLUENCES ON SNAPPS IMPLEMENTATION

While we did not set out to formally measure the DoP's culture, we can surmise it was likely to have had some influence on the success of our SNAPPS implementation in four important ways. First, the centralized leadership of the department confirmed that I did not have the authority to initiate a project requiring this level of faculty behaviour change. I had leadership approval and support but I did not have the sway to make this a priority for my fellow faculty. Implementation literature maintains that "anything less than wholehearted support from leaders dooms implementation to failure."[173]

Second, the lack of shared influence and accountability among faculty resulted in less external motivation for behaviour change. Since it was unlikely that leadership was going to join their rounds to evaluate their clinical teaching skills, there was less external motivation to improve clinical teaching skills. Third, the culture of 'frustration' had previously established that often barriers impeded the success of department initiatives, which decreased enthusiasm for new projects being introduced to the department. Fourth, the culture of 'disorder' led to a variable and dynamic clinical setting; trialling SNAPPS in such an environment added an additional layer of complexity.

8.4.4 (IV) CHARACTERISTICS OF INDIVIDUALS

An individual's "stage of change" can be described as his/her "progress toward skilled, enthusiastic, and sustained use of the intervention."[173] As part of our dialectic reflection, we considered faculty "stage of change" in terms of job satisfaction, department commitment and emotional health.[173] We also considered underlying motivations, attitudes and values of individuals within the department, because "the degree to which new behaviours are positively or negatively valued heightens intention to change, which is a precursor to actual change."[173]

In Phase 1, we found faculty motivating factors included: learning through teaching, transfer of knowledge; and demotivating factors included the uninterested learner. Thus, as part of our SNAPPS orientation, we included an in-depth discussion on the value and importance of learner-centred clinical teaching. We did this to provide faculty with the "underlying principles that justify using the

intervention."[173] We had hoped that the SNAPPS orientation would provide both skill of and enthusiasm for SNAPPS. But what we found was that despite our SNAPPS orientation session, not only did faculty continue to lack skill and confidence to use SNAPPS, they lacked the motivation to overcome these challenges.

While faculty reported positive perceived *'helpfulness'* of SNAPPS, ultimately, the actual use of SNAPPS was very low. This is a direct contradiction of faculty reported likelihood of their future use of SNAPPS to be *'A great amount'*. Those who used SNAPPS more frequently had higher levels of motivation. But for most faculty, they did not successfully progress through the desired stages of change, but instead remained static in the process, which ultimately resulted in their "rejection and discontinuance" of SNAPPS.[173]

For faculty members not trained in and/or using SNAPPS, the most cited reason for their lack of motivation to either learn or use SNAPPS was competing priorities. For some faculty, this lack of motivation extended beyond SNAPPS training, but included nearly all other aspects of the workplace. This reduced 'individual identification with the organization', and likely negatively affected SNAPPS implementation due to individuals' decreased "willingness of staff to fully engage in implementation efforts or use the intervention."[173]

The overarching lack of "relationship and degree of commitment" to the DoP may also indicate possible faculty burnout. Literature explains that "emotional exhaustion . . . may negatively influence implementation by stunting the ability and energy of an individual to help or initiate change."[173] Therefore, despite intrinsically aligned values and motivation of faculty with the SNAPPS model, the effort required to learn new knowledge, skill and develop confidence to use SNAPPS was outweighed by the overall lack of motivation and energy to engage in the implementation process.

In contrast, my own motivations to use SNAPPS were very high with both intrinsic and extrinsic motivating factors, which assisted me to gain higher levels of SNAPPS usage. As described in Phase 3 – Cycle 2, I readily passed through my own stages of change: prepared implementation strategies, commitment to practicing SNAPPS, overcoming the adjustment period, and finally, full integration – these qualitative themes identified in Cycle 2 mirror Prochaska's trans-theoretical model of individual

stages of change: “pre-contemplation, contemplation, preparation, action and maintenance.”[173,179] These motivational discrepancies may indicate why my SNAPPS use in Phase 3 was successful whereas that had not been found to be the case at a department-wide level.

8.4.5 (V) PROCESS

The ‘process’ domain considers constructs related to the planning and implementation of the intervention, with particular emphasis on both formal and informal leadership roles that emerge during the implementation processes. Unfortunately, during our implementation of SNAPPS, no leadership roles emerged which would have benefited the process. And several aspects of the execution of SNAPPS were found wanting.

8.4.5.1 EXECUTING

While I feel confident that our Phase 2 planning was satisfactory, where we may have fallen short was on the actual execution during Phase 3. Part of this was that the SNAPPS literature did not describe difficulties with education of SNAPPS, but left the reader feeling that the orientation alone was sufficient to implement the model. In retrospect, we may have benefited from additional execution strategies.

CFIR literature describes “three general approaches” to executing an intervention that “increase the likelihood of [its] success”: 1. ‘dry runs’ or simulated practice sessions, 2. trials of new intervention, and 3. incremental implementation.[173] For our project execution, we used all three approaches, but could have maximized these efforts.

First, during the SNAPPS orientation, dry runs were built into the session with role-play of simulated patient cases, but this was underutilized. Second, the trialling of SNAPPS on the ward rounds was not assigned to specific faculty, nor was it mandatory. In retrospect, a pre-set protocol for trialling SNAPPS may have been useful. While this slow uptake of SNAPPS allowed for the newness not to be overwhelming, it may have prevented more opportunities to practice.

Third, while SNAPPS was incrementally implemented on an individual ward round, another potential advantage could have been to incrementally implement the individual steps of SNAPPS. “Successes in early increments of the implementation help increase confidence, give an opportunity to make adjustments, and gain new ‘believers’.”[173] In this way, if we had focused on mastering Summarize before moving onto Narrow, this may have decreased the challenges faculty and trainees faced while using SNAPPS and positively affected its uptake.

8.4.5.2 Engaging change agents

An important aspect of the ‘process’ domain are the formal and informal leadership roles that emerge as part of implementation: ‘opinion leaders’, ‘champions’, ‘external change agents’, and ‘formally appointed internal implementation leaders’.[173]

Unfortunately, over the course of the department-wide SNAPPS testing and implementation process, despite the emergence of early adopters, no opinion leaders, or change agents emerged, and no internal implementation leader was formally appointed, and I lacked the agency required to be influential within these roles. AR literature warns that the action researcher needs to “make sure that the work you have in mind is something for which *you* have some sort of responsibility.”[138] My ineffectiveness to *“garner support from those in authority and/or build a broad base of support”* prevented me from being a successful influencer.[173]

8.5 CHAPTER SUMMARY

In this chapter, I provided a detailed description of the reflective exploration of the project to date, with specific emphasis on understanding why our implementation experience with SNAPPS differed from the literature. The next chapter will describe the research design, methods used and results found in Phase 3 - Cycle 3 of this study.

CHAPTER 9: PHASE 3 – CYCLE 3

9.1 CHAPTER INTRODUCTION

This chapter serves as a continuation of Phase 3 project activity, with an ongoing description of the research design, methods, results and reflections used and developed within this phase of the study. This chapter will describe the activities of Phase 3 - Cycle 3, which was conducted as ongoing inquiry group action research and practitioner research within the Paediatric Haematology-Oncology (PHO) ward within the Department of Paediatrics at Princess Marina Hospital from mid-December 2018 through March 2019. We continued to utilize an exploratory sequential mixed method design in an ongoing effort to achieve the last two objectives of the study and to answer the last three research questions.

9.2 PHASE 3 – CYCLE 3: RESEARCHER POSITIONALITY

By the end of Cycle 2, I experienced the simultaneous contradictions of 'failure' and 'success' of the project. On the one hand, at a department-wide level, I felt the project had failed . . .

"If action research is 'building the plane while flying it', I think I've got a dilapidated version of a plane and I'm not sure I ever took off the ground – maybe skipped and scuffed and crashed on the runway a few times." [137]

. . . on the other hand, I continued to be inspired by the success of SNAPPS on my own clinical teaching and practice.

"I love SNAPPS – it's made me a better teacher and clinician!" (ARJ)

These contrasting experiences and perspectives greatly influenced the ongoing project in terms my researcher positionality and methods used in Cycle 3.

9.2.1 A GROWING "FIXED MINDSET" VERSUS A FIXED "GROWTH MINDSET"

When reviewing my action research journal for Cycle 2 thematic data analysis, a notable element was of my own vacillating perspective of the project. Within my ARJ there was a general tone of negativity and disappointment toward the ongoing project interspersed with more positive reflections. Comments such as *"feeling demoralized", "burnout"* and *"sense of failure"* were not uncommon. These negative reflections were generally in relation toward the faculty uptake and usage of SNAPPS.

"Why do I always feel like I'm fighting the department?" (ARJ)

". . . I think when I realized that I was the only one using SNAPPS after all of this time – after doing the focus groups, faculty interviews, teaching sessions, more interviews, more teaching sessions, etc. – and to find out I'm still the only one using it – I just felt an overwhelming sense of failure." (ARJ)

At the time, I did not see the faculty's challenges and barriers to using SNAPPS as an opportunity to provide additional support for the project. Instead, in many ways, I approached these setbacks with a "fixed mindset": I avoided the presented challenges, I easily gave up in the face of obstacles, and I delegitimized the critical feedback I was getting from colleagues.[87] My growing sense of feeling personally rejected by the department resulted in a retreat from my continued engagement with the department-wide faculty development.

Interestingly, this occurred simultaneously with my own eagerness to integrate SNAPPS into my ward rounds with very much a "growth mindset".[87] Every challenge and obstacle I faced using SNAPPS on ward rounds was greeted with enthusiasm. I engaged trainees about the use and adaptation of SNAPPS, I took daily notes on my patient rounding sheet for ideas how to modify SNAPPS to meet the

learning needs within our setting, and I welcomed the unexpected surprises and benefits of using SNAPPS.

"This was a phenomenal week for using SNAPPS and teaching in general on ward rounds!" (SNAPPS Debrief; SM)

"I find myself saying lots throughout the week, 'This is why I like SNAPPS'." (ARJ)

"I'm still amazed at what a single Probe can do for a patient." (SNAPPS Debrief; SM)

Eventually, this dichotomy of a "fixed mindset" toward the faculty uptake of SNAPPS and a "growth mindset" toward the advancement of my clinical teaching using SNAPPS developed into a vicious cycle. The more I gained and learned from using SNAPPS, the more frustration I felt toward my colleagues for not taking advantage of such a useful tool.

Despite the negative emotions I felt at the time, this ultimately provided me with additional insight into the overall project. As Elliot described, "Action research focuses on the problems practitioners experience in realizing their aims and values in practice. Such problems are basically experienced at the level of feelings, e.g. of powerlessness, frustration, anxiety, fear, and anger."[1] Through this tension, in a bittersweet realization, I recognized that it wasn't my colleagues that I was mad at, but my own inadequacies to provide the support and additional training they needed to implement SNAPPS onto their ward rounds.

Elliot goes on to describe the importance for action researchers to "develop strategies which enable individual practitioners to reflect about feelings which persist and recur in certain practical contexts. Such 'patterns of feeling' are likely to be indicative of salient problems within an individual's practice."[1] From my own "patterns of feeling" I was able to realize that I had overestimated my capacity to provide the faculty with the necessary tools to incorporate SNAPPS into their rounds. Which is likely

why instead I placed so much focus and energy into my own rounds – learning about and improving my own practice was within my capacity.

"I set out to improve the teaching on ward rounds in general, but ended up really only improving my own teaching practice." (ARJ)

Through this ongoing reflection, albeit difficult, it allowed me to make practical adjustments for the project moving into Cycle 3. Since I no longer felt I was able to pursue the project at a department-wide level, I took advantage of my PHO-specific clinical work space to continue our work. This decision to downsize our study setting and population was discussed at length with the project group members and the PHO staff. While trainees and PHO staff continued to contribute as a shared inquiry group of researchers, much of cycle 3 was focused at practitioner research level.

9.3 PHASE 3 - CYCLE 3: PARTICIPATORY POPULATION

For Phase 3 – Cycle 3, as the scope of the project changed, so too did the project group. By the end of Phase 3 - Cycle 2, the original project group had essentially disbanded and I was no longer formally engaged with the original project group beyond Cycle 2. Instead, during Cycle 3, a new project group formed, which included three PHO paediatricians, a PHO-dedicated medical officer, and myself. The new project group agreed to continue to trial and integrate SNAPPS onto their ward rounds and provide weekly updates of their successes, reflections and barriers to using SNAPPS on the PHO service. The original project group continued to receive email updates about the ongoing project.

9.4 PLAN: PHASE 3 – CYCLE 3

9.4.1 INFLUENCES FROM CYCLE 2

9.4.1.1 DOWNSCALING ADJUSTMENT OF STUDY SETTING AND POPULATION

For the reasons described above, for Cycle 3, the study setting and population were modified to no longer engage at the entire Department of Paediatrics level, but to decrease the scope of the testing, adaptation and implementation of the bedside teaching model to the PHO service, its staff and trainees only. This decision to downscale the project setting and population was based on the results of Cycle 2 and my continued critical reflection.

9.4.1.2 Update of study instruments

First, the SNAPPS Debriefs for both faculty and trainees were updated. In addition, a short, open-ended-question survey for trainees rotating on PHO was also developed.

9.4.1.3 Update of the SNAPPS Debrief – Faculty – Cycle 3

The Cycle 3 version of the Faculty SNAPPS Debrief was an integration of the Cycle 2 Faculty SNAPPS Debrief and the Faculty Rounding Log, updated with additional questions. Based on my Cycle 2 SNAPPS usage and the adaptive approaches I had experienced, I wanted to see if other faculty using SNAPPS experienced similar adaptive approaches. Specifically, questions now included focus on if/how SNAPPS was used to 1) narrow acute clinical problems, 2) develop the expanded physician role, 3) provide role-modelling use of SNAPPS, and 4) determine if there were any influences on patient care. *(Appendix B.47)* The hope was that through capturing faculty use of SNAPPS with patient-specific vignettes, we could better appreciate how SNAPPS could be best adapted and implemented into our setting.

9.4.1.4 Update of the SNAPPS Debrief – Trainee – Cycle 3

During Cycle 2, despite the use of the Trainee Rounding Log and Trainee SNAPPS Debriefs, we felt that a missing component of the data was more 'voice' of the trainees themselves, particularly what trainees experienced when they had the opportunity to use SNAPPS. In order to refocus our trainee study instruments to better provide us with this deeper insight, we first chose to update our Trainee

SNAPPS Debrief questions to be more reflective of the Cycle 2 findings and that were in sync with our main research questions. *(Appendix B.48)*

9.4.1.5 Development of the PHO Trainee SNAPPS Feedback Survey

Second, we created an open-ended question survey for trainees. The first version was to provide basic feedback on the use of SNAPPS on ward rounds and its effects on trainee PSE. Later, this survey was modified to reflect the same five questions asked during the trainee SNAPPS debrief, which encompassed a more holistic perspective of using SNAPPS, particularly in regards to PSE, COP and the CLE. *(Appendix B.49, B.50)*

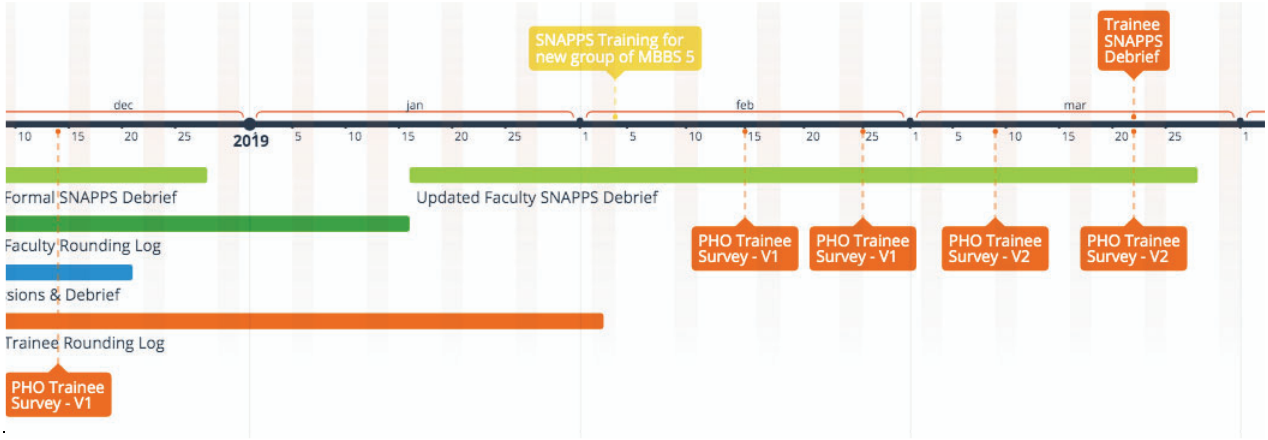
9.4.2 Methods

Refer to Chapter 3 – Methods for more details.

9.4.2.1 Cycle 3 - Timeline

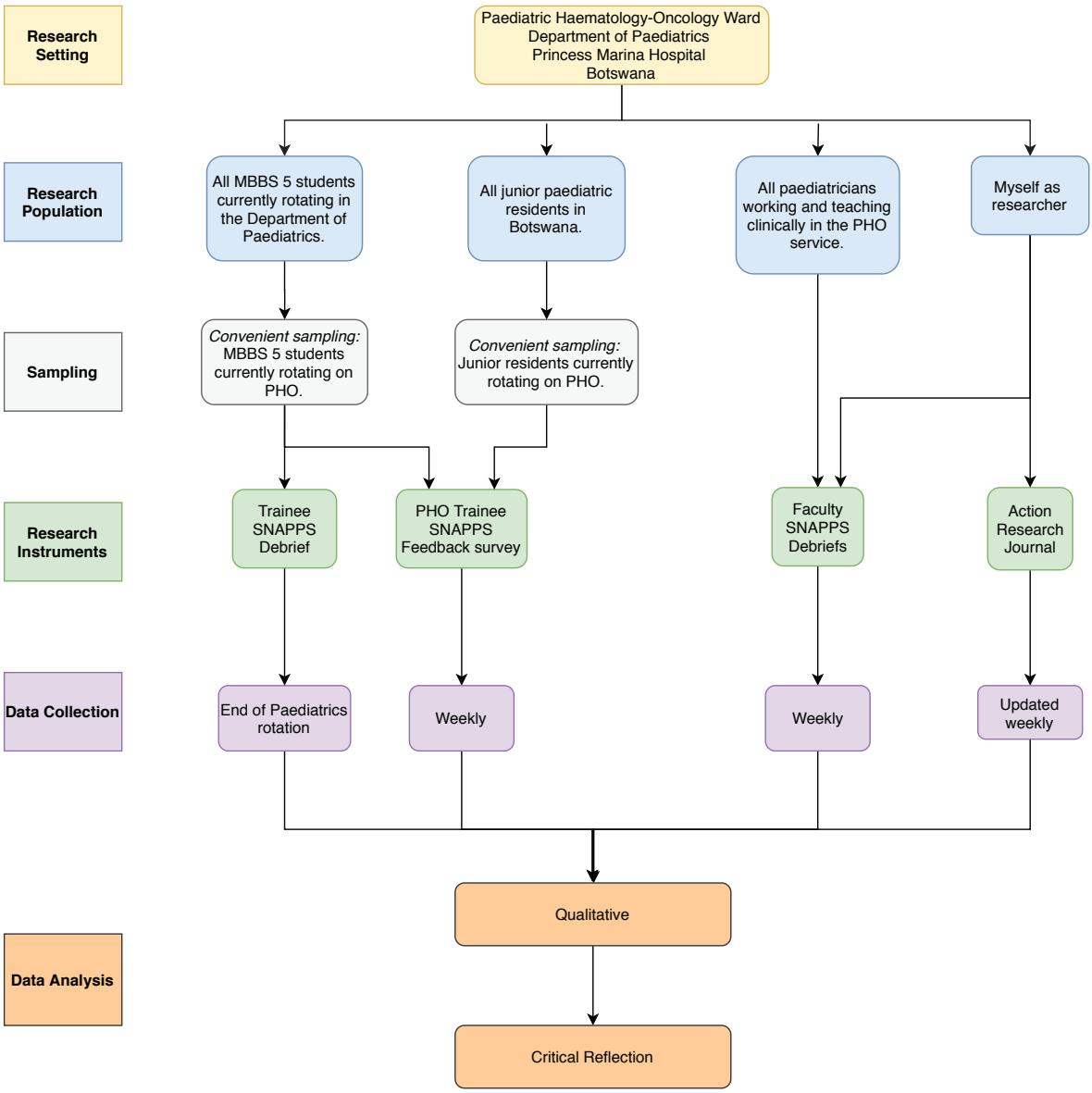
Phase 3 - Cycle 3 occurred between mid-December 2018 thru mid-March 2019. *(Figure 73) Note*: there was significant overlap of Cycle 2 and 3 from mid-December to January, most of late December data was reported in Cycle 2.

FIGURE 73: CYCLE 3 - RESEARCH ACTIVITY TIMELINE



9.4.2.2 CYCLE 3 – RESEARCH DESIGN

FIGURE 74: CYCLE 3 - RESEARCH DESIGN



9.4.2.3 CYCLE 3 - STUDY SETTING

Cycle 3 took place in the PHO ward within the Department of Paediatrics at Princess Marina Hospital. The PHO service is comprised of a combination of daily inpatient and outpatient services. The PHO faculty is comprised of three general paediatricians dedicated to the PHO service (i.e. they do not cover the PMW or NNU services) and one paediatric haematologist-oncologist. On a weekly basis, the faculty rotate the coverage of clinical service, including bedside teaching.

The team consists of two MBBS 5 students, one dedicated PHO medical officer, and one dedicated PHO paediatrician. Unlike the PMW and NNU services, the PHO team does not have rotating MBBS 3 students, interns, or department MOs. Depending on the annual rotation schedule, a UB junior resident will join the service for up to 4-8 weeks at a time. In addition, the PHO service is host to several visiting US paediatric residents, with usually one visiting resident per month.

The physical location of the PHO service is within the PMW, but most patients are kept on the "side ward" – an area slightly removed from the general paediatric population to decrease the risk of infectious exposures, but often the PHO patients are mixed within the same cubicles as the PMW patients. Both inpatient and outpatient services occur in this shared space.

In addition to the inpatient clinical teaching on rounds, the PHO rotation for trainees is supplemented by PHO-related topics for problem-based learning sessions, topic-focused teaching modules (e.g. 'delivering bad news'), assigned reading materials, case presentations, procedures and mock exams.

In summary, the main differences between the PMW and PHO services are: smaller team size, select patient population, dedicated PHO medical officer (MO) (i.e. there is not frequent change of upper level week to week), trainees interact with only one of four paediatricians (vs one of 15 paediatricians), there is no sharing of the service with a senior resident, all paediatricians are foreigners, and the side ward offers a somewhat quieter space for rounding than the general paediatric ward.

9.4.2.4 Cycle 3 - Study population

Cycle 3 study population included medical students, junior residents, and paediatricians.

As part of their 8-week paediatric rotation, MBBS 5 medical students spend two weeks training on the PHO service. Twenty MBBS 5 students rotated through PHO service during Cycle 3. (Note, the first ten of these students were also part of Cycle 2.) This was their first exposure to PHO, as they do not receive this rotation during their MBBS 3 year.

During Cycle 3, there was only 1 paediatric resident on the PHO rotation. The resident rotated for 8-weeks total; this was the resident's first exposure to the PHO service.

The PHO faculty is comprised of three dedicated general paediatricians and the country's only paediatric haematologist-oncologist. The faculty are all foreigners either from the United States or southern Africa, and are hired through an affiliate university partnership between the Botswana MOHW and Baylor College of Medicine. The faculty are similar in age, are equal in gender distribution, three of the four received paediatric training in North America and one received paediatric training in southern Africa. During Cycle 3, only the three general paediatricians covered the service at weekly intervals, for 5, 3 and 3 weeks each respectively; the paediatric haematologist-oncologist did not provide clinical service or teaching during this phase of the study.

9.4.2.5 Cycle 3 - Sampling

Convenient sampling was used to select medical students to complete surveys and provide formal verbal feedback, (i.e. to be eligible, the student had to be currently rotating within the department). The open-ended question surveys were collected during the students' PHO rotation; the verbal feedback was collected at the end of the students' paediatric rotation.

Convenient sampling was used to select junior residents invited to complete surveys and provide informal verbal feedback. To be eligible, the junior resident had to be currently rotating on the PHO service. Junior residents rotating on other services within the department were excluded from completing the surveys.

All PHO paediatricians working and teaching on the PHO service at the time of the study were eligible to complete the Cycle 3 surveys and provide verbal feedback. Note, I included myself as part of the study population.

9.4.2.6 Cycle 3 - Study instruments

9.4.2.6.1 - Surveys

9.4.2.6.1.1 - PHO Trainee SNAPPS Feedback survey

This paper-based survey was designed to capture PHO trainees' experience using SNAPPS on ward rounds. The first version contained two open-ended questions to elicit for basic learning usefulness of SNAPPS and its effects on trainee PSE. The second version included five open-ended questions to elicit for trainees' perspective of SNAPPS' influences on their PSE, COP and the CLE.

9.4.2.6.2 - Debrief Guides

9.4.2.6.2.1 - SNAPPS Debrief – Faculty – Cycle 3

This debrief guide was a combination of a paper-based record designed to capture faculty frequency of SNAPPS usage on ward rounds and verbal feedback on the experience of using SNAPPS. The debrief provided space to document the total number of patients seen, the number of times SNAPPS was used, and the start/end times of rounds. This was followed by five open-ended questions which could be filled out directly onto the paper by faculty, or could be used as a verbal debrief template. The

questions were generated to elicit for any ongoing barriers to using SNAPPS, as well as to capture any adaptive approaches used by the faculty.

9.4.2.6.2.2 - SNAPPS DEBRIEF – TRAINEES – CYCLE 3

This debrief guide included five questions aimed to elicit for trainees' perspective of SNAPPS' influences on the organization of ward rounds, trainees' sense of perceived self-efficacy, trainees' sense of belonging to the ward round community of practice, the clinical learning environment on ward rounds, and an overall portrayal of using SNAPPS. The questions were all open-ended and conversational in nature.

9.5 ACT: PHASE 3 – CYCLE 3

9.5.1 CONTINUED EDUCATIONAL SERIES – CYCLE 3

From mid-December 2018 until March 2019, only one educational session (Introduction to SNAPPS) was conducted. This was a session offered to new incoming rotating MBBS 5 students. Based on ongoing feedback during Cycle 2, this version of the Introduction to SNAPPS Training was updated with several items. *(Appendix G)*

9.5.2 CYCLE 3 - DATA COLLECTION

Data was continuously collected throughout Cycle 3. *(Figure 73)*

9.5.2.1 SNAPPS Debriefs

9.5.2.1.1 - Faculty Debriefs

The faculty SNAPPS Debrief was captured weekly at the end of the faculty's clinical service. Faculty debriefs were conducted either in our PHO physician office or at our weekly PHO meeting, and took approximately 10 minutes. At the faculty's discretion, they could complete the debrief on a paper form using open-ended answer space, or provide verbal feedback. PHO faculty found it easier to take small notes of their SNAPPS use during their ward rounds over the week and then to provide verbal feedback to me at the end of the week; therefore no faculty frequency of SNAPPS use was captured during Cycle 3. My own SNAPPS Debrief was also captured by jotting down notes on my rounding sheet, which I would later review to provide more detail to my weekly SNAPPS Debrief.

9.5.2.1.2 - Trainee Debriefs

One trainee SNAPPS Debrief with MBBS 5 students was conducted at the end of Cycle 3. The first half of the trainee debrief session was an opportunity for the MBBS 5 students to complete their PHO rotation trainee feedback survey. The second half of the session was a group discussion answering the same five survey questions, but as a group. The second part of the session took approximately 30 minutes. Since the debrief session occurred over the lunch hour, MBBS 5 students were provided with refreshments during the session.

9.5.2.2 Survey

9.5.2.2.1 - PHO Trainee SNAPPS Feedback survey

PHO Trainee SNAPPS Feedback surveys were captured weekly on Fridays. Alternatively, the survey could be completed at the end of the rotation trainee Debrief session.

9.5.3 Cycle 3 - Data analysis

9.5.3.1 Qualitative data analysis

Refer to Chapter 3 – Methods for more details.

9.5.3.1.1 - Ongoing bias as the researcher

My greatest bias during Cycle 3 was that as I was using SNAPPS more on my own clinical service and gradually watching it transform and improve my clinical teaching, I likely focused on the positive aspects that SNAPPS offered versus the potential negative effects. To counter this, my note-taking was inclusive of all types of responses and reflections, so as to provide opportunity for both positive and negative perspectives to emerge.

9.5.3.2 Quantitative data analysis

Note: Faculty did not complete their frequency of SNAPPS use part of the *SNAPPS Debrief – Faculty – Cycle 3* and therefore there was no quantitative data to analyse.

9.5.3.3 Critical reflection data analysis

Refer to Chapter 3 – Methods for more details.

9.6 OBSERVE: PHASE 3 – CYCLE 3

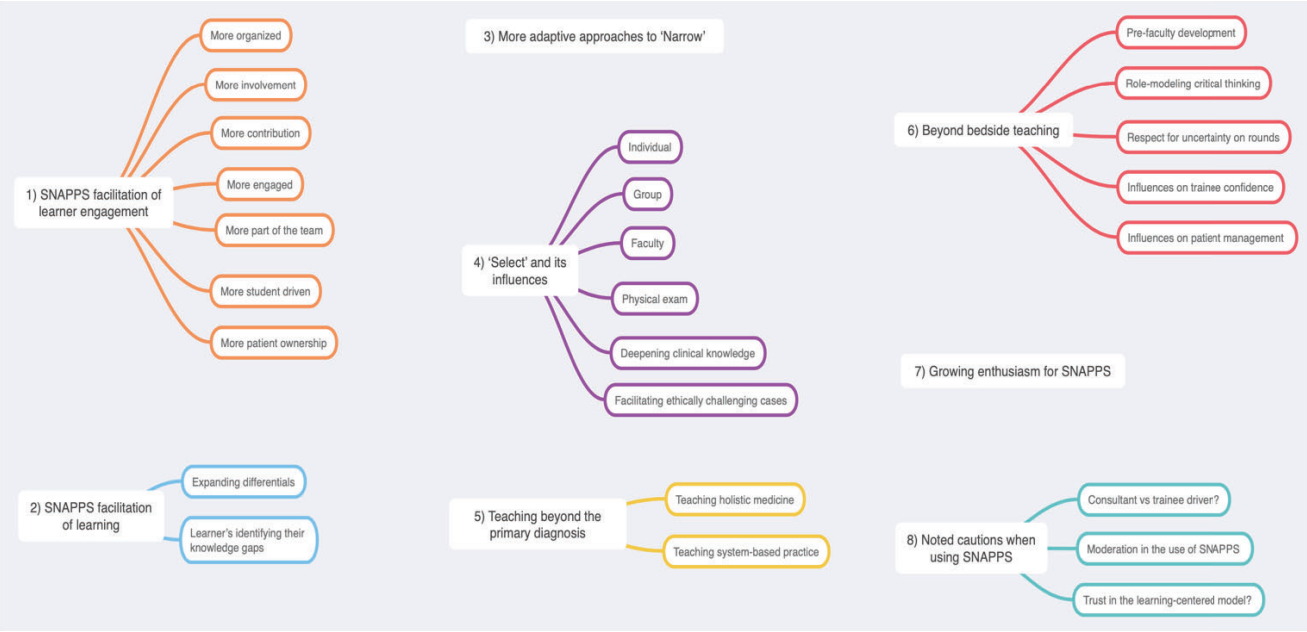
9.6.1 CYCLE 3 – QUALITATIVE RESULTS

During Cycle 3, all informal observations and comments about the experiences of using SNAPPS on the PHO ward were captured weekly in my action research journal. Three PHO faculty (including myself) formally contributed weekly to the ongoing SNAPPS Debrief dialogue. One Trainee SNAPPS Debrief session was held at the end of Cycle 3; this session was attended by eight of the nine consented MBBS 5 students. A second debrief session had been scheduled for the first group of MBBS 5, but due to scheduling conflicts, this session was cancelled.

The first version of the PHO Trainee SNAPPS Feedback survey was collected bi-weekly from mid-December to the end of February, which captured feedback from one junior resident and five MBBS 5 students. The second version was collected in March, and captured feedback from a total of nine MBBS 5 students.

A total of eight themes and 25 sub-themes were identified during the thematic analysis. *(Figure 75)*

FIGURE 75: CYCLE 3 - RESULTS OF THEMATIC ANALYSIS



9.6.1.1 - 1) SNAPPS FACILITATION OF LEARNER ENGAGEMENT

Trainees reflected on the several ways that the structured and learner-centred approach of SNAPPS provided them with a means to be more involved, engaged, and integrated into the team, and achieve more student-driven goals and patient ownership during ward rounds.

9.6.1.1.1 - MORE ORGANIZED

Trainees felt that SNAPPS provided a more systematic and organized structure for presenting on rounds, which in turn created a clearer understanding of ward round objectives.

"[SNAPPS] helps by creating a format for presentation and discussion. Makes the rounds flow faster when all team members participate and know what to do." (Trainee)

9.6.1.1.2 - MORE INVOLVEMENT

Trainees felt more involved with the use of SNAPPS.

"The discussion can take place at my level, so even if I am new to the team, I feel involved." (Trainee)

"Instead of blankly reading from the patient's file, we will be discussing what we think about the case." (Trainee)

"I realized that I spoke more during rounds when using SNAPPS. It sort of forces the student to ask questions and participate." (Trainee)

9.6.1.1.3 - More contribution

Trainees also reflected on their greater contribution to rounds when using SNAPPS.

“Student input matters more when you use SNAPPS.” (Trainee)

“My voice was heard and my thoughts appreciated and where possible implemented and added to the patient's management. I wasn't just a presenter.” (Trainee)

“[SNAPPS] allows you to talk more; there’s time allocated for it as part of the routine in every patient verses other rounds, you only present the findings and the plan and then wait for them to ask you something, and if they don’t ask, you don’t talk – that’s it for that patient.” (Trainee)

9.6.1.1.4 - More engaged

In turn, this greater involvement and contribution resulted in students feeling more engaged on ward rounds.

“You follow up labs more because you understand more because you used SNAPPS and it was your Plan.” (Trainee)

9.6.1.1.5 - More a part of the team

Trainees also discussed the enhanced sense of team on ward rounds when using SNAPPS.

“Because all these [SNAPPS steps] are done by team not just the individual directly caring for the patient it makes one to be more part of the team.” (Trainee)

“Probing the whole team, not just all questions to you, so everyone is listing and waiting to talk about the patient, not just waiting for your turn to present.” (Trainee)

“SNAPPS increases the interaction between you and the doctor [faculty] on the patient plan.” (Trainee)

9.6.1.1.6 - More student-driven

Trainees also felt that SNAPPS allowed for more trainee-driven learning to occur.

“It allows us as students to dictate topics we want to learn about regarding patient's diagnosis and care.” (Trainee)

“ . . . and also we then focus on my topic of interest, not what the specialist or senior personnel wants to focus on.” (Trainee)

9.6.1.1.7 - More ownership

And through this involvement and engagement, trainees began to feel a more authentic sense of ownership of their patient care.

“Feel in control of patient's preservation and next step, as well as aware of why doing certain investigations thus need for follow up.” (Trainee)

"It made the student to be in control of their patient and become an advocate." (Trainee)

"Able to engage in the patient management, unlike the other ward rounds where they tell you the Plan, in the other ward rounds, you just see what they did the previous day [and write that as your plan.]" (Trainee)

9.6.1.2 - 2) SNAPPS FACILITATION OF LEARNING

9.6.1.2.1 - EXPANDING DIFFERENTIALS

A common theme identified by trainees on the usefulness of SNAPPS was its ability to help them expand their differentials in relationship to their patient.

"Helps one not to limit their thinking when dealing with a patient but to consider all possibilities and in the end narrow to what is more likely." (Trainee)

"Differentials are important, not just as generalized differentials but ones that are more fit for that patient." (Trainee)

9.6.1.2.2 - LEARNER'S IDENTIFYING THEIR GAPS

SNAPPS also provided a process for trainees to identify and address their own knowledge gaps.

"One day the student Narrowed 'hypothermia' . . . What we found was that as he Analysed the three items from his initial Narrow, that none of them fit well, so he then discovered on his own that his initial Narrow differential was missing something. From his Analyse, he took himself back to Narrow

and tried again to broaden his original differential. It allowed him to see a gap in his thought process." (SNAPPS Debrief, SM)

"His initial Narrow differential wasn't broad enough to fit her actual aetiology, but through his Analyse he was able to better reflect on his Narrow." (SNAPPS Debrief, SM)

This unprompted self-discovery of a learner identifying his/her own knowledge gaps continued during the other steps of SNAPPS and provided a means to address those gaps through either re-Narrowing/Analysing, Probing or directed self-learning.

"I have learned to Analyse different presentations. I challenged myself daily as I had to Narrow and come up with different Probe and Select which were specific and helped me not get swamped with things to read." (Trainee)

"SNAPPS organizes your Plan because it's based on your Narrow and Analyse, because your plan corresponds with what you discussed under Narrow and Analyse, then you understand your Plan." (Trainee)

9.6.1.3 - 3) More adaptive approaches of Narrow

One of the first noted themes to develop in Cycle 3 was the ongoing applications of 'Narrow'. In Cycle 2, eight 'solutions' to allow trainees to narrow beyond the primary diagnosis in a known patient were discovered. In Cycle 3, four of these solutions were further described and developed. In addition, five new applications of Narrow were also described during Cycle 3. *(See PAOR Boxes)*

BOX 21: PAOR - SOLUTIONS TO 'NARROW' IX) RE-VISITING THE NARROW

Observe: Frequently trainees would modify SNAPPS to suit their learning needs. In one example, a student used the same Narrow "cough" several days in a row for the same patient, but based on the

changing clinical findings and the updated diagnostic information, her analysis of her differential changed.

"11yo male with possible relapse acute myeloid leukaemia. On the first day the student Narrowed his cough (viral, pneumocystis pneumonia, tuberculosis, etc.). As part of her plan, she wanted to order a chest x-ray. The next day, once she had the chest x-ray images, she chose to again Narrow his cough, but this time she did so with the new chest x-ray evidence – it was great to hear how her Analyse shifted based on these new findings. This was the first time I'd heard a student chose the same Narrow topic two days in a row, but differ in the Analysis based on new findings." (SNAPPS Debrief, SM)

Reflect: This strategy allowed the trainee to update her differential daily based on the ongoing investigations, which in turn deepened her thought process about the patient's differential.

"SNAPPS helped to stimulate thinking on what could be wrong with the patient." (Trainee)

BOX 22: PAOR - SOLUTIONS TO 'NARROW' X) 'BACKWARD' NARROW

Observe: For patients with very rare conditions, another strategy used by trainees to modify Narrow to fit their learning needs was to use what I termed a 'backward' narrow. In these cases, the approach was, *"Rather than the patient fitting a diagnosis, how does our diagnosis fit our patient." (SNAPPS Debrief, SM)*

"10mo female with fevers, failure to thrive, hepatosplenomegaly, pancytopenia and macular rash on palms and soles – our working diagnosis was Langerhans Cell Histiocytosis (LCH). Since this is a rare topic, the resident chose to use LCH as the Narrow alone (no other differentials) and then Analysed in detail how are patient did or did not fit this single, complex disease process. It was like trying Narrow on backwards – instead of 'x, y, and z are the signs/symptoms this patient has, so could be A, B, or C', the resident said "Let's take a close look at Diagnosis A only and see how this does or doesn't fit our patient.' (SNAPPS Debrief, SM)

Reflect: This approach also allowed the trainee to consider other rare conditions and how they may or may not also 'fit' our patient's presentation.

"In this way, it was as if the Narrow for this patient lasted for days and gave the trainee a chance to read up on several different, more complex or rare disease topics." (SNAPPS Debrief, SM)

"For these rare types of diseases which can be diagnostically challenging in resources limited areas, I thought this was a great alternative to using the Narrow." (SNAPPS Debrief, SM)

BOX 23: PAOR - SOLUTIONS TO 'NARROW' XI) ADVANCED LEVELS OF NARROW

Observe: In some instances, trainees used SNAPPS at a much higher level of complexity than was expected.

"15yo with newly diagnosed leukaemia. The student used SNAPPS to Narrow a very oncology-specific type question: of the leukaemias, which is he most likely to have, she then discussed in detail the differences between the leakaemias, etc." (SNAPPS Debrief, SM)

Reflect: This revealed that based on the learner's interests and level of knowledge, SNAPPS could provide an advanced level of learning for the trainee.

"*It was amazing to see SNAPPS used at this level of complexity – I'm not sure if SNAPPS has ever been used in Fellowship programs, but this was of that level of training, definitely not for the general paediatrician!" (SNAPPS Debrief, SM)*

BOX 24: PAOR - SOLUTIONS TO 'NARROW' XII) NARROW THE LAB RESULTS ALONE

Observe: Similar to Narrowing just a physical exam finding, sometimes trainees would Narrow based on a lab result alone.

"Since cerebral spinal fluid (CSF) had been sent from the shunt, the following day, analysing his CSF results became the Narrow: what could the CSF be telling us? i.e. Narrow your differential based on this lab finding." (SNAPPS Debrief; SM)

Reflect: This directed focus on a lab result generated discussions about laboratory investigations themselves – how/why they are performed and the meaning of their results. These conversations then allowed the lab results to be applied more meaningfully to our patient.

BOX 25: PAOR - SOLUTIONS TO 'NARROW' XIII) NARROW THE VITAL SIGNS

Observe: Trainees often chose a patient's abnormal vital signs to Narrow and Analyse.

"Let's Narrow tachycardia in this patient." (SNAPPS Debrief, SM)

Reflect: This was incredibly useful for trainees to consider why their patient may or may not be having abnormal vital signs and provided faculty with the opportunity to stress the importance of vital signs in general, but especially for the dynamic inpatient.

9.6.1.4 - 4) SELECT & ITS INFLUENCES

During Cycle 3, the Select steps of SNAPPS became a dynamic and growing educational activity at multiple levels. Additionally, Select became a useful strategy for advancing trainees' physical exam skills, deepening clinical knowledge, and even facilitated ethically challenging cases.

9.6.1.4.1 - INDIVIDUAL

From an individual perspective, trainees found the Select step to be a practical and motivating educational activity.

"The Select allows for more information/data on the management of the patient's condition as well as to consolidate on what one has learnt from the case." (Trainee)

"Sometimes not given an assignment for a whole week [on other rounds]; SNAPPS helps with that." (Trainee)

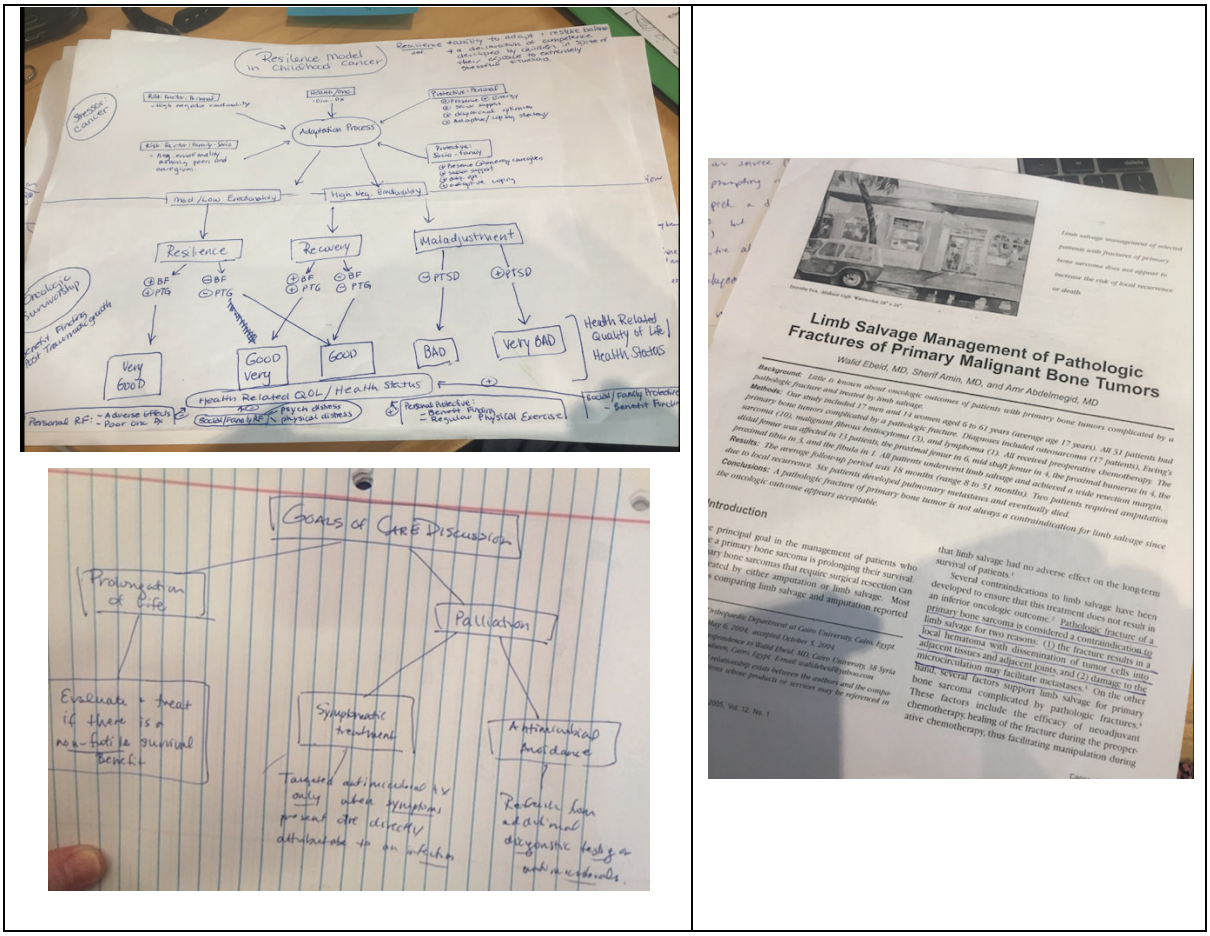
9.6.1.4.2 - GROUP

From a group perspective, during Cycle 3, the Select step became a team-driven activity.

"They were very engaged, especially in the Select part and would give mini-presentations the following day to get their Select heard – even if the patient had already been discharged, they still wanted us to have time to share." (SNAPPS Debrief, SM)

"This became a recurring theme in the group where everyone became more and more excited to share their Select with the team the following day – drawings, articles, etc." (SNAPPS Debrief, SM) (Figure 76)

FIGURE 76: EXAMPLES OF TRAINEE-LED 'SELECT' MINI-PRESENTATIONS



9.6.1.4.3 - FACULTY

At a faculty level, Select continued to be an excellent source of continued learning.

"I find I'm using Select more and more for my own 'selfish' reasons – things that I've forgotten or would like to learn more about. If a student doesn't already have a Select in mind, I ask them to use 'my Select' and often say 'Here are my questions about this patient'." (SNAPPS Debrief, SM)

"This week was full of helpful learning Selects. The resident had so many good Probes and she wanted to tackle a lot of information for her Selects. It was great! I learned so much!" (SNAPPS Debrief, SM)

9.6.1.4.4 - PHYSICAL EXAM

In several instances, trainees were uncertain or did an unsatisfactory job of presenting their physical exam findings for a patient. This prompted us to use the Select from SNAPPS as a means to advance this important skill.

" 'Your Select today is to do a full neuro exam on this patient and present back tomorrow your findings.' " (SNAPPS Debrief, SM)

This was a particularly useful strategy, because it allowed the physical exam skills to be advanced without adding additional time to rounds.

"*I found this helpful as a teacher because we don't always have time on the ward rounds to do a full exam with the group . . . and the student's ability to perform a physical exam is often missed on rounds. I liked having the Select there to help prompt the dedicated learning/time on proper techniques." (SNAPPS Debrief, SM)*

9.6.1.4.5 - DEEPENING CLINICAL KNOWLEDGE

In several instances, the trainees' report from their previous day's Select prompted additional Probes and ongoing discussion about the case.

"Probing helps you get insight into the assignments/Select out on your own – on other rounds, used to feel not know where to start." (Trainee)

"Sometimes the previous days' Select would be instead of doing a new Narrow/Analyse, instead we would generate a follow up discussion for more Probes and more time to discuss the patient's Plan and how the new information from the Select would influence our Plan." (SNAPPS Debrief, SM)

9.6.1.4.6 - Facilitated ethically challenging cases

On several occasions, Select was used to help guide us through ethically challenging cases and promoted rich discussion among the trainees for how to approach such cases.

"One day, his Select was 'What is the definition of palliative care?' – the following day, when he reported back to us what he'd read up on, he had more Probes 'What about a spiritual person as part of palliative care?' This brought us a great, culturally sensitive discussion about religion and traditional healers in the context of 'western medicine' and palliative care. This conversation was led by the resident & MO with a lot of contribution from the other students. It was great to see them critical think and consider dimensions of the patient and family, and their own health system and country that went way beyond the scope of medical knowledge but the ethics of applied practice." (SNAPPS Debrief, SM)

9.6.1.5 - 5) Teaching Beyond the Primary Diagnosis

Trainees and faculty alike felt that SNAPPS allowed them to learn/teach beyond the primary diagnosis of the patient. SNAPPS was found to be particularly useful to be more holistic in our approach to the patient and to prompt conversations about system-based practice.

"SNAPPS taught me how to address all the issues/processes of the patient's condition while in the ward. We normally focus on the main diagnosis and forget to approach or understand the complications." (Trainee)

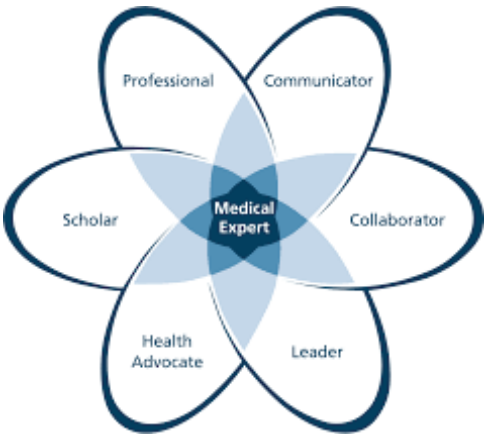
"There was a lot of focus beyond the primary diagnosis so enriches the teaching beyond oncology. Always something to learn!" (SNAPPS Debrief, KC)

9.6.1.5.1 - TEACHING HOLISTIC MEDICINE

In order to effectively use SNAPPS each day on each patient, once the primary diagnosis and its potential complications had been reviewed and discussed, the continued use of SNAPPS to Narrow other aspects of the patient often resulted in a fully integrated and holistic approach to patient care and management. Trainees and faculty felt that the continued use of SNAPPS particularly opened up space to explore the psychosocial issues of patient care.

"*Today, I needed to modify the N-A-P for a patient that is really only admitted for social issues, so we're using CanMEDS to show that the elements of being doctor requires more than just medical knowledge. We used SNAPPS to direct conversation around non-medical relevant issues as well. We have two social workers with us on rounds this week, so it's been nice to incorporate them into the Probe and Plan as well." (SNAPPS Debrief; SM) (Figure 77)*

FIGURE 77: CANMEDS MODEL OF THE EXPANDED PHYSICIAN ROLE



"The students would Narrow and Analyse and Select a medically related topic . . . but they would use the Probe to ask questions related to psychosocial issues." (SNAPPS Debrief, SM)

"I learnt that a doctor needs to be more engaged in the patient's disease and morbidity as a whole." (Trainee)

"[SNAPPS] influenced management of all aspects of the patient's health, social and psychological effect on their condition." (Trainee)

"[Trainees] really use the Probe of SNAPPS to ask questions about the non-medical issues of a child: e.g. 'how to advocate for a child with Wilms tumour for a nephrectomy?'; 'how to be sensitive to the specific needs of adolescents with chronic disease or cancer?'; etc. These are questions not easily looked up in text books, which is the point of the Probe. I felt it allowed me to teach on rounds the non-medical aspects." (SNAPPS Debrief; SM)

"The discussions really helped me view the patient in a more holistic way, not to just focus on new issue each day, but to see the whole patient and his interacting complications and helped guide my management; otherwise would have just focused on one issue." (SNAPPS Debrief, SM)

9.6.1.5.2 - TEACHING SYSTEMS-BASED PRACTICE

Similarly, the daily use of SNAPPS also provided opportunity for system-based practice discussions to unfold. Examples include trainees debating about their healthcare system and discussing ways in which they can advocate for their patients.

"They Narrowed his encephalopathy but then spent a great deal of time on the Plan discussing whether or not they should send the CSF from his lumbar puncture earlier in the day . . . but they knew the results would likely not yield much since he'd been on treatment for so long and wouldn't change their management, so discussed the resources and reasoning behind why they should or shouldn't send the CSF." (SNAPPS Debrief, MD)

"When we got to Plan, we discussed at length how since we can no longer refer to RSA and we don't have treatment here in Botswana for acute myeloid leukaemia (AML), that we can now only offer palliative care for Motswana with AML . . . This had the whole team enter into a very lengthy debate about how the healthcare system needs to be changed so that patients with leukaemia can be managed in Botswana, and not only rely on the possibility of referral to RSA. It was fun to see the students get so heated! And we tied it into larger health care advocate roles of the physician – because our Plan doesn't rely on a knowledge gap that needs to be filled, but a systems issue where we know what we want to do, but we can't do it – how do you fix that problem?" (SNAPPS Debrief, SM)

9.6.1.6 - 6) Beyond Bedside Teaching

9.6.1.6.1 - Pre-faculty development

Another noted use of SNAPPS during Cycle 3 was its ability to provide the resident with additional teaching opportunities and responsibilities on rounds.

"We used the Select as a way for the resident to teach the students detailed system exams. . .. The resident would pair with the student in the afternoon and do a thorough physical exam . . . and then the next morning, the student would present back their physical exam findings . . . which was a great way of distributing the shared teaching responsibilities." (SNAPPS Debrief, SM)

"The best part of this was that the senior trainees took a very large and active part in the everyday teaching of rounds – they came prepared to share their Select with the whole team." (SNAPPS Debrief, SM)

Additionally, SNAPPS was noted to be used as a teaching model for residents to use for their own teaching. On several occasions, (unprompted!) residents used SNAPPS to lead rounds or to teach a topic at morning report. In this way, they used SNAPPS as a model not only for their own learning purposes, but considered it a model by which they could cultivate their own teaching style and method.

"I asked [the resident] if she'd like to 'run rounds' starting on Wednesday so she could experience 'being the attending'. . . . She used SNAPPS for all of her teaching – it was amazing to see a resident use SNAPPS as their teaching method! Not only did she grasp SNAPPS, but when the students had questions about SNAPPS, she would give them instruction and clarification of 'how to use SNAPPS' – not just about the medical parts of the rounds. It was awesome!." (SNAPPS Debrief, SM)

"He reported that the resident took the lead in teaching and they used SNAPPS for most of the patients. He would assist with answering the Probes." (SNAPPS Debrief, KC)

"But what was really fun was listening to the resident who was running rounds answer the Probes – it was great to watch her use SNAPPS to teach." (SNAPPS Debrief, SM)

9.6.1.6.2 - ROLE-MODELLING CRITICAL THINKING USING SNAPPS

In certain instances, it was noted that a patient's clinical condition was very complex and possibly too difficult for a student to Summarize. In those cases, faculty would role-model their own internal clinical thinking process using SNAPPS to approach these very challenging cases. This was found to be a useful technique to both demonstrate SNAPPS and critical thinking and was a very efficient method of teaching when short on time.

"We had a lot of very clinically challenging patients – it was maybe too hard for even the MO or MBBS 5 to get through a differential. So what I'd do on some days is I'd play the 'learner' role and let them hear my thought process aloud for how I was getting to a management plan. . . .I found SNAPPS to be helpful to provide a guided structure to 'role model' my critical thinking skills." (SNAPPS Debrief; SM)

"For the first two days, because the patient was so complicated, I did the SNAPPS aloud and modelled my thought process. I let whoever had rounded on the patient contribute, but I wanted to show him as an example of how you can approach a very complicated patient." (SNAPPS Debrief; SM)

“As a way to help the students practice their SNAPPS, when they were presenting a patient, I coached them to narrow "anaemia" so we did it together. Or I gave an example, ‘this is my Narrow for ‘tachycardia’ and we’d analyse together." (SNAPPS Debrief; MD)

“After the student gave her three possibilities, I gave mine as an example of how to broaden based on the patient in front of us; we analysed both her differentials and then mine.” (SNAPPS Debrief; SM)

“When you’re busy, modelling SNAPPS is a very effective way of teaching critical thinking without taking more time on rounds.” (SNAPPS Debrief; SM)

9.6.1.6.3 - RESPECT FOR UNCERTAINTY ON ROUNDS

Another theme identified during Cycle 3 was that the Probe and Select steps of SNAPPS created a space whereby trainees felt that uncertainty of medical knowledge and patient care was both a natural and respected process on the ward round.

“It also created a calm environment where there were no far-fetched questions that leave us feeling like we don’t know anything.” (Trainee)

“The Probe influences the environment the most. I may have a Probe in my head on PMW, but not feel free to ask.” (Trainee)

“We were allowed to Probe the consultant on anything we did not understand which was more welcoming and engaging.” (Trainee)

“It gives you an allowance to not know and go and check. Allows us to ask questions.” (Trainee)

Faculty also noted that the use of SNAPPS promoted an environment of respect for uncertainty.

"It also sets it up that it's ok if I (as the attending) also don't know – I felt freer on rounds, which was an unexpected benefit." (SNAPPS Debrief; MD)

"Another case was of a child who I really didn't know what was going on. . . . [SNAPPS] helped me not to feel too bad about not knowing and helped me to counsel the family, because sometimes it's hard not to know what's going on with a patient when running a team and everyone is looking at you for the answers. So by using SNAPPS, I was able to model that uncertainty is a big part of medicine – and it helped me stay calm, too." (SNAPPS Debrief; SM)

"A lot of the Probes I can't answer, but I like role-modelling being comfortable saying 'I don't know, but I think . . .' or 'I don't know, but let's make that our Select' . . ." (SNAPPS Debrief; SM)

9.6.1.6.4 - Influences on trainee confidence

Through the continued use of the individual steps of SNAPPS and promotion of learner engagement, trainees felt that this positively influenced their confidence to manage paediatric patients.

"[SNAPPS] has positively influenced my confidence because it enabled me to be able to present patients without looking down into the notes and also having a systematic structure of presenting." (Trainee)

"Also knowing about the differentials I was mentioning gave me a confidence boost." (Trainee)

"SNAPPS allows a student [to go] beyond and use the little knowledge they have gained to help in managing patients hence gives you the confidence that you can manage patient well." (Trainee)

"By presenting the patient without reading the notes and being systematic, I was able to improve on my presenting skills and not hide in the file." (Trainee)

9.6.1.6.5 - Influencing Patient Management

As observed in Cycles 1 and 2, the continued use of SNAPPS in Cycle 3 revealed more examples of how using SNAPPS on ward rounds resulted in positive influences on patient management. The Probe and Select steps were found to be the most influential on the faculty's decision making and patient management.

"The Probe for the group was 'Can we use ACE-inhibitors in patients with known renal pathology?' The team looked up the answer and the following day they decided to start an ACE-I based on their findings." (SNAPPS Debrief, MD)

"The probe was 'Can we give ferrous during an acute infection?' – based on the findings, it changed her management because she delayed the initiation of ferrous by a few days based on their SNAPPS discussion." (SNAPPS Debrief, MD)

"The student's Probe changed my management plan. This happens sometimes where their Probe will direct my focus to something I may have overlooked about the patient: 'What is this blister?' and then my more focused attention toward that question influences my plan." (SNAPPS Debrief, SM)

"The student Narrowed and Analysed the patient's oral lesion; the Probe was then about which antibiotic would be the best in his case. I didn't know the answer of the best appropriate empiric antibiotic, so I ended looking up and changing his antibiotic regimen." (SNAPPS Debrief, SM)

9.6.1.7 - 7) Growing enthusiasm for SNAPPS

From a faculty, trainee (and even patient!) perspective, the continued use of SNAPPS coincided with a growing enthusiasm for SNAPPS. This was first noted by encouraged and more frequent use of SNAPPS on rounds.

"She reported that students were now prompting her for the next stage of SNAPPS, rather than needing to be prompted by the attending." (SNAPPS Debrief; MD)

"We had one patient who was just lodging for the week and we weren't officially rounding on him each day, but the MO wanted to briefly discuss something about the patient, so he said 'just a quick Narrow for him . . .' and we ended up using SNAPPS." (SNAPPS Debrief, SM)

"We used SNAPPS for nearly every case for the entire week!" (SNAPPS Debrief; SM)

Further examples of growing enthusiasm included a MBBS 5 student changed his social media profile status to "SNAPPS". And even one of our adolescent patients with a prolonged hospitalization course, asked if she could "present herself on rounds" using SNAPPS.

By the end of Cycle 3, SNAPPS had become something valued and promoted.

"Personally, I think SNAPPS should be introduced globally." (Trainee)

"Let's hold onto this tiny template to work our way through the complexities of medicine!!" (SNAPPS Debrief; SM)

9.6.1.8 - 8) NOTED CAUTIONS WHEN USING SNAPPS

9.6.1.8.1 - CONSULTANT VS TRAINEE DRIVEN?

As seen in previous cycles, despite being a learner-centred model, SNAPPS continued to be very much *"consultant driven".*

"If the consultant isn't doing SNAPPS, the students won't either." (Trainee SNAPPS Debrief)

But from a faculty perspective, it still needed buy-in from the learners to be most effective.

"When students use SNAPPS it's awesome, harder to use when the students don't try." (SNAPPS Debrief; MD)

Interestingly, when SNAPPS was used correctly by faculty, trainees did not think it made a difference *who* the faculty member was when using SNAPPS.

"Students who worked with other faculty also worked with me and they didn't find a big difference using SNAPPS, but it was good with all." (Trainee SNAPPS Debrief)

9.6.1.8.2 - MODERATION IN THE USE OF SNAPPS

Trainees cautioned not to overuse SNAPPS – in some instances, if SNAPPS was being used for every patient, then trainees were less motivated to drive their learning and would result in *"pretend"* learning.

"Does it need to be every patient, because otherwise 'pretend learning' – i.e. pick a Narrow we already know well so we don't have to work." (Trainee)

"Sometimes students can Select a topic they already know hence no knowledge gain." (Trainee)

Similarly, trainees cautioned the over use of SNAPPS could lead to prolonged rounds or being overwhelmed by information.

"But at the same time it has to be used properly, to avoid spending too much time causing loss of concentration and ending up not benefiting from discussion." (Trainee)

"It can be used globally but it has to be structured well to avoid long rounds. And also not to do detailed SNAPPS in all patients every day because too much information at once do not really help much." (Trainee)

9.6.1.8.3 - Trust in the learner-driven model?

In some instances, trainees were concerned about the learner-driven aspect of SNAPPS and worried that they might miss important general knowledge if the rounds weren't faculty led.

"On PMW you're told what you need to know about this patient, but maybe using SNAPPS, you may not know what you need to get out of this patient because learner directed." (Trainee)

"I would like to keep using SNAPPS, if additionally the senior physician at the end of the session recommended or asks topics that could be practically and academically beneficial for me and learning, not just solely relying on my direction of learning." (Trainee)

9.6.2 CYCLE 3 – QUANTITATIVE RESULTS

Note: Faculty did not complete the frequency of SNAPPS use part of the *SNAPPS Debrief – Faculty – Cycle 3* and therefore there was no quantitative data to report. From verbal report, of the three faculty, F1 used *"once in a while"*, F2 used *"around 3 days per week"*; and F3 *"the most often"*. *(SNAPPS Trainee Debrief)*

9.7 REFLECT: PHASE 3 – CYCLE 3

By the end of Cycle 3, we felt confident that we had achieved our goal in completing the last two objectives of the study and to answer the last three research questions. After nearly nine months since the introduction of SNAPPS into the Department of Paediatrics, we now felt we had a much better grasp of its potential influences on learning, teaching, the clinical learning environment, as well as trainees' perceptions of their participation in the clinical COP and their PSE to provide paediatric patient care. We now had experience and documentation of 'real time' modifications and flexible applications of SNAPPS in our setting. We also had several illustrations of unexpected benefits of SNAPPS, particularly in regards to faculty learning, engagement, and critical thinking, as well as to positive influences on patient management.

9.8 CHAPTER SUMMARY

In this chapter, I provided a detailed description of the research activities, results and reflections that occurred during Cycle 3. The next chapter will provide a discussion of our overall project findings in terms of our original research questions.

CHAPTER 10: DISCUSSION

"I like using SNAPPS and I would like to use it more in the ward rounds. It is a better approach that engages us in the rounds, it also creates an environment which is fun and calm for learning. And it does not make us feel like we don't know anything, hence improve our confidence, this makes me more excited to attend the rounds." (Trainee)

10.1 CHAPTER INTRODUCTION

There were three primary outcomes of this action research project. 1) Trainee use of SNAPPS was associated with (i) a CLE that was more favourable to respecting uncertainty; (ii) an increase in trainees' participation in and, sense of belonging to, a ward round; and (iii) positive influences on trainee perceived self-efficacy to manage paediatric patients. 2) We identified several non-traditional uses of SNAPPS that created opportunities for trainees to learn and faculty to teach beyond the primary diagnosis. 3) In contrast to the literature, we were unsuccessful in introducing SNAPPS at a department-wide level. In this chapter, I will discuss the first two outcomes as they pertain to the literature and any possible broader implications. The last outcome was discussed in Chapter 8. As part of this discussion, I aim to offer summation answers to our original research questions.

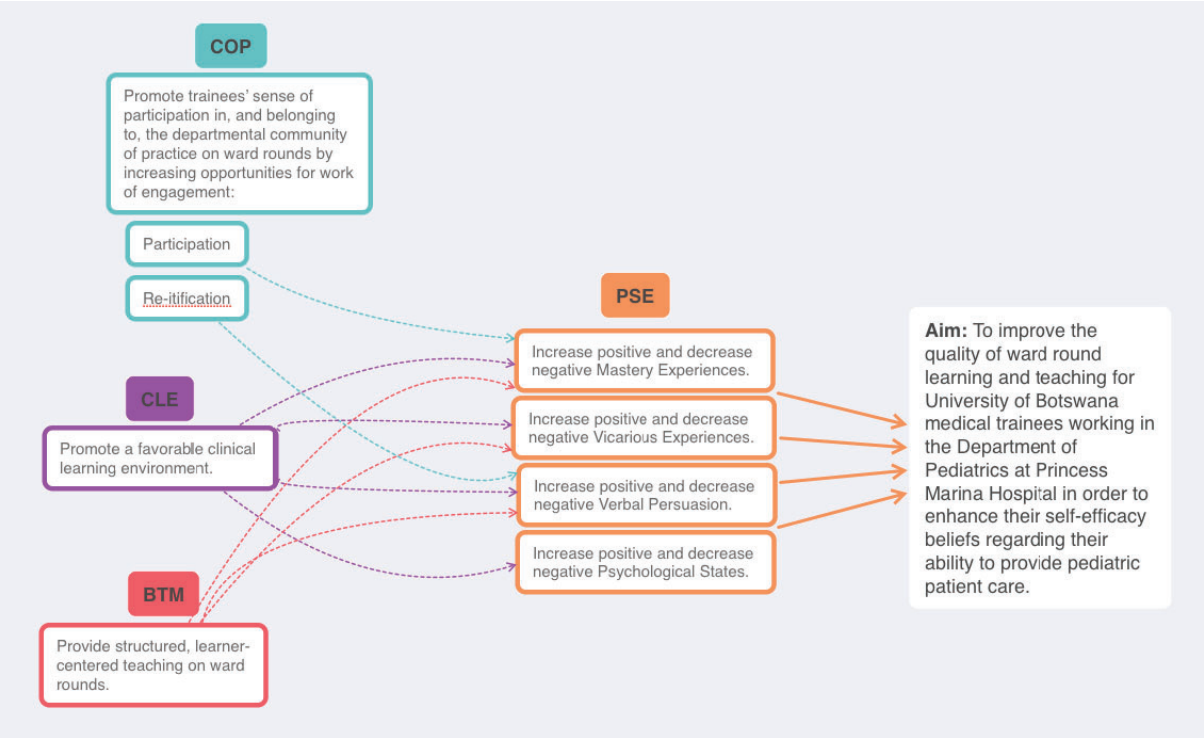
Note: While the below is a reflection of the accumulation of all of the data and experiences during all phases of this project, this final reflection most readily provides a description of the findings from Phase 3 – Cycle 3. As described in Chapter 9, Cycle 3 took place over a 3-month period in the Paediatric Haematology Oncology ward within the Department of Paediatrics at Princess Marina Hospital. During Cycle 3, twenty MBBS 5 students and 1 paediatric resident rotated on the PHO service, for 2 and 8-weeks respectively. Three paediatricians covered the PHO service at weekly intervals for 5, 3 and 3 weeks each. Data was captured from 14 MBBS 5 students, 1 paediatric resident and all 3 PHO faculty. During this time, ward rounds for all PHO patients (approximately 12-20 inpatient encounters per day) occurred at the bedside daily. Depending on the faculty, SNAPPS use occurred from a few times a week, to nearly every patient, every day. Therefore, it is within this context for which much of the final reflections are based.

10.2 THE INFLUENCES OF SNAPPS ON CLE, COP & PSE

10.2.1 A CONCEPTUAL SHIFT IN FOCI

When I first set out to do this research, I made the assertion that four educational elements (bedside teaching, the CLE, COP and PSE) - i.e. the *method* of teaching, the *environment* in which learning occurs, the *epistemological* value of social participation, and an individual's ability to both *acquire and utilize* their knowledge - are not distinct phenomena, but are interrelated, dynamic forces that influence each other in meaningful ways. I postulated that bedside teaching, the clinical learning environment, and participation in a community of practice all had the potential to influence an individual's perceived self-efficacy. *(Figure 78)*

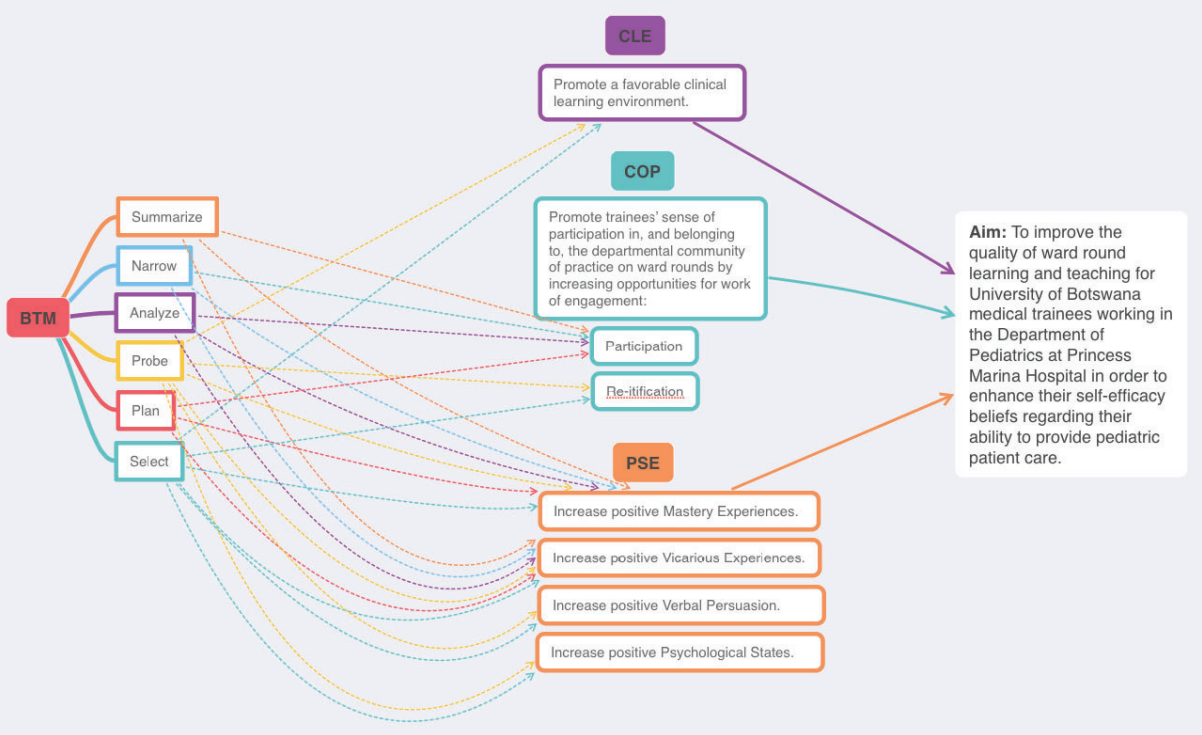
FIGURE 78: ORIGINAL - DYNAMIC INFLUENCES OF EDUCATIONAL ELEMENTS



While I postulated that *structured* ward round teaching, as compared to *unstructured* teaching, could have a positive influence on trainees' self-efficacy beliefs, I did not consider the influence of a BTM on

a learner's sense of belonging to a community of clinical practice, and I assumed that bedside teaching models, in and of themselves, do *not* regulate the clinical learning environment in which they occur. But through the findings of this project, I discovered the power of the BTM in and of itself, which shifted the foci of influence within my conceptual framework. I discovered that not only does a BTM have the potential to positively influence learner's PSE, but indeed can have direct influential effects on the CLE and elements of COP as well. *(Figure 79)* These findings are not necessarily contradictory, but indeed compliment and broaden my original assumptions, in that, the educational dimensions involved during a ward round are not isolated elements, but together, simultaneously impact learning and teaching.

FIGURE 79: MODIFIED - DYNAMIC INFLUENCES OF EDUCATIONAL ELEMENTS



In this section, I would like to explore this shift of focus of my original conceptual framework, because I believe that this change is advantageous to other clinical teachers. In that, by using the BTM as the starting point, it offers a very practical way to promote a holistic approach to optimize learning and teaching and address several learner and environmental needs concurrently.

10.2.2 RE-VISITING SNAPPS

Literature has previously shown SNAPPS to be effective in enhancing trainees' clinical reasoning, expression of uncertainties, and driving self-directed learning.[45,46,64] Integral to its design, SNAPPS is a learner-centred approach, with built-in experiential learning, verbalization of critical reasoning and uncertainties, and self-directed learning.[14] In this study, we found that these design elements, fashioned in a step-by-step approach, (i) promote a favourable CLE thru respecting uncertainty, (ii) allow for meaningful work of engagement to occur, thereby enhancing trainee sense of belonging to and participating in a clinical community of practice, and (iii) offers ample opportunities to positively influence trainees' PSE by providing built-in positive mastery and vicarious experiences, and verbal persuasion. While several SNAPPS publications have demonstrated supportive findings and eluded to the positive aspects that SNAPPS makes on the CLE, COP and PSE, none have explicitly correlated SNAPPS with these elements as such. To my knowledge, this study was the first to explicitly consider the direct relationship of SNAPPS to the CLE, COP and PSE.

10.3 SNAPPS INFLUENCES ON THE CLE

All bedside teaching encounters occur within the context of the clinical learning environment. To date, while bedside teaching models can provide an outline to potentially enhance the *content* of bedside teaching, they have not been, in and of themselves, shown to regulate the *clinical learning environment* in which they occur. Our study showed that through the utilization of SNAPPS, particularly the Probe and Select steps, that this BTM does indeed positively affect the clinical learning environment to be more *learning-oriented* as opposed to *performance-oriented*.

10.3.1 DEFINING THE LEARNING CLIMATE

In our literature review, we saw that one method to describe an 'unfavourable' versus a 'favourable' learning environment is to distinguish it as either a *performance-oriented* or a *learning-oriented* climate. In their work, Krupat et al., describe a *performance-oriented* climate as a CLE that "places emphasis on the demonstration of competence rather than its development."[86] In this environment,

trainees “are likely to hide their uncertainty” and “avoid feedback for fear of its possible negative consequences.”[86] In contrast, a ‘growth’ or ‘learning-oriented’ climate is one that focuses “on students’ development and growth . . . [and] encourages critical thinking and self-directed learning.”[86] In this environment, “uncertainty is to be embraced rather than feared.”[86]

10.3.2 Reviewing the SNAPPS literature through the lens of CLE

In prior work, SNAPPS has been shown to enhance trainees’ expression of uncertainties during the clinical encounter. In their original work, Wolpaw et al. found that the inclusion of the Probe step of SNAPPS was well received by both students and faculty.[14] Students particularly enjoyed the “unique approach of questioning the preceptor,” and faculty reported that students more “readily came up with questions for the preceptor when using the SNAPPS approach.”[14] In their later work, Wolpaw et al. found that “students in the SNAPPS group formulated nearly eight times more questions and uncertainties than the students in the comparison group.”[45] Subsequent researchers found similar findings. Nixon et al. showed, “. . . with SNAPPS-Plus presentations, participating students identified uncertainties 99% of the time.”[54] In a direct comparison to the one-minute-preceptor bedside teaching model, Seki et al. found that “members of the SNAPPS group used significantly more meaning units related to questions and uncertainty than members of the OMP group.”[59] Likewise, Fagundes et al., also in a direct comparison to the OMP model, found that “the SNAPPS group expressed significantly more questions and uncertainties . . . than students in the OMP group.”[65] The conclusion of these studies was that SNAPPS “greatly facilitates and enhances expression of diagnostic reasoning and uncertainties during case presentations.”[45]

Based on the above, there is no doubt in the literature that the use of SNAPPS quantitatively increases the expression of uncertainty for trainees when compared to traditional ward rounds or other BTMs. But the quantity of questions asked on a ward round does not necessarily result in a *learning-oriented* environment. While the mere act of probing on a ward round is a step in the right direction away from *performance-oriented* climates where trainees are more likely “to hide their uncertainty,” the question is not ‘how often do trainees express uncertainties?’ but rather, ‘is the expression of uncertainty valued?’[86]

Fortunately, previous SNAPPS publications have already answers this question for us. Literature has described the effects of SNAPPS utilization as "encouraging learners to raise questions themselves,"[59] and "structured to encourage learners to express their uncertainties,"[65] and "specifically supports students in their expression of uncertainty or diagnostic confusion."[49] *(underline added)* Therefore, literature has already established that through the inclusion of the Probe step, SNAPPS offers an "encouraging" and "supportive" environment for the learner to express his/her uncertainties.

The literature goes one step further and argues that not only is the expression of uncertainty encouraged and supported, it is indeed "essential": "setting the expectation that it is acceptable, in fact essential, for students to reveal their uncertainties,"[45] and "clearly stipulating that expressing uncertainties is an obligatory part of the case presentation,"[46] and "raises learners' awareness that they can and should ask questions."[65] And most pointedly, "During this step [Probe], the learner is expected to reveal areas of confusion and knowledge deficits and is rewarded for doing so."[14] *(underline added)* This "obligatory" rhetoric shows that literature has described SNAPPS as a method that thoroughly embraces uncertainty, and thus achieving a *learning-oriented* climate. While this direct correlation between SNAPPS and the CLE has not been explicitly discussed in previous literature, from the above, it is easy to make the conceptual argument in its favour.

10.3.3 Beyond the conceptual argument – our CLE findings

Beyond this conceptual argument, our findings support the direct correlation of SNAPPS to promote a *learning-oriented* environment. In Phase 1, as we assessed the prevailing teaching and learning environment on paediatric ward rounds at Princess Marina Hospital in the Department of Paediatrics, we found that with a few individual faculty exceptions, the DoP had a *performance-oriented* CLE.

In keeping with the literature's definitions of 'unfavourable' and 'favourable' CLEs, in Phase 1, participants were consistent in describing an 'unfavourable' learning environment as having the same characteristics as a *performance-oriented* climate: *"afraid to ask question,"* . . . *"not allowed to ask questions on rounds,"* . . . *"Reprimanded in front of patients for not knowing an answer,"* describing an overall *"should-know environment verses learning environment."* Likewise, a 'favourable' learning environment was described with characteristics and themes in keeping with a *learning-oriented*

climate: *"students are free to ask questions," . . . "when I didn't know an answer, it was ok," . . . "room to learn and make mistakes,"* with an overall climate toward *"tolerance of learning."*

While participants were able to give examples of both 'favourable' and 'unfavourable' learning environments experienced, specific to the DoP, there was a general sense from trainees that being in the department was felt to be 'unfavourable' or *performance-oriented* – *"in Paeds you're going to be crucified in that meeting!"* Often, the variable that was most notable to influence the learning environment on ward rounds was the individual clinical teacher: *"it depends on who you're with."*

The Phase 1 findings that the DoP learning climate is predominately *performance-oriented* was further substantiated during Phase 3, Cycles 1 and 2. The initial trainee apprehension of the Probe step during the educational series and difficulty during early introduction to SNAPPS highlights how foreign the concept of trainees 'asking questions' was on ward rounds. For instance, during the educational series, trainees expressed several apprehensions about the Probe step. Both medical students and junior residents alike asked what could their 'Probe' be about. *"What can we 'Probe' for?"* . . . *'Could it be about making a differential? Could it be about the plan? Could it be about a physical exam finding? Could it be about a social issue?'*

Trainees also expressed nervousness that if they probed the consultant, that he/she would not answer the question, but respond with a question re-directed back to the trainee or by saying 'Go read'. "*Students said they are uncomfortable with this step [Probe] because it usually leads to the consultant then asking a lot of intimidating questions."* Indeed, 'Probe' appeared to be the hardest step for them to practice during the educational session. Similarly, the Select step was noted to be a difficult step for trainees. "*Student didn't know how to Select so I need to guide them."*

Despite this prevailing *performance-oriented* climate, through the use of SNAPPS, there was a slow shift toward that of a *learning-oriented* climate. Initially, this started as small inquires and trials: *"A student asked, 'Can the Probe come after the Plan? So we can ask why are we doing this or not doing that?'." (SM) . . . "One student reframed Probe = 'My curiosities about the patient'." (SM)*

Eventually, in Phase 3-Cycle 3, with persistent use of SNAPPS on PHO, we found that the CLE had indeed shifted from a *performance* to a *learning-oriented* environment. When specifically asked "*Does using SNAPPS improve the learning environment on ward rounds?*" trainees collectively responded by answering that SNAPPS provided a CLE whereby uncertainty was respected. *"We were allowed to Probe the consultant on anything we did not understand which was more welcoming and engaging." (Trainee)*

Interestingly, while some trainees used descriptions such as *"calm"* and *"low stress"* to define their perceptions of an "improved" learning environment, many, in keeping with Phase 1 results, described the CLE in terms of whether they felt comfortable based on if uncertainty was accepted or denied. *"Comfortable to probe on curiosities/doubts and express that I am unsure about something." (Trainee)* In both descriptions, SNAPPS was associated with a 'favourable' learning environment. *"It also created a calm environment where there were no far-fetched questions that leave us feeling like we don't know anything." (Trainee)*

10.3.4 A TRUE CHANGE IN CLIMATE

The CLE shift we saw in Phase 3-Cycle 3 was not just figurative, but indeed represented a true alteration in the climate of the ward rounds. The persistent exposure to the SNAPPS model required trainees to participate in the Probe and Select steps of SNAPPS, which provided space for the change in climate from *performance* to *learning*-oriented.

10.3.4.1 FROM 'PIMPING' TO 'PROBING'

The "pimping phenomenon" can be described as when "a medical teacher poses a series of difficult questions in succession to medical students with the objective to teach while maintaining dominant hierarchy."[111] In this model, trainees are discouraged from asking questions because they are either directly discouraged, *"Not allowed to ask questions,"* or because their questions are answered with the deflective statement *'Go read'*. *"Makes you not ask questions because you know that every question will come back to me; I'd rather read than ask." (Trainee)* But with SNAPPS, the learner-

centred approach essentially shifts the encounter from the trainee being 'pimped' to the trainee 'probing': *"The Probe influences the environment the most. I may have a Probe in my head on PMW, but not feel free to ask." (Trainee)*

In this regard, the Probe step offers trainees an opportunity to express uncertainties and encourages them to ask questions. *"The Probe allows one to ask the team any questions." (Trainee)* This is in direct contrast to how trainees described the prevailing CLE in the DoP. Trainees described the traditional scenario of faculty 'pimping' of information from the learner. *"Most of the time we get grilled with questions and topics we're not prepared for," (Trainee)* and the effects of this bombardment of questions had on trainees: *"If you just ask one questions, I don't follow, you ask another one, you ask another one . . . now I'm shattered." (Trainee)*

10.3.4.2 FROM 'GO READ' TO 'SHARING AND LEARNING'

The Select step acknowledges that there is information currently not known that needs to be identified and learned, and where applicable, applied to patient care. In the prevailing CLE, participants described the importance of being given reading assignments, but acknowledged that for effective learning to occur, the reading assignments needed to be a two-step process: "*read and present."* A major advantage of this two-step process was that it created a space for a *"discussion"* on rounds, which promoted understanding and retention of the material. Yet trainees also expressed their frustration with a single-step reading assignment of *'Go read'* without the follow up discussion step.

While there is no specific step in SNAPPS to review or discuss the previous days' Selects, during Cycle 3, trainees found the Select step to be a practical and motivating educational activity. And contrasted it to the typical ward rounds where, *"No assignments with just SOAP, easier to report assignments with SNAPPS." (Trainee)* From a group perspective, during Cycle 3, the Select step became a team-driven activity. In this way, Select was not seen as an arbitrary, deflective response to 'Go read', but instead was seen to engage learners by "encouraging critical thinking and self-directed learning" and creating a genuine environment of sharing and learning on ward rounds.[86]

10.3.5 CLE SHIFT, NOT JUST FOR TRAINEES, BUT FACULTY, TOO!

Only one SNAPPS publication looked at the number and type of faculty expression of uncertainties. They found on the whole very little faculty expression of uncertainty, "preceptors expressed their own uncertainties five times during three of the 60 case presentations," and they found no difference between those faculty using SNAPPS and those not using SNAPPS.[46] In our study, while we did not specifically measure the number of uncertainties expressed by faculty during the ward round, we did measure trainees' perceptions of consultant expression of uncertainty. They reported that the consultant expressed his/her uncertainty *'A little bit'* during ward rounds; with no difference between the SNAPPS-Yes and SNAPPS-No groups. Yet, from our qualitative data, we saw the influences of SNAPPS on faculty. In particular, we saw Probe and Select facilitating a shift from a *performance-oriented* to *learning-oriented* climate for faculty as well as trainees.

We saw this occur in three ways. First, faculty readily acknowledged that the Probe step aided them in their own learning. *"I'm still learning a ton from the Probe." (SM)* In addition, the Select step encouraged ongoing faculty learning through reading: *"The system makes the Attending read too." (Faculty)*

Second, faculty and trainees began to acknowledge that the task of looking up information didn't always fall on the trainees, but also on the faculty as well. *"We laughed that we were doing our 'Probe homework'." (SM)* . . .*"This is why I love SNAPPS – you can give the consultant Select homework!" (Trainee)*. This in turn became a tool for role-modelling uncertainty and the importance of ongoing learning as a practicing physician. *"A lot of the Probes I can't answer, but I like role-modelling being comfortable saying, 'I don't know, but let's make that our Select'." (SM)*

Finally, we saw the CLE shift in a meaningful way for faculty revealing how SNAPPS helped them acknowledge their own performance-oriented bias and accept a more learning-oriented approach. *"I learn more because of SNAPPS; it also sets it up that it's ok if I (as the attending) also don't know – I felt freer on rounds, which was an unexpected benefit." (Faculty)*

10.3.6 More than just asking questions: a shift in the 'medical' paradigm

When we consider the traditions of medicine and its 'all knowing' culture, SNAPPS has the capacity to provide momentum for this much needed fundamental shift in the medical paradigm from 'all knowing' to 'all learning'. Bleakley, Bligh and Browne describe the established persistent hierarchy within medicine controlled by a "sovereign power" and its influences on the CLE.[21] By making Probing and Selecting a common place event, every day on rounds, several times a day, it becomes the norm and shows trainees, 'this is what physicians do': ask questions and look-up answers. In turn, this diminishes the 'all knowing' façade whereby faculty and trainees alike exchange the "old-fashioned apprenticeship of 'see one, do one, teach one'"[21] for the new tools of Probe and Select – a practical way to acknowledge, address and resolve uncertainties.

10.3.7 Was this all just SNAPPS?

Based on our Phase 1 findings of the 'impact of the individual teacher' on the CLE, one could argue that the positive influence on the CLE from *performance-oriented* to *learning-oriented* was motivated not just by the use of SNAPPS, but by the specific faculty members using SNAPPS. In support of this perspective is the fact that our most convincing results were from Phase 3 – Cycle 3, which was only conducted on the PHO service. Even prior to the introduction of SNAPPS, we saw in previous ECI surveys that PHO tended to score generally higher than PMW/NNU. This could be interpreted that the PHO faculty were in general more approachable or provided a more ideal CLE for trainees than those faculty who worked in PMW and NNU. This would support the theory that the positive influence on the CLE was secondary to the faculty members themselves as opposed to SNAPPS itself.

Yet, when asked about their experience of SNAPPS, trainees did not comment on the characteristics of the faculty conducting rounds, instead comments remained reflective of SNAPPS itself as supporting uncertainty. While this response could have been secondary to the phrasing of the open-ended question asked, these questions were also discussed in an open dialogue debrief session, where again, the individual characteristics of the faculty were not described. In fact, the only direct comparison of faculty made was that trainees specifically said that their impressions of SNAPPS did ***not*** change

depending on which PHO faculty was conducting rounds. This is in contrast with Phase 1 results, where the CLE very much depended on the individual faculty.

10.3.8 CLE CONCLUSION

This inclusion of the Probe and Select steps on a ward round have profound implications for future physicians – that it's ok not to know, and here's the practice to find the answer – this is one of the most practical and safe practices a physician-in-training could ever hope to learn. That's it's ok to be wrong, it's ok to not know, but it's not ok to not look up the answer. This shifts medicine from an 'all-knowing' paradigm to a humbled growth and advanced approach to evidence-based medicine. Therefore, through the daily act of asking questions and looking up answers, Probe and Select produce a climate that fosters questioning and reading. It is this *"allowance to not know"* and *"allows us to ask questions"* that reframes the learning climate to be one that is focused on "students' development and growth" and that "uncertainty is to be embraced,"[86] which is nothing but positive for trainees and patients.

10.4 SNAPPS INFLUENCES ON COP

While previous literature has described the importance of workplace learning activities to create space for learner work of engagement to occur,[109] to date, literature has not specifically looked at the influence of a structured BTM and its effects on COP. Our study showed that through the utilization of SNAPPS, that this BTM not only offers the opportunity for the work of engagement to occur, but indeed acts as a catalyst for learner engagement, thereby enhancing trainee sense of belonging to and participating in a clinical community of practice.

10.4.1 THE COMMUNITY OF PRACTICE OF MEDICINE

As discussed in Chapter 2, communities of practice are formed through *work of engagement*, and engagement occurs through *participation* and *reification*.[18,103] Activities that promote learner

engagement (*participation* and *reification*) to practice medical expert skills facilitate the entrance of newcomers into the COP of medicine. Traditionally, the most common workplace learning activity used in the clinical setting is bedside teaching.

10.4.2 CONTENT IS KEY

Yet, while bedside teaching has the potential to support learner engagement, the *content* within the bedside teaching encounter must allow for both participation and reification to occur. I.e. the learner must have the "*ability* and *legitimacy* to make contributions" and to receive appropriate feedback.[18,103] As we saw in Phase 1 of our results, while the bedside teaching encounter was valued as an effective means of clinical teaching, it did not, in and of itself, always provide learners with opportunities for work of engagement.

Specifically, challenges in work-learning balance often resulted in what participants described as *"business rounds"* whereby the focus on rounds *"isn't about teaching, but about being done with the patient."* This shift from the desired dual-focused ward round of patient care *and* teaching, to the sole focus of patient care, in turn led to a shift in the trainee role. In that, instead of being invited to participate in rounds in a meaningful way, such as practicing critical thinking or patient management plans, the trainee role was limited to reporting. *"Sometimes . . . I just recite my plan and feel like a secretary."* These missed opportunities for trainees to contribute in meaningful ways delegitimized their role, and instead of enhancing their sense of belonging to or participation in the community of practice, it weakened it. This resulted in trainees feeling *"ignored,"* or that *"students were just there,"* and questioning *"why did I even do this in the first place?"*

Likewise, trainees also described a paucity of bedside teaching feedback. *"We don't get enough feedback, so you're left wondering, 'Did I do a good job?'"* This lack of reification prevented learner engagement, and in some instances, unconstructive feedback prevented the learning opportunity altogether, *"When the feedback feels like an embarrassment, then you don't learn."*

Therefore, despite the potential of bedside teaching to be a platform upon which the *work of engagement* can occur, unless specific steps are made to ensure learner engagement, then the BT encounter has the potential to not only elude learner engagement, but more worrisome, can lead to delegitimizing newcomers from entering the COP of medicine.

10.4.3 ENVIRONMENT IS KEY

Not only does the *content* of the bedside teaching encounter need to be supportive of learner engagement, so too does the *environment* of the encounter. Establishing a safe, "respectful, welcoming, and supportive" learning environment is absolutely necessary for the work of engagement to occur.[109] As we saw in our Phase 1 data, trainees described scenarios where they were *"nervous to present on rounds"* or *"petrified to be asked a question"*, which results in learner behaviours that are inconsistent with learner engagement.

This indicates that while bedside teaching has the potential to offer learners relevant and authentic opportunities to practice medical expert skills, too often the "verbal interaction between clinical teachers and learners," instead of promoting work of engagement, transforms into a "toxic" learning environment where the learner is devalued, belittled and/or humiliated.[111]

10.4.4 SNAPPS VS SOAP

Unlike traditional, unstructured bedside teaching encounters, SNAPPS readily supports learner engagement through both the *content* and the *environment* of the bedside teaching encounter. Whereas the SOAP model and other similar unstructured bedside teaching encounters rely heavily on the content of the encounter to ensure participation and reification is occurring, the learner-centred, step-by-step approach of SNAPPS acts as a catalyst for learner engagement by providing the "ability and legitimacy to make contributions" and reification for greater work of engagement to occur. And, as described above, our findings indicate that SNAPPS positively affects the learning environment to be more *learning-oriented*, which is not always the case with traditional, unstructured bedside teaching.

10.4.5 Reviewing the SNAPPS literature through the lens of COP

While none of the SNAPPS literature directly refers to Wegner's social learning theory of communities of practice, five key points are made throughout the literature that support that the use of SNAPPS promotes learner work of engagement and enhances trainee sense of belonging to and participating in a clinical community of practice.

10.4.5.1 The "cognitive dance" - from passive participant to active learner

Wolpaw et al.'s descriptions of their original work clearly describe learner work of engagement. They assert that through the SNAPPS' "five steps that require the verbalization of thinking and reasoning", in turn, a "cognitive dance" is created which "links learner initiation and preceptor facilitation in an active learning conversation."[14]

This "collaborative learning conversation" does three things.[14,62] First, "it helps learners to understand what is expected of them and take on a central role during the case presentation," which is an essential participation aspect of COP.[65] Second, it "encourages the expression of thinking and reasoning about a clinical case," which provides trainees with legitimate practice of medical expert skills.[61] And third, it fundamentally changes the role of the learner from *passive participant* (giving of facts and information) into an *active learner* (engaging in conversations about the patient and medical care).[14,65] In this way, SNAPPS creates a space for trainees to legitimately practice the skills of a medical expert during an authentic patient encounter, and as such, facilitates learner work of engagement. Literature has described that "such active learning strategies support learner autonomy, foster motivation and, consequently, impact positively on the learning outcomes,"[65] all of which aid in the sense of belonging to the COP of medicine.

10.4.5.2 "DESIGNED TO PROMOTE ENGAGEMENT"

Literature also reflects on how the individual steps of SNAPPS promotes learner engagement through offering the ability to continuously practice medical expert skills. For instance, the Select step encourages trainees to "read nightly in a regular disciplined, and patient-based manner."[14] The Probe step "focuses not on the questions or explanations of the preceptor, but rather on encouraging learners to raise questions themselves to accelerate problem-solving and autonomous learning."[59] And as a whole, SNAPPS "is a technique for case presentation which enables the process of hypothetic-deductive approach and also of self-directed learning," and "gives explicit steps to the postgraduates' and hones their clinical reasoning skills."[64]

From these discussions, the literature has described SNAPPS as an educational activity "designed to promote engagement" of trainee acquisition of medical expertise, which in turn, facilitates their entrance into the COP of medicine.[109]

10.4.5.3 "FROM PRIVATE THOUGHTS TO ACCESSIBLE, DISCUSSABLE TEACHING OPPORTUNITIES"-AIDING THE PROCESS OF REIFICATION

Literature also describes SNAPPS as an "effective cognitive forcing strategy that transforms students' clinical reasoning and uncertainties from private thoughts to accessible, discussable teaching opportunities for teachers."[46] This forced "airing" of thoughts and clinical reasoning greatly aids in the process of reification and feedback for the learner. In that, "the preceptor can learn a great deal about the learner's thought process and knowledge base by such interactions."[14] In turn, the teacher can now accurately meet the learner where he/she is at and teach and provide feedback accordingly.

Literature has previously described the benefits of this real time feedback process; "The SNAPPS technique gives the teacher insight into the clinical reasoning of students; makes space for the immediate feedback and the teaching moments depending on the students need."[64] Specifically, the Probe step of SNAPPS was reported to lead "to better discourse and immediate feedback from the teacher."[64] And the Plan step, "helps the teacher understand the level of the learner and shape subsequent management plan."[64]

In this way, SNAPPS literature describes how the steps of SNAPPS improves the reification process for trainees, in that, too often, traditional forms of unstructured bedside teaching rely on teacher assumptions about what the trainee does or doesn't know and provides feedback based on these assumptions. Whereas, SNAPPS, through the obligatory divulgence of trainee's clinical reasoning and thought process allows the teacher to *know*, rather than *assume*, and provides a more focused, accurate and trainee-specific level of feedback that augments the sense of belonging to and participating in the clinical COP.

10.4.5.4 "TREATED AS THINKERS"

Literature has also described SNAPPS as "a type of constructive learning in which students are treated as thinkers who are able to develop new knowledge,"[57] and "encourages problem-solving and autonomous learning."[59] These quotes directly describe SNAPPS influence on trainees' transition from the peripheral ("outsider") to the central ("insider") within the COP. In this way, SNAPPS not only recognizes, but also supports the role of trainees from "legitimate peripheral participation to full membership in the group"[109] by providing a mechanism by which trainees can practice the desired medical expert skill set and contribute to the medical COP.

10.4.5.5 "ENCOURAGING AUTONOMY" AND ITS INFLUENCES ON IDENTIFY FORMATION

Literature describes SNAPPS as providing "learners the opportunity to be more active in their learning"[64] and "encouraging autonomy" whereby "learners using the SNAPPS approach assume a key role during the session with their supervisors."[65]

This acquisition of autonomy can be directly linked with learner identity formation. As learners gain more and more opportunities to practice medical expert skills, in turn, learners develop an advancing level of competence (i.e. "autonomy") and this "practice translates into an identify as a form of competence."[18,103] Therefore, SNAPPS as an educational activity, provides opportunities for trainees to "think, act, and feel like physicians",[109] resulting in trainees to identify themselves as members of the community of practice of medicine.

The SNAPPS literature supports this direct correlation between autonomy and identify formation. "Taking such an active role in clinical practice is crucial to achieving the desired educational outcomes, enhancing one's sense of competence . . . engaging students in the patient's care may boost the feeling of relatedness. Students can really feel part of the team. These are key elements of self-determination theory."[65]

10.4.6 BEYOND THE CONCEPTUAL ARGUMENT – OUR COP FINDINGS

Based on this conceptual argument, while not explicitly stated, the SNAPPS literature does indeed describe how SNAPPS promotes learner work of engagement and therefore promotes trainee entrance into the COP of medicine. Our findings further support this. We found that compared to the 'traditional' ward round, the SNAPPS model offered more organization, more structure, more trainee contribution, more engagement between faculty and learners, allowed faculty to identify trainees' knowledge gaps, allowed trainees to feel more part of a team, and encouraged learner autonomy – all of which contributed to the enhancement of learner work of engagement.

In Phase 1, despite the practice of bedside teaching, we saw several challenges and missed opportunities for trainees to legitimately participate in and contribute to the clinical COP. *"With some consultants your input means nothing."* Instead of being able to practice medical expert skills or contribute to the ward round, trainees' roles were limited to reporting. *"No interaction; just want to hear numbers spit back at them and sign off."* This resulted in an absence of contribution and disconnection from the COP that the trainees are trying to enter. *"Pushed to do ward work without teaching, you don't get a sense of purpose as to why you are doing this."*

In Phase 3, with the introduction of SNAPPS, we start to see the reclaiming of these missed bedside teaching opportunities. During the initial introduction, it became apparent that the traditional method to present on ward rounds was the SOAP model, which provided limited opportunity for trainees to share their thought process. *"She reported that he really only used the Summarize part, then skips to the Plan, so she didn't know how to Narrow, Analyse or Probe."* But through the utilization of SNAPPS, we see a shift whereby the structure, contribution, engagement, feedback, sense of belonging, and competence of and within the ward round are positively influenced. Also in Phase 3, with the use of

the Trainee Rounding Log, the two COP-related questions were shown to be rated higher by those students who used SNAPPS versus those who did not; 14% higher in the first group of students and 26% higher in the second group of students.

10.4.6.1 "ALL SPEAKING THE SAME LANGUAGE" (FACULTY)

One of the most powerful concepts of COP is "access to the full reificative paraphernalia of [the] practice",[18,103] which includes access to the shared knowledge, norms, language, values, and goals of the COP. A central part of this access is for the trainee to know what his/her specific role is and expectations are within the COP. Without this understanding, individuals are left as "outsiders" beyond the peripheral boundaries of the COP and are void of access to a role that will promote entrance.

In terms of a clinical setting, it is immensely important for trainees to have a clear understanding of what their role is and what is expected of them, i.e. communication of goals. Communication of goals "includes the establishment as well as explicit expression of teachers' and learners' expectations . . . setting goals provides a structure for the teaching process,"[38] and "this process encourages trust."[96] This allows the trainee to focus on that specific contribution; to master that skill before moving from a more peripheral role toward a more central role within the COP. Without these identified boundaries, trainees can experience a sense of confusion and remain persistently on the outskirts of the COP because they don't know what to do or how to fulfil a role that will advance them inward.

During Phase 1, communication of goals was found to be lacking within the Department of Paediatrics. Trainees described a sense of being generally *"confused about [the] worker-learner role"* and often felt *"just lost"* or questioning *"why are we there?"* Without communication of goals, trainees were left to *"just standing in the ward, we don't know what to do."* Subsequently, this led to a description of a general disconnect between the trainees and the faculty, *"Couldn't understand what they wanted from me."* And in some instances, trainees feeling penalized for not understanding faculty expectations. *"Leaves a lot of grey area where you're in trouble and you don't even know why."* Indeed, Phase 1 related survey questions from DREEM, PHEEM, and EEL were among the most poorly scored

of all the questions, indicating that there was certainly a deficiency in a shared understanding of the role and expectations of trainees.

But with the introduction of SNAPPS in Phase 3, we saw from both faculty and trainees that SNAPPS offered a shared structure and organization to the rounds that was previously absent. *"It is something good to replace the past – more organized & all speaking same language on ward rounds." (Faculty) . . . "In the past, you feel rounds is a bit haphazard, but with the new format that you follow is helpful." (Faculty)* This sense of a *"general direction"* whereby "*all team members participate and know what to do" (Trainee)* allowed for a shared direction, language, and common goal which is essential for COP to form and facilitate learning. In this way, as compared to a traditional, unstructured bedside teaching, SNAPPS, through a guided six-step process, promotes a shared experience among the COP members, which facilitates learning through social participation.

10.4.6.2 "STUDENT INPUT MATTERS MORE WHEN YOU USE SNAPPS." (TRAINEE)

Similar to the SNAPPS literature, we found that SNAPPS actively promoted learner participation during ward rounds. In Phase 1 we saw that often the role of the learner was limited to a passive role. One of the most worrisome examples of this was identified just after the introduction of SNAPSP in Phase 3 – Cycle 1, when faculty described their lack of trust in trainees to Summarize; "*I found I didn't trust the students fully to Summarize for new patients." (Faculty)* This lack of trust was paired with lack of obligation to teach the trainees how to adequately Summarize. *"I don't have time to go back over the chart every day to see what the student has missed – I have other patient responsibilities that take up my time." (Faculty)* Without guidance of how to obtain the medical expert skill of Summarization – i.e. to identify pertinent positive and negatives from a patient's history and exam – it became the norm for trainees to read the entire chart each day, and then for the faculty member to sift through and identify the pertinent information being reported to them. This limited reporter role not only keeps the trainee at the periphery of contribution, it limits their ability to ever enter or move beyond that role.

But through the utilization of SNAPPS in Phase 3 – Cycle 3, trainees unanimously described a shift in their role from passive participant to actively contributing to the ward round. *"I was more intellectually*

involved" . . . "a greater opportunity to voice out our contribution" . . . "Our input was often soughted unlike in the [PMW] ward rounds" . . . "We are involved in the care of the patient from the word go!"

Compared to the traditional ward round, trainees felt that the structured steps of SNAPPS not only provided opportunity, but indeed the expectation, for the trainee to voice his/her thoughts about the case. *". . . students do most of the talking . . . instead of blankly reading from the patient's file, we will be discussing what we think about the case." . . . "I realized that I spoke more during rounds when using SNAPPS. It sort of forces the student to ask questions and participate."* The trainee description of being involved and contributing in patient care reflects a shift from "low-level" to "high-level" clinical teaching during the ward round, allowing for more meaningful contribution and thus practicing medical expert skills required to enter the COP.[43]

10.4.6.3 PROMOTION OF MEANINGFUL ENGAGEMENT

As described in the SNAPPS literature, we also found that SNAPPS promoted engagement between faculty and trainees, allowing for "development of shared practice."[18] Participants described that the use of SNAPPS stimulated more interaction between faculty and trainees, which fostered an environment for more active teaching. *"SNAPPS increases the interaction between you and the doctor [faculty]." (Trainee). . . "It forced me to provide some teaching I wouldn't have otherwise." (Faculty) . . ."[SNAPPS] make[s] you feel like you were teaching more on rounds." (Faculty)*

In turn, this interaction led to an increased sense of engagement during the rounds, particularly for faculty. *"Student learning interest has peaked." (Faculty) . . . "they are not reading from the file and they are now looking around." (Faculty) . . . "Seemed less boring when students were presenting using SNAPPS." (Faculty) . . . "pull me back into the specific Narrow or Probe of the patient, then I'm more engaged." (Faculty)*

The increased engagement led to descriptions of *"richer discussions"* and more meaningful trainee contribution and learning during ward rounds, *"Encouraged more thought process about patients."*

(Trainee) . . . "You follow up labs more because you understand more because you used SNAPPS and it was your Plan." (Trainee) All of which reflects successful work of engagement.

10.4.6.4 IDENTIFY TRAINEES' KNOWLEDGE GAPS TO IMPROVE REIFICATION

One of the most notable issues identified during Phase 1 was the lack of feedback trainees received. Feedback-related questions from the DREEM, PHEEM and EEL surveys were among the lowest scored of all the survey questions; and qualitative reports supported the poorly timed, potentially damaging content, and overall paucity of feedback trainees received. While there is no specific step in SNAPPS that instructs the teacher to provide feedback for the learner, we found that through the process of the trainee expressing his/her thoughts, this in turn allows for faculty to more readily identify trainees' knowledge gaps. "*Has been helpful to identify that the students don't know what's being said on rounds, we wouldn't have known otherwise without SNAPPS." (Faculty)* Through the more readily accessible trainee thought process, faculty in turn were able to directly provide relevant feedback to the learner. In this way, feedback during SNAPPS "provides an educational loop through which the teacher can guide learners to use the evaluation of their performance to reassess attainment of goals."[38,96] And omission of verbalized trainee thought process limits constructive faculty feedback, "reduced discourse makes providing feedback and guidance to the students about their clinical reasoning nearly impossible."[45] Parallel to what was described in the SNAPPS literature, this interaction aids in the reificiation process of work of engagement, and encourages specific direction for how to better become a member of the COP of medicine.

10.4.6.5 INFLUENCES ON IDENTIFY FORMATION

By the end of Phase 3-Cycle 3, the enriched learner sense of belonging was palpable. Our qualitative findings demonstrated that trainees not only felt *"heard"* and *"appreciated",* but that they were indeed now *"involved"* and *"part of the team".* Specifically, trainees felt that SNAPPS aided in this process in two key ways. First, as described above, SNAPPS-use resulted in a shift of learner role from passive to active participant. *"My voice was heard and my thoughts appreciated . . . and added to the patient's management. I wasn't just a presenter."* In turn, this provided trainees with a growing sense

of autonomy to take *"control"* and *"engage"* in patient care, which made their contribution to ward rounds feel more valued. *"You're more involved with patient care, so you're more part of the team."*

Second, SNAPPS was found to positively encourage a group approach toward patient care. Faculty and trainees alike provided descriptions of team learning and shared responsibility of patient care, including *"together Narrows," . . . "they did SNAPPS as a team"* and new emphasis on *"our patient."* This newly established group dynamic using SNAPPS led to trainees feeling a novel engagement with others on the team. *"Because all these [SNAPPS steps] are done by team not just the individual directly caring for the patient it makes one to be more part of the team."* Trainees' growing sense of autonomy and competence paired with an enhanced feeling of being part of the team directly influenced their identity formation toward membership within the COP, which is a central aspect of the process from peripheral to central role within the COP.

Beyond its influences on COP, the team dynamics of SNAPPS was an interesting and unexpected finding for us because SNAPPS has not been directly studied in its relation to team or group dynamics on ward rounds, most studies have only looked at one-on-one faculty-trainee dynamic, and none have looked at the use of SNAPPS with differing trainee levels (i.e. students and residents) at once. While one review article speculated on the flexibility of SNAPPS to work well in a group teaching setting,[52] there is no published evidence to date to support this statement; our study is the first to support this. In a world where interdisciplinary practice is valued, this offers opportunities for interesting further research.

10.4.7 COP Conclusion

Of the many aspects that makes SNAPPS an excellent catalyst for the work of engagement to occur is its inherent learner-centred approach. The individual steps of SNAPPS offers the faculty and trainee a process by which to focus on the learner's understanding, gaps, and needs, while simultaneously allowing them the opportunity to practice essential medical expert skills. As seen both conceptually in the literature and supported by our findings, this learner-centred process provides the content and environment needed to directly support trainee participation and reification, fostering learner engagement and allowing entrance toward full membership of the COP of medicine.

10.5 SNAPPS INFLUENCES ON PSE

While previous literature has described the importance of promotion of learner self-efficacy in an academic setting,[130,131] to date, literature has not specifically looked at the influence of a structured BTM and its effects on trainee PSE. Our study showed that SNAPPS offers ample opportunities that positively influence trainees' PSE by providing built-in positive mastery and vicarious experiences, verbal persuasion; and through the promotion of a positive CLE, can promote positive psychological states for learners.

10.5.1 REVIEWING THE SNAPPS LITERATURE THROUGH THE LENS OF PSE

While none of the SNAPPS literature directly refers to Bandura's theories of perceived self-efficacy, two key points are made throughout the literature that support that the use of SNAPPS positively influences trainees' perceptions of self-efficacy.

10.5.1.1 GAINED MASTERY EXPERIENCES

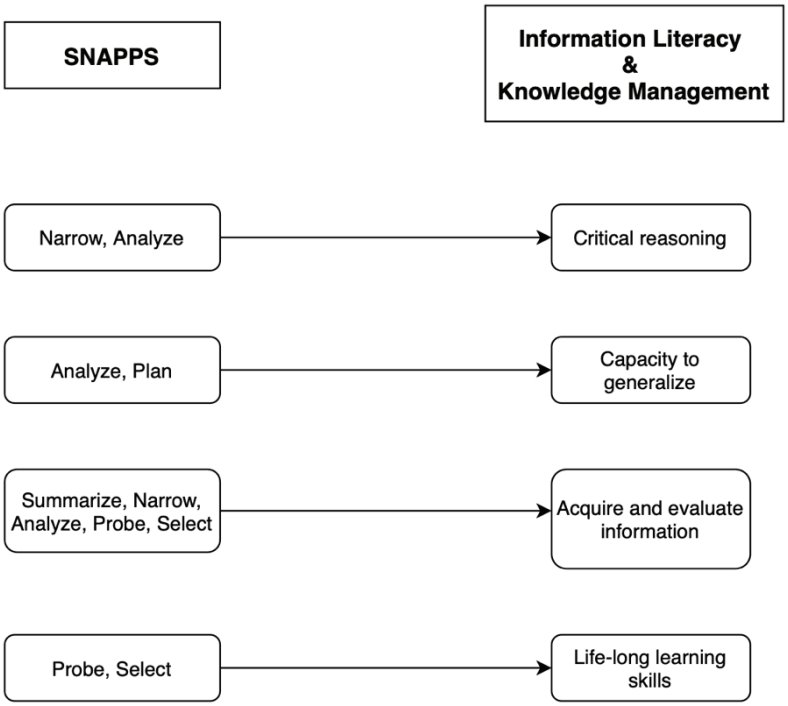
Wolpaw's original work showed impressive outcomes in terms of clinical reasoning, particularly with "expression of diagnostic reasoning and uncertainties."[45,46] Specifically, "learners who were instructed to use SNAPPS (with trained faculty) provided on average 1.27 more items in the differential diagnosis (2.08 SNAPPS vs 0.81 comparison group) and 1.04 more total justification reasons for items in the differential diagnosis (1.26 versus 0.22).[46] Students also were far more likely to seek information by asking questions or acknowledging uncertainties (84.38% SNAPPS versus 10.77% comparison), discuss patient management (84.84% versus 53.72%), and initiate reading selections for self-study (51.61% versus 0%).[45]" [40]

Subsequent studies found similar results with trainees expressing more differential diagnosis, justifying their differential diagnosis more often, expressing more questions and uncertainties, and selecting cases for self-directed learning more often as compared to the control/comparison groups.

[56,57,59,62,64,65, 60] What these studies show is that through the utilization of SNAPPS (as opposed to traditional rounds or other BTMs), trainees who used SNAPPS gained more experience in practicing medical expert skills.

As described in Chapter 2, the fundamental goal of medical training is for learners to become "medical experts."[104] Medical expertise can be achieved through the acquisition and interplay of two skills sets: "information literacy and knowledge management."[105] To this end, "medical education has been aimed primarily at helping medical students develop the power of critical reasoning, the capacity to generalize, the ability to acquire and evaluate information, and the intellectual tools to become lifelong learners."[106] From this perspective, the individual steps of SNAPPS provide opportunities for learners to practice "medical expert" skills. While there is great overlap, in general, each step of SNAPPS provides an opportunity to practice a specific medical expert skill. *(Figure 80)*

FIGURE 80: RELATIONSHIPS BETWEEN SNAPPS AND MEDICAL EXPERT SKILLS



SNAPPS literature readily links the steps of SNAPPS with medical expert skills: "SNAPPS gives explicit steps to the postgraduates' and hones their clinical reasoning skill."[64] . . . "SNAPPS . . . enables the

process of hypothetic-deductive approach and also of self-directed learning."[64] What literature does not explicitly state, but can be conceptually argued, is that these opportunities to practice medical expert skills are a form of gained mastery experiences for medical trainees. In that, if a mastery experience results in an "authentic successes in dealing with a particular situation,"[113] then each use of SNAPPS provides an opportunity to practice medical expert skills and subsequently provides the learner with a positive experience that he/she can draw on in the future that references their success at a given task, (i.e. a gained mastery experience).

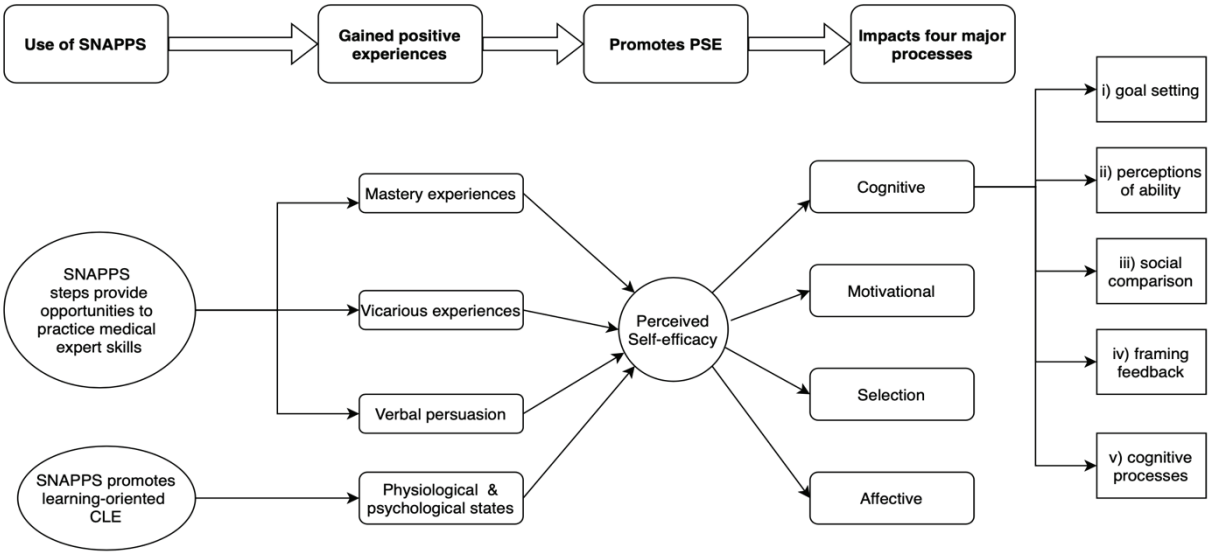
Without explicitly stating this, SNAPPS literature argues for such a case,

"Case presentations require many skills including gathering and summarizing patient data, and elaboration and expression of clinical reasoning. It is a challenge to achieve such complex skills by just watching peers or clinical teachers in action, which is why supervisors should facilitate this process by clarifying instructions and guiding the learners through the steps of clinical reasoning."[65]

(I.e. faculty ought to guide learners to achieve medical expert mastery experiences).

From this viewpoint, the argument can be made that trainees' practice of medical expert skills on a ward round during an authentic patient encounter results in gained mastery experiences (for the trainee presenting), vicarious experiences (for the trainees observing), and verbal persuasion (from the feedback offered by faculty). Therefore, through the use of SNAPPS, the trainee has a direct link to positively influence their PSE on their path toward medical expertise. *(Figure 81)*

FIGURE 81: RELATIONSHIP BETWEEN SNAPPS, 'MEDICAL EXPERT' SKILLS & PSE



Subsequently, since the most powerful way to promote learner self-efficacy beliefs is through gained mastery experiences, this in turn influences an individual's self-efficacy beliefs and their four major processes of cognition, motivation, selection and affective processes.[19] *(Figure 82)* This line of thought has been indirectly argued in previous literature. Indeed, SNAPPS' literature makes direct reference to trainee *'confidence'* and *'motivation'*.[60, 65] And is also discussed in terms of future outcomes : "These experiences provide experiential learning to be applied in future."[60] . . . "Such active learning strategies impact positively on the learning outcomes and academic performance."[65] From this assessment, through the use of SNAPPS, educational outcomes in terms of skills, confidence, and motivation have already been argued in previous literature.

10.5.1.2 SUPPORTS LEARNER AUTONOMY

Furthermore, SNAPPS literature describes scenarios whereby the use of SNAPPS not only allows for trainees to practice medical expert skills, but indeed provides context and opportunities to achieve autonomy in patient care. SNAPPS use is described as providing trainees with a "central role",[62,65] to "take charge"[51] and "commitment"[14] to patient care, which in turn enhances their sense of learner autonomy. "Based on adult learning principles and encouraging autonomy, learners using the SNAPPS

approach assume a key role during the session with their supervisors."[65] As indirectly argued in the literature, this type of facilitated mastery experience provides a realistic familiarity of what it means to practice medicine, and subsequently can positively influence trainee PSE: "Such active learning strategies support learner autonomy, foster motivation and, consequently, impact positively on the learning outcomes."[65]

10.5.2 Beyond the conceptual argument – our PSE findings

Beyond the conceptual arguments presented above, our findings support that SNAPPS offers ample opportunities to practice medical expert skills, which in turn provides built-in positive mastery and vicarious experiences and verbal persuasion, and through the promotion of a positive CLE, can promote positive psychological states for learners. This can potentially lead to improved trainee PSE in terms of becoming a medical expert.

10.5.2.1 Trainee perceptions of self-efficacy

As described in Chapter 2, "perceived efficacy is a judgement of capability" in relation to a specific domain of functioning,[19] but can be difficult to evaluate and measure, particularly in a clinical learning environment.[129] Throughout our project, we used several methods to capture trainee PSE in relation to their paediatric patient care. In Phase 1 and 2, using our original PSE survey, we saw trainees score themselves quite high, with students and residents rating themselves an average of 74% (median 96.5; range 67-116) and 84% (median 108; range 98-126) capable in performing paediatric medical expert skills, respectively.

And in Phase 2, using the Daily PSE survey, MBBS 3, MBBS 5 and residents continued to rate their confidence to perform medical expert skills relatively high: 75% (median 16, range 10-19); 76% (median 12, range 9-13); and 85% (median 12, range 9-15), respectively. This was further illustrated by the MSLQ sub-category of self-efficacy whereby students and residents rated their capacity to perform well on ward rounds as 71% (median 36, range 11-47) and 76% (median 39, range 17-43), respectively.

Yet, other data indicated that the *opportunity* for trainees to practice these skills was infrequent and dependant on the individual clinical teacher. For instance, from the EEL survey, students and residents reported an average perception of faculty encouragement of medical expert skills to be only 63% (median 26, range 4-40) and 64% (median 23, range 18-37), respectively.

And from the Phase 1 qualitative data, we saw that while critical thinking was valued as an important tool to promote effective learning, and did indeed lead to improved trainee perceptions of their confidence, there were several factors of the clinical environment and/or the individual faculty attending rounds that made engaging in critical thinking challenging. Trainees described scenarios of being *"allowed"* to make their own conclusions or contemplate difficult clinical scenarios as the exception instead of the standard practice. This resulted in ward rounds functioning as a type of 'mimicking' of medical expert skills, particularly on *"business rounds",* rather than authentic participation in medical expert skills. This led trainees to describe feelings of being uninvolved and/or confused about patient care management.

Interestingly, while trainees rated their perceptions of mastery skills relatively high, they rated much lower in the other areas that influence PSE. For instance, when asked to compare themselves to their peers to elicit information about trainees' vicarious experiences on a ward round, MBBS 3, MBBS 5 and residents rated their social comparison to perform on a ward round much lower than their mastery experiences: 59% (median 3, range 1-4); 67% (median 3, range 1-5); and 62% (median 3, range 1-4), respectively.

And when asked to report on trainees' experiences with verbal persuasion (i.e. evaluative feedback on ward rounds) trainees reported this to be significantly ineffective and lacking, with students and residents rating the overall sub-category of feedback from the original EEL survey as 54% (median 8, range 0-15) and 44% (median 7, range 0-13), respectively.

Similarly, trainees' psychological experience of rounds was noted to be frequently dependent on the individual faculty member attending rounds, and could vary from a learning environment where

trainees either felt safe and respected, or nervous with the development of self-doubt. With MBBS 3 and MBBS 5 rating on their Daily PSE survey positive psychological experience of rounds an average of 66% (median 6, range 3-10), and 68%: (median 7, range 4-10), respectively. And on the MSLQ survey, students and residents scored their positive psychological experience of rounds an average of 56% (median 14, range 4-28), and 69% (median 20, range 12-27), respectively.

During Phase 3 – Cycle 1, as we introduced SNAPPS (and thus opportunities to practice medical expert skills on ward rounds), we continued to see mixed and divergent results. With the exception of MBBS 3 (who were on their first clinical rotation ever), high levels of confidence to perform medical expert skills continued to be reported on the Daily PSE survey. MBBS 3, MBBS 5 and residents reported their confidence to perform medical expert skills to be: 61% (median 12, range 7-16); 71% (median 12, range 5-15); and 87% (median 13, range 10-15), respectively. Yet, trainees noted on the EEL survey that the faculty encouragement of medical expert skills (i.e. elements for effective teaching) on PMW and NNU to be only 61% (median 17.5, range 9-19) and 54% (median 14, range 5-12), respectively – again, highlighting missed opportunities to authentically engage in medical expert skills.

In reference to the specific steps of SNAPPS, Phase 3-Cycle 1 mixed methods results continued to support previous findings of limited opportunities for trainees to practice medical expert skills. In that, the reports of trainees struggling with Summarize, Narrow, Analyse, Probe, Plan and Select suggests that trainees lacked experience and skill in these critical areas of medical expert skills.

10.5.2.2 DIVERGENCE?

These divergent results of trainees rating themselves relatively high in capacity to provide paediatric care in the setting of frequent missed opportunity to engage in such activities, and with lower scores for the other three categories that influence perceptions of self-efficacy was confusing. This divergence may be explained by the previously published doubt in self-reported self-efficacy, whereby "research has demonstrated varying degrees of discrepancy between self-assessment and observers' ratings of corresponding skills."[132] Or the divergence may indicate that frequent trainee engagement in 'mimicking' of medical expert skills created an area of misperception, whereby trainees *thought* they were capable to perform paediatric medical expert skills, but in fact, they *were* not.

This latter explanation is consistent with our Phase 3 – Cycle 2 findings, in that, with the continued introduction of SNAPPS, trainees now had an authentic comparison of medical expert skills, which was reflected in their reported PSE. In Group 1 of Cycle 2, we saw a decrease in overall trainee PSE for both SNAPPS-Yes and SNAPPS-No groups: 67% (median 40, range 29-51), and 62% (median 21, range 12-32), respectively. These values appeared to be more congruent with our other findings, and allowed us to more readily consider in which ways SNAPPS did and did not influence trainees' PSE.

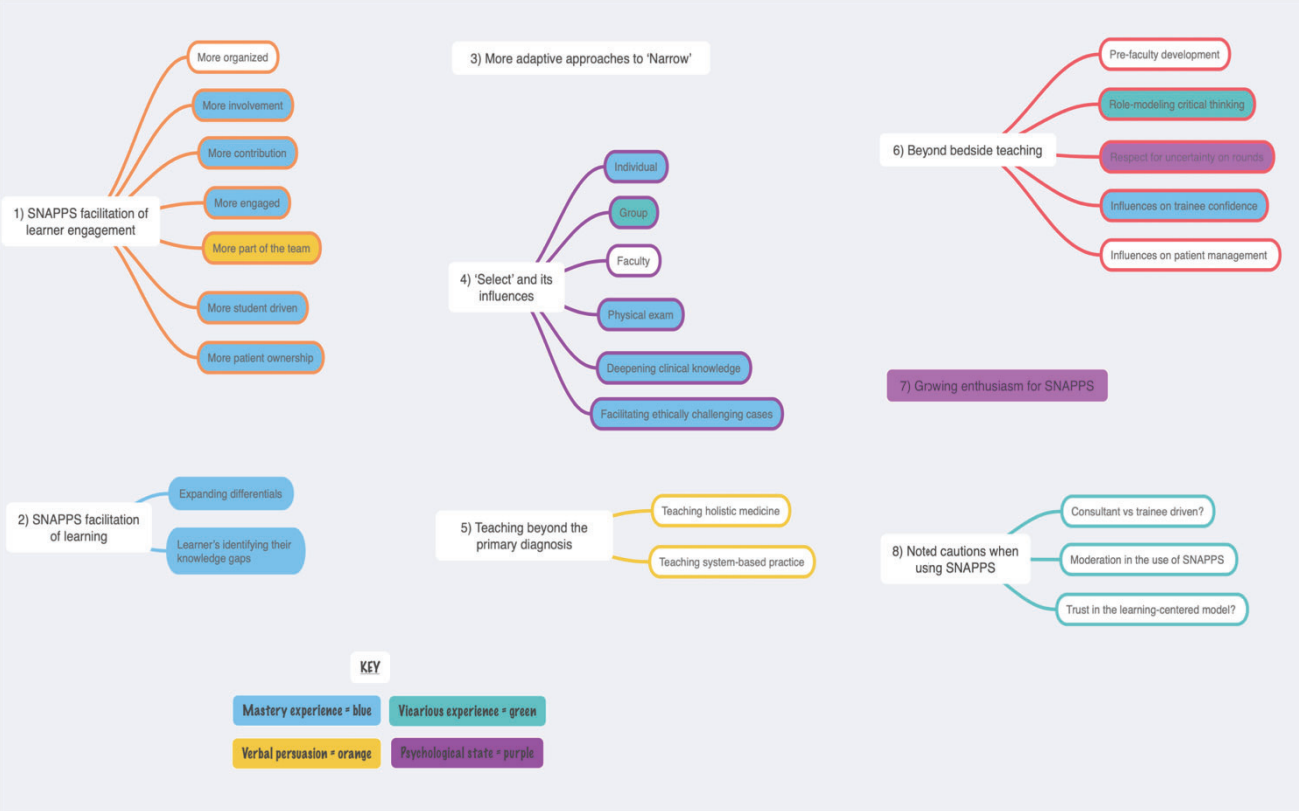
Throughout Phase 3-Cycle 2, despite the varied use of SNAPPS by faculty and trainees, we were still able to capture information about the effects of consistent use of SNAPPS. And we started to see evidence of increased opportunities to practice medical expert skills, whereby the use of SNAPPS was found to be more structured, more engaging, provided built-in teaching, and promoted critical thinking. This in turn was found to be associated with some improved trainee PSE.

This was particularly noticeable in the second group of Phase 3 – Cycle 2 students who reported higher mastery and vicarious experiences when using SNAPPS compared to those trainees who did not: Mastery SNAPPS-Yes 84% vs SNAPPS-No 58%; Vicarious SNAPPS-Yes 73% vs SNAPPS-No 55%. In this regard, our qualitative and quantitative data was found to be more congruent – indicating that the use of SNAPPS led to more opportunities to engage trainees in critical thinking.

10.5.2.3 Opportunities to practice medical expert skills

As we continued into Phase 3 – Cycle 3, more dedicated and consistent use of SNAPPS revealed even more opportunities for trainees to gain experiences in medical expert skills. Trainee and faculty descriptions of SNAPPS use showcased a large breadth of engagement in information literacy and knowledge management. Trainees provided descriptions of SNAPPS allowing them to be more involved, to have greater contribution, and be more engaged on ward rounds – all of which showed that through the use of SNAPPS, trainees had the opportunity to participate in ward rounds in meaningful ways which allowed them to practice medical expert skills – in turn providing them with positive mastery, vicarious experiences, frequent and constructive verbal persuasion, all in the setting of a more positive, learning oriented clinical learning environment. *(Figure 82)* And in turn, trainees reported enhanced confidence to manage paediatric patients.

FIGURE 82: CYCLE 3 - RESULTS OF THEMATIC ANALYSIS THRU A PSE PERSPECTIVE



10.5.3 MASTERY EXPERIENCES

Twelve themes were identified in Cycle 3 that correspond to positive mastery experiences for trainees. Similar to previous SNAPPS studies, our study showed that the use of SNAPPS facilitated learning, particularly in regards to trainees expanding and analysing differential diagnoses for their patients, which are key medical expert skills. Likewise, as described in previous SNAPPS literature, our trainees also reported enhanced sense of learner autonomy and support of self-directed learning.

10.5.3.1 LEARNER AUTONOMY

Allowing trainees to be more involved, engaged and integrated into rounds is crucial for them to practice medical expert skills. Learner-centred, trainee-driven rounds allows *"students to dictate the topics [they] want to learn about regarding patient's diagnosis and care,"* which, in turn provides them with the practical mastery experience of authentic patient care that cannot be simulated. In that, in

the daily practice of medicine, physicians determine what they need to consider when caring for their patients, and SNAPPS replicates this in a safe and facilitated manner for trainees. In turn, from these experiences, our trainees described development of patient ownership that was lacking on traditional rounds.

10.5.3.2 'Flipping' the script

Learner-centred rounds and learner engagement has implications beyond just the practice of medical expertise, but indeed, our study showed that SNAPPS supports "low ranking" individuals to speak up. The innate learner-centred nature of SNAPPS forces the learner's voice to be heard. The daily act of 'listening to the learner' has dual consequences. First, it provides learners with the mastery experience of 'speaking up', which is an essential aspect of patient advocacy.[104] And second, it challenges the historic inability of "low ranking" individuals from 'speaking-up' – essentially 'flipping the script' of the persistent "sovereign power" within medicine and offers an alternative "democratic, horizontal structure" of "shared practice."[21]

10.5.3.3 Self-directed learning

As with previous studies, our study found the Select step of SNAPPS to be a practical and motivating self-directed learning activity. Bandura argues that "a major goal of formal education should be to equip students with the intellectual tools, self-beliefs, and self-regulatory capabilities to educate themselves throughout their lifetime."[19] This is especially true for medical students and residents who are entering into a field which requires a commitment to life-long learning to navigate the sheer volume of medical knowledge and become familiar with the fast-paced advances of medicine.[104] Bandura describes that "self-directed learning requires motivation as well as cognitive and metacognitive strategies."[19] From this perspective, the incorporation of self-directed learning into daily ward rounds, provides the learner with more opportunities to practice the skills required for life-long, self-directed learning. Expanding on the current literature, our study also showed that Select could be used as a means to deepen clinical knowledge and advance physical exam skills.

10.5.3.4 LEARNER'S IDENTIFYING THEIR OWN KNOWLEDGE GAPS

While previous literature has argued that SNAPPS provides a mechanism for *faculty* to identify learner's knowledge gaps,[14] our study also showed that SNAPPS can assist *learners* in identifying their *own* knowledge gaps. The Narrow and Analyse steps of SNAPPS resulted in several examples of unprompted learner self-discovery of his/her own knowledge gaps. This has profound implications for the learner in terms of information literacy and knowledge management, in that, a key aspect of becoming a medical expert is to understand the limits of one's own expertise.[104] From this perspective, SNAPPS provides learners the opportunity to self-diagnosis their knowledge gaps to better identify their limitations. And in turn, this motivated our trainees to address their gaps through either re-Narrowing/Analysing, Probing or directed self-learning.

10.5.4 VICARIOUS EXPERIENCES

On a ward round, every medical expert skill practiced by a trainee is simultaneously observed by their peers, becoming a vicarious experience. Beyond the typical observational experiences expected to occur on a ward rounds, two additional themes were identified in Cycle 3 that correspond to enhanced vicarious experiences for trainees.

We found that unlike traditional ward rounds, trainees participating in SNAPPS led ward rounds created opportunities for facilitated group learning, particularly at the Probe and Select steps. This resulted in more engaged and attentive peer observation *"everyone is listing and waiting to talk about the patient, not just waiting for your turn to present," (Trainee)* which likely enhanced their vicarious experiences on rounds since they were more involved.

While not previously described in the literature, we found the use of SNAPPS provided opportunities for faculty to role model their own critical thinking. This provided another avenue for trainee vicarious experiences to occur. In that, through the observation of faculty's thought processes in relation to the patient encounter, trainees could now deduce "information about their own capabilities"[113] not otherwise available to them.

10.5.5 VERBAL PERSUASION

As described above under 'SNAPPS influences on COP', we saw that SNAPPS led rounds offered more interaction between faculty and trainees. In turn, this enhanced the quality and frequency of feedback received, thereby promoting opportunities for positive verbal persuasion. This provides yet another facet to promote trainee PSE during a clinical ward round.

10.5.6 PSYCHOLOGICAL STATE

As described under 'SNAPPS influences on CLE', we found evidence to support that the use of SNAPPS promoted a 'learning oriented' clinical learning environment. Creating a space whereby trainees felt that uncertainty of medical knowledge and patient care was both a natural and respected process of the ward round resulted in trainee 'comfort' with being uncertain. We also saw several examples of growing trainee enthusiasm to use SNAPPS on ward rounds. Since inferences from one's psychological state can be perceived as a reflection of their ability, increased trainee comfort and enthusiasm provides an improved psychological state for trainees, as opposed to unnecessary stress or anxiety which may interfere with promotion of their PSE.

10.5.7 SNAPPS' INFLUENCES ON TRAINEE MOTIVATION & CONFIDENCE

Bandura's Social Cognitive Theory argues that through positive mastery experiences, an individual's perceptions of self-efficacy are promoted, and in turn promotes motivation and perceptions of ability within a specific domain of function.[19] Throughout Cycle 3, with consistent use of SNAPPS, we saw a positive increase in trainee sense of confidence to manage paediatric patients. *"SNAPPS allows a student [to go] beyond and use the little knowledge they have gained to help in managing patients hence gives you the confidence that you can manage patient well." (Trainee)* We also saw many examples of trainees being motivated to practice medical expert skills, to look up information about their patients, and to understand more about their patient's condition and management plan. From this perspective, the opportunity to practice medical expert skills using the SNAPPS steps results in increased mastery experiences that in turn can positively affect trainee PSE, which is illustrated by improved learner motivation and confidence in their ability to manage paediatric patients.

10.5.8 SOAP – 'MIMICKING' MASTERY

While the SOAP format provides a systemic way to approach and document patient encounters, there is no formal opportunity for trainees to share their thought process using this format. In order for a physician to generate a patient assessment and plan, he/she must make clinical connections between the SOAP steps. SOAP rounds assumes that this process is occurring, but does not require specific expression or instruction of these skills, and therefore these connections are concealed from both the learner and the faculty.

Without the explicit expression of trainee critical thinking, essential medical expert skills are not necessarily practiced. Instead, the trainee role risks becoming limited to "*blankly reading from the patient's file*" and only 'mimicking' medical expert skills instead of actually practicing them. Some could argue that the critical thinking is occurring, just silently, but our study found that trainees initially had difficulty with Summarize, Narrow, Analyse, Probe, and Select, which indicates that without the space to verbalize these skills, these skills may not be taught or practiced at all.

Both within the SNAPPS literature and our study, we saw that without the opportunity to verbalize clinical thinking, ask questions, and prepare for additional learning, trainees learn how to practice a type of 'reflex' medicine – creating a patient plan without really understanding why. "It was not uncommon for the students in the comparison and usual-and-customary groups to introduce management suggestions immediately after their summaries of the patient findings."[45] . . . "The students in the control group lacked in their diagnostic hypotheses and were more eager to jump to management issues."[64]

In our study, we also saw trainees jumping straight to the Plan, often in a 'copy-paste' manner in an effort to shield their lack of understanding, "*in the other ward rounds, you just see what they did the previous day [and write that as your plan.]"* But through the use of SNAPPS, we began to see trainees try to understand their Plan. *"Can the Probe come after the Plan? So we can ask why are we doing this or not doing that?" . . . "Because your plan corresponds with what you discussed under Narrow and Analyse, then you understand your Plan."*

10.5.9 Mastery experiences beyond the specific case

As discussed in Chapter 7, in medicine, the specific patient encounter is very important to evaluate and manage a patient,[129] and it has been argued that "diagnostic reasoning is highly case specific."[64] From this perspective, generating medical expert skills can be limited to specific patient encounters. Yet, we saw that SNAPPS promotes learning at both the case-specific level *and* the more generalizable information literacy and knowledge management level.

It is this second level – applying generalizable medical expert skills to *any* case that makes SNAPPS so appealing in the clinical context. While each SNAPPS use is indeed engaged at the level of the specific clinical case, the model offers a generic template which can be applied to any clinical case; that is, SNAPPS does not solely focus on a specific medical topic, but instead focuses on "on encouraging learners to raise questions themselves to accelerate problem-solving and autonomous learning."[59] Therefore, frequent SNAPPS use has the potential to create mastery experiences beyond the specific case, but indeed creates mastery experiences for generalizable medical expert skills that can be applied in any patient scenario, which is an essential goal of bedside teaching.

10.5.10 PSE Conclusion

From the perspective of Social Cognitive Theory, in the context of medical education, it is not enough to know the facts of medicine or to possess certain procedural or exam skills, but learners must also have a positive perception of their self-efficacy in order to practice medicine as a competent physician. To achieve this, learners must have access to legitimate mastery experiences of medical expertise and skills. SNAPPS offers a simple and practical model to achieve these mastery experiences by providing built-in opportunities that can be applied to any clinical scenario. In turn, this can promote a more positive trainee perception of their capability to provide patient care.

10.6 BEYOND THE SNAPPS LITERATURE

As discussed in Chapter 2, despite the several SNAPPS original research publications, there still remains gaps in the SNAPPS literature. There are particularly large gaps to SNAPPS use in an inpatient setting. There is only one study which has examined SNAPPS use in an inpatient setting.[64] This significantly limits our understanding of SNAPPS use during a dynamic ward round with multiple complex patients, rounding on the same patient multiple days in a row, with multiple trainee levels on a single-team, and simultaneous interdisciplinary learners.

In addition, there is no report of the effects of the use of SNAPPS beyond clinical reasoning, expression of uncertainties, and engagement in self-directed learning. There is limited report of faculty perceptions of using SNAPPS and its effects on their clinical teaching. And while SNAPPS has been introduced in a variety of global settings, including low middle income countries within Asia and South America, none have been done on the African continent, and there was limited discussion of the cultural and/or limited resources implications of the setting in which they occurred. To that end, our study describes several adaptive, non-traditional uses and unexpected benefits of SNAPPS not previously described in the literature.

10.6.1 BEYOND 'NARROW' - ADAPTIVE APPROACHES TO SNAPPS

Only one SNAPPS publication describes an adaptation to Wolpaw's original work. In their letter to the editor publication, Connor and Pearson describe SNAPPS use in their outpatient child and adolescent psychiatry clinic.[61] Rather than using the traditional "Narrow 2-3 differential diagnoses", they encouraged their learners to identify "what issues are currently important to the child and family in the current visit" and then to narrow "the presentation to the supervisor to these issues."[61] This adaptation shows the flexibility of SNAPPS to the particular clinical and educational need.

Likewise, in the early stages of our study, we saw the limitations of the traditional 'Narrow' step in an inpatient setting, particularly when the patient diagnosis was already known. While this resulted in some faculty and trainees omitting the Narrow and Analyse steps of SNAPPS altogether, with

continued use of SNAPPS, several scenarios were identified where trainees and faculty began to reframe the 'Narrow' step in order to suit their learning and teaching needs. As such, a total of 13 adaptive uses of 'Narrow' were identified. *(Table 20)*

TABLE 20: ADAPTIVE APPROACHES TO 'NARROW'

1. Narrow the cause of a secondary diagnosis from the patient's problem list
2. Narrow risk factors that a patient might have from or for a primary/secondary diagnosis
3. Narrow the initial presenting signs and symptoms
4. Narrow the physical exam findings
5. Narrow the lab results
6. Narrow the vital signs
7. Narrow the Narrow
8. Re-visiting the Narrow
9. Start with a Probe, then Narrow
10. Using Select to broaden the Narrow & deepen the Analysis
11. Narrow on the spot with online resources
12. 'Backward' Narrow
13. Advanced levels of Narrow

Similar to previous SNAPPS studies that showed that the "nature of the student uncertainty drove the content of the just-in-time teaching,"[15] our study found that *what* and *how* the trainee Narrowed influenced the teaching engagement. Some of the alternative approaches to Narrow were useful to engage trainees in important aspects of clinical care that may be overlooked due to other competing priorities or difficult to teach within limited resource settings.[25,26,27]

For instance, in the situations when the primary diagnosis of the patient was already known, trainees were encouraged to consider issues related to secondary diagnoses.[51] This technique helped to discuss and teach about the problem list and how it's important to address all aspects of the patient's issues during the admission, not to just focus on the primary diagnosis. Similarly, when trainees *'Narrowed*

the risk factors that a patient might have from a primary or secondary diagnosis', this created space for teaching about progression of diseases, anticipatory management, and understanding iatrogenic risks. Alternatively, trainees were also encouraged to reflect back on the patient's initial presentation and asked to *Narrow the initial presenting signs and symptoms*. This technique was very helpful in generating more meaningful differentials and allowed subsequent trainees to experience the original presentation of the patient.

Another notably alternative to "Narrow 2-3 differentials" was when trainees focused on a single aspect about the patient to Narrow, such as a physical exam finding, vital signs, or lab results. When trainees *'Narrowed physical exam findings alone'*, this focused the learning conversation around the importance of a thorough physical exam. This often led to on-the-spot demonstrations of physical exam techniques and provided dedicated time with the Select step for trainees to improve their exam skills, which in a resource-limited setting is crucial for patient management.[28] When trainees *'Narrowed an abnormal vital sign'* this provided excellent opportunity to stress the importance of vital signs, especially in a clinically dynamic patient. In a setting with limited staffing and inconsistent recording of vital signs, concepts such as "early warning signs" could be discussed in detail. And when trainees *'Narrowed the lab results'*, this generated discussion about laboratory investigations themselves – how and why they are performed, the meaning of their results, and their cost/availability in our resource-limited setting.

In other instances, trainees used the SNAPPS structure itself to help support the Narrow step. For instance, trainees would *'Narrow the Narrow'* – i.e. Narrow one of their previously identified differential diagnoses. For example, the student Narrowed 'causes of hypokalaemia' as the problem: 1) vomiting 2) renal aetiology 3) diuretics, then later Narrowed again 'vomiting': 1) gastroenteritis 2) obstruction, 3) pancreatitis. This allowed continued analysis of the patient and trainees were able to make cause and effect clinical connections (i.e. gastroenteritis causes vomiting and in turn excessive vomiting can cause hypokalaemia).

Similarly, when trainees *'Re-visited the previous days' Narrow'*, this strategy allowed the trainee to update their differential daily based on the ongoing investigations, which in turn deepened their thought process about the patient's differential. In a setting with delayed investigations, even for basic

bloods or imaging, this helped the trainees understand the importance of stepwise approach to working-up the patient.

Another helpful strategy was using the Probe to jumpstart the Narrow. This was an excellent way of showing trainees how to take their clinical questions and then walk them through a stepwise critical thought process of Narrow and Analyse. Similarly, trainees were encouraged to use their Select to deepen their understanding of their Narrow. Or, if they weren't able to come up with a Narrowed differential at all, they used their Select to find a list of differentials to broaden their Narrow and have a differential to Analyse. Related, with difficult and complex patient cases, online resources were used at the bedside to help broaden the differential. This 'real time' *Select to Narrow* technique of looking up differentials at the bedside was a great teaching technique to show that if a differential diagnosis isn't obvious, then bedside tools can be used to provide a starting point to consider the patient and his/her differential diagnosis.

An additional approach to Narrow was the *'Backward Narrow'*, which allowed the trainee to deepen their knowledge about rare conditions and how they may or may not 'fit' our patient's presentation. In a setting where definitive diagnostic capability is usually unavailable for rare diseases, this approach to Narrow resulted in very interesting clinical conversations.

Finally, in some instances, trainees used SNAPPS at a much higher level of complexity than was expected. This revealed that based on the learner's interests and level of knowledge, SNAPPS could provide an advanced level of learning for the trainee.

10.6.2 Beyond the primary diagnosis – Non-traditional uses of SNAPPS

While not explored in previous SNAPPS literature, our study showed that SNAPPS could facilitate learning beyond medical expert skills. Several examples throughout Cycles 2 and 3 showed how SNAPPS could facilitate learning beyond the 'typical' medical expert skills. In that, once the primary diagnosis and its potential complications had been reviewed and discussed, the continued daily use of SNAPPS to Narrow and Probe other aspects of the patient often resulted in a fully integrated and

holistic approach to patient care and management. These non-medically focused 'Narrows' and 'Probes' led to the unexpected use of CanMEDS during the ward round as a platform to explore these issues further through the lens of the expanded role of the physician. In turn, this produced conversations at bedside about "the roles physicians have in meeting societal needs."[29] This particularly opened up space to explore the psychosocial issues of patient care, for system-based practice discussions to unfold, and to facilitate ethically challenging cases. These types of conversations are important in any academic clinical setting, but are crucial in low-resourced settings where future physicians have an even greater role in determining and improving their healthcare systems.[30]

10.6.3 Beyond bedside teaching - Unexpected benefits of using SNAPPS

While not discussed in previously published SNAPPS literature, in our study, we saw several unexpected benefits of using SNAPPS for trainees, faculty and indeed, even the patient.

10.6.3.1 SNAPPS: A template for pre-faculty development

In our study, we saw several examples of trainees using SNAPPS as a model for both their own learning purposes *and* a model by which they could cultivate their own teaching style and method. Two SNAPPS publications have discussed this potential opportunity of SNAPPS to pair "faculty development and learner development as companion in education."[64] In their editorial publication, Zeidman et al hypothesized that SNAPPS has "the potential to demystify the teaching process, offering an accessible framework for supervising residents to learn teaching both by practicing and by comprehending what their attending is doing to lead a team through a case discussion."[52] In Cycle 3, our study showed several examples of this potential come to fruition whereby junior residents were provided with teaching opportunities on rounds and readily used SNAPPS as a framework to model their own teaching style.

10.6.3.2 SNAPPS: A TEMPLATE FOR FACULTY TO ROLE-MODEL CLINICAL REASONING

Throughout Cycle 2 and 3 we saw several examples of faculty using the SNAPPS model as a template to role-model their own critical thinking. This non-traditional use of SNAPPS was an unexpected but excellent strategy to provide on-the-spot demonstration of faculty internal clinical thought processes to be unpacked and shared in a structured way. In terms of clinical teaching, this alternative use of SNAPPS creates a readily-accessible and coordinated bedside training technique to role-model critical thinking, which is an integral part of health professional education.[31,32,33] In low-resource academic clinical settings where dependable access to faculty can be challenging,[26,27] this alternative use of SNAPPS holds promising potential.

10.6.3.3 SNAPPS POSITIVE INFLUENCES ON CLINICAL TEACHING

I set out to improve the learning and teaching within the department, what I did not expect was the impact SNAPPS would have on *me*. SNAPPS made me a better clinical teacher and a better clinician. SNAPPS provides clinical teachers with a multipurpose template for teaching, role-modelling, and applying their own critical thinking. The advantages of using SNAPPS was not isolated to the trainees, but also of the faculty using SNAPPS. The trainee perspective of improved learning and teaching (i.e. more organized, more student involvement, more contribution, more engagement, improved team dynamic, more student driven, etc.) on rounds using SNAPPS is indeed a reflection of the behaviour change of the faculty's clinical teaching while using SNAPPS.

10.6.3.4 SNAPPS POSITIVE INFLUENCES ON PATIENT CARE

In several instances, faculty described scenarios where the use of SNAPPS stimulated either further thought about their patient care or indeed influenced their management plan. The influence of SNAPPS on faculty's clinical practice and patient care was another unexpected finding in our study. While all six-steps were used by faculty, the Probe and Select steps especially offered additional influences on clinical practice and management. This dual use of SNAPPS as both a learner-centred bedside teaching model *and* a clinical tool for physicians is yet another exciting alternative use of

SNAPPS, particularly in low-resource clinical settings where the daily additional burdens to provide clinical care could benefit from a readily available clinical tool.[30]

10.7 CHAPTER SUMMARY

In this chapter we offered a summation of our original research questions and described our unexpected findings in relation to the literature and potential broader implications. In the next chapter, I will describe the overall limitations of our study.

CHAPTER 11: LIMITATIONS

11.1 CHAPTER INTRODUCTION

Action research "should not be judged by the same validity criteria with which we judge positivistic and naturalistic research,"[137] but instead is judged on its ability to provide ongoing reflective processes, engage collaboratively, transform reality, ensure ongoing critical evaluation, and finally, produce a successful outcome.[137] Therefore, in this chapter, I will reflect on the limitations of our study through the perspective of Anderson and Herrs' five action research validity criteria: process, democratic, catalytic, dialogic, and outcome.[137]

11.2 PROCESS

Process validity is defined as "to what extent problems are solved that permits ongoing learning?"[137] While overall our project followed a "process reflection" and our findings were indeed a result of a "series of reflective cycles that include the ongoing problematization of the practices under study"[137] some of our methods were limited. Specifically, (1) we over utilized traditional research instruments and analysis, and (2) we struggled with consistently determining what was being measured.

11.2.1 TRADITIONAL VS ACTION RESEARCH

While literature warns us that the use of traditional research instruments and analysis in AR can be problematic,[138] embracing the mores of AR can be challenging for a inexpert researcher, making more familiar forms of data collection and analysis tempting.

In an attempt to capture the 'voice' of the department, I relied heavily on the use of questionnaires. Yet, instead of using these as a single tool within a much larger data collection toolbox, in late Phase

2 and early Phase 3 of the project, the questionnaires began to distract from the larger goals of our project. I became overly dependent on the questionaries to provide me with ongoing process reflections.

My unease with moving away from more traditional forms of research created an over reliance on and an overabundance of questionnaires in this project. Consequently, analysing and deciphering conclusions from this data was problematic and in some instances delayed the real-time critical reflection ethos of AR. The result of this forced positivist perspective was that I was often overwhelmed by the data capture and analysis, and consequently, my time and energy was diverted away from the overall goals of our project. In addition, the tension of using these types of instruments in AR made them in and of themselves less helpful from either an AR or positivist perspective.

From a quantitative perspective, the sample size was both dynamic and too small to provide any comparative analysis. There was no control group. Newly generated questionnaires were unvalidated, and previously validated questionnaires were not locally validated for our setting. The questionnaires were over stratified which made the already small sample size smaller. And in some instances the method of data analysis was no longer in sync with the data collection process. Combined, this significantly limited the quantitative data's ability to "stand alone" which is essential for mixed method analysis.[151]

From a qualitative perspective, while we worked very hard to achieve trustworthiness of our data, including member-checking and triangulation, our Phase 3 researcher triangulation was limited, making my personal researcher biases more influential in the final analysis. In addition, while our FGDs and interviews used audio recording and professional service verbatim transcriptions, these did not include voice identification of individuals and are thus our description of these results was limited to the individual's role and did not portray the individual speaker, which weakens the dependability of our data. While we could have gone back into the transcriptions, particularly for the faculty interviews, and try to retrospectively identify individual speakers, due to the very small department, in order to preserve confidentiality and anonymity, we chose not to go back and assign numbers to quotations in fear of individuals being identified by their statements alone. We recognize this as a significant methodological limitation.

11.2.2 MEASURING WHAT, EXACTLY?

Validity of results "depends on knowing what people 'mean' by their replies."[138] We struggled with this in three ways. First, the complex constructs we were trying to capture (CLE, COP and PSE) are in and of themselves difficult to measure. Literature reports little success to adequality capture this type of data, which makes interpretation and broader comparison of our data challenging. (*Refer to Literature Review*) Second, since there was no quality control of how SNAPPS was being conducted on rounds, it was difficult to interpret if trainees were reporting on SNAPPS or just a slightly different version of SOAP. And third, we relied heavily on trainees' perspectives to inform our project. Literature has shown that trainee responses to be problematic, particularly in regards to self-efficacy measurements and evaluation feedback.[132, 175] (*Refer to Literature Review*)

11.3 DEMOCRATIC

Democratic validity is defined as the "extent research is done in collaboration with others."[137] While great effort was made to ensure a high standard of collaboration of our project, including creation of a dedicated project group, and frequent and in-depth feedback from all members of the department, our democratic validity was limited in two major ways.

First, as described in Chapter 3, the inception of the overall project came from the department head, but this was never publicly declared and was not known to the rest of the department. Second, while the project team was introduced at department meetings, their specific roles were not fully recognized. Thus, despite efforts to show this as an internally and collaboratively developed intervention, I continued to be seen as the 'face' of the project and department members continued to perceive the introduction of SNAPPS as *my* project. " . . . *'SM is doing a project about that' . . . " (ARJ)* This perception prevented a more robust democratic validity.

To reflect the level of democratic commitment, Cornwall created a six-item scale of the *Continuum of purposes of participatory action research* where "co-option" was seen to be the least collaborative and "collective action" was seen to be the most collaborative.[180] During this project, the most

collaborative we managed to engage on was on level 4 “cooperation” whereby “local people work together with outsiders to determine priorities; [but the] responsibility remains with outsiders for directing the process.”[137,180] While the project group members and their roles were a corner stone of this project, and I had hoped that the project team members (and later identified early adopters) could have contributed more significantly, unfortunately, this did not occur.

11.4 CATALYTIC

Catalytic validity is the “degree to which the research process focuses on participants transforming reality.”[137] Indeed, “the most powerful action research studies are those in which the researchers recount a spiralling change in their own and their participants’ understandings.”[137] As described in previous chapters, this project had profound catalytic validity in regards to my own practice, but this was not the case for the entire department. Further dialectic reflection of this divergence indicated that an overall lack of faculty motivation to engage in the implementation process, combined with the unexpected gap between SNAPPS theoretical knowledge to actual bedside skills, hindered individual progression through important stages of change and greatly affected the success of our SNAPPS implementation.

11.5 DIALOGIC

Dialogic validity is defined as the degree to which peer review or scrutiny occurred over the course of the project.[137] Often this is achieved through working “with a critical friend who is familiar with the setting and can serve as devil’s advocate for alternative explanations of research data.”[137] Adding to the action research discourse of ‘reflective practice’ and ‘reflective critique’,[149] Winter constructed the perspective that ‘critical reflection’ is a combination of “reflexivity” and “dialectics”, where “reflexivity” is a form of “self-questioning” and dialectics is a focus on the “contradictions, tensions and dilemmas inherent in a situation.”[138] While the concept of ‘critical reflection’ appears to be a personal endeavour, it is important to remember that action research is “concerned equally with changing *individuals*, on the one hand, and, on the other, the *culture* of the groups, institutions and societies to which they belong.”[156] Therefore, it is through the processes of *shared* critical reflection

within action research that "enables us to recognize the existence of alternative rationalities, the limitations of our immediate interpretations, and . . . possibilities for change."[138]

One of the project group members double as my co-supervisor (TA) and functioned as my 'critical friend' over the course of the project. These conversations were captured in my AR journal and were incorporated into our findings. Unfortunately, due to complex data capture and analysis, often more robust conversations of our findings were delayed. Most notably there was a delay in dialogic reflection between Cycles 2 and 3 of Phase 3. In an effort to keep the momentum of the project going, a more thorough investigation as to why SNAPPS had limited uptake at the department level was deferred until the completion of Cycle 3. This delayed reflection limited our ability to respond to the issues we identified in real-time during the project, but in hindsight, provided us with insights into the limitations of the outcome of the project as a whole.

11.6 OUTCOME

As we reflect on our *outcome validity*, or "the extent to which action occurred"[137] within our project, we must acknowledge that we were unsuccessful in introducing SNAPPS at a department-wide level. In that, while SNAPPS was successfully introduced into *my* ward rounds, there was limited uptake and use of SNAPPS department-wide. AR validity demands that "action researchers must be competent at both research procedure ***and*** moving participants toward successful action outcomes,"[137] (*italics/underline added*). To this end, our reflections on the limitations of our project are indeed a reflection of the limitations of the project outcome itself. There were three primary outcomes of this project, the first two were discussed in Chapter 9. The third outcome, discussed in Chapter 8, was: in contrast to the literature, we were unsuccessful in introducing SNAPPS at a department-wide level.

11.7 CHAPTER SUMMARY

In this chapter, I reflected on the limitations of our study through the perspective of Anderson and Herrs' five action research validity criteria: process, democratic, catalytic, dialogic, and outcome.[137]

CHAPTER 12 - CONCLUSION

"I also want to teach them confidence, because when I give them confidence, I'm teaching them how to survive out there." (Senior Resident)

12.1 CHAPTER INTRODUCTION

Based on the findings from this study, a structured bedside teaching model, specifically SNAPPS, offers a holistic approach to maximize learning and teaching, addressing several learner and environmental needs concurrently. The flexibility and potential advanced uses of SNAPPS promotes its use, especially in clinically challenging teaching environments. That said, when clinical teachers set out to introduce SNAPPS, they ought to be prepared to offer ongoing support for the successful implementation beyond a brief SNAPPS sensitization. Below offers a description of specific contributions and retrospective recommendations for others considering improving learning and teaching on ward rounds and/or introducing SNAPPS into their clinical setting.

12.2 CONTRIBUTIONS

While we acknowledge that this work took place within a very specific clinical context: a paediatric inpatient department within a single, tertiary hospital in southern Africa; based on our findings, there are several contributions that are potentially transferrable to other health professional education contexts.

12.2.1 THE INFLUENCES OF SNAPPS ON THE CLE, COP AND PSE

First, while several SNAPPS publications have demonstrated supportive findings and elude to the positive aspects that SNAPPS makes on the clinical learning environment, trainee sense of participation in and belonging to a clinical community of practice, and trainee perceived self-efficacy,

none have explicitly correlated SNAPPS with these elements as such. To my knowledge, this study is the first to explicitly consider the direct relationship of SNAPPS to the CLE, COP and PSE, and provides a more elaborate description of this potential influence. This is significant, in that, literature shows that educators are concerned with each of these complex constructs but often these domains remain theoretical and somewhat elusive to practical application. The framework presented in this work *(Figure 79)* is advantageous to other health profession educators, in that, by utilizing SNAPPS as the foundation for endeavours aimed at optimizing ward round learning and teaching, it offers a practical way to promote a holistic approach and address several learner and environmental needs concurrently.

12.2.2 Adaptive approaches and non-traditional uses of SNAPPS

Second, several non-traditional uses of SNAPPS were identified in this work, including: 1) adaptive approaches to the 'Narrow' step of SNAPPS, 2) the use of SNAPPS for mapping the expanded role of the physician, 3) the use of SNAPPS by faculty to unpack their own clinical thinking in a structured way, and 4) the use of SNAPPS and its influences on faculty clinical practice and patient care. To my knowledge, this study is the first to describe alternative applications of SNAPPS and its capacity to 'teach beyond the primary diagnosis'. This is significant for other health professional educators, in that, our work shows how SNAPPS can be adapted for practical purposes to meet the needs of the clinical and educational context for which it is used. We found this flexibility to be both faculty and learner driven, which again highlights the accessibility of SNAPPS to a variety of clinical education contexts and needs. This flexibility and potential advanced uses of SNAPPS promotes its use, especially in clinically challenging teaching environments.

12.2.3 SNAPPS, an easy uptake?

Third, this study describes in detail the unexpected challenges of implementing SNAPPS into a paediatric inpatient setting, including a systematic description of the potential barriers and facilitators of this process. To my knowledge, this study is the first to describe SNAPPS implementation challenges. This is significant for other health professional educators, in that, several of our identified barriers are likely to be pervasive in other medical education contexts, and therefore relevant and applicable to

other settings with similar ambitions to implement a bedside teaching model. Specifically, identified barriers that are likely to be similar in other health professional education environments include: (i) dynamic and unpredictable clinical context; (ii) a centralized, vertical hierarchy within the department; (iii) tensions around learner-centred but faculty driven model of teaching; (iv) despite likely intrinsically aligned values of faculty to engage in faculty development, this is outweighed by competing priorities; (v) the diminished relative priority of faculty to learn a new skill; (vi) the lack of faculty motivation or buy-in to either engage in or sustain new clinical teaching techniques; (vii) due to complexity of SNAPPS application, likely need for adjunct experience-based learning for faculty and trainees beyond teaching SNAPPS theoretical concepts; and (viii) ward rounds as a central component of the department workflow and any direct change to this process is likely to result in its disruption. Therefore, this study cautions other health professional educators on the potential pitfalls of SNAPPS implementation and provides several 'trouble shooting' recommendations for anyone attempting to implement SNAPPS into their clinical setting.

12.2.4 A FEW EDUCATIONAL NOVELTIES

Finally, this study made novel use of educational applications that might be intriguing to other health professional educators, including the use of a driver diagram to map out health professional aims and interventions; and the use of the Observational Learning Tool as the foundation for our faculty development curriculum. To my knowledge, this study is the first to describe these applications used in these ways.

12.3 RECOMMENDATIONS

Our findings indicate that the level of support that is needed to implement SNAPPS should not be underestimated. While the individual steps of SNAPPS are not difficult to learn, they can be difficult to apply. Due to its centrality, as SNAPPS is introduced, disruption to the standard workflow should be expected. We determined that the process of planning and executing SNAPPS requires more than a 'brief' orientation as described in the literature. Our findings indicate several augmenting factors that could aid in the implementation of SNAPPS: 1) didactic course supplementation with 'in time' SNAPPS

coaching at the bedside, 2) incremental introduction of SNAPPS steps, 3) create faculty and trainee pairs, and 4) utilization of 'early adopters'.

First, in addition to a brief didactic sensitization of SNAPPS to faculty and trainees, our study recommends ongoing 'in time' SNAPPS coaching at the bedside to ensure acquisition of 'SNAPPS' skills. The aim of this coaching is to bridge the theoretical knowledge and practical skills of SNAPPS at the bedside. Approaches to bedside coaching could consist of faculty/trainees joining the SNAPPS-facilitator's rounds to observe successful integration of SNAPPS on a ward round, *and/or* of the SNAPPS-facilitator to join other faculty/trainees' rounds to assist in their integration of SNAPPS into their ward round.

Second, while the didactic portion of SNAPPS could familiarize the faculty/trainees with all of the steps of SNAPPS, our findings recommend that the bedside coaching be structured in a way that SNAPPS is learned and practiced in incremental steps – focusing on a single step of SNAPPS until it is mastered before moving onto the next step. This allows faculty/trainees to build confidence overtime, instead of being overwhelmed and reverting back to the traditional form of rounds.

Next, we recommend assigning 'faculty-trainee SNAPPS-testing pairs' to assist in the implementation process. Instead of asking all post-oriented faculty and trainees to use SNAPPS on their ward rounds at their discretion, we recommend pairing one faculty and one trainee to provide 'early testing' of SNAPPS. By providing focused paired training, this assists in alleviating the 'faculty-trainee gap' we saw with our implementation. Our faculty-trainee gap was experienced in terms of relative priorities, hierarchy, role expectation, and discourse on ward rounds. The pairing of one faculty and one trainee to trial SNAPPS ensures that each 'role' in SNAPPS is adequately understood and captured, (i.e. the faculty-facilitator and the trainee-driver roles), as part of the SNAPPS training itself.

Finally, an additional benefit of these 'early faculty-trainee paired testers' is to create champions of the SNAPPS project so that they, in turn, can assist the next group of faculty and trainees with implementation of SNAPPS. In this way, enthusiasm is gained for SNAPPS in increments based on successes, rather than trying to defend SNAPPS at a department level based on experience of failed attempts.

12.4 CHAPTER SUMMARY

The introduction to SNAPPS had profound implications on my clinical teaching *and* my clinical practice. Despite the limitations of our successes at a department-wide level, I continue to advocate for SNAPPS integration into any academic clinical setting. SNAPPS is an effective means to revitalize and disseminate the skills of bedside teaching through the promotion of structured, nurturing learning spaces, whereby trainees engage with faculty in high level critical clinical thinking, and promotes opportunities for positive clinical mastery skills to be developed on a daily basis.

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APPENDIX

APPENDIX A - RECRUITMENT MATERIALS (BACK)

A.1. Verbal announcement - Invitation to participate in the study for medical students, junior residents, senior residents & faculty to participate in focus group discussions and interviews

"Good morning!

As you know, I am Dr. Savarra Mantzor, one of the Paediatricians working in the Department of Paediatrics at Princess Marina Hospital. Over the next several months a group of us will be working on a medical education improvement project with the goal of optimizing clinical learning and teaching on ward rounds conducted in the Department of Paediatrics.

As a means to enhance the success of the improvement project, Dr. Tonya Arscott-Mills and I will be conducting qualitative research in the form of focus group discussions and one-on-one interviews. Meaning that, your input of what it is like to be a medical student, resident, chief or paediatrician on rounds is highly valued and will provide essential insight to advance the success of the project.

Therefore I would like to invite you to participate in either a medical student, resident or chief resident focus group discussion. Each discussion will last approximately ninety minutes. Since the discussions will take place around lunch, food will be provided. This will allow you to share your experience of ward rounds with us.

Attending Paediatricians, you are invited to attend one-on-one interviews where you can share your perspective and experiences of ward rounds. Each interview will take approximately one hour.

I have brought several copies of the Information Sheet for Participants for your review. I have also brought a sign-up sheet for those interested.

If there are any questions, myself or Dr. Tonya would be happy to answer.

Thank you very much."

A.2. Verbal announcement - Invitation to participate in the study for medical students and junior residents to complete surveys

"Good morning!

As you know, I am Dr. Savarra Mantzor, one of the Paediatricians working in the Department of Paediatrics at Princess Marina Hospital. Over the next several months a group of us will be working on a medical education improvement project with the ultimate goal of optimizing clinical learning and teaching on ward rounds conducted in the Department of Paediatrics.

As a means to enhance the success of the improvement project, we will be distributing surveys to assess your perspective of the clinical learning environment on ward rounds, your perceptions of your confidence in patient management, and your perception of being an active participant on ward rounds. Meaning that, your input of what it is like to be a medical student or resident on ward rounds is highly valued and will provide essential insight to advance the success of the project.

Therefore I would like to invite medical students and paediatric residents to complete a total of four surveys. The surveys will be distributed and collected in paper format. Each survey should take approximately 10-20 minutes to complete. You will be given time to complete the surveys after our Morning Report meeting. The surveys will not have any identifying information on them, but will ask for your level of training, i.e. 'medical student' or 'paediatric resident'.

I have brought several copies of the Information Sheet for Participants for your review. I have also brought a sign-up sheet for those interested.

If there are any questions, I would be happy to answer.

Thank you very much."

A.3. Email announcement - Invitation to participate in the study for medical students, junior residents, & senior residents to participate in focus group discussions

Dear Medical Students, Residents, & Chief Residents,

This email is to inform you that over the next several months a group of us will be working on a medical education improvement project with the goal of optimizing clinical learning and teaching on ward rounds conducted in the Department of Paediatrics at Princess Marina Hospital.

The rational to conduct the study is based on a recent literature review that asserts that bedside teaching on ward rounds within an engaging learning environment has the potential to significantly influence student learning, performance at university, and clinical practice once graduated. Studies that address these aspects of clinical training have clear implications for the quality of patient care likely to be delivered by these graduates.

As a means to enhance the success of the improvement project, Dr. Tonya Arscott-Mills and I will be conducting qualitative research in the form of focus group discussions and one-on-one interviews. Meaning that, your input of what it is like to be a medical student, resident, or chief resident on rounds is highly valued and will provide essential insight to advance the success of the project.

Therefore I would like to invite you to participate in either a medical student, resident or chief resident focus group discussion. Each discussion will last approximately ninety minutes. Since the discussions are likely to take place during lunch time, food will be provided.

Attached to this email is a copy of the Information Sheet for Participants for your review. I will be distributing a sign-up sheet at morning report for those interested.

If there are any questions, myself or Dr. Tonya would be happy to answer.

Thank you very much.

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A.4. Email announcement - Invitation to participate in the study for faculty to participate in Interviews

Dear Paediatricians,

This email is to inform you that over the next several months a group of us will be working on a medical education improvement project with the goal of optimizing clinical learning and teaching on ward rounds conducted in the Department of Paediatrics at Princess Marina Hospital.

The rational to conduct the study is based on a recent literature review that asserts that bedside teaching on ward rounds within an engaging learning environment has the potential to significantly influence student learning, performance at university, and clinical practice once graduated. Studies that address these aspects of clinical training have clear implications for the quality of patient care likely to be delivered by these graduates.

As a means to enhance the success of the improvement project, Dr. Tonya Arscott-Mills and I will be conducting qualitative research in the form of one-on-one interviews. Meaning that, your input of what it is like to be a Paediatrician on ward rounds is highly valued and will provide essential insight to advance the success of the project.

Therefore I would like to invite you to attend one-on-one interviews with myself where you can share your perspective and experiences of ward rounds. Each interview will take approximately one hour. This invitation is open to both University of Botswana and Ministry of Health Paediatricians.

Attached to this email is a copy of the Information Sheet for Participants for your review. I will be distributing a sign-up sheet at morning report for those interested.

If there are any questions, myself or Dr. Tonya would be happy to answer.

Thank you very much.

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A.5. Email announcement - Invitation to participate in the study for medical students & junior residents to complete surveys

Dear Medical Students and Residents,

This email is to inform you that over the next several months a group of us will be working on a medical education improvement project with the ultimate goal of optimizing clinical learning and teaching on ward rounds conducted in the Department of Paediatrics at Princess Marina Hospital.

The rational to conduct the study is based on a recent literature review that asserts that bedside teaching on ward rounds within an engaging learning environment has the potential to significantly influence student learning, performance at university, and clinical practice once graduated. Studies that address these aspects of clinical training have clear implications for the quality of patient care likely to be delivered by these graduates.

As a means to enhance the success of the improvement project, we will be distributing surveys to assess your perspective of the clinical learning environment on ward rounds, your perceptions of your confidence in patient management, and your perception of being an active participant on ward rounds.

Meaning that, your input of what it is like to be a medical student or resident on ward rounds is highly valued and will provide essential insight to advance the success of the project.

Therefore I would like to invite medical students and paediatric residents to complete a total of four surveys. The surveys will be distributed and collected in paper format. Each survey should take approximately 10-20 minutes to complete. You will be given time to complete the surveys after our Morning Report meeting. The surveys will not have any identifying information on them, but will ask for your level of training, i.e. 'medical student' or 'paediatric resident'.

I have attached the Information Sheet for Participants for your review. I will be distributing a sign-up sheet at morning report for those interested.

If there are any questions, I would be happy to answer.

Thank you very much.

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A.6. Recruitment flyers - Invitation to participate in the study for medical students to participate in focus group discussions

Let your voice be heard!

All 3rd & 5th year medical students are Invited to . . .

What? An opportunity to provide feedback and insight into our current teaching on paediatric ward rounds.

Why? To enhance a medical education improvement project via qualitative research

Bonus? Food & beverages will be provided

Where? Morning Report room

When?

How? For more info, email Dr. Savarra Mantzor at mantzors@email.chop.edu

A.7. Recruitment flyers - Invitation to participate in the study for junior residents to participate in focus group discussions

Let your voice be heard!

All Paediatric Residents are Invited to . .

What? An opportunity to provide feedback and insight into our current teaching on paediatric ward rounds.

Why? To enhance a medical education improvement project via qualitative research

Bonus? Food & beverages will be provided

Where? Morning Report room

When?

How? For more info, email Dr. Savarra Mantzor at mantzors@email.chop.edu

A.8. Recruitment flyers - Invitation to participate in the study for senior residents to participate in focus group discussions

Children's Hospital of Philadelphia | GLOBAL HEALTH

BOTSWANA-UPENN PARTNERSHIP
Building a Healthy Future Together

University of Cape Town • Universiteit van Kaapstad • Yunivesithi yaseKapa • University of Cape Town

Let your voice be heard!

All Chief Residents are Invited to . . .

What? An opportunity to provide feedback and insight into our current teaching on paediatric ward rounds.

Why? To enhance a medical education improvement project via qualitative research

Bonus? Food & beverages will be provided

Where? Morning Report room

When?

How? For more info, email Dr. Savarra Mantzor at mantzors@email.chop.edu

A.9. Information sheet for participants for focus group interview - Medical students

This form provides you with information about the study. A member of the research team will describe this study to you and answer all of your questions. Please read the information below and ask questions about anything you do not understand before deciding whether or not to take part. You can leave the session at any time without any negative consequence and you can choose not to answer questions asked of the group or individual. Participation and your responses are completely voluntary and will in no way influence your position as a medical student.

Why is this study being done?
To learn about your perspective, experiences, beliefs, thoughts and recommendations about the best way to improve bedside teaching on ward rounds.
You are invited to participate in this study because you are a medical student with a unique perspective on how best to optimize the learning and teaching environment on ward rounds.

What happens if I join this study?
You will participate in a group interview about paediatric ward rounds that will last between 1 and 1 ½ hours. The interview will be audio-recorded for research purposes.

What are the possible discomforts or risks?
You may be uncomfortable answering some of the questions during the interview. You are free to not to answer any question that makes you uncomfortable.

Will I be paid for being in the study? Will I have to pay for anything?
No, you will not be paid to be in the study. Focus group participants will receive food and beverages. It will not cost you anything to be in the study.

Is my participation voluntary?
Taking part in this study is voluntary. You have the right to choose not to take part in this study. You also have the right not to answer any questions if you do not wish to do so. If you choose to take part, you have the right to stop at any time. If you choose not to answer particular questions, refuse to participate, or change your mind, you will not be penalized in any way.

How confidential are my responses?
The researchers will not share your responses with anyone outside the research team. We ask that you, as a participant, not share anything said during the group interview with anyone outside of the group. However, the confidentiality of anything you choose to say during the session cannot be guaranteed should another participant choose to talk about the group interview with others. Because the group interview is being audio-recorded, you should not use your name or others names in your answers. We will remove any information that may identify participants before analysis if someone uses a name in their response.

What happens at the end of the study?
All members within the Department of Paediatrics at Princess Marina Hospital and all participants will receive email notification about the study findings, including online references to any academic or scholarly output from the study.

Who do I call if I have questions?

The researchers carrying out this study are Dr. Savarra Mantzor and Dr. Tonya Arscott-Mills from the Botswana-UPenn Partnership, and Dr. Vanessa Burch from the University of Cape Town. You may ask any questions you have now. If you have questions later, you may email:
- Dr. Mantzor at mantzors@email.chop.edu, or
- Dr. Arscott-Mills at tonyaarscottmillsbup@gmail.com, or
- Dr. Vanessa Burch at PA: sipho.mankayi@uct.ac.za.

If you have any questions about your rights as a research participant, you may call the Botswana Head of Health Research Unit, Ministry of Health, (+267) 391-4467 or the University of Cape Town Faculty of Health Sciences Human Research Ethics Committee can be contacted on (+27) 021 406 6338 in case participants have any questions regarding their rights and welfare as research participants on the study.

Agreement to be in this study:

I have read this paper about the research study. I understand the possible risks and benefits of this study. I know that being in this study is voluntary. I choose to be in this study. By signing below, I consent to participate in this study.

Name: _____
Signature: _____
Date: _____

Thank you for your time and help.

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A.9. Information sheet for participants for focus group interview - Junior residents

This form provides you with information about the study. A member of the research team will describe this study to you and answer all of your questions. Please read the information below and ask questions about anything you do not understand before deciding whether or not to take part. You can leave the session at any time without any negative consequence and you can choose not to answer questions asked of the group or individual. Participation and your responses are completely voluntary and will in no way influence your position as a paediatric resident.

Why is this study being done?
To learn about your perspective, experiences, beliefs, thoughts and recommendations about the best way to improve bedside teaching on ward rounds.

You are invited to participate in this study because you are a paediatric resident with a unique perspective on how best to optimize the learning and teaching environment on ward rounds.

What happens if I join this study?
You will participate in a group interview about paediatric ward rounds that will last between 1 and 1 ½ hours. The interview will be audio-recorded for research purposes.

What are the possible discomforts or risks?
You may be uncomfortable answering some of the questions during the interview. You are free to not to answer any question that makes you uncomfortable.

Will I be paid for being in the study? Will I have to pay for anything?
No, you will not be paid to be in the study. Focus group participants will receive food and beverages. It will not cost you anything to be in the study.

Is my participation voluntary?
Taking part in this study is voluntary. You have the right to choose not to take part in this study. You also have the right not to answer any questions if you do not wish to do so. If you choose to take part, you have the right to stop at any time. If you choose not to answer particular questions, refuse to participate, or change your mind, you will not be penalized in any way.

How confidential are my responses?
The researchers will not share your responses with anyone outside the research team. We ask that you, as a participant, not share anything said during the group interview with anyone outside of the group. However, the confidentiality of anything you choose to say during the session cannot be guaranteed should another participant choose to talk about the group interview with others. Because the group interview is being audio-recorded, you should not use your name or others names in your answers. We will remove any information that may identify participants before analysis if someone uses a name in their response.

What happens at the end of the study?
All members within the Department of Paediatrics at Princess Marina Hospital and all participants will receive email notification about the study findings, including online references to any academic or scholarly output from the study.

Who do I call if I have questions?

The researchers carrying out this study are Dr. Savarra Mantzor and Dr. Tonya Arscott-Mills from the Botswana-UPenn Partnership, and Dr. Vanessa Burch from the University of Cape Town. You may ask any questions you have now. If you have questions later, you may email:

- Dr. Mantzor at mantzors@email.chop.edu, or
- Dr. Arscott-Mills at tonyaarscottmillsbup@gmail.com, or
- Dr. Vanessa Burch at PA: sipho.mankayi@uct.ac.za.

If you have any questions about your rights as a research participant, you may call the Botswana Head of Health Research Unit, Ministry of Health, (+267) 391-4467 or the University of Cape Town Faculty of Health Sciences Human Research Ethics Committee can be contacted on (+27) 021 406 6338 in case participants have any questions regarding their rights and welfare as research participants on the study.

Agreement to be in this study:

I have read this paper about the research study. I understand the possible risks and benefits of this study. I know that being in this study is voluntary. I choose to be in this study. By signing below, I consent to participate in this study.

Name: _____

Signature: _____

Date: _____

Thank you for your time and help.

Savarra M. Mantzor, MD
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A.10. Information sheet for participants for focus group interview - Senior residents

This form provides you with information about the study. A member of the research team will describe this study to you and answer all of your questions. Please read the information below and ask questions about anything you do not understand before deciding whether or not to take part. You can leave the session at any time without any negative consequence and you can choose not to answer questions asked of the group or individual. Participation and your responses are completely voluntary and will in no way influence your position as a chief resident.

Why is this study being done?
To learn about your perspective, experiences, beliefs, thoughts and recommendations about the best way to improve bedside teaching on ward rounds.

You are invited to participate in this study because you are a chief paediatric resident with a unique perspective on how best to optimize the learning and teaching environment on ward rounds.

What happens if I join this study?
You will participate in a group interview about paediatric ward rounds that will last between 1 and 1 ½ hours. The interview will be audio-recorded for research purposes.

What are the possible discomforts or risks?
You may be uncomfortable answering some of the questions during the interview. You are free to not to answer any question that makes you uncomfortable.

Will I be paid for being in the study? Will I have to pay for anything?
No, you will not be paid to be in the study. Focus group participants will receive food and beverages. It will not cost you anything to be in the study.

Is my participation voluntary?
Taking part in this study is voluntary. You have the right to choose not to take part in this study. You also have the right not to answer any questions if you do not wish to do so. If you choose to take part, you have the right to stop at any time. If you choose not to answer particular questions, refuse to participate, or change your mind, you will not be penalized in any way.

How confidential are my responses?
The researchers will not share your responses with anyone outside the research team. We ask that you, as a participant, not share anything said during the group interview with anyone outside of the group. However, the confidentiality of anything you choose to say during the session cannot be guaranteed should another participant choose to talk about the group interview with others. Because the group interview is being audio-recorded, you should not use your name or others names in your answers. We will remove any information that may identify participants before analysis if someone uses a name in their response.

What happens at the end of the study?
All members within the Department of Paediatrics at Princess Marina Hospital and all participants will receive email notification about the study findings, including online references to any academic or scholarly output from the study.

Who do I call if I have questions?

The researchers carrying out this study are Dr. Savarra Mantzor and Dr. Tonya Arscott-Mills from the Botswana-UPenn Partnership, and Dr. Vanessa Burch from the University of Cape Town. You may ask any questions you have now. If you have questions later, you may email:

- Dr. Mantzor at mantzors@email.chop.edu, or
- Dr. Arscott-Mills at tonyaarscottmillsbup@gmail.com, or
- Dr. Vanessa Burch at PA: sipho.mankayi@uct.ac.za.

If you have any questions about your rights as a research participant, you may call the Botswana Head of Health Research Unit, Ministry of Health, (+267) 391-4467 or the University of Cape Town Faculty of Health Sciences Human Research Ethics Committee can be contacted on (+27) 021 406 6338 in case participants have any questions regarding their rights and welfare as research participants on the study.

Agreement to be in this study:

I have read this paper about the research study. I understand the possible risks and benefits of this study. I know that being in this study is voluntary. I choose to be in this study. By signing below, I consent to participate in this study.

Name: _____

Signature: _____

Date: _____

Thank you for your time and help.

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A.11. Information sheet for participants for Paediatrician interview

This form provides you with information about the study. A member of the research team will describe this study to you and answer all of your questions. Please read the information below and ask questions about anything you do not understand before deciding whether or not to take part. You can leave the session at any time without any negative consequence and you can choose not to answer questions asked. Participation and your responses are completely voluntary and will in no way influence your position as a paediatrician.

Why is this study being done?
To learn about your perspective, experiences, beliefs, thoughts and recommendations about the best way to improve bedside teaching on ward rounds.

You are invited to participate in this study because you are a paediatrician with a unique perspective on how best to optimize the learning and teaching environment on ward rounds.

What happens if I join this study?
You will participate in an individual interview about paediatric clinical rounds that will last between 1 and 1 ½ hours. The interview will be audio-recorded for research purposes.

What are the possible discomforts or risks?
You may be uncomfortable answering some of the questions during the interview. You are free to not to answer any question that makes you uncomfortable.

Will I be paid for being in the study? Will I have to pay for anything?
No, you will not be paid to be in the study. It will not cost you anything to be in the study.

Is my participation voluntary?
Taking part in this study is voluntary. You have the right to choose not to take part in this study. You also have the right not to answer any questions if you do not wish to do so. If you choose to take part, you have the right to stop at any time. If you choose not to answer particular questions, refuse to participate, or change your mind, you will not be penalized in any way.

How confidential are my responses?
The researchers will not share your responses with anyone outside the research team. Because the interview is being audio-recorded, you should not use your name or others names in your answers. We will remove any information that may identify participants before analysis if someone uses a name in their response.

What happens at the end of the study?
All members within the Department of Paediatrics at Princess Marina Hospital and all participants will receive email notification about the study findings, including online references to any academic or scholarly output from the study.

Who do I call if I have questions?
The researchers carrying out this study are Dr. Savarra Mantzor and Dr. Tonya Arscott-Mills from the Botswana-UPenn Partnership, and Dr. Vanessa Burch from the University of Cape Town. You may ask any questions you have now. If you have questions later, you may email:

- Dr. Mantzor at mantzors@email.chop.edu, or
- Dr. Arscott-Mills at tonyaarscottmillsbup@gmail.com, or
- Dr. Vanessa Burch at PA: sipho.mankayi@uct.ac.za.

If you have any questions about your rights as a research participant, you may call the Botswana Head of Health Research Unit, Ministry of Health, (+267) 391-4467 or the University of Cape Town Faculty of Health Sciences Human Research Ethics Committee can be contacted on (+27) 021 406 6338 in case participants have any questions regarding their rights and welfare as research participants on the study.

Agreement to be in this study:
I have read this paper about the research study. I understand the possible risks and benefits of this study. I know that being in this study is voluntary. I choose to be in this study. By signing below, I consent to participate in this study.

Name: _____
Signature: _____
Date: _____

Thank you for your time and help.

Savarra M. Mantzor, MD
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A.12. Information sheet for participants to complete surveys - Medical students - [Phase 1]

This form provides you with information about the study. A member of the research team will describe this study to you and answer all of your questions. Please read the information below and ask questions about anything you do not understand before deciding whether or not to take part. You can leave the study at any time without any negative consequence and you can choose not to answer any question asked of you. Participation and your responses are completely voluntary and will in no way influence your position as a medical student.

Why is this study being done?
To learn about your perspective, experiences, beliefs, thoughts and recommendations about the best way to improve bedside teaching on ward rounds. You are invited to participate in this study because you are a medical student with a unique perspective on how best to optimize the learning and teaching environment on ward rounds.

What happens if I join this study?
You will be asked to complete surveys related to your perspective of the clinical learning environment on ward rounds, your perceptions of your confidence in patient management, and your perception of being an active participant on ward rounds.

What are the possible discomforts or risks?
You may be uncomfortable answering some of the questions on the survey. You are free to not to answer any question that makes you uncomfortable. You may feel fatigue from completing several surveys. You are free not to complete a survey at any time during the study.

Will I be paid for being in the study? Will I have to pay for anything?
No, you will not be paid to be in the study. It will not cost you anything to be in the study.

Is my participation voluntary?
Taking part in this study is voluntary. You have the right to choose not to take part in this study. You also have the right not to answer any questions if you do not wish to do so. If you choose to take part, you have the right to stop at any time. If you choose not to answer particular questions, refuse to participate, or change your mind, you will not be penalized in any way.

How confidential are my responses?
The researchers will not share your responses with anyone outside the research team. You will not write your name or other identifying information on your survey, instead all survey data will be anonymised using a unique alphanumeric code for each participant to permit comparison of data pre- and post-intervention. Alphanumeric codes will be assigned to participants at the start of the study and will be kept by them. The list of alphanumeric codes, will be known only to Dr. Savarra Mantzor, and will be destroyed at the conclusion of the post-intervention research. The surveys will ask for your level of training, i.e. ‘medical student’ or ‘paediatric resident’.

What happens at the end of the study?

All members within the Department of Paediatrics at Princess Marina Hospital and all participants will receive email notification about the study findings, including online references to any academic or scholarly output from the study.

Who do I call if I have questions?

The researchers carrying out this study are Dr. Savarra Mantzor and Dr. Tonya Arscott-Mills from the Botswana-UPenn Partnership, and Dr. Vanessa Burch from the University of Cape Town. You may ask any questions you have now. If you have questions later, you may email:

- Dr. Mantzor at mantzors@email.chop.edu, or
- Dr. Arscott-Mills at tonyaarscottmillsbup@gmail.com, or
- Dr. Vanessa Burch at PA: sipho.mankayi@uct.ac.za.

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Agreement to be in this study:

I have read this paper about the research study. I understand the possible risks and benefits of this study. I know that being in this study is voluntary. I choose to be in this study. By signing below, I consent to participate in this study.

Name: _____

Signature: _____

Date: _____

Thank you for your time and help.

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Professor and Chair of Clinical Medicine
Department of Medicine
Faculty of Health Sciences
University of Cape Town
PA: sipho.mankayi@uct.ac.za
Office: 021 4066836

A.13. Information sheet for participants to complete surveys - Junior residents - [Phase 1]

This form provides you with information about the study. A member of the research team will describe this study to you and answer all of your questions. Please read the information below and ask questions about anything you do not understand before deciding whether or not to take part. You can leave the study at any time without any negative consequence and you can choose not to answer any question asked of you. Participation and your responses are completely voluntary and will in no way influence your position as a paediatric resident.

Why is this study being done?
To learn about your perspective, experiences, beliefs, thoughts and recommendations about the best way to improve bedside teaching on ward rounds.

You are invited to participate in this study because you are a paediatric resident with a unique perspective on how best to optimize the learning and teaching environment on ward rounds.

What happens if I join this study?
You will be asked to complete surveys related to your perspective of the clinical learning environment on ward rounds, your perceptions of your confidence in patient management, and your perception of being an active participant on ward rounds.

What are the possible discomforts or risks?
You may be uncomfortable answering some of the questions on the survey. You are free to not to answer any question that makes you uncomfortable. You may feel fatigue from completing several surveys. You are free not to complete a survey at any time during the study.

Will I be paid for being in the study? Will I have to pay for anything?
No, you will not be paid to be in the study. It will not cost you anything to be in the study.

Is my participation voluntary?
Taking part in this study is voluntary. You have the right to choose not to take part in this study. You also have the right not to answer any questions if you do not wish to do so. If you choose to take part, you have the right to stop at any time. If you choose not to answer particular questions, refuse to participate, or change your mind, you will not be penalized in any way.

How confidential are my responses?
The researchers will not share your responses with anyone outside the research team. You will not write your name or other identifying information on your survey, instead all survey data will be anonymised using a unique alphanumeric code for each participant to permit comparison of data pre- and post-intervention. Alphanumeric codes will be assigned to participants at the start of the study and will be kept by them. The list of alphanumeric codes, will be known only to Dr. Savarra Mantzor, and will be destroyed at the conclusion of the post-intervention research. The surveys will ask for your level of training, i.e. ‘medical student’ or ‘paediatric resident’.

What happens at the end of the study?

All members within the Department of Paediatrics at Princess Marina Hospital and all participants will receive email notification about the study findings, including online references to any academic or scholarly output from the study.

Who do I call if I have questions?

The researchers carrying out this study are Dr. Savarra Mantzor and Dr. Tonya Arscott-Mills from the Botswana-UPenn Partnership, and Dr. Vanessa Burch from the University of Cape Town. You may ask any questions you have now. If you have questions later, you may email:

- Dr. Mantzor at mantzors@email.chop.edu, or
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Agreement to be in this study:

I have read this paper about the research study. I understand the possible risks and benefits of this study. I know that being in this study is voluntary. I choose to be in this study. By signing below, I consent to participate in this study.

Name: _____

Signature: _____

Date: _____

Thank you for your time and help.

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Office: 021 4066836

A.14. Information sheet for participants to complete surveys - Medical students - [Phase 2 & 3]

This form provides you with information about the study. A member of the research team will describe this study to you and answer all of your questions. Please read the information below and ask questions about anything you do not understand before deciding whether or not to take part. You can leave the study at any time without any negative consequence and you can choose not to answer any question asked of you. Participation and your responses are completely voluntary and will in no way influence your position as a medical student.

Why is this study being done?
To learn about your perspective, experiences, beliefs, thoughts and recommendations about the best way to improve bedside teaching on ward rounds. We will be utilizing quality improvement methods to measure this over time. You are invited to participate in this study because you are a medical student with a unique perspective on how best to optimize the learning and teaching environment on ward rounds.

What happens if I join this study?
You will be asked to complete surveys related to your perspective of the clinical learning environment on ward rounds, your perceptions of your confidence in patient management, and your perception of being an active participant on ward rounds.

What are the possible discomforts or risks?
You may be uncomfortable answering some of the questions on the survey. You are free to not to answer any question that makes you uncomfortable. You may feel fatigue from completing several surveys. You are free not to complete a survey at any time during the study.

Will I be paid for being in the study? Will I have to pay for anything?
No, you will not be paid to be in the study. It will not cost you anything to be in the study.

Is my participation voluntary?
Taking part in this study is voluntary. You have the right to choose not to take part in this study. You also have the right not to answer any questions if you do not wish to do so. If you choose to take part, you have the right to stop at any time. If you choose not to answer particular questions, refuse to participate, or change your mind, you will not be penalized in any way.

How confidential are my responses?
The researchers will not share your responses with anyone outside the research team. You will not write your name or other identifying information on your survey. The surveys will ask for your level of training, i.e. ‘medical student’ or ‘paediatric resident’.

What happens at the end of the study?
All members within the Department of Paediatrics at Princess Marina Hospital and all participants will receive email notification about the study findings, including online references to any academic or scholarly output from the study.

Who do I call if I have questions?
The researchers carrying out this study are Dr. Savarra Mantzor and Dr. Tonya Arscott-Mills from the Botswana-UPenn Partnership, and Dr. Vanessa Burch from the University of Cape Town. You may ask any questions you have now. If you have questions later, you may email:

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Agreement to be in this study:
I have read this paper about the research study. I understand the possible risks and benefits of this study. I know that being in this study is voluntary. I choose to be in this study. By signing below, I consent to participate in this study.

Name: _____
Signature: _____
Date: _____

Thank you for your time and help.

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PA: sipho.mankayi@uct.ac.za
Office: 021 4066836

A.15. Information sheet for participants to complete surveys - Junior residents - [Phase 2 & 3]

This form provides you with information about the study. A member of the research team will describe this study to you and answer all of your questions. Please read the information below and ask questions about anything you do not understand before deciding whether or not to take part. You can leave the study at any time without any negative consequence and you can choose not to answer any question asked of you. Participation and your responses are completely voluntary and will in no way influence your position as a paediatric resident.

Why is this study being done?
To learn about your perspective, experiences, beliefs, thoughts and recommendations about the best way to improve bedside teaching on ward rounds. We will utilize quality improvement methods to measure this over time. You are invited to participate in this study because you are a paediatric resident with a unique perspective on how best to optimize the learning and teaching environment on ward rounds.

What happens if I join this study?
You will be asked to complete surveys related to your perspective of the clinical learning environment on ward rounds, your perceptions of your confidence in patient management, and your perception of being an active participant on ward rounds.

What are the possible discomforts or risks?
You may be uncomfortable answering some of the questions on the survey. You are free to not to answer any question that makes you uncomfortable. You may feel fatigue from completing several surveys. You are free not to complete a survey at any time during the study.

Will I be paid for being in the study? Will I have to pay for anything?
No, you will not be paid to be in the study. It will not cost you anything to be in the study.

Is my participation voluntary?
Taking part in this study is voluntary. You have the right to choose not to take part in this study. You also have the right not to answer any questions if you do not wish to do so. If you choose to take part, you have the right to stop at any time. If you choose not to answer particular questions, refuse to participate, or change your mind, you will not be penalized in any way.

How confidential are my responses?
The researchers will not share your responses with anyone outside the research team. You will not write your name or other identifying information on your survey. The surveys will ask for your level of training, i.e. ‘medical student’ or ‘paediatric resident’.

What happens at the end of the study?
All members within the Department of Paediatrics at Princess Marina Hospital and all participants will receive email notification about the study findings, including online references to any academic or scholarly output from the study.

Who do I call if I have questions?
The researchers carrying out this study are Dr. Savarra Mantzor and Dr. Tonya Arscott-Mills from the Botswana-UPenn Partnership, and Dr. Vanessa Burch from the University of Cape Town. You may ask any questions you have now. If you have questions later, you may email:

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Agreement to be in this study:
I have read this paper about the research study. I understand the possible risks and benefits of this study. I know that being in this study is voluntary. I choose to be in this study. By signing below, I consent to participate in this study.

Name: _____
Signature: _____
Date: _____

Thank you for your time and help.

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Office: 021 4066836

A.16. Information sheet for participants to complete surveys - Senior residents - [Phase 2 & 3]

This form provides you with information about the study. A member of the research team will describe this study to you and answer all of your questions. Please read the information below and ask questions about anything you do not understand before deciding whether or not to take part. You can leave the study at any time without any negative consequence and you can choose not to answer any question asked of you. Participation and your responses are completely voluntary and will in no way influence your position as a senior resident.

Why is this study being done?
To learn about your perspective, experiences, beliefs, thoughts and recommendations about the best way to improve bedside teaching on ward rounds. We will utilize quality improvement methods to measure this over time. You are invited to participate in this study because you are a senior resident with a unique perspective on how best to optimize the learning and teaching environment on ward rounds.

What happens if I join this study?
You will be asked to complete surveys related to your perspective of the clinical learning environment on ward rounds, your perceptions of your confidence in patient management, and your perception of being an active participant on ward rounds.

What are the possible discomforts or risks?
You may be uncomfortable answering some of the questions on the survey. You are free to not to answer any question that makes you uncomfortable. You may feel fatigue from completing several surveys. You are free not to complete a survey at any time during the study.

Will I be paid for being in the study? Will I have to pay for anything?
No, you will not be paid to be in the study. It will not cost you anything to be in the study.

Is my participation voluntary?
Taking part in this study is voluntary. You have the right to choose not to take part in this study. You also have the right not to answer any questions if you do not wish to do so. If you choose to take part, you have the right to stop at any time. If you choose not to answer particular questions, refuse to participate, or change your mind, you will not be penalized in any way.

How confidential are my responses?
The researchers will not share your responses with anyone outside the research team. You will not write your name or other identifying information on your survey. The surveys will ask for your level of training, i.e. 'senior resident' or 'faculty'.

What happens at the end of the study?
All members within the Department of Paediatrics at Princess Marina Hospital and all participants will receive email notification about the study findings, including online references to any academic or scholarly output from the study.

Who do I call if I have questions?
The researchers carrying out this study are Dr. Savarra Mantzor and Dr. Tonya Arscott-Mills from the Botswana-UPenn Partnership, and Dr. Vanessa Burch from the University of Cape Town. You may ask any questions you have now. If you have questions later, you may email:

- Dr. Mantzor at mantzor@bcm.edu, or
- Dr. Arscott-Mills at tonyaarscottmillsbup@gmail.com, or
- Dr. Vanessa Burch at PA: sipho.mankayi@uct.ac.za.

If you have any questions about your rights as a research participant, you may call the Botswana Head of Health Research Unit, Ministry of Health, (+267) 391-4467 or the University of Cape Town Facutly of Health Sciences Human Research Ethics Committee can be contacted on (+27) 021 406 6338 in case participants have any questions regarding their rights and welfare as research participants on the study.

Agreement to be in this study:
I have read this paper about the research study. I understand the possible risks and benefits of this study. I know that being in this study is voluntary. I choose to be in this study. By signing below, I consent to participate in this study.

Name: _____
Signature: _____
Date: _____

Thank you for your time and help.

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A.17. Information sheet for participants to complete surveys - Faculty - [Phase 2 & 3]

This form provides you with information about the study. A member of the research team will describe this study to you and answer all of your questions. Please read the information below and ask questions about anything you do not understand before deciding whether or not to take part. You can leave the study at any time without any negative consequence and you can choose not to answer any question asked of you. Participation and your responses are completely voluntary and will in no way influence your position as a faculty member.

Why is this study being done?
To learn about your perspective, experiences, beliefs, thoughts and recommendations about the best way to improve bedside teaching on ward rounds. We will utilize quality improvement methods to measure this over time. You are invited to participate in this study because you are a faculty member with a unique perspective on how best to optimize the learning and teaching environment on ward rounds.

What happens if I join this study?
You will be asked to complete surveys related to your perspective of the clinical learning environment on ward rounds, your perceptions of your trainees' confidence in patient management, and your perception your trainees' ability to be an active participant on ward rounds.

What are the possible discomforts or risks?
You may be uncomfortable answering some of the questions on the survey. You are free to not to answer any question that makes you uncomfortable. You may feel fatigue from completing several surveys. You are free not to complete a survey at any time during the study.

Will I be paid for being in the study? Will I have to pay for anything?
No, you will not be paid to be in the study. It will not cost you anything to be in the study.

Is my participation voluntary?
Taking part in this study is voluntary. You have the right to choose not to take part in this study. You also have the right not to answer any questions if you do not wish to do so. If you choose to take part, you have the right to stop at any time. If you choose not to answer particular questions, refuse to participate, or change your mind, you will not be penalized in any way.

How confidential are my responses?
The researchers will not share your responses with anyone outside the research team. You will not write your name or other identifying information on your survey. The surveys will ask for your level of training, i.e. 'senior resident' or 'faculty'.

What happens at the end of the study?
All members within the Department of Paediatrics at Princess Marina Hospital and all participants will receive email notification about the study findings, including online references to any academic or scholarly output from the study.

Who do I call if I have questions?
The researchers carrying out this study are Dr. Savarra Mantzor and Dr. Tonya Arscott-Mills from the Botswana-UPenn Partnership, and Dr. Vanessa Burch from the University of Cape Town. You may ask any questions you have now. If you have questions later, you may email:
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Agreement to be in this study:
I have read this paper about the research study. I understand the possible risks and benefits of this study. I know that being in this study is voluntary. I choose to be in this study. By signing below, I consent to participate in this study.

Name: _____
Signature: _____
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Thank you for your time and help.

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APPENDIX B – STUDY INSTRUMENTS

B.1. MEDICAL STUDENT & JUNIOR RESIDENT FOCUS GROUP DISCUSSION GUIDE (BACK CH.3; BACK CH. 4)

Medical Student & Junior Resident Focus Group Discussion Guide

1) Opening Question - Index cards will be distributed:

1.1 Please think back to *any* teaching experience that was really good and you learned a lot from. On one side of the index card, please write down three things that made it 'good'?

1.2 Now think back to *any* teaching experience that was not good and you didn't learn from. On the other side of the index card, please write down three things that made it 'not good'?

2) Focused Introduction Question:

2.1 Thinking specifically to PMH Paediatric Department either in the NNU or the PMW, think of a positive ward round teaching experience. Please share what made the experience positive.

2.2 Thinking specifically to PMH Paediatric Department either in the NNU or the PMW, think of a negative ward round teaching experience. Please share what made the experience negative.

3) Transition Question:

3.1 What is the purpose of ward rounds in the NNU and/or the PMW?

3.2 What are the goals and objectives of ward rounds?

3.3 What are the expectations of you (student/resident) during ward rounds?

4) To elicit information about the perceived learning environment – prompting follow up questions could be:

4.1 When thinking specifically about teaching ward rounds in the NNU or PMW, when rounding, how do you feel? (i.e. Do you feel comfortable, respected, stimulated/motivated to learn?)

4.2 How is the environment helpful or not helpful to learning?

4.3 Do you ever receive feedback or evaluation of your performance during ward rounds or for your patient care? Please describe.

4.4 After ward rounds, do you feel stimulated to read up on your patients? Why or why not?

Key Questions:

5.1 What are the positive aspects of ward rounds?

5.2 What/who facilitates (helps) or enhances (improves) your learning on ward rounds?

5.3 What/who enables (improves) or facilitates (helps) you to be a motivated/stimulated learner?

Barriers:

6.1 Are there any barriers to learning or weaknesses of ward rounds?

6.2 Are there any opportunities to improvement ward rounds? Describe.

6.3 What/who prevents you from gaining the most from ward rounds?

6.4 What/who prevents you from being a motivated/stimulated learner?

Resources:

7.1 Are there resources that you need to be prepared for and get the most out of ward rounds?

7.2 Do you have access to those resources?

Ending Question:

Today, we have tried to gain a better understanding of the student/resident perspective and opinion about ward rounds.

8.1 Is there anything we did not ask or discuss that you think is important for us to know?

8.2 What has been the most important topic discussed today?

B.2. SENIOR RESIDENT FOCUS GROUP DISCUSSION GUIDE (BACK CH. 3; BACK CH. 4)

Senior Resident Focus Group Discussion Guide

(combination of student/junior resident FGD guide questions & faculty interview questions)

1) Opening Question - Index cards will be distributed:

1.1 Please think back to *any* teaching experience that was really good and you learned a lot from. On one side of the index card, please write down three things that made it 'good'?

1.2 Now think back to *any* teaching experience that was not good and you didn't learn from. On the other side of the index card, please write down three things that made it 'not good'?

2) Focused Introduction Question:

2.1 Thinking specifically to PMH Paediatric Department either in the NNU or the PMW, think of a positive ward round teaching experience. Please share what made the experience positive.

2.2 Thinking specifically to PMH Paediatric Department either in the NNU or the PMW, think of a negative ward round teaching experience. Please share what made the experience negative.

1) Questions to contextualize information:

1.7 How do you view teaching in relation to your role as a Paediatrician?

1.8 What is the purpose of teaching on ward rounds?

1.9 When you run ward rounds, what are your priorities?

1.10 What is your personal approach to teaching on ward rounds?

1.11 What experiences have led you to run ward rounds/teach the way you do?

1.12 What are the most important aspects of bedside teaching?

1.13 What are the most important aspects of a teacher's role during ward rounds?

1.15 Please describe the ideal learning environment on ward rounds for you and the learner.

1.16 What aspects of a ward rounds (the learning environment) have a good/bad effect on student learning on ward rounds?

1.19 What effects students' self-confidence during teaching on ward rounds?

1.20 What could improve students' self-confidence on ward rounds?

1.21 What detracts from students' self-confidence on ward rounds?

2) Intrinsic Motivators (perceived risks? benefits? align with belief systems?)

2.1 What do you perceive as positive aspects of bedside teaching? Negative?

2.2 Do you think bedside teaching enhances the quality of patient care?

2.3 Do you find joy in bedside teaching? Why/why not?

2.4 Do you find bedside teaching to be burdensome? Why/why not?

3) Extrinsic Motivators (incentive? disincentive?)

3.1 Do you feel supported to teach on ward rounds?

3.2 Are there any incentives to teach on ward rounds?

3.3 Are there disincentives to teach on ward rounds?

5) Environment (are my superiors/institution supportive?)

5.1 Does the Ministry of Health &/or UB value bedside teachers? How/how not?

1.17 Could learning/teaching be improved on ward rounds? 1.18 How?

4) Behavior Skills & Self-Efficacy (do I have the skills or access/support to practice?)

4.1 Do you consider yourself to be a good bedside teacher? Why/why not?

4.2 Would a structured approach to ward round teaching be helpful?

4.3 Do you have any knowledge of structured methods of ward round teaching?

4.4 Do you have any interest in learning to use a structured method of teaching on ward rounds? Why/why not?

4.5 What resources, if any, to you need to support you in your role in providing bedside teaching?

Ending Question:

Today, we have tried to gain a better understanding of the student/resident perspective and opinion about ward rounds.

8.1 Is there anything we did not ask or discuss that you think is important for us to know?

8.2 What has been the most important topic discussed today?

B.3. FACULTY INTERVIEW GUIDE (BACK CH. 3; BACK CH.4)

Faculty Interview Guide

1) Questions to contextualize information:

1.1 Where are you from?

1.2 Where did you do your medical training? Paediatric training?

1.3 Why did you choose to practice Paediatrics?

1.4 What has brought you to Princess Marina Hospital?

1.5 Do you have any previous teaching experience? Or any formal teaching course or previous faculty development experience?

1.6 Are you employed by UB, Ministry of Health, or other?

1.7 How do you view teaching in relation to your role as a Paediatrician?

1.8 What is the purpose of teaching on ward rounds?

1.9 When you run ward rounds, what are your priorities?

1.10 What is your personal approach to teaching on ward rounds?

1.11 What experiences have led you to run ward rounds/teach the way you do?

1.12 What are the most important aspects of bedside teaching?

1.13 What are the most important aspects of a teacher's role during ward rounds?

1.14 As a *student*, think back to any bedside teaching experience that was really good and you learned a lot from. What made it 'good'? Think back to a bedside teaching experience that was not good and you didn't learn anything from. What made it 'not good'?

1.15 Please describe the ideal learning environment on ward rounds for you and the learner.

1.16 What aspects of a ward rounds (the learning environment) have a good/bad effect on student learning on ward rounds?

1.17 Could learning/teaching be improved on ward rounds?

1.18 How could learning and teaching be improved on ward rounds?

1.19 What effects students' self-confidence during teaching on ward rounds?

1.20 What could improve students' self-confidence on ward rounds?

1.21 What detracts from students' self-confidence on ward rounds?

2) Intrinsic Motivators (perceived risks? benefits? align with belief systems?)

2.1 What do you perceive as positive aspects of bedside teaching? Negative?

2.2 Do you think bedside teaching enhances the quality of patient care?

2.3 Do you find joy in bedside teaching? Why/why not?

2.4 Do you find bedside teaching to be burdensome? Why/why not?

3) Extrinsic Motivators (incentive? disincentive?)

3.1 Do you feel supported to teach on ward rounds?

3.2 Are there any incentives to teach on ward rounds?

3.3 Are there disincentives to teach on ward rounds?

4) Behavior Skills & Self-Efficacy (do I have the skills or access/support to practice?)

4.1 Do you consider yourself to be a good bedside teacher? Why/why not?

4.2 Would a structured approach to ward round teaching be helpful?

4.3 Do you have any knowledge of structured methods of ward round teaching?

4.4 Do you have any interest in learning to use a structured method of teaching on ward rounds? Why/why not?

4.5 What resources, if any, to you need to support you in your role in providing bedside teaching?

5) Environment (are my superiors/institution supportive?)

5.1 Does the Ministry of Health &/or UB value bedside teachers? How/how not?

B.4. DEBRIEF GUIDE (BACK, CH. 3)

Development of the SNAPPS Debrief Guide

Faculty - SNAPPS Debrief
(collected weekly)

1) Please describe how you've been using SNAPPS on ward rounds? (i.e. since when? how many days a week? number of trainees? etc.)

2) What are your general impressions of using SNAPPS?

3) Any comments on any specific step of S-N-A-P-P-S?

4) Are you learning more by using SNAPPS to teach?

5) Has your patient management changed at all using SNAPPS?

6) Is anything missing from SNAPPS?

7) Any other questions/comments or suggestions to improve SNAPPS and/or SNAPPS training?

Trainee - SNAPPS Debrief
(collected mid & end of rotation)

1) Please describe if you've had opportunities to use SNAPPS on ward rounds? (i.e. since when? how many days a week? number of faculty using it? which wards? etc.)

2) What are your general impressions of using SNAPPS?

3) Any comments on any specific step of S-N-A-P-P-S?

4) Are you learning more by using SNAPPS?

5) *For residents only:* How do you feel helping the students with SNAPPS?

6) Is anything missing from SNAPPS?

7) Any other questions/comments or suggestions to improve SNAPPS and/or SNAPPS training?

B.5. ACTION RESEARCH JOURNAL – EXCERPT (BACK, CH. 3)

Action Research Journal

August 2017 – April 2019

(Excerpt Only – full document 67 pages and 34,000 words)

**Note: Individuals' names have been removed.*

→ **20 June, 2018:** "Ten Tips to Survive the Pre-Round" – informal "how did you enjoy the session? was it helpful?" I asked *Resident X* because she had left early for clinic – "yes, it was good – some of those things you think are obvious, but they aren't and it's good to hear them" *Resident Y and MO X* said something similar when asked about it.

→ **6 July, 2018:** First "Teach the Teacher" session "What does it mean to be a clinical teacher? Part I": fairly good attendance, no one drank tea/coffee, so the next time I set it up along the table with three stations instead of one at the front. The main comment from *Dr. X* was if we're so focused on the learner, what about the patient? Are we compromising patient care/time by focusing on the learner? I addressed this that the ideal setting would be patient-centered rounds where you are providing patient-centered care and learner-centered teaching simultaneously. It was otherwise a pretty quiet group. The group easily picked up on the differences between the first and second video; *Dr. Y* made a comment that in the second video they didn't do a physical exam (mistake in the script being followed).

→ **13 July, 2018:** Second "Teach the Teacher" session "What does it mean to be a clinical teacher Part II – Introduction to Observation & Learning tool": had lots of good conversation here: comment by *Dr. Z*, "one student told me that it was his right to be excessive/long-winded? because he was a student"; gave them example scenario to practice with, (put poor *Dr. A* on the spot!); *Dr. B* commented about her time with *Sr Resident A* – "what level of trainee am I?" but I don't think the practice worked well – it wasn't guided enough and the group wasn't sure what they were supposed to be doing; in the end, I just made the point that were are meeting the learner where he/she is at and that by putting the learner at the forefront and hearing their thinking, then we can actually teach appropriately.

→ **25 July, 2018:** "Resident Intro to SNAPPS" – they seemed to really like the idea of the rounds being learner-centered and the opportunity to show their thinking on rounds; they admitted with facial expressions and sighs of how that's not always the case. When came time to practice, they initially had a hard time committing to Narrow – they would start to analyze right away as a means to justify their differential, but didn't really want to commit to a differential – almost as if they were nervous to just commit to a differential; but I kept pressing them on it and they would state "1, 2, 3 . . ." then when they would Analyze, at first they would start to make a Plan – again, had to give them some guidance on it's just about analyzing their differential; for Probe, this was the hardest part for them – it was hard for them as a group to generate questions, then they asked what could the question be about – could it be about making a differential? could it be about the plan? could it be about a physical exam finding? could it be about a social issue? It was as if they were nervous to ask a question – then it started to come out during these SNAPPS sessions that N-A-P are a created safe space to allow the learner to think aloud – a chance for us to hear what he/she is thinking and response gently guiding, non-judgmentally, non-pimping style. They easily came up with a Plan and Select a case for further reading. In general, they seemed excited to want to try out SNAPPS and they seemed to take to it well.

→ **27 July, 2018:** Teach the Teacher – Session 3, "Intro to SNAPPS": The biggest thing when first presenting SNAPPS to the faculty was this issue of the Summarize – *Dr. C and Dr. D* especially made the biggest fuss

"traditionally in the department, we allow the 3rd year students to present the entire case" & concern that the 3rd years will be so new, they won't know how to summarize the case; this brought up a big issue: the "Case Presentation" which is mandatory for all students and their rotation log books vs "Summarize" what needs to be said on rounds. We discussed as a group that the Case Presentation shouldn't really be used for rounds – that should happen at another time; *Dr. E* brought up that he allows one student per day to do a "Case Presentation" but the rest will need to do it on another day and will need to "Summarize" instead. There was another point about "faculty that take a lot of notes, are seen by the students to 'not know' what they're doing vs those faculty who are just there to give answers" comment from *Dr. C.* . . . Another point was the use of the resident – get the resident to help the juniors figure out what is pertinent positive or pertinent negative; this idea that there is a built-in levels on our rounds, and if we use the senior learners to help with the junior learners, this takes pressure and time off us during the rounds. In general, other than the concern about when students would get a chance to read their Case Presentation, seemed to be well received.

→ **3 August, 2018:** Teach the Teacher – Session 4 "Practice SNAPPS" this session was supposed to be about practicing SNAPPS, but since most of the attendees hadn't attended session 3, it pretty much became another Intro to SNAPPS session. There was discussion about when to do the physical exam – before the learner presents or after; or before rounds, or after rounds all together? Talked about how with SNAPPS, it should actually cut down on time of us just listening to the entire medical record being read so that we'll actually have time to watch them do a portion of the physical exam in front of us; again, overall seemed to be well received.

→ **Week 30 July – 3 Aug, 2018:** *I was on Primary with MO on PHO*
I first tested it out on my own a few times with residents I was rounding with over the weekend and the dedicated PHO MO. This wasn't captured by any written data collection tool, but I just wanted to get a sense of how it felt to use SNAPPS on rounds. I would usually just do one patient per day. The on-call weekend residents seemed to like it, but had a hard time coming up with a probe question; I found it interesting to use, because otherwise I wouldn't have done any teaching on weekend rounds, but since SNAPPS was built-in teaching while they presented the case, it was easy to quickly add a few learning/teaching comments.

The first week I practiced with the PHO MO, he found it really tricky to Narrow and Probe. We used it on a new patient with hemolytic anemia and jaundice, which was a great case to use it on – we liked that one a lot, but each day, we couldn't figure out new probes since we'd spent so much time the first day asking questions. Summarize was straight forward; Narrow was a good chance to broaden our differential, Analyze he liked (I took a little note "MO likes N&A" but he laughed so hard, I didn't think I should keep taking notes); Plan and Select were intuitive and easy. Initially it felt a little forced "Ok, let's practice SNAPPS on this patient" but by the end of the week, he really took to it and would even say "Dr. Savarra – let's do SNAPPS for this patient." I was surprised how easily it set us up for teaching without having to prepare for teaching rounds – it was even exciting! Since it was just the two of us that week (students on holiday) and only a few patients, it was a good week to practice something new. The Select a case turned out to be very helpful for coming up with a meaningful differential for this child – we even found an algorithm from one of my colleagues and used it on rounds. I'm pretty certain, because it was just us and it was such a quiet week, if we hadn't done SNAPPS and forced ourselves to do the Probe and Select, we wouldn't have done much teaching that week at all – but I found I was learning a ton as the pediatrician for using SNAPPS because of the questions generated by the MO.

→ **Week 6 – 10 Aug, 2018**: *I was Primary with MO & new MBBS 5 students on PHO*
I didn't collect any written data during this week. The students were only trained on in SNAPPS on Wednesday and then on the Thursday and Friday I was away for the Intern boot camp.

→ **8 August, 2018:** Students' Intro to SNAPPS. The students were trained their first week back on 8 Aug (3rd, 5th, and residents who missed the 25 July session); This seemed to be a good session – for the practice, juniors were paired with more seniors to practice SNAPPS with the 7mo female w/ neck mass example. There was some discussion about the Summarize - one MBBS 5 student was worried that if they didn't do their Case Presentations on rounds, then the faculty wouldn't avail themselves later in the day for them to present their cases. The narrow was harder for some – even coming up with a differential of neck mass (but just shows the importance of doing SNAPPS, because then shows where the learner is at – clearly not on the management of neck masses, but the differential!); Analyze seemed easier for the group; again Probe was a bit tricky – lots of questions about "what can we probe for?" Plan & Select were straight forward. One pair was particularly good and put in a lot of effort to summarize and then follow the SNAPPS guide. Think went well overall – and students asked "how will SNAPPS be implemented in the department?"

→ **Week 13 – 17 Aug, 2018:**

Since I was on Project Week this week, I asked *Drs A, B and C* if they would try to practice SNAPPS. I chose *Drs. A and B* because they are a part of the project group and this project (although *Dr. B* had not done the formal training of SNAPPS until 31 Aug); I asked *Dr. C* because she'd undergone the training and works with me in the PHO service.

→ **14 Aug:** I made the first SNAPPS data collection tool and gave it to *Dr. A, B and D* – this one probed about 'do you know *how* to use SNAPPS?' – I wanted to see if further training was needed, but after one week, it seemed pretty clear people understood the process.

- *Dr. A* reported back that he didn't have time to practice SNAPPS on rounds because the 3rd years required so much attention with even basic bedside physical exams, etc. so he spent time getting them even prepared for ward rounds instead of using SNAPPS.

**This is an important point since SNAPPS was developed and used with North American medical students who have a very different experience and training, i.e. MBBS 3 does not equal 3rd year North American medical student; need to look to see where else has SNAPPS been used to look for modifications for different levels of training.*

- *Dr. B* said he used it with once with one resident in NICU and the trainee completed the data collection tool, but he didn't have further feedback.

- *Dr. C* was a bit confused of who and when the data collection tool should be filled out. In the end she filled out two forms together with the student for two different days on two different patients. She noted that the students were nervous to Probe thinking that if they asked a question, then they would receive back a host of questions they may not be able to answer.

→ **Week 20 – 24 Aug, 2018:**

I was Back-up this week, so I asked *Dr. D* if he would practice SNAPPS on the PHO service in addition to *Dr. A* and *Dr. B*.

à 20 Aug, I modified the data collection tool to assess for 'did you find it *helpful* to use SNAPPS?' I gave only one form to both the faculty and the trainee, but the faculty reported back that it was confusing to answer from a faculty's perspective based on how I'd worded the questions for a trainee to answer – the idea was that maybe they could complete together or each fill out one about the experience?

- *Dr. A* didn't report anything. I'm not sure if he practiced SNAPPS and/or if he used the data collection forms or if they were lost by students, but I didn't receive anything back.

- *Dr. B* had been assigned to Prem with an Intern, but none of the Interns had received SNAPPS training yet so he wasn't able to practice SNAPPS this week.

- *Dr. D* said he practiced SNAPPS once a day with the students on three different days this week – he turned in his data collection tool, but the students didn't. It seems clear that if you give the students the forms, even if they complete, they won't hand them in at a later date.

- I learned *Dr. E* was using SNAPPS but since I didn't know he'd already started to incorporate it into his rounds, I didn't give him the data collection tools and so we did not capture any data from him during these weeks.

B.6. DREEM SURVEY (BACK CH. 4)

Dundee Ready Educational Environment Measure - Original

[Likert scale: 0 = Strongly disagree, 1 = Disagree, 2 = Unsure, 3 = Agree, and 4 = Strongly agree]

I. Students' perception of teaching:

(12 items/max score 48 for this subscale)

* I am encouraged to participate in class
* The teaching is sufficiently concerned to develop my confidence
* The teaching encourages me to be an active learner
* The teaching is well focused
* The teaching is sufficiently concerned to develop my competence
* I am clear about the learning objectives of the course
* The teaching is often stimulating
* The teaching time is put to good use
* The teaching is student centered
* Long-term learning is emphasized over short term
* The teaching is too teacher-centered
* The teaching over-emphasizes factual learning

II. Students' perceptions of teachers:

(11 items/max score 44 for this subscale)

* The teachers are good at providing feedback to students
* The teachers have good communications skills with patients
* The teachers are knowledgeable
* The teachers give clear examples
* The teachers are well prepared for their classes
* The teachers provide constructive criticism here
* The teachers ridicule the students
* The teachers get angry in class
* The teachers are authoritarian
* The teachers are patient with patients
* The students irritate the teachers

III. Students' academic. self-perceptions:

(8 items/max score 32 on this subscale)

* I am able to memorize all I need
* Much of what I have to learn seems relevant to a career in medicine
* I feel I am being well prepared for my profession
* Last year's work has been a good preparation for this year's work
* My problem-solving skills are being well developed here
* I am confident about passing this year
* I have learned a lot about empathy in my profession
* Learning strategies which worked for me before continue to work for me now

IV. Students' perceptions of atmosphere:

(12 items/max score for this subscale 48)

* The atmosphere is relaxed during lectures
* I feel able to ask the questions I want
* I feel comfortable in class socially
* There are opportunities for me to develop interpersonal skills
* The atmosphere is relaxed during seminars/tutorials
* The enjoyment outweighs the stress of studying medicine
* The atmosphere motivates me as a learner
* I am able to concentrate well
* The atmosphere is relaxed during the ward teaching
* This school is well timetabled
* I find the experience disappointing
* Cheating is a problem in this school

V. Student's social self-perceptions:

(7 items/max score for this subscale is 28)

* I have good friends in this school
* There is a good support system for students who get stressed
* I am too tired to enjoy this course
* I am rarely bored on this course
* My accommodation is pleasant

* My social life is good
* I seldom feel lonely

___

Dundee Ready Educational Environment Measure – <u>Modified</u>

This questionnaire is designed to help us get a better understanding of your perspective of the clinical learning environment within the Department of Paediatrics.

Your answers will be kept ***strictly confidential*** and will not be identified by name.

Please rate your level of agreement with the statement based on a scale of:

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
0	1	2	3	4

Question:	**0**	**1**	**2**	**3**	**4**
1. I am encouraged to participate on ward rounds					
2. The teaching is sufficiently concerned to develop my confidence					
3. The teaching encourages me to be an active learner					
4. The teaching is well focused					
5. The teaching is sufficiently concerned to develop my competence					
6. I am clear about the learning objectives on ward rounds					
7. The teaching is often stimulating					
8. The teaching time is put to good use					
9. The teaching is student centred					
10. Long-term learning is emphasized over short term					
11. The teaching is too teacher-centred					
12. The teaching over-emphasizes factual learning					
13. The teachers are good at providing feedback to students					
14. The teachers have good communications skills with patients and families					
15. The teachers are knowledgeable					
16. The teachers give clear examples					
17. The teachers are well prepared for ward rounds					
18. The teachers provide constructive criticism					
19. The teachers ridicule the students					

20. The teachers get angry on ward rounds					
21. The teachers are authoritarian					
22. The teachers are patient with patients and families					
23. The students irritate the teachers					
24. I am able to memorize all I need					
25. Much of what I have to learn seems relevant to a career in medicine					
26. I feel I am being well prepared for my profession					
27. Last year's work has been a good preparation for this year's work					
28. My problem-solving skills are being well developed here					
29. I am confident about passing this year					
30. I have learned a lot about empathy in my profession					
31. Learning strategies which worked for me before continue to work for me now					
32. The atmosphere is relaxed during ward rounds					
33. I feel able to ask the questions I want					
34. I feel comfortable on ward rounds socially					
35. There are opportunities for me to develop interpersonal skills					
36. The atmosphere is relaxed during seminars/tutorials					
37. The enjoyment outweighs the stress of studying medicine					
38. The atmosphere motivates me as a learner					
39. I am able to concentrate well					

40. The atmosphere is relaxed during the ward teaching					
41. The paediatric department is well time-tabled					
42. I find the experience of my paediatric rotation disappointing					
43. Cheating is a problem in the paediatric department					
44. I have good friends in this school					
45. There is a good support system for students who get stressed					
46. I am too tired to enjoy paediatrics					
47. I am rarely bored of paediatrics					
48. My accommodation is pleasant					
49. My social life is good					
50. I seldom feel lonely					

B.7. PHEEM SURVEY (BACK CH. 4)

Postgraduate Hospital Educational Environment Measure (PHEEM)

(Modified for Princess Marina Hospital's Department of Paediatrics: *Q.17 My hours conform to the New Deal - removed)*

This questionnaire is designed to help us get a better understanding of your perspective of the clinical learning environment within the Department of Paediatrics.

Your answers will be kept ***strictly confidential*** and will not be identified by name.

Please rate your level of agreement with the statement based on a scale of:

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
0	1	2	3	4

Question:	**0**	**1**	**2**	**3**	**4**
1. I have a contract of employment that provides information about hours of work					
2. My clinical teachers set clear expectations					
3. I have protected educational time in this post					
4. I had an informative induction programme					
5. I have the appropriate level of responsibility in this post					
6. I have good clinical supervision at all times					
7. There is racism in this post					
8. I have to perform inappropriate tasks					
9. There is an informative Junior Doctors Handbook					
10. My clinical teachers have good communication skills					
11. I am bleeped inappropriately					
12. I am able to participate actively in educational events					
13. There is sex discrimination in this post					
14. There are clear clinical protocols in this post					
15. My clinical teachers are enthusiastic					

16. I have good collaboration with other doctors in my grade					
17. I have the opportunity to provide continuity of care					
18. I have suitable access to career advice					
19. This hospital has good quality accommodation for junior doctors, especially when on call					
20. There is access to an educational programme relevant to my needs					
21. I get regular feedback from seniors					
22. My clinical teachers are well organized					
23. I feel physically safe within the hospital environment					
24. There is a no-blame culture in this post					
25. There are adequate catering facilities when I am on call					
26. I have enough clinical learning opportunities for my needs					
27. My clinical teachers have good teaching skills					
28. I feel part of a team working here					
29. I have opportunities to acquire the appropriate practical procedures for my level of training					
30. My clinical teachers are accessible					
31. My workload in this job is fine					
32. Senior staff utilize learning opportunities effectively					
33. The training in this post makes me feel ready to be a Consultant					
34. My clinical teachers have good mentoring skills					
35. I get a lot of enjoyment out of my present job					
36. My clinical teachers encourage me to be an independent learner					
37. There are good counselling opportunities for junior doctors who fail to complete their training satisfactorily					
38. The clinical teachers provide me with good feedback on my strengths and weaknesses					
39. My clinical teachers promote an atmosphere of mutual respect					

B.8. Elements for Effective Learning survey – Development (back, Ch. 4) (back, Ch.5)

Development of Element for Effective Learning (EEL) survey based on Stanford Faculty Development Program (SFDP)

SFDP Learning Domain	Corresponding Survey Questions
1) Establish a Positive Learning Environment: *"Promote a climate where residents can both learn and teach in a non-intimidating environment."*[78] Promoting a positive learning climate: "The learning climate is defined as the tone or atmosphere of the teaching setting including whether it is stimulating, and whether learners can comfortably identify and address their limitations. It sets the stage for effective teaching and learning."[36]	1) Paediatric ward rounds have a learning environment where I feel ***involved*** to perform as the ***presenting*** medical student or resident. 2) Paediatric ward rounds have a learning environment where I feel ***stimulated*** to perform as the ***presenting*** medical student or resident. 3) Paediatric ward rounds have a learning environment where I feel ***respected*** to perform as the ***presenting*** medical student or resident. 4) Paediatric ward rounds have a learning environment where I feel ***comfortable*** to perform as the ***presenting*** medical student or resident. 5) Paediatric ward rounds have a learning environment where I feel ***involved*** to actively participate as a ***member*** of the team. 6) Paediatric ward rounds have a learning environment where I feel ***stimulated*** to actively participate as a ***member*** of the team. 7) Paediatric ward rounds have a learning environment where I feel ***respected*** to actively participate as a ***member*** of the team. 8) Paediatric ward rounds have a learning environment where I feel ***comfortable*** to actively participate as a ***member*** of the team. 9) Paediatric ward rounds promote an atmosphere where uncertainty is respected. 10) On paediatric ward rounds, teachers and learners are encouraged to acknowledge their limitations. (I.e. When I do *not* know an answer, I am *not* scolded, but instead am encouraged to look-up or discuss the answer.)
2) Control of Teaching Session:	11) Paediatric ward rounds are well organized for appropriate learning.

"The [teacher] is responsible for planning and organizing the session so that it is natural, unhassled, and spontaneous."[78] Control of session: "This refers to the manner in which the teaching interaction is focused and paced, as influenced by the teacher's leadership style. It reflects the group dynamics, which affect the efficiency and focus of each teaching interaction."[36]	12) There are minimal interruptions during ward rounds. 13) Ward rounds are well paced and the time spent rounding on each patient is appropriate. 14) On paediatric ward rounds, there is a clearly defined agenda of learning topics. 15) Teaching points are focused with minimal deviations. 16) Learners are encouraged to help focus teaching topics.
3) Communication of goals: *"The [teacher] describes plans for each day; expectations and learning goals are set for each month. This process encourages trust and reiterates the objective that residents teach each other."*[78] Communication of goals: "This includes establishment as well as explicit expression of teachers' and learners' expectations for the learners. Setting goals provides a structure for the teaching process, guides teachers in planning the teaching and provide a basis for assessment."[36]	17) The goals and objectives of ***paediatric ward rounds*** have been clearly explained to me. 18) I understand the purpose of ***paediatric ward rounds.*** 19) The goals and objectives of my role as a ***presenter*** during paediatric ward rounds have been clearly explained to me. 20) I understand what is expected of me ***as a presenter*** during paediatric ward rounds. 21) The goals and objectives of my role as a ***participant*** during paediatric ward rounds have been clearly explained to me. 22) I understand what is expected of me ***as a participant*** during paediatric ward rounds.
4) Promotion of Understanding and Retention: *"It is important for the [teacher] . . . to listen and extract substance from the presentation and condense the important learning points into a daily take-home message."*[78] Promoting understanding and retention: "Understanding is the ability to correctly analyse, synthesize and apply whereas retention is the process of remembering facts or concepts. This category deals with approaches teachers can use to explain content being taught and have learner meaningfully interact with the content, enabling them to understand and retain it."[36]	23) During paediatric ward rounds, specific key learning points are identified in a clear manner. 24) During paediatric ward rounds, I am encouraged to ask questions. 25) During paediatric ward rounds, I am stimulated to make comparisons and evaluations about my patients' diagnosis. 26) During paediatric ward rounds, I am encouraged to discuss my differential diagnoses.

	27) During paediatric ward rounds, I am encouraged to discuss my thought process about my management plan. 28) During paediatric ward rounds, my role is limited to reporting or summarizing the patient case. 29) During paediatric ward rounds, if I am asked a question, it is usually asking only about facts, not my thinking process. 30) After paediatric ward rounds, I am able to retain specific key learning points discussed on rounds.
5) Feedback: *"The [teacher] . . . gives frequent positive feedback to residents, which, in turn, makes it easier to deliver constructive criticism in private or as part of the session."*[78] Feedback: "Feedback is the process by which the teacher provides learners with information about their performance for potential improvement. It provides an educational loop through which the teacher can guide learners to use the evaluation of their performance to reassess attainment of goals."[36]	31) I receive frequent positive and constructive feedback after paediatric ward rounds. 32) The feedback I receive relates to a specific behavior. (i.e. something I did or didn't do and can adjust). 33) I am encouraged to self-assess my own performance.
6) Self-directed Learning: *"[R]esidents who present cases with pertinent literature will be stimulated into regular reading that is sustained by the excitement of discovering information that enables better patient care."*[78] Promoting self-directed learning: "Teachers achieve this by facilitating learning initiated by learner's needs, goals and interests. It stresses the importance of acquiring skills to equip the learner to continue learning beyond the time of formal education."[36]	34) After paediatric ward rounds, I feel motivated or stimulated to read further about cases presented. 35) I feel confident that I can utilize my available resources to read up on patients and topics after ward rounds. 36) I feel that those resources are adequate for my learning.
Communities of Practice: Participation	Questions 1, 2, 3, 4, 5, 6, 7, 8, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, and 29
Communities of Practice: Reification	Questions 31, 32, 35 and 36

B.9. Elements for Effective Learning survey - Phase 1, original (back Ch. 4) (back, Ch.5) (Appendix E.3) (Appendix E.10)

Elements for Effective Learning on Ward Rounds Survey

This questionnaire is designed to help us get a better understanding of your perspective of paediatric ward rounds.

Your answers will be kept ***strictly confidential*** and will not be identified by name.

Please circle one:

Are you a 'medical student' or 'paediatric resident'?

Please rate your level of agreement with the statement based on a scale of:

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
0	1	2	3	4	5

Question:	**0**	**1**	**2**	**3**	**4**	**5**
1. Paediatric ward rounds have a learning environment where I feel ***involved*** to perform as the ***presenting*** medical student or resident.						
2. Paediatric ward rounds have a learning environment where I feel ***stimulated*** to perform as the ***presenting*** medical student or resident.						
3. Paediatric ward rounds have a learning environment where I feel ***respected*** to perform as the ***presenting*** medical student or resident.						
4. Paediatric ward rounds have a learning environment where I feel ***comfortable*** to perform as the ***presenting*** medical student or resident.						
5. Paediatric ward rounds have a learning environment where I feel ***involved*** to actively participate as a ***member*** of the team***.***						
6. Paediatric ward rounds have a learning environment where I feel ***stimulated*** to actively participate as a ***member*** of the team***.***						
7. Paediatric ward rounds have a learning environment where I feel ***respected*** to actively participate as a ***member*** of the team***.***						
8. Paediatric ward rounds have a learning environment where I feel ***comfortable*** to actively participate as a ***member*** of the team						
9. Paediatric ward rounds promote an atmosphere where uncertainty is respected.						
10. On paediatric ward rounds, teachers and learners are encouraged to acknowledge their limitations. (I.e. When I do *not* know an answer, I am *not* scolded, but instead am encouraged to look-up or discuss the answer.)						

11. Paediatric ward rounds are well organized for appropriate learning.						
12. There are minimal interruptions during ward rounds.						
13. Ward rounds are well paced and the time spent rounding on each patient is appropriate.						
14. On paediatric ward rounds, there is a clearly defined agenda of learning topics.						
15. Teaching points are focused with minimal deviations.						
16. Learners are encouraged to help focus teaching topics.						
17. The goals and objectives of ***paediatric ward rounds*** have been clearly explained to me.						
18. I understand the purpose of ***paediatric ward rounds.***						
19. The goals and objectives of my role as a ***presenter*** during paediatric ward rounds have been clearly explained to me.						
20. I understand what is expected of me ***as a presenter*** during paediatric ward rounds.						
21. The goals and objectives of my role as a ***participant*** during paediatric ward rounds have been clearly explained to me.						
22. I understand what is expected of me ***as a participant*** during paediatric ward rounds.						
23. During paediatric ward rounds, specific key learning points are identified in a clear manner.						
24. During paediatric ward rounds, I am encouraged to ask questions.						
25. During paediatric ward rounds, I am stimulated to make comparisons and evaluations about my patients' diagnosis.						
26. During paediatric ward rounds, I am encouraged to discuss my differential diagnoses.						
27. During paediatric ward rounds, I am encouraged to discuss my thought process about my management plan.						
28. During paediatric ward rounds, my role is limited to reporting or summarizing the patient case.						
29. During paediatric ward rounds, if I am asked a question, it is usually asking only about facts, not my thinking process.						
30. After paediatric ward rounds, I am able to retain specific key learning points discussed on rounds.						
31. I receive frequent positive and constructive feedback after paediatric ward rounds.						
32. The feedback I receive relates to a specific behaviour. (i.e. something I did or didn't do and can adjust).						
33. I am encouraged to self-assess my own performance.						
34. After paediatric ward rounds, I feel motivated or stimulated to read further about cases presented.						
35. I feel confident that I can utilize my available resources to read up on patients and topics after ward rounds.						
36. I feel that those resources are adequate for my learning.						

B.10. Perceived Self Efficacy survey – Development (back, Ch. 4)(back, Ch.5)

Development of Perceived Self Efficacy (PSE) survey
Based on CANMeds and SNAPPS

CANMeds:
Medical Expert (10 items) → used 6/10
Scholar (6 items) → used 3/6
Communicator (9 items) → used 2/9
Collaborator (2 items) → used 1/2
Manager (5 items) → 0
Health Advocate (5 items) → 0
Professionalism (6 items) → 1/6

SNAPPS:
1. Summarize briefly the history and findings
2. Narrow the differential to two or three relevant possibilities
3. Analyze the differential by comparing and contrasting the possibilities
4. Probe the preceptor by asking questions about uncertainties, difficulties, or alternative approaches
5. Plan management for the patient's medical issues
6. Select a case-related issue for self-directed learning

CANMeds Question	CANMeds Role	SNAPPS Model	PSE Survey Question
Elicit accurate, organized and appropriate focused histories	Medical Expert		1. Elicit accurate, organized and appropriate focused histories for Paediatric patients.
Elicit accurate, organized and appropriate focused histories	Medical Expert		2. Elicit accurate, organized and appropriate focused histories for Neonatal patients.
Conduct accurate, sensitive and organized physical examinations	Medical Expert		3. Conduct accurate, sensitive and organized physical examinations for Paediatric patients.
Conduct accurate, sensitive and organized physical examinations	Medical Expert		4. Conduct accurate, sensitive and organized physical examinations for Neonatal patients.
Demonstrates Basic Science Knowledge Relevant to: (this rotation)	Medical Expert		5. Accurately assess the developmental age of a child based on history and physical exam.
Demonstrates Clinical Knowledge Relevant to: (this rotation)	Medical Expert		6. Accurately assess the growth of a child given weight, height, and head circumference.
Presents cases in accurate, organized and thoughtful manner	Communicator	1. Summarize	7. Summarize and present the pertinent information obtained from the patient's history on ward rounds in an accurate, organized and thoughtful manner.

Presents cases in accurate, organized and thoughtful manner	Communicator	1. Summarize	8. Summarize and present the pertinent information obtained from the patient's physical exam on ward rounds in an accurate, organized and thoughtful manner.
Critically analyse information and interpret test results relevant to (rotation)	Medical Expert		9. Critically analyse information and interpret test results relevant to Paediatric patients.
Critically analyse information and interpret test results relevant to (rotation)	Medical Expert		10. Critically analyse information and interpret test results relevant to Neonatal patients.
Demonstrates proficiency in Problem Formulation Judgment & Clinical Decision-Making	Medical Expert	2. Narrow	11. Generate a meaningful differential diagnosis.
Demonstrates proficiency in Problem Formulation Judgment & Clinical Decision-Making	Medical Expert	2. Narrow	12. Narrow differential diagnosis in regards to current patient.
Demonstrates proficiency in Problem Formulation Judgment & Clinical Decision-Making	Medical Expert	3. Analyse	13. Analyse differential (discuss what is more or less likely).
Integrate prior knowledge with new information.	Medical Expert		14. Integrate prior knowledge with new information.
Demonstrates proficiency in Problem Formulation Judgment & Clinical Decision-Making	Medical Expert	5. Plan	15. Competently devise a management plan for your patient (that does not require much addendum from consulting physician).
Provide clear and thorough explanations to patients/families.	Communicator		16. Provide clear and thorough explanations to patients/families.
Consults and Delegates Appropriately	Collaborator	4. Probes	17. Ask questions or guidance from the consulting physician.
Seek help when necessary.	Professional	4. Probes	18. Seek help when necessary.
Identifies Personal Knowledge Gaps	Scholar	6. Select	19. Choose a case-related topic for further learning.
Develops Effective Learning Strategies	Scholar		20. Utilize available resources to find information about a case-related topic.
Demonstrates Curiosity & Motivation to Learn	Scholar		21. Perform self-directed learning, including curiosity and motivation to learn.

B.11. PERCEIVED SELF EFFICACY SURVEY – PHASE 1, ORIGINAL (BACK, CH. 4) (APPENDIX E.7) (APPENDIX E.11)

Perceived Self-Efficacy Survey

This questionnaire is designed to help us get a better understanding of the kinds of things that are difficult for learners in relation to patient care.

Your answers will be kept ***strictly confidential*** and will not be identified by name.

Please rate how certain you are that you can do each of the things described below by writing the appropriate number.

Rate your degree of confidence by recording a number 0 to 100 using the scale given below:

0	10	20	30	40	50	60	70	80	90	100
Cannot do at all can do				Moderately can do					Highly certain	

Please circle one:

Are you a 'medical student' or 'paediatric resident'?

Question	Confidence
1. Elicit accurate, organized and appropriate focused histories for Paediatric patients.	
2. Elicit accurate, organized and appropriate focused histories for Neonatal patients.	
3. Conduct accurate, sensitive and organized physical examinations for Paediatric patients.	
4. Conduct accurate, sensitive and organized physical examinations for Neonatal patients.	
5. Accurately assess the developmental age of a child based on history and physical exam.	
6. Accurately assess the growth of a child given weight, height, and head circumference.	
7. Summarize and present the pertinent information obtained from the patient's history on ward rounds in an accurate, organized and thoughtful manner.	
8. Summarize and present the pertinent information obtained from the patient's physical exam on ward rounds in an accurate, organized and thoughtful manner.	
9. Critically analyse information and interpret test results relevant to Paediatric patients.	

10. Critically analyse information and interpret test results relevant to Neonatal patients.		
11. Generate a meaningful differential diagnosis.		
12. Narrow differential diagnosis in regards to current patient.		
13. Analyse differential (discuss what is more or less likely).		
14. Integrate prior knowledge with new information.		
15. Competently devise a management plan for my patient (that does not require much addendum from consulting physician).		
16. Provide clear and thorough explanations to patients/families.		
17. Ask questions or guidance from the consulting physician.		
18. Seek help when necessary.		
19. Choose a case-related topic for further learning.		
20. Utilize available resources to find information about a case-related topic.		
21. Perform self-directed learning, including curiosity and motivation to learn.		

B.12 Work-flow on ward rounds – Data collection tool, PMW/PHO (back, Ch. 5)

PMW/PHO

Date _____

Team _____

Was your team today, *please circle one*: Admitting Post-intake Neither

Time Rounds Started _____

Time Rounds Ended _____

Number of patients seen _____

Number of team members:

MBBS3	MBBS5	Intern	MO/Resident	Chief

Reason and number of times rounds was interrupted and/or a team member was pulled away:

Nurse	Phone call	Bench	Pt Emergency	Other*

*Specify 'Other' Reason(s):

_____

_____

_____

B.13 Work-flow on ward rounds – Data collection tool, NNU (back Ch.5)

NNU

Date _____

Team _____

Time Rounds Started _____

Time Rounds Ended _____

Number of patients seen _____

Number of team members:

MBBS3	MBBS5	Intern	MO/Resident	Chief

Reason and number of times rounds was interrupted and/or a team member was pulled away:

Nurse	Phone call	Covering L&D/T	Pt Emergency	Other*

*Specify 'Other' Reason(s):

_____

_____

_____

B.14 Resident perceived self-efficacy leadership survey (back Ch.5) (Appendix E.12)

Weekly: Resident Perceived Self-Efficacy Leadership

*Please answer the following based on your behavior **over the past week.***

1) I effectively **manage a team** so that **pre-rounds** are conducted in an organized and efficient manner.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
○	○	○	○	○	○	○

2) I effectively **supervise a team** so that all patients on the team are known to me and I am ultimately responsible for their care.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
○	○	○	○	○	○	○

3) I effectively **delegate tasks** so that **ward work** is conducted in an organized and efficient manner.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
○	○	○	○	○	○	○

4) I effectively **prioritize and organize** ward work so that patient care is effective and efficient.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
○	○	○	○	○	○	○

5) Compared with other residents, I am a good team manager.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

6) Compared with other residents, I am a good team supervisor.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

7) Compared with other residents, I am good at delegating tasks.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

8) Compared with other residents, I am a good at prioritizing and organizing.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

9) I get easily overwhelmed and am unsure where to prioritize ward work and patient care.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

10) I worry a great deal about being a good resident team supervisor.

Not like	Mostly not	Somewhat	Mostly	Very much

me at all	like me	like me	like me	like me
○	○	○	○	○

B.15 Faculty perspective of resident leadership skills survey (back Ch. 5) (Appendix E.13)

Weekly: Faculty Perspective of Resident Leadership Skills

Please answer the following based on your observations of the resident's behavior ***over the past week.***

1) The resident effectively **managed the team** so that **rounds** were conducted in an organized and efficient manner.

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

2) The resident effectively **supervised the team** so that all patients on the team were known to him/her and not just by individuals on the team.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
○	○	○	○	○	○	○

3) The resident effectively **delegated tasks** so that **ward work** was conducted in an organized and efficient manner.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
○	○	○	○	○	○	○

4) The resident effectively **prioritized and organized** ward work so that patient care was effective and efficient.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
○	○	○	○	○	○	○

B.16 Resident perceived self-efficacy of patient care at PMH (back Ch.5) (Appendix E.14)

Weekly: Resident Perceived Self-Efficacy of patient care at PMH

*Please answer the following based on your behavior **over the past week.***

1) At Princess Marina Hospital, I am certain that I can make the 'Plan' written in the chart happen ***exactly as written*** for all of my patients by the end of the working day.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
○	○	○	○	○	○	○

2) If a chest x-ray is ordered for my patient, I am sure that I can get a chest x-ray for my patient by the end of my shift.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
○	○	○	○	○	○	○

3) If packed red blood cells are ordered for my patient, I am certain that my patient will receive his/her transfusion by the end of my shift.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
○	○	○	○	○	○	○

4) If a certain medication for my patient is ordered, I am certain that my patient will receive it as indicated on the drug sheet.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
○	○	○	○	○	○	○

5) Circumstances at Princes Marina Hospital influence my ability to complete ward work as discussed on ward rounds.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
○	○	○	○	○	○	○

B.17 EDUCATIONAL CLIMATE INVENTORY – PMW – MBBS 3/5 (BACK CH.5) (APPENDIX E.15)(BACK CH.7)

Educational Climate Inventory
Paediatric Medical Ward – Students (MBBS 3/5)

Please answer the following questions in relation to your current or most recent Paediatric rotation in the **Paediatric Medical Ward.** Your answers will be kept ***strictly confidential*** and will ***not*** be identified by name.

Please rate your level of agreement with the statement below.

Question:	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
1. In the **Paediatric Medical Ward**, we focus on a sense of discovery and the excitement of inquiry.				
2. I often get valuable and supportive advice from faculty on how to improve.				
3. Most faculty here are deeply interested in the welfare of the students.				
4. When you make an error here, it is seen as an opportunity for learning and growth.				
5. The faculty care about how I think, not simply about whether I get the right answer.				
6. Students here are encouraged to embrace uncertainty rather than be afraid of it.				
7. There is a great deal of trust and respect between students and faculty here.				
8. Faculty and students here see themselves as partners in learning.				
9. Faculty here are more interested in building up students' confidence rather than tearing them down.				
10. The faculty here react well when students question or challenge them.				
11. Around here you have to act confidently even if you have little idea what you are doing.				
12. Faculty tell us they are concerned with our welfare, but then put us under great stress.				
13. When students are having difficulties here, it is best if they hide these from anyone else.				
14. Most of what we do here is focused on the passive transfer of knowledge, (i.e. we are expected to just listen and absorb knowledge, not interactive learning).				
15. Education here is all about memorizing as much content as you can.				
16. The faculty tell us that they are interested in our thinking, but their actions on rounds suggest otherwise.				
17. The goal of most students here is to figure out what we will be tested on and to study that material.				

B.18 Educational Climate Inventory – NNU – MBBS 3/5 (back Ch.5)

Educational Climate Inventory
Neonatal Unit – Students (MBBS 3/5)

Please answer the following questions in relation to your current or most recent Paediatric rotation in the **Neonatal Unit.** Your answers will be kept ***strictly confidential*** and will ***not*** be identified by name.

Please rate your level of agreement with the statement below.

Question:	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
1. In the **Neonatal Unit**, we focus on a sense of discovery and the excitement of inquiry.				
2. I often get valuable and supportive advice from faculty on how to improve.				
3. Most faculty here are deeply interested in the welfare of the students.				
4. When you make an error here, it is seen as an opportunity for learning and growth.				
5. The faculty care about how I think, not simply about whether I get the right answer.				
6. Students here are encouraged to embrace uncertainty rather than be afraid of it.				
7. There is a great deal of trust and respect between students and faculty here.				
8. Faculty and students here see themselves as partners in learning.				
9. Faculty here are more interested in building up students' confidence rather than tearing them down.				
10. The faculty here react well when students question or challenge them.				
11. Around here you have to act confidently even if you have little idea what you are doing.				
12. Faculty tell us they are concerned with our welfare, but then put us under great stress.				
13. When students are having difficulties here, it is best if they hide these from anyone else.				
14. Most of what we do here is focused on the passive transfer of knowledge, (i.e. we are expected to just listen and absorb knowledge, not interactive learning).				
15. Education here is all about memorizing as much content as you can.				
16. The faculty tell us that they are interested in our thinking, but their actions on rounds suggest otherwise.				
17. The goal of most students here is to figure out what we will be tested on and to study that material.				

B.19 EDUCATIONAL CLIMATE INVENTORY – PHO – MBBS 5 (BACK CH.5)

Educational Climate Inventory
Paediatric Haematology-Oncology – MBBS 5

Please answer the following questions in relation to your most recent Paediatric rotation in **Paediatric Haematology-Oncology.** Your answers will be kept ***strictly confidential*** and will ***not*** be identified by name.

Please rate your level of agreement with the statement below.

Question:	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
1. In **Paediatric Haematology-Oncology**, we focus on a sense of discovery and the excitement of inquiry.				
2. I often get valuable and supportive advice from faculty on how to improve.				
3. Most faculty here are deeply interested in the welfare of the students.				
4. When you make an error here, it is seen as an opportunity for learning and growth.				
5. The faculty care about how I think, not simply about whether I get the right answer.				
6. Students here are encouraged to embrace uncertainty rather than be afraid of it.				
7. There is a great deal of trust and respect between students and faculty here.				
8. Faculty and students here see themselves as partners in learning.				
9. Faculty here are more interested in building up students' confidence rather than tearing them down.				
10. The faculty here react well when students question or challenge them.				
11. Around here you have to act confidently even if you have little idea what you are doing.				
12. Faculty tell us they are concerned with our welfare, but then put us under great stress.				
13. When students are having difficulties here, it is best if they hide these from anyone else.				
14. Most of what we do here is focused on the passive transfer of knowledge, (i.e. we are expected to just listen and absorb knowledge, not interactive learning).				

15. Education here is all about memorizing as much content as you can.				
16. The faculty tell us that they are interested in our thinking, but their actions on rounds suggest otherwise.				
17. The goal of most students here is to figure out what we will be tested on and to study that material.				

B.20 Educational Climate Inventory – PHO – Resident (back Ch. 5)

Educational Climate Inventory
Paediatric Haematology-Oncology - Residents

Please answer the following questions in relation to your most recent rotation on **Paediatric Haematology-Oncology.** Your answers will be kept ***strictly confidential*** and will ***not*** be identified by name.

Please rate your level of agreement with the statement below.

Question:	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
1. On the Paediatric Haematology-Oncology rotation, we focus on a sense of discovery and the excitement of inquiry.				
2. I often get valuable and supportive advice from faculty on how to improve.				
3. Most faculty here are deeply interested in the welfare of the residents.				
4. When you make an error here, it is seen as an opportunity for learning and growth.				
5. The faculty care about how I think, not simply about whether I get the right answer.				
6. Residents here are encouraged to embrace uncertainty rather than be afraid of it.				
7. There is a great deal of trust and respect between residents and faculty here.				
8. Faculty and residents here see themselves as partners in learning.				
9. Faculty here are more interested in building up residents' confidence rather than tearing them down.				
10. The faculty here react well when residents question or challenge them.				
11. Around here you have to act confidently even if you have little idea what you are doing.				
12. Faculty tell us they are concerned with our welfare, but then put us under great stress.				
13. When residents are having difficulties here, it is best if they hide these from anyone else.				
14. Most of what we do here is focused on the passive transfer of knowledge, (i.e. we are expected to just listen and absorb knowledge, not interactive learning).				

15. Education here is all about memorizing as much content as you can.				
16. The faculty tell us that they are interested in our thinking, but their actions on rounds suggest otherwise.				
17. The goal of most residents here is to figure out what we will be tested on and to study that material.				

B.21 Educational Climate Inventory – Dept of Peds – Resident (back Ch.5)

Educational Climate Inventory
Department of Paediatrics - Residents

Please answer the following questions in relation to your experiences working in the **Department of Paediatrics**. Your answers will be kept ***strictly confidential*** and will ***not*** be identified by name.

Please rate your level of agreement with the statement below.

Question:	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
1. In the **Department of Paediatrics**, we focus on a sense of discovery and the excitement of inquiry.				
2. I often get valuable and supportive advice from faculty on how to improve.				
3. Most faculty here are deeply interested in the welfare of the residents.				
4. When you make an error here, it is seen as an opportunity for learning and growth.				
5. The faculty care about how I think, not simply about whether I get the right answer.				
6. Residents here are encouraged to embrace uncertainty rather than be afraid of it.				
7. There is a great deal of trust and respect between residents and faculty here.				
8. Faculty and residents here see themselves as partners in learning.				
9. Faculty here are more interested in building up residents' confidence rather than tearing them down.				
10. The faculty here react well when residents question or challenge them.				
11. Around here you have to act confidently even if you have little idea what you are doing.				
12. Faculty tell us they are concerned with our welfare, but then put us under great stress.				
13. When residents are having difficulties here, it is best if they hide these from anyone else.				
14. Most of what we do here is focused on the passive transfer of knowledge, (i.e. we are expected to just listen and absorb knowledge, not interactive learning).				

15. Education here is all about memorizing as much content as you can.				
16. The faculty tell us that they are interested in our thinking, but their actions on rounds suggest otherwise.				
17. The goal of most residents here is to figure out what we will be tested on and to study that material.				

B.22 Observation & Learning Tool for Clinical Supervision – Self (back Ch.5) (Appendix E.16)

Please circle one: **Chief Resident or Faculty.** *Please complete the form below by thinking back to your last week on service and indicate which statement most resembles your average encounter with a medical trainee. Only circle* ***one*** *response per line.*			
Step 1: Organizes the supervision			
1. Welcomes the learner	☹ I do not put the learner at ease and concentrate on the clinical problem	☺ I welcome the learner and express my availability	☺☺ I assure adequate time and space or I suggest arrangements to put the learner at ease
2. Drives the supervision according to the learner's needs	☹ I listen to the case presentation without asking the learner's own question or needs to drive the supervision	☺ I let the learner express the problem that prevents him/her to solve the case (before or just after the case presentation)	☺☺ I clarify or reflect what prevents the learner to solve the case (learning needs) (before or just after the case presentation) or I discuss the case aiming explicitly at the learner's needs
Step 2: helps the learner to learn from the case			
3. Discusses the case and explores . . .			
a. clinical reasoning	☹ a. I interrupt the learner so as to get more information following his/her own medical reasoning or I think aloud *without* including the learner	☺ a. I ask the learner what hypotheses has driven his/her reasoning, or I speak aloud involving the learner	☺☺ a. I encourage the learner to argue or I complete the hypotheses of his/her medical reasoning
b. the underlying medical knowledge	☹ b. I question/explain theoretical notions without making a clear link with the case or I do not discuss any related knowledge	☺ b. I teach the knowledge related to the missing notions or wrong interpretations of the learner	☺☺ b. I stimulate the learner to remember the relevant knowledge, or I help to find relevant missing knowledge (give tools/references)

4. Teaches or corrects . . .			
a. the history taking or clinical exam	☹ a. I tell what the learner should do without explanation or modeling; or I do not teach the history taking or clinical exam	☺ a. I teach history taking or clinical examination by explanation or modeling	☺☺ a. I let the learner demonstrate a skill or history taking or clinical examination
b. interpersonal/ communicational skills	☹ b. I tell what the learner should do without explanation or modeling or I do not teach interpersonal skills	☺ b. I teach relevant interpersonal/ communication skills by explanation or modeling	☺☺ b. I let the learner demonstrate an interpersonal/ communication skill
5. Discusses the plan . . .			
a. developing an action plan	☹ a. after a diagnosis or definition of the problem, I tell the learner what to do	☺ a. I ask the learner to express an action plan (investigations, treatment and follow up) or I express an action plan involving the learner	☺☺ a. I ask the learner to argue and discuss his/her own action plan
b. verifying the strategies of application	☹ c. I do not check the learner's strategies of application, or I tell the action plan to the patient without discussing it with the learner	☺ c. I ask the learner if he/she feels confident to apply the action plan, or I offer to help for the application of the action plan	☺☺ c. I check how the learner will apply the action plan
6. Addressing own limits of knowledge			
	☹ I express no doubt about my medical knowledge	☺ I express the limits of my own knowledge or my doubts	☺☺ I express the doubts or limits of my own knowledge and define with the learner a way to find the needed information to overcome the doubts

Step 3: Ends the supervision			
7. States . . .			
a. strengths: what is mastered	☹ a. I do not value or reflect on learner's strengths that helped him/her to solve the problem	☺ a. I stress the learner's strengths that helped him/her to solve the problem and value them	☺☺ a. I encourage the learner to reflect on his/her own strengths before valuing them
b. new learning	☹ b. I do not speak about what should be remembered	☺ b. I tell the learner what he/she should remember	☺☺ b. I ask the learner what he/she will remember and add some suggestions (or I ask for some transfer to other case) or I ask the learner for some general principles/ rules that can be deducted from present case
c. what has to be learned	☹ c. I do not speak about what should be learned on behalf of the discussion	☺ c. I suggest some ideas to enhance the learner's ongoing learning	☺☺ c. I define with the learner a learning plan (actions, literature, timing, evaluation)
8. Evaluation of supervision process			
	☹ I do not speak about my supervision process	☺ I check if my supervision has answered learner's learning needs (content)	☺☺ I check if my supervision has answered the learning needs and if my supervision process is adequate or I ask for suggestions of improvement in my supervision process

Comments:

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B.23 OBSERVATION & LEARNING TOOL FOR CLINICAL SUPERVISION – PEER (BACK CH.5)

Supervisor: Chief or Faculty	**Level X (weak):** makes the learning unpredictable	**Level Y (good):** has good teaching skills to enhance the learning	**Level Z (very good):** has excellent teaching skills to enhance learning
Step 1: Organizes the supervision			
1. Welcomes the learner	☹ does not put the learner at ease and concentrates on the clinical problem	☺ welcomes the learner and expresses his availability	☺☺ assures adequate time and space or suggests arrangements to put at ease
2. Drives the supervision according to the learner's needs	☹ listens to the case presentation without asking the learner's own question or needs to drive the supervision	☺ lets the learner express the problem that prevents him/her to solve the case (before or just after the case presentation)	☺☺ clarifies or reflects what prevents the learner to solve the case (learning needs) (before or just after the case presentation) or discusses the case aiming explicitly at the learner's needs
Step 2: helps the learner to learn from the case			
3. Discusses the case and explores . . .			
a. clinical reasoning	☹ a. interrupts the learner so as to get more information following his/her own medical reasoning or thinks aloud *without* including the learner	☺ a. asks the learner what hypotheses has driven his/her reasoning, or speaks aloud involving the learner	☺☺ a. encourages the learner to argue or complete the hypotheses of his/her medical reasoning
b. the underlying medical knowledge	☹ b. questions/ explains theoretical notions without clear link with the case or does not discuss any related knowledge	☺ b. teaches the knowledge related to the missing notions or wrong interpretations of the learner	☺☺ b. stimulates the learner to remember the relevant knowledge, or helps to find relevant missing knowledge (gives tools/references)

4. Teaches or corrects . . .			
a. the history taking or clinical exam	☹ a. tells what the learner should do without explanation or modeling; or does not teach the history taking or clinical exam	☺ a. teaches history taking or clinical examination by explanation or modeling	☺☺ a. lets the learner demonstrate a skill or history taking or clinical examination
b. interpersonal/ communicational skills	☹ b. tells what the learner should do without explanation or modeling or does not teach interpersonal skills	☺ b. teaches relevant interpersonal/ communication skills by explanation or modeling	☺☺ b. lets the learner demonstrate an interpersonal/ communication skill
5. Discusses the plan . . .			
a. developing an action plan	☹ a. after a diagnosis or definition of the problem, tells the learner what to do	☺ a. asks the learner to express an action plan (investigations, treatment and follow up) or expresses an action plan involving the learner	☺☺ a. asks the learner to argue and discuss own action plan
b. verifying the strategies of application	☹ b. does not check the learner's strategies of application, or tells the action plan to the patient without discussing it with the learner	☺ b. asks the learner if he/she feels confident to apply the action plan, or offers to help for the application of the action plan	☺☺ b. checks how the learner will apply the action plan
6. Addressing own limits of knowledge			
	☹ expresses no doubt about the medical knowledge	☺ expresses the limits of his/her own knowledge or his/her doubts	☺☺ expresses the doubts or limits of his/her own knowledge and defines with the learner a way to find the needed information to overcome the doubts

Step 3: Ends the supervision			
7. States . . .			
a. strengths: what is mastered	☹ a. does not value or reflect on learner's strengths that helped him/her to solve the problem	☺ a. stresses the learner's strengths that helped him/her to solve the problem and values them	☺☺ a. encourages the learner to reflect on own strengths before valuing them
b. new learning	☹ b. does not speak about what should be remembered	☺ b. tells the learner what he/she should remember	☺☺ b. asks the learner what he/she will remember and can add some suggestions (or asks for some transfer to other case) or asks the learner for some general principles/ rules that can be deducted from present case
c. what has to be learned	☹ c. does not speak about what should be learned on behalf of the discussion	☺ c. suggests some ideas to enhance his/her ongoing learning	☺☺ c. defines with the learner a learning plan (actions, literature, timing, evaluation)
8. Evaluation of supervision process			
	☹ does not speak about the supervision process	☺ checks if supervision has answered his/her learning needs (content)	☺☺ checks if supervision has answered the learning needs and if supervision process is adequate or asks for suggestions of improvement in supervision process

Comments: (any comments about this observation tool, about the teaching session, the learner(s), etc.)

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B.24 Elements for Effective Learning – Dept of Peds – MBBS 3/5 (back Ch.5) (Appendix E.17)

Elements for Effective Learning – Department of Paediatrics – Students

Circle One: **Which rotation are you on this week? NNU PMW PHO**

Please answer the following questions in relation to your experience on ward rounds today. Your answers will be kept ***strictly confidential*** *and will* ***not*** *be identified by name.*

1) During ward rounds today, were the learning goals and expectations for you laid out clearly?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

2) Did you feel confused about what you were supposed to do or say on ward rounds today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

3) Did you understand your responsibilities on ward rounds today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

4) During ward rounds today, did the consultant take the time to assess for your understanding?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

5) During ward rounds today, did you feel like the consultant just assumed you knew stuff you didn't know?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

6) During ward rounds today, did the consultant expect you to answer questions you didn't know the answers to?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

7) During ward rounds today, were you mainly just told what to do?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

8) During ward rounds today, did you feel like you were able to understand the thought process of the consultant when he/she discussed the case or management plan?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

9) During ward rounds today, did you feel the consultant helped you identify your knowledge gaps?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

10) During ward rounds today, when you asked a question, did you feel that the consultant adequately answered it?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

March 2023

11) During ward rounds today, did you feel the consultant guided you through the learning point so that you could understand?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

12) During ward rounds today, when discussing a case, did the discussion feel like a 'drill session'?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

13) Were you given an opportunity on rounds today to demonstrate your history taking or clinical examination skills?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

14) Were you given an opportunity on rounds today to demonstrate your patient/family communication skills?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

15) During ward rounds today, did the consultant encourage you to come up with your own patient plan?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

16) During ward rounds today, did the consultant express his/her uncertainty about the case?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

17) After ward rounds, did the consultant ask you for feedback for how he/she can improve the teaching on rounds?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

18) During ward rounds today, did you feel stimulated by the consultant to read about the case(s) you presented?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

B.25 Elements for Effective Learning – Dept of Peds – Resident (back. Ch.5)

Elements for Effective Learning – Department of Paediatrics – Resident

Circle One: **Which rotation are you on this week? NNU PMW PHO**

*Please answer the following questions in relation to your experience on ward rounds today. Your answers will be kept **strictly confidential** and will **not** be identified by name.*

1) During ward rounds today, were the learning goals and expectations for you laid out clearly?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

2) Did you feel confused about what you were supposed to do or say on ward rounds today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

3) Did you understand your responsibilities on ward rounds today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

4) During ward rounds today, did the consultant take the time to assess for your understanding?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

5) During ward rounds today, did you feel like the consultant just assumed you knew stuff you didn't know?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

6) During ward rounds today, did the consultant expect you to answer questions you didn't know the answers to?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

7) During ward rounds today, were you mainly just told what to do?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

8) During ward rounds today, did you feel like you were able to understand the thought process of the consultant when he/she discussed the case or management plan?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

9) During ward rounds today, did you feel the consultant helped you identify your knowledge gaps?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

10) During ward rounds today, when you asked a question, did you feel that the consultant adequately answered it?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

11) During ward rounds today, did you feel the consultant guided you through the learning point so that you could understand?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

12) During ward rounds today, when discussing a case, did the discussion feel like a 'drill session'?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

13) Were you given an opportunity on rounds today to demonstrate your history taking or clinical examination skills?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

14) Were you given an opportunity on rounds today to demonstrate your patient/family communication skills?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

15) During ward rounds today, did the consultant encourage you to come up with your own patient plan?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

16) During ward rounds today, did the consultant express his/her uncertainty about the case?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

17) After ward rounds, did the consultant ask you for feedback for how he/she can improve the teaching on rounds?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

18) During ward rounds today, did you feel stimulated by the consultant to read about the case(s) you presented?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

B.26 Motivated Strategies for Learning Questionnaire – Dept of Peds – MBBS 3 (back Ch.5) (Appendix E.18) (back Ch.7)

Motivated Strategies for Learning Questionnaire
Department of Paediatrics – Student – MBBS 3

Please rate the following items based on your behavior on this rotation. Your rating should be on a 7-point scale, where **1 = not at all true of me** to **7 = very true of me.**

Question	Rating (1-7)
1. I prefer paediatric cases that are challenging so I can learn new things.	
2. Compared with other students on ward rounds, I expect to do well.	
3. I am so nervous during ward rounds that I cannot remember facts I have learned.	
4. It is important for me to learn what is being taught on ward rounds.	
5. I like what I am learning on ward rounds.	
6. I'm certain I can understand the ideas taught on ward rounds.	
7. On ward rounds, I think I will be able to use what I learn from one patient to other patients.	
8. I expect to do very well on ward rounds.	
9. Compared with others on ward rounds, I think I'm a good student.	
10. I often chose patients I will learn something from even if they require more work.	
11. I am sure I can do an excellent job of presenting my patient when on ward rounds.	
12. I am sure I can do an excellent job of generating an assessment and plan for my patient when on ward rounds.	
13. I have an uneasy, upset feeling when I am on ward rounds.	
14. Even when I do poorly on ward rounds, I try to learn from my mistakes.	
15. I think what I am learning on ward rounds is useful for me to know.	
16. I think that what we are learning on ward rounds is interesting.	
17. Compared with other students on ward rounds I think I know a great deal about paediatrics.	
18. Compared with other students on ward rounds I think I know a great deal about neonatology.	
19. I worry a great deal about presenting on ward rounds.	
20. Understanding my patient's condition and management is important to me.	
21. When I present on ward rounds, I think about how poorly I am doing.	
22. When I prepare to present a patient on ward rounds, I try to put together information I have learned from previous patients and my text books.	

23. When I prepare for ward rounds, I try to remember what the consultant said on rounds so I can answer his/her questions correctly.	
24. It is hard for me to decide what the main ideas being taught are when I am on ward rounds.	
25. When the patient case is hard, I either give up or study only the easy parts.	
26. When I prepare for ward rounds, I put important ideas into my own words.	
27. I always try to understand what the consultant is saying on ward rounds even if it doesn't make sense.	
28. When I prepare for ward rounds, I try to remember as many facts as I can.	
29. I continue to read up on patients and their conditions even when I don't have to.	
30. Even when the patient cases are dull and uninteresting, I keep working until I understand.	
31. I use what I have learned from previous patients and the textbook to care for new patients.	
32. I often find that I have been on ward rounds but don't know what has been discussed.	
33. I find that when the consultant is talking on ward rounds I think of other things and don't really listen to what is being said.	
34. When I am taking care of a patient, I try to make everything fit together.	
35. When I'm reading about a patient I stop once in a while and go over what I have read.	
36. When taking care of a patient I try to connect the things I am seeing with what I already know.	

B.27 Motivated Strategies for Learning Questionnaire – Dept of Peds – MBBS 5 (back Ch.5)

Motivated Strategies for Learning Questionnaire
Department of Paediatrics – Student – MBBS 5

Please rate the following items based on your behavior on this rotation. Your rating should be on a 7-point scale, where **1 = not at all true of me** to **7 = very true of me.**

Question	Rating (1-7)
1. I prefer paediatric cases that are challenging so I can learn new things.	
2. Compared with other students on ward rounds, I expect to do well.	
3. I am so nervous during ward rounds that I cannot remember facts I have learned.	
4. It is important for me to learn what is being taught on ward rounds.	
5. I like what I am learning on ward rounds.	
6. I'm certain I can understand the ideas taught on ward rounds.	
7. On ward rounds, I think I will be able to use what I learn from one patient to other patients.	
8. I expect to do very well on ward rounds.	
9. Compared with others on ward rounds, I think I'm a good student.	
10. I often chose patients I will learn something from even if they require more work.	
11. I am sure I can do an excellent job of presenting my patient when on ward rounds.	
12. I am sure I can do an excellent job of generating an assessment and plan for my patient when on ward rounds.	
13. I have an uneasy, upset feeling when I am on ward rounds.	
14. Even when I do poorly on ward rounds, I try to learn from my mistakes.	
15. I think what I am learning on ward rounds is useful for me to know.	
16. I think that what we are learning on ward rounds is interesting.	
17. Compared with other students on ward rounds I think I know a great deal about paediatrics.	
18. Compared with other students on ward rounds I think I know a great deal about neonatology.	
19. I worry a great deal about presenting on ward rounds.	
20. Understanding my patient's condition and management is important to me.	
21. When I present on ward rounds, I think about how poorly I am doing.	

22. When I prepare to present a patient on ward rounds, I try to put together information I have learned from previous patients and my text books.	
23. When I prepare for ward rounds, I try to remember what the consultant said on rounds so I can answer his/her questions correctly.	
24. It is hard for me to decide what the main ideas being taught are when I am on ward rounds.	
25. When the patient case is hard, I either give up or study only the easy parts.	
26. When I prepare for ward rounds, I put important ideas into my own words.	
27. I always try to understand what the consultant is saying on ward rounds even if it doesn't make sense.	
28. When I prepare for ward rounds, I try to remember as many facts as I can.	
29. I continue to read up on patients and their conditions even when I don't have to.	
30. Even when the patient cases are dull and uninteresting, I keep working until I understand.	
31. I use what I have learned from previous patients and the textbook to care for new patients.	
32. I often find that I have been on ward rounds but don't know what has been discussed.	
33. I find that when the consultant is talking on ward rounds I think of other things and don't really listen to what is being said.	
34. When I am taking care of a patient, I try to make everything fit together.	
35. When I'm reading about a patient I stop once in a while and go over what I have read.	
36. When taking care of a patient I try to connect the things I am seeing with what I already know.	

B.28 Motivated Strategies for Learning Questionnaire – Dept of Peds – Resident (back Ch.5)

Motivated Strategies for Learning Questionnaire
Department of Paediatrics - Resident

Please rate the following items based on your behavior during your paediatric residency training. Your rating should be on a 7-point scale, where **1 = not at all true of me** to **7 = very true of me.**

Question	Rating (1-7)
1. I prefer paediatric cases that are challenging so I can learn new things.	
2. Compared with other residents on ward rounds, I expect to do well.	
3. I am so nervous during ward rounds that I cannot remember facts I have learned.	
4. It is important for me to learn what is being taught on ward rounds.	
5. I like what I am learning on ward rounds.	
6. I'm certain I can understand the ideas taught on ward rounds.	
7. On ward rounds, I think I will be able to use what I learn from one patient to other patients.	
8. I expect to do very well on ward rounds.	
9. Compared with others on ward rounds, I think I'm a good resident.	
10. I often chose patients I will learn something from even if they require more work.	
11. I am sure I can do an excellent job of presenting my patient when on ward rounds.	
12. I am sure I can do an excellent job of generating an assessment and plan for my patient when on ward rounds.	
13. I have an uneasy, upset feeling when I am on ward rounds.	
14. Even when I do poorly on ward rounds, I try to learn from my mistakes.	
15. I think what I am learning on ward rounds is useful for me to know.	
16. I think that what we are learning on ward rounds is interesting.	
17. Compared with other residents on ward rounds I think I know a great deal about paediatrics.	
18. Compared with other residents on ward rounds I think I know a great deal about neonatology.	
19. I worry a great deal about presenting on ward rounds.	
20. Understanding my patient's condition and management is important to me.	
21. When I present on ward rounds, I think about how poorly I am doing.	

22. When I prepare to present a patient on ward rounds, I try to put together information I've learned from previous patients and my text books.	
23. When I prepare for ward rounds, I try to remember what the consultant said on rounds so I can answer his/her questions correctly.	
24. It is hard for me to decide what the main ideas being taught are when I am on ward rounds.	
25. When the patient case is hard, I either give up or study only the easy parts.	
26. When I prepare for ward rounds, I put important ideas into my own words.	
27. I always try to understand what the consultant is saying on ward rounds even if it doesn't make sense.	
28. When I prepare for ward rounds, I try to remember as many facts as I can.	
29. I continue to read up on patients and their conditions even when I don't have to.	
30. Even when the patient cases are dull and uninteresting, I keep working until I understand.	
31. I use what I have learned from previous patients and the textbook to care for new patients.	
32. I often find that I have been on ward rounds but don't know what has been discussed.	
33. I find that when the consultant is talking on ward rounds I think of other things and don't really listen to what is being said.	
34. When I am taking care of a patient, I try to make everything fit together.	
35. When I'm reading about a patient I stop once in a while and go over what I have read.	
36. When taking care of a patient I try to connect the things I am seeing with what I already know.	

B.29 Daily Rounds: Perceived Self-efficacy – PMW – MBBS 3 (back Ch.5) (Appendix E.19-E.21)

Daily Rounds: Perceived Self-Efficacy – PMW – MBBS 3

*After presenting your patient on **paediatric ward rounds today . . .***

1) How **self-confident** are you about obtaining an accurate and organized **history** for a paediatric patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

2) How **self-confident** are you about obtaining an accurate and organized **physical exam** for a paediatric patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

3) How **self-confident** are you to summarize the pertinent information from a paediatric patient's **history** on ward rounds in an accurate and organized manner?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

4) How **self-confident** are you to summarize the pertinent information from a paediatric patient's **physical exam** on ward rounds in an accurate and organized manner?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

*Please rate the following items based on your behavior on **paediatric** ward rounds **today.***

5) Compared with other students on ward rounds I think I know a great deal about paediatrics.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

6) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
○	○	○	○	○

7) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

B.30 Daily Rounds: Perceived Self-efficacy – PMW – MBBS 5 (back Ch.5)

Daily Rounds: Perceived Self-Efficacy – PMW – MBBS 5

*After presenting your patient on **paediatric ward rounds today . . .***

1) How **self-confident** are you to generate and narrow a meaningful differential diagnosis for a paediatric patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

2) How **self-confident** are you to critically analyze information and interpret test results for a paediatric patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

3) How **self-confident** are you to competently devise a management plan for a paediatric patient that does not require much addendum from the consulting physician?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

*Please rate the following items based on your behavior on **paediatric** ward rounds **today.***

4) Compared with other students on ward rounds I think I know a great deal about paediatrics.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

5) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
○	○	○	○	○

6) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

B.31 Daily Rounds: Perceived Self-Efficacy – PMW – Resident (back Ch.5)

Daily Rounds: Perceived Self-Efficacy – PMW – Residents

*After presenting your patient on **paediatric ward rounds today . . .***

1) How **self-confident** are you to generate and narrow a meaningful differential diagnosis for a paediatric patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

2) How **self-confident** are you to critically analyze information and interpret test results for a paediatric patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

3) How **self-confident** are you to competently devise a management plan for a paediatric patient that does not require much addendum from the consulting physician?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

*Please rate the following items based on your behavior on **paediatric** ward rounds **today.***

4) Compared with other residents on ward rounds I think I know a great deal about paediatrics.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

5) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
○	○	○	○	○

6) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

B.32 Daily Rounds: Perceived Self-Efficacy – NNU – MBBS 3 (back Ch.5)

Daily Rounds: Perceived Self-Efficacy – NNU – MBBS 3

*After presenting your patient on **neonatal ward rounds today . . .***

1) How **self-confident** are you about obtaining an accurate and organized **history** for a neonatal patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

2) How **self-confident** are you about obtaining an accurate and organized **physical exam** for a neonatal patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

3) How **self-confident** are you to summarize the pertinent information from a neonatal patient's **history** on ward rounds in an accurate and organized manner?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

4) How **self-confident** are you to summarize the pertinent information from a neonatal patient's **physical exam** on ward rounds in an accurate and organized manner?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

*Please rate the following items based on your behavior on **neonatal** ward rounds **today.***

5) Compared with other students on ward rounds I think I know a great deal about neonatology.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

6) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
○	○	○	○	○

7) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

B.33 Daily Rounds: Perceived Self-Efficacy – NNU – MBBS 5 (back Ch.5)

Daily Rounds: Perceived Self-Efficacy – NNU – MBBS 5

*After presenting your patient on **neonatal ward rounds today . . .***

1) How **self-confident** are you to generate and narrow a meaningful differential diagnosis for a neonatal patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

2) How **self-confident** are you to critically analyze information and interpret test results for a neonatal patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

3) How **self-confident** are you to competently devise a management plan for a neonatal patient that does not require much addendum from the consulting physician?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

*Please rate the following items based on your behavior on **neonatal** ward rounds **today.***

4) Compared with other students on ward rounds I think I know a great deal about neonatology.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

5) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
○	○	○	○	○

6) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

B.34 Daily Rounds: Perceived Self-Efficacy – NNU – Resident (back Ch.5)

Daily Rounds: Perceived Self-Efficacy – NNU – Residents

*After presenting your patient on **neonatal ward rounds today . . .***

1) How **self-confident** are you to generate and narrow a meaningful differential diagnosis for a neonatal patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

2) How **self-confident** are you to critically analyze information and interpret test results for a neonatal patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

3) How **self-confident** are you to competently devise a management plan for a neonatal patient that does not require much addendum from the consulting physician?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

*Please rate the following items based on your behavior on **neonatal** ward rounds **today.***

4) Compared with other residents on ward rounds I think I know a great deal about neonatology.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

5) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
○	○	○	○	○

6) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

B.35 Daily Rounds: Perceived Self-Efficacy – PHO – MBBS 5 (back Ch.5)

Daily Rounds: Perceived Self-Efficacy – PHO – MBBS 5

*After presenting your patient on **paediatric haematology-oncology ward rounds today . . .***

1) How **self-confident** are you to generate and narrow a meaningful differential diagnosis for a paediatric haematology-oncology patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

2) How **self-confident** are you to critically analyze information and interpret test results for a paediatric haematology-oncology patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

3) How **self-confident** are you to competently devise a management plan for a paediatric haematology-oncology patient that does not require much addendum from the consulting physician?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

*Please rate the following items based on your behavior on **paediatric haematology-oncology** ward rounds **today.***

4) Compared with other students on ward rounds I think I know a great deal about paediatric haematology-oncology.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

5) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
○	○	○	○	○

6) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

B.36 Daily Rounds: Perceived Self-Efficacy – PHO – Resident (back Ch.5)

Daily Rounds: Perceived Self-Efficacy – PHO – Residents

*After presenting your patient on **paediatric haematology-oncology ward rounds today . . .***

1) How **self-confident** are you to generate and narrow a meaningful differential diagnosis for a paediatric haematology-oncology patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

2) How **self-confident** are you to critically analyze information and interpret test results for a paediatric haematology-oncology patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

3) How **self-confident** are you to competently devise a management plan for a paediatric haematology-oncology patient that does not require much addendum from the consulting physician?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
○	○	○	○	○

*Please rate the following items based on your behavior on **paediatric haematology-oncology** ward rounds **today.***

4) Compared with other residents on ward rounds I think I know a great deal about paediatric haematology-oncology.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

5) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
○	○	○	○	○

6) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

B.37 Daily Rounds: Communities of Practice – MBBS 3/5 (back Ch.5) (Appendix E.22)

Daily Rounds: Communities of Practice – Students (MBBS 3/5)

1) During ward rounds today, when you presented your patient, how much were you encouraged to discuss your differential diagnosis?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

2) During ward rounds today, when you presented your patient, how much were you stimulated to make comparisons about your patient's differential?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

3) During ward rounds today, when you presented your patient, how many questions were you asked?

None	A few	Some	Quite a few	A great amount
○	○	○	○	○

**If 'None', skip to Question 4*

(a) How many of these questions were only about facts?

None	A few	Some	Quite a few	A great amount
○	○	○	○	○

(b) How many of these questions asked about your thinking process?

None	A few	Some	Quite a few	A great amount
○	○	○	○	○

4) During ward rounds today, when you presented your patient, how much were you encouraged to ask the consultant questions?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

5) During ward rounds today, when you presented your patient, how much did the consultant encourage you to discuss your thought process about your management plan?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

6) During ward rounds today, when you presented your patient, how much was your role limited to reporting the patient case.

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

7) During ward rounds today, when the consultant created the addendum, how much you were involved in the new plan.

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

8) How often did you feel ignored on the ward round today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount

○	○	○	○	○

9) During ward rounds today, when you presented your patient, how much feedback did you receive from the consultant?

None	A few	Some	Quite a few	A great amount
○	○	○	○	○

If 'None', skip to question 10.

(a) How much were you encouraged to reflect on your own strengths and/or limitations before being given feedback?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

(b) How helpful did you find the feedback?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

(c) How much of the feedback you received relate to a specific behavior that you can change? (i.e. something you did or didn't do that you can adjust?)

None	A few	Some	Quite a few	A great amount
○	○	○	○	○

(d) Did the feedback you received make you feel embarrassed or demoralized?

None	A few	Some	Quite a few	A great amount
○	○	○	○	○

(e) Did the feedback you received make you feel encouraged to improve?

None	A few	Some	Quite a few	A great amount
○	○	○	○	○

10) During ward rounds today, when you presented your patient, how much did you get to *think* like a doctor?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

11) During ward rounds today, when you presented your patient, how much did you get to *act* like a doctor?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

12) During ward rounds today, when you presented your patient, how much did you get to *feel* like a doctor?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

13) At what level were you able to participate on rounds today? Please mark below.

I----------I

MBBS 3 **MBBS 5** **Intern**

B.38 Daily Rounds: Communities of Practice – Resident (back Ch.5)

Daily Rounds: Communities of Practice – Residents

1) During ward rounds today, when you presented your patient, how much were you encouraged to discuss your differential diagnosis?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

2) During ward rounds today, when you presented your patient, how much were you stimulated to make comparisons about your patient's differential?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

3) During ward rounds today, when you presented your patient, how many questions were you asked?

None	A few	Some	Quite a few	A great amount
○	○	○	○	○

**If 'None', skip to Question 4*

(a) How many of these questions were only about facts?

None	A few	Some	Quite a few	A great amount
○	○	○	○	○

(b) How many of these questions asked about your thinking process?

None	A few	Some	Quite a few	A great amount
○	○	○	○	○

4) During ward rounds today, when you presented your patient, how much were you encouraged to ask the consultant questions?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

5) During ward rounds today, when you presented your patient, how much did the consultant encourage you to discuss your thought process about your management plan?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

6) During ward rounds today, when you presented your patient, how much was your role limited to reporting the patient case.

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

7) During ward rounds today, when the consultant created the addendum, how much you were involved in the new plan.

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

8) How often did you feel ignored on the ward round today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount

○	○	○	○	○

9) During ward rounds today, when you presented your patient, how much feedback did you receive from the consultant?

None	A few	Some	Quite a few	A great amount
○	○	○	○	○

If 'None', skip to question 10.

(a) How much were you encouraged to reflect on your own strengths and/or limitations before being given feedback?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

(b) How helpful did you find the feedback?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

(c) How much of the feedback you received relate to a specific behavior that you can change? (i.e. something you did or didn't do that you can adjust?)

None	A few	Some	Quite a few	A great amount
○	○	○	○	○

(d) Did the feedback you received make you feel embarrassed or demoralized?

None	A few	Some	Quite a few	A great amount
○	○	○	○	○

(e) Did the feedback you received make you feel encouraged to improve?

None	A few	Some	Quite a few	A great amount
○	○	○	○	○

10) During ward rounds today, when you presented your patient, how much did you get to *think* like a paediatrician?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

11) During ward rounds today, when you presented your patient, how much did you get to *act* like a paediatrician?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

12) During ward rounds today, when you presented your patient, how much did you get to *feel* like a paediatrcian?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

13) At what level were you able to participate on rounds today? Please mark below.

I----------I

Junior Resident **Senior Resident** **Paediatrician**

B.39 SNAPPS - 'How to?' (BACK CH.6)

SNAPPS – How To?

Date _____

Please circle one: **PMW** **NNU** **PHO** Team/Cubicle _____

Time SNAPPS Started _____ Time SNAPPS Ended _____

1) Did you know how to ***Summarize*** *briefly the history and physical exam* for this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

Questions/Comments about Summarize:

_____

_____

_____

2) Did you know how to ***Narrow*** *the differential to 2-3 possibilities* for this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

Questions/Comments about Summarize:

_____

_____

_____

3) Did you know how to ***Analyse*** *the narrowed differential* for this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

Questions/Comments about Summarize:

_____

_____

_____

4) Did you know how to ***Probe*** *the consultant with questions* related to this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

Questions/Comments about Summarize:

_____

_____

_____

5) Did you know how to make a ***Plan*** for this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

Questions/Comments about Summarize:

_____

_____

_____

6) Did you know how to ***Select*** *a case related question* for this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

Questions/Comments about Summarize:

_____

_____

_____

7) Based on today's experience, how confident are you to use SNAPPS for other patients in the future?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

Questions/Comments about SNAPPS: _____

_____

_____

B.40 SNAPPS – 'HELPFUL?' - FACULTY (BACK CH.6)

SNAPPS – Paediatrician

Date _____

Please circle one: PMW NNU PHO Clinic Team/Cubicle _____

1) Did you find it helpful for the trainee to ***Summarize*** *briefly the history and physical exam* for this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

2) Did you find it helpful for the trainee to ***Narrow*** *the differential to 2-3 possibilities* for this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

3) Did you find it helpful for the trainee to ***Analyze*** *the narrowed differential* for this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

4) Did you find it helpful for the trainee to ***Probe*** *the consultant with questions* related to this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

5) Did you find it helpful for the trainee to make a ***Plan*** for this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

6) Did you find it helpful for the trainee to ***Select*** *a case related question* for this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

7) Based on today's experience, how likely are you to use SNAPPS for other patients in the future?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

Questions/Comments: _____

_____

B.41 SNAPPS – 'HELPFUL?' – TRAINEE (BACK CH.6)

SNAPPS - Trainee

Date _____

Please circle one: PMW NNU PHO Clinic Team/Cubicle _____

1) Did you find it helpful to ***Summarize*** *briefly the history and physical exam* for this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

2) Did you find it helpful to ***Narrow*** *the differential to 2-3 possibilities* for this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

3) Did you find it helpful to ***Analyze*** *the narrowed differential* for this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

4) Did you find it helpful to ***Probe*** *the consultant with questions* related to this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

5) Did you find it helpful to make a ***Plan*** for this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

6) Did you find it helpful to ***Select*** *a case related question* for this patient today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

7) Based on today's experience, how likely are you to use SNAPPS for other patients in the future?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

Questions/Comments: _____

_____

B.42 FACULTY ROUNDING LOG (BACK CH.7)

SNAPPS - Paediatrician Dates of Week _____

Please circle one: PMW NNU PHO Clinic Team/Cubicle _____

Please tally the total number of SNAPPS presentations per day in the boxes below & the total number of patients rounded on.

	Example	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Start Time of Rounds	*10:29*					
End Time of Rounds	*11:33*					
Total # of times SNAPPS was used by a trainee to present a patient on ward rounds or in the clinic.	*4*					
Total # of patients rounded on or seen in clinic.	*5*					

What were the barriers you faced to use SNAPPS more frequently? _____

_____

Questions/Comments about SNAPPS: _____

_____

B.43 Development of Trainee Rounding Log (back Ch.7)

Reflective development of the TRL:

With the realization that we needed to create a new study instrument to address the issues identified in Cycle 1, we wanted to ensure we maintained focus on the primary project measures:

1) trainees' perceived self-efficacy to manage paediatric patients,
2) trainees' sense of participation in and belonging to a clinical community of practice on rounds,
3) extent of elements of effective learning and teaching experienced on the ward round, and
4) the nature of the learning climate.

As a guide, I followed the steps illustrated in the article *AMEE Guide No 87: Development of Questionnaires for Educational Research.*[145] (*Refer to Chapter 3 – Methods)* Steps 1 thru 3 (1. Conduct a literature review, 2. Conduct interviews and/or focus groups, and 3. Synthesize the literature review and interviews/focus groups) occurred in Phases 1 and 2 of the project. Therefore, my approach to the development of the Trainee Rounding Log started at Step 4. Develop items.

I began by ensuring I understood my construct: trainee PSE, sub-categorized into the four elements of PSE: mastery, vicarious, verbal and psychological experiences. I then took all previously used survey questions developed in Phase 2 and re-categorized them based on the four PSE sub-categories. I picked several questions from each category based on what seemed to be the most relevant to the study at this point and with the best ability to track over time. Note: I chose not to create new questions, but to modify (as needed) previously generated questions, because the feeling was that these were good questions, generated using good methods, but that the data collection and analysis of them had not been practical. *(Figure 84)*

FIGURE 83: CATEGORIZATION OF PREVIOUS SURVEY QUESTIONS INTO PSE SUB-CATEGORIES

Mastery Experiences

A	B	C	D	E	
Bandura's INFLUENCES on PSE	**MSLQ**	**COP**	**ECI**	**EEL**	
Mastery Experiences	*21. When I present on ward rounds, I think about how poorly I am doing.*	1) During ward rounds today, when you presented your patient, how much were you encouraged to discuss your differential diagnosis?	4. When you make an error here, it is seen as an opportunity for learning and growth.	3) Did you understand your responsibilities on ward rounds today?	1) How sel **obtaining** a **history** for
Some of these questions are negative mastery experiences or previous mastery experiences influencing the current PSE, or are a measure of the curent PSE.	*25. When the patient case is hard, I either give up or study only the easy parts.*	2) During ward rounds today, when you presented your patient, how much were you stimulated to make comparisons about your patient's differential?	*14. Most of what we do here is focused on the passive transfer of knowledge, (i.e. we are expected to just listen and absorb knowledge, not interactive learning).*	*7) During ward rounds today, were you mainly just told what to do?*	2) How sel **obtaining** a **physical ex** patient?
From Theoretic Framework: **Bedside Teaching: ME, VE, VP** **CLE: ME, VE, VP, PS** **COP: ME, VE, VP, PS**	29. I continue to read up on patients and their conditions even when I don't have to.	3) During ward rounds today, when you presented your patient, how many questions were you asked?	*15. Education here is all about memorizing as much content as you can.*	13) Were you given an opportunity on rounds today to demonstrate your history taking or clinical examination skills?	3) How sel **summarize** from a **pae** ward round organized r
	30. Even when the patient cases are dull and uninteresting, I keep working until I understand.	*(a) How many of these questions were only about facts?*	*17. The goal of most students here is to figure out what we will be tested on and to study that material.*	14) Were you given an opportunity on rounds today to demonstrate your patient/family communication skills?	4) How sel summarize from a **pae exam** on w and organi
	35. When I'm reading about a patient I stop once in a while and go over what I have read.	(b) How many of these questions asked about your thinking process?			1) How sel generate a **differential** patient?
	32. I often find that I have been on ward rounds but don't know what has been discussed.	*6) During ward rounds today, when you presented your patient, how much was your role limited to reporting the*			2) How sel **critically a** interpret te

Vicarious Experiences

Bandura's INFLUENCES on PSE	MSLQ	COP	ECI	EEL	PSE	
Vicarious Experiences	2. Compared with other students/residents on ward rounds, I expect to do well.			16) During ward rounds today, did the consultant express his/her uncertainty about the case?	5) Compared with other **students** on ward rounds I think I know a great deal about **paediatrics.**	5) Cor reside team
	9. Compared with others on ward rounds, I think I'm a good student/resident.				5) Compared with other **students** on ward rounds I think I know a great deal about **neonatology.**	6) Cor reside team
	17. Compared with other students/residents on ward rounds I think I know a great deal about paediatrics.				4) Compared with other **residents** on ward rounds I think I know a great deal about **neonatology.**	7) Cor reside deleg
	18. Compared with other students/residents on ward rounds I think I know a great deal about neonatology.				4) Compared with other **residents** on ward rounds I think I know a great deal about **paediatrics.**	8) Cor reside priori organ
					4) Compared with other **students** on ward rounds I think I know a great deal about paediatric **haematology-oncology** .	
					4) Compared with other **residents** on ward rounds I think I know a great deal about paediatric **haematology-oncology** .	

Verbal Persuasion

Bandura's INFLUENCES on PSE	MSLQ	COP	ECI	EEL
Verbal Persuasion		**4) During ward rounds today, when you presented your patient, how much were you encouraged to ask the consultant questions?**	2. I often get valuable and supportive advice from faculty on how to improve.	1) During ward rounds today, were the learning goals and expectations for you laid out clearly?
Here, we are looking at verbal persuasion not just as basic "feedback" but also as guiding - this can be guiding through a thought process or guiding through a procedure which can result in a mastery experience (pos/neg). This can also relate to goals and objectives being laid out for a trainee which they need in order to create mastery experiences.		5) During ward rounds today, when you presented your patient, how much did the consultant encourage you to discuss your thought process about your management plan?	10. The faculty here react well when students question or challenge them.	4) During ward rounds today, did the consultant take the time to assess for your understanding?
		9) During ward rounds today, when you presented your patient, how much feedback did you receive from the consultant?	*16. The faculty tell us that they are interested in our thinking, but their actions on rounds suggest otherwise.*	*6) During ward rounds today, did the consultant expect you to answer questions you didn't know the answers to?*
		(a) How much were you encouraged to reflect on your own strengths and/or limitations before being given feedback?		*5) During ward rounds today, did you feel like the consultant just assumed you knew stuff you didn't know?*
		(b) How helpful did you find the feedback?		9) During ward rounds today, did you feel the consultant helped you identify your knowledge gaps?

Psychological States

Bandura's INFLUENCES on PSE	MSLQ	COP	ECI	EEL	PSE
Psychological States	*3. I am so nervous during ward rounds that I cannot remember facts I have learned.*	*8) How often did you feel ignored on the ward round today?*	1. In the **Paediatric Medical Ward, Neonatal Unit, Paeds Hem-Onc ward** we focus on a sense of discovery and the excitement of inquiry.	*2) Did you feel confused about what you were supposed to do or say on ward rounds today?*	*6) I am so nervous durin ward rounds that I cann remember facts I have learned.*
	13. I have an uneasy, upset feeling when I am on ward rounds.	12) During ward rounds today, when you presented your patient, how much did you get to feel like a doctor/paediatrician?	3. Most faculty here are deeply interested in the welfare of the students.	*12) During ward rounds today, when discussing a case, did the discussion feel like a 'drill session'?*	*7) I have an uneasy, ups feeling when I am on wa rounds.*
	19. I worry a great deal about presenting on ward rounds.	*(d) Did the feedback you received make you feel embarrassed or demoralized?*	5. The faculty care about how I think, not simply about whether I get the right answer.	18) During ward rounds today, did you feel stimulated by the consultant to read about the case(s) you presented?	
	5. I like what I am learning on ward rounds.	(e) Did the feedback you received make you feel encouraged to improve?	6. Students here are encouraged to embrace uncertainty rather than be afraid of it.		
	16. I think that what we are learning on ward rounds is interesting.		7. There is a great deal of trust and respect between students and faculty here.		
			8. Faculty and students here see themselves as partners in learning.		
			9. Faculty here are more interested in building up students' confidence rather than tearing them down.		
			11. Around here you have to act		

For those trainees who used SNAPPS to present their patient case on ward rounds, we wanted to see its influence on the trainees PSE, so I chose to frame the first six questions to correlate with the six steps of SNAPPS. Questions 7-13 were not dependent on whether or not a trainee had used SNAPPS to present their patient case, but were relevant for any case presentation on rounds. By doing this, we hoped to offer a descriptive comparison of trainee experiences from those who had used SNAPPS to those who presented in the traditional format.

Development of Survey Questions to Measure Positive/Negative Mastery Experiences:

Personal performance mastery experiences

The most powerful way to promote learner self-efficacy beliefs is through gained *mastery experiences*: "Enactive mastery experiences are authentic successes in dealing with a particular situation."[17] Gained mastery experiences give the learner a set of positive experiences that he/she can draw on in the future that reference their success at a given task. For example, if a medical student correctly differentiates bronchiolitis from asthma in a patient during ward rounds, then he/she will be more confident in their ability to diagnose bronchiolitis or asthma in the next patient who presents similarly.

One of the questions from the MSLQ sub-category PSE was:

- *"I am sure I can do an excellent job of presenting my patient when on ward rounds." (Q11. MSLQ)*

I used this same question model from to frame the six steps of SNAPPS: e.g. *"I did an excellent job of Summarizing my patient on rounds today."* My thought was that if the trainee rated high, then this would correlate to a positive mastery experience, and if they rated it low, then this would correlate to a negative mastery experience.

For those trainees who were not using SNAPPS, as a way to measure mastery experiences, I chose questions that reflected the same activity inherent within the SNAPPS model but that used different terminology, so the question wouldn't be dependent if SNAPPS had been used or not.

- *During ward rounds today, when you presented your patient, how much were you encouraged to discuss your differential diagnosis? (Q1. COP)*

- *During ward rounds today, when you presented your patient, how much were you stimulated to make comparisons about your patient's differential? (Q2. COP)*

These questions had been used previously in the Communities of Practice survey and were able to capture not only a mastery experience, but also sense of trainee participation, as well as elements of effective teaching.

Development of Survey Questions to Measure Positive/Negative Vicarious Experiences:

Vicarious (observed) experiences

Vicarious experiences are when "[o]ther people's performances . . . provide a common source of information about skills and abilities." [18] Bedside teaching offers many opportunities for vicarious experiences – students and residents on rounds have the opportunity to observe the attending physician, each other, and the patients on rounds. Each of these observed experiences could lead to an enhanced sense of self-efficacy. For instance, in the same example from above, if a medical student observes his/her peer successfully differentiate between bronchiolitis and asthma, then through the vicarious experience, the observing individual can deduce "information about their own capabilities."[17] Although there are more opportunities for vicarious experiences, this type of experience "has a weaker effect than does performance-based information, [therefore] people with little mastery experience or those who are uncertain about their capacities, are more sensitive to it."[17]

In order to capture vicarious experiences, I used a question originally modified from the MSLQ:

- *"Compared with other students/residents on ward rounds, I expect to do well." (Q2. MSLQ)*

In order to make it more specific to their presentation on rounds, it was modified to:

- *Compared with other trainees, how well did you present your patient today?*

In addition, in order to ascertain what faculty are modelling for (and therefore observed by) the trainee, I included a question from the Elements of Effective Learning survey:

- *"During ward rounds today, did the consultant express his/her uncertainty about the case?" (Q16. EEL)*

This question gets at the idea of the faculty role-modelling uncertainty. The reason we chose to record if this behaviour is being modelled verses other important areas to model is because SNAPPS asks trainees to Probe and Select. We wanted to determine if these steps of SNAPPS (the ability to generate, ask, and answer clinical questions) were being modelled for the trainee. In addition, this would enable us to indirectly measure the clinical learning environment's respect for uncertainty – the more uncertainty is being modelled for the trainees, the more the CLE is showing that uncertainty is a respected aspect of the

practice of medicine. This would in turn allow the trainee to not only generate questions, but to feel comfortable enough to ask them.

Development of Survey Questions to Measure Positive/Negative Verbal Experiences:

Verbal persuasion concerning one's abilities

Verbal persuasion (evaluative feedback) is an important component of both bedside teaching and the promotion of self-efficacy. If the appropriate person delivers evaluative feedback that is also appropriate in both content and delivery, this can positively influence medical students' and residents' self-efficacy beliefs. In that, verbal persuasion can "affirm or persuade them that they are able to perform a task,"[17] which in turn influences their self-efficacy beliefs regarding that task.

Here, we are looking at verbal persuasion not just as basic *feedback* but also as *guiding* – faculty guiding a trainee through a thought process or guiding a trainee through a procedure, which can result in a mastery experience (positive or negative) for the trainee. This can also relate to goals and objectives being laid out for a trainee which they need in order to create mastery experiences. Several questions from previous surveys captured this:

- *During ward rounds today, when you presented your patient, how much were you encouraged to ask the consultant questions? (Q4. COP)*

- *During ward rounds today, when you presented your patient, how much feedback did you receive from the consultant? (Q9a. COP)*

- *How helpful did you find the feedback? (Q9b. COP)*

- *During ward rounds today, did you feel the consultant guided you through the learning point so that you could understand? (Q11. EEL)*

We felt that this last question could both a) capture amount of verbal guidance faculty offer trainees to help him/her achieve a mastery experience, and b) to evaluate the effectiveness of the faculty's teaching.

Development of Survey Questions to Measure Positive/Negative Psychological Experiences:

Inferences made from one's physiologic and affective state

"People make inferences about their abilities from emotional arousal and other physiologic cues experienced while enacting a behaviour or anticipating its enactment." [18] The type of emotions experienced can influence an individual's perceived self-efficacy. "Negative interpretations of arousal, identified as fear or anxiety, reduce one's sense of self-efficacy. Positive interpretations of arousal, such as excitement, enhance self-efficacy." [18] Since inferences from one's physiologic state can affect their self-efficacy beliefs, this highlights the importance of ensuring a positive clinical learning environment where learners are not needlessly made to feel anxious or stressed. Unnecessary stress or anxiety, could lead the learner to negatively infer that the stress they feel is a reflection of their ability. But if the situation is stressful or anxiety provoking by the nature of the event itself, which is often the case in medicine, then the teacher can reassure the learner that this is a natural part of the experience. This reassurance will allow the learner to infer that their emotions are not a reflection of their ability, but are a natural part of the experience. [18]

Of the many survey questions that elicited trainees' perceptions of the clinical learning environment and how they felt on rounds, the following questions seemed the most relevant to the use of SNAPPS on rounds:

- I have an uneasy, upset feeling when I am on ward rounds. (Q13. MSLQ)

- Did the feedback you received make you feel embarrassed or demoralized? (Q9d. COP)

- During ward rounds today, when discussing a case, did the discussion feel like a 'drill session'? (Q12. EEL)

We focused on questions that would elicit both the psychological experiences of the trainee while also having the ability to measure the CLE.

Of the first round of selected questions to use in the Trainee Rounding Log based on their relevance to the ongoing project, I further selected questions based on their relevance to the steps of SNAPPS:

Mastery:
- During ward rounds today, when you presented your patient, how much were you encouraged to discuss your differential diagnosis? (Q1. COP) → *Narrow*
- During ward rounds today, when you presented your patient, how much were you stimulated to make comparisons about your patient's differential? (Q2. COP) → *Analyse*
- During ward rounds today, when you presented your patient, how much did you get to think like a doctor/paediatrician? (Q10. COP)
- During ward rounds today, were you mainly just told what to do? (Q7. EEL)

Vicarious:
- Compared with other students/residents on ward rounds, I expect to do well. (Q2. MSLQ)
- During ward rounds today, did the consultant express his/her uncertainty about the case? (Q16. EEL) → *Probe & Select*

Verbal:
- During ward rounds today, when you presented your patient, how much were you encouraged to ask the consultant questions? (Q4. COP) → *Probe*
- During ward rounds today, did you feel the consultant guided you through the learning point so that you could understand? (Q11. EEL) → *Probe*
- During ward rounds today, when you presented your patient, how much feedback did you receive from the consultant? (Q9.a COP)
- How helpful did you find the feedback? (Q9b. COP)

Psychological:
- I have an uneasy, upset feeling when I am on ward rounds. (Q13. MSLQ)
- Did the feedback you received make you feel embarrassed or demoralized? (Q9d. COP)
- During ward rounds today, when discussing a case, did the discussion feel like a 'drill session'? (Q12. EEL) → *Probe*

While I wanted to be mindful of the length of the survey to prevent survey fatigue and encourage completion of the survey, based on the guidelines described by AMEE Guide 87, my goal was to develop "15 potential items in the hopes of ultimately creating an eight-item scale)."[145]

Trainee Rounding Log – Page 1 - Draft 1:

1. I did an excellent job of briefly Summarizing the history and physical exam of my patient on rounds today.

2. I did an excellent job of Narrowing my patient's differential to 2-3 possibilities (or, if the diagnosis was already known, Narrowing differentials or risk factors for that problem).

3. I did an excellent job of Analysing the narrowed differential (or problem) for my patient on ward rounds today.

4. How many questions did you Probe the consultant on rounds when presenting your patient today?

5. I did an excellent job generating a Plan for my patient on ward rounds today.

6. Did you Select a case related question for your patient today? Did you get an opportunity to report back to the group what you learned?

After the initial selection of survey items, I spent a great deal of time considering the language and phrasing of each item and its response. I went through each item to determine if it met the "best practices" of generating questionnaire items, including: "writing questions rather than statements, avoiding negatively worded items and biased language, matching the item step to the response anchors and using response anchors that emphasize the construct being measured."[145]

Previously, in Phase 1, when developing the original PSE survey, we had modelled the survey based off of surveys described by Bandura "Rate your degree of confidence . . . to do . . ." This resulted in generally high levels of trainee PSE that seemed to diverge from the qualitative data. We thought maybe the formality or depersonalization of the scale had allowed trainees to overestimate their confidence. Therefore, in Phase 2, we intentionally worded the PSE survey items to be in the first person e.g. "I am confident to . . ." This idea was supported in the literature from other questionnaires aimed at measuring PSE and was also used in the MSLQ.[112, 165]

But in Phase 3, after re-reviewing the recommendations by the AMEE Guide 87, one of the issues of using the first-person items is that they were statements, not questions. As Artino et al describe, "Questions are more conversational, more straightforward and easier to process mentally. People are more practiced at responding to them."[145] So I tried to reframe the questions to maintain the personal aspect (and therefore accountability) of the question but in a conversational tone. e.g. Question: *"So how did you do when Summarizing your patient today?"* Response: *"I did great! In fact, I did an excellent job."*

Item and response development progression with thought process

Question Item	Reflections

I did an excellent job of briefly Summarizing the history and physical exam of my patient on rounds today.	It's a statement, not question; I need to make into conversational, question format.	
Change to . . .		
How well were you able to briefly Summarize the history and physical exam of your patient on rounds today?	Now my construct appears to be "How well"? I'm trying to 'count' mastery experiences, which are defined as: "Enactive mastery experiences are authentic successes in dealing with a particular situation."[17] Gained mastery experiences give the learner a set of positive experiences that he/she can draw on in the future that reference their success at a given task. So the experience is a measurement of success, so my construct be also be a measurement of "success."	
Change to . . .		
How successful were you at briefly Summarizing the history and physical exam for your patient on rounds today?	I decided that I did not need to define "successful" but that the trainee interpretation of their success would be enough because if whether they were successful or not is not the goal of the survey, but did they *perceive* it as a successful experience. In addition, with this new phrasing of the question, I now have a vocabulary within the question item that will allow me to directly relate the construct with a response item; e.g. "Not at all successful, Slightly successful, Moderately successful, Quite successful, Extremely successful"; whereas I couldn't do that with "How well . . ." or with the statement type question item.	
Final version of question and response scale:		
1. How successful were you at *briefly* ***Summarizing*** *the history and physical exam* for your patient on rounds today? Not at all successful ○ Slightly successful ○ Moderately successful ○ Quite successful ○ Extremely successful ○		
	This was then recycled for four other steps of SNAPPS: Narrow, Analyse, Plan and Select. *Note*: for Probe, we measured how many questions the trainee asked as a measure of a gained mastery experience, not how successful the trainees were at asking the question(s).	

Note: the mastered event elicited by these questions is the steps of SNAPPS – i.e. the *Summarizing* of the history and physical exam, not the actual *performance* of the history or physical exam, which was already been measured in previous phases.

This was then repeated for all of the steps of SNAPPS, except for Probe, which was instead a tally of questions asked during the ward round.

Trainee Rounding Log – Page 2 - Draft 1:

7) During ward rounds today, when you presented your patient, how much were you encouraged to discuss your differential diagnosis?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

8) During ward rounds today, when you presented your patient, how much were you stimulated to make comparisons about your patient's differential?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

9) During ward rounds today, when you presented your patient, how much were you encouraged to ask the consultant questions?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

10) During ward rounds today, when discussing a case, did the discussion feel like a 'drill session'?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

11) During ward rounds today, did you feel the consultant guided you through the learning point so that you could understand?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

12) During ward rounds today, did the consultant express his/her uncertainty about the case?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

13) During ward rounds today, when you presented your patient, how much feedback did you receive from the consultant?

None	A few	Some	Quite a few	A great amount
○	○	○	○	○

If 'None', skip to question 14.

(a) How helpful did you find the feedback?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

(b) Did the feedback you received make you feel embarrassed or demoralized?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

14. Compared with other students, I did well today when I presented my patient.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

15. I had an uneasy, upset feeling when I presented my case today.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
○	○	○	○	○

At this point of the survey design, while I had chosen my construct and chose relevant questions in the hopes of measuring that construct, I realized that from the picking of items from previously used surveys, I was essentially merging four different surveys (MSLQ, COP, EEL and EET) into one, which meant that I needed to rephrase my response scale to reflect the unified construct. Since we decided to indirectly measure PSE based on the quantity of mastery, vicarious, and verbal experiences, in relation to elements of COP, EEL and EET, I was able to reconstruct the survey to reflect 'How much or often' events were occurring "Not at all; A little bit; Somewhat; Quite a bit: A great amount". (i.e. ***how much*** participation, reitification, elements of effective learning, and elements of effective teaching occurred on the rounds?) To ensure that each question was relevant to the focused construct, I placed each item in a table to evaluate its relevance to the survey.

Relevance of question item to survey:

Question	Previously used Survey	Original Sub-Category	PSE Sub-category	SNAPPS step
During ward rounds today, when you presented your patient, how much were you encouraged to discuss your differential diagnosis?	COP – Question 1	Participation	Mastery	Narrow
During ward rounds today, when you presented your patient, how much were you stimulated to make comparisons about your patient's differential?	COP – Question 2	Participation	Mastery	Analyse
During ward rounds today, when you presented your patient, how much were you encouraged to ask the consultant questions?	COP – Question 4	Participation	Verbal	Probe
During ward rounds today, when discussing a case, did the discussion feel like a 'drill session'?	EEL – Question 12	Promotion of Understanding and Retention	Psychological	Probe
During ward rounds today, did you feel the consultant guided you through the learning point so that you could understand?	EEL – Question 11	Evaluation	Verbal	Probe

During ward rounds today, did the consultant express his/her uncertainty about the case?	EEL – Question 16	Elements for Effective Teaching	Vicarious	Probe & Select
During ward rounds today, when you presented your patient, how much feedback did you receive from the consultant?	COP – Question 9	Reitificaiton	Verbal	n/a
Compared with other students, I did well today when I presented my patient. **Modified Q.*	MSLQ – Question 2	Self-efficacy	Vicarious	
I had an uneasy, upset feeling when I presented my case today. **Modified Q.*	MSLQ – Question 13	Test Anxiety	Psychological	

While we felt it was important to measure the amount of feedback being provided for trainees during the ward round, since SNAPPS doesn't have a specific step of feedback built into it, and due to limited space on the survey and scope of the project, we limited the measurement of the Verbal experience to verbal guidance faculty offer trainees to help him/her achieve a mastery experience.

This resulted in a paper-based rounding log composed of four stapled half-sheets of paper. The first page included instructions and my contact information; the following pages were three identical copies of the survey, intended to capture three different patient presentations over the course of a week. The final draft of this was then reviewed by my PhD supervisor for input and minor modifications. It was then shown to trainees for feedback prior to its use, but no changes were made.

B.44 TRAINEE ROUNDING LOG (BACK CH.7)

Rounding Log – Trainee **Week _____**

Please circle one: **MBBS 3** **MBBS 5** **Resident**

Included in this Rounding Log are three surveys. For each survey, please complete based on *only **one** presentation per survey*.

*Please only say "Yes" to using SNAPPS on rounds if you AND your consultant are using SNAPPS together.

*Please remember, *this is **not** an evaluation* of your performance on rounds. This log gives us insight into how we in the Department of Paediatrics are doing as educators on ward rounds.

*Do NOT write your name on this log.

*Return to: Dr. Savarra on Friday afternoon.

*If you have any questions, please contact, Dr. Savarra. Phone: 76498140 Email: mantzor@bcm.edu

---

Rounding Log - Trainee Date _____

Please circle one: PMW NNU PHO Clinic Team/Cubicle _____

Case Description:

_____

(e.g. 2mo male with vomiting; 5yo female with ALL and neutropenic fever; 2-day-old infant, prem GA 28wks)

→ Did you use SNAPPS to present your patient today? *Please circle one*: Yes / No *If 'No', answer Q #4, then skip to Q #7*

1. How successful were you at *briefly **Summarizing** the history and physical exam* for this patient on rounds today?

Not at all successful	Slightly successful	Moderately successful	Quite successful	Extremely successful
○	○	○	○	○

2. How successful were you at ***Narrowing** the patient's differential* to 2-3 possibilities*? (*If the diagnosis was already known, how successful were you at using the patient's problem list to **Narrow** differentials &/or risk factors for that problem)?

Not at all successful	Slightly successful	Moderately successful	Quite successful	Extremely successful
○	○	○	○	○

3. How successful were you at ***Analysing** the patient's narrowed differential* or problem?

Not at all successful	Slightly successful	Moderately successful	Quite successful	Extremely successful
○	○	○	○	○

4. How many questions did you ***Probe** the consultant* with on rounds when presenting the patient today? _____

5. How successful were you at *making a **Plan*** for this patient today?

Not at all successful	Slightly successful	Moderately successful	Quite successful	Extremely successful
○	○	○	○	○

6. How successful were you at ***Selecting*** *a case related question* for this patient today?

Not at all successful	Slightly successful	Moderately successful	Quite successful	Extremely successful
○	○	○	○	○

7. During ward rounds today, when you presented your patient, how much were you <u>encouraged to discuss</u> your differential diagnosis?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

8. During ward rounds today, when you presented your patient, how much were you <u>stimulated to make comparisons</u> about your patient's differential?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

9. During ward rounds today, when discussing a case, did the discussion feel like a 'drill session'?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

10. During ward rounds today, did you feel the consultant guided you through the learning point so that you could understand?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

11. During ward rounds today, did the consultant express his/her uncertainty about the case?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

12. Compared with other trainees, how well did you present your patient today?

Not well at all	Not well	Similar	Better	Much better
○	○	○	○	○

13. I had an uneasy, upset feeling when I presented my case today.

Not at all	A little bit	Somewhat	Quite a bit	A great amount
○	○	○	○	○

Questions/Comments:

_____

_____

B.45 SNAPPS Debrief – Faculty (back Ch.7)

Faculty - SNAPPS Debrief

1) Please describe how you've been using SNAPPS on ward rounds? (i.e. since when? how many days a week? number of trainees? etc.)

2) What are your general impressions of using SNAPPS?

3) Any comments on any specific step of S-N-A-P-P-S?

4) Are you learning more by using SNAPPS to teach?

5) Has your patient management changed at all using SNAPPS?

6) Is anything missing from SNAPPS?

7) Any other questions/comments or suggestions to improve SNAPPS and/or SNAPPS training?

B.46 SNAPPS Debrief – Trainee (back Ch.7)

Trainee - SNAPPS Debrief

1) Please describe if you've had opportunities to use SNAPPS on ward rounds? (i.e. since when? how many days a week? number of faculty using it? which wards? etc.)

2) What are your general impressions of using SNAPPS?

3) Any comments on any specific step of S-N-A-P-P-S?

4) Are you learning more by using SNAPPS?

5) *For residents only:* How do you feel helping the students with SNAPPS?

6) Is anything missing from SNAPPS?

7) Any other questions/comments or suggestions to improve SNAPPS and/or SNAPPS training?

B.47 UPDATED SNAPPS DEBRIEF – FACULTY (BACK, CH.9)

SNAPPS - Paediatrician Dates of Week _____

Please tally the total number of SNAPPS presentations per day in the boxes below & the total number of patients rounded on.

	Example	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Start Time of Rounds	*10:29*					
End Time of Rounds	*11:33*					
Total # of times SNAPPS was used by a trainee to present a patient on ward rounds or in the clinic.	*4*					
Total # of patients rounded on or seen in clinic.	*5*					

What were the barriers you faced to use SNAPPS more frequently?

_____
_____
_____
_____

Was SNAPPS used to solve an acute patient problem? If yes, please describe:
Example: 6yo female with known chronic, refractory ITP, now with tachycardia. The trainee uses SNAPPS to Narrow the tachycardia and solve/approach the acute problem.

_____
_____
_____
_____

Was SNAPPS used to discuss the expanded role of the physician? (i.e. health advocate, communicator, professional, scholar, collaborator, leader). If yes, please describe:
Example: 15yo female with known rhabdomyosarcoma – Narrow/Analyze discussion "how do you communicate diagnosis and prognosis of cancer with a teenager?"
Example: 2yo female with Wilms tumour needs a nephrectomy - Narrow/Analyze discussion "how do we navigate the system to advocate for this patient to get her nephrectomy?"

_____
_____
_____
_____

Did the use of SNAPPS influence or change your patient management? If yes, please describe:
Example: 5yo male with presumed relapsed CNS ALL – trainee's Probe: "How does ALL CNS relapse cause hydrocephalus?" --> the result of discussing this on rounds and doing a literature review found that hydrocephalus is not a common presentation of CNS relapse and so we did a bone marrow biopsy to confirm.

_____
_____
_____
_____

Did you use SNAPPS as a template to role model your thought process of patient management? If yes, please describe:

Example: 9yo female with large abdominal mass complicated by ascites, pleural effusion, anasarca, and with persistent tachycardia – Paediatrician: "My Narrow is her tachycardia, could be secondary to hypovolemia, sepsis, or heart failure. My Analyze: I'm concerned that her tachycardia is due to poor intravascular volume, but my Probe is: How do I manage her hypovolemia in the setting of diffuse edema and pleural effusions? I'll discuss my thoughts on fluid management and improving oncotic pressures for this patient."

_____
_____
_____
_____

B.48 UPDATED SNAPPS DEBRIEF – TRAINEE (BACK, CH.9)

1) Does using SNAPPS on ward rounds make the teaching more organized? The learning more organized? How so/How not?

2) Does using SNAPPS improve the learning environment on ward rounds? Yes/No? Why/Why not?

3) Did the use of SNAPPS help to make you feel more part of the team? Yes/No? Why/Why not?

4) Does using SNAPPS on ward rounds improve your self-confidence to manage paediatric patients? Yes/No? Why/Why not?

5) Do you like using SNAPPS? Why/Why not? Would you want to keep using SNAPPS on your other ward rounds? Why/Why not?

Note: the same questions were offed both verbally and by anonymous written form

B.49 PHO TRAINEE SNAPPS FEEDBACK SURVEY – VERSION 1 (BACK, CH.9)

SNAPPS – Trainee on PHO Date _____

Please circle one: Resident MBBS 5

Please describe one thing (if any) you learned from using SNAPPS today?

_____
_____
_____
_____

Did this influence your self-confidence to managing paediatric patients? If yes, how? Positively or negatively? Please describe.

_____
_____
_____
_____

B.50 PHO TRAINEE SNAPPS FEEDBACK SURVEY – VERSION 2 (BACK, CH.9)

SNAPPS – Trainee on PHO Date _____

Please circle one: Resident MBBS 5

1) Does using SNAPPS on ward rounds make the teaching more organized? The learning more organized? How so/How not?

_____
_____
_____
_____
_____
_____

2) Does using SNAPPS improve the learning environment on ward rounds? Yes/No? Why/Why not?

_____
_____
_____
_____
_____
_____

3) Did the use of SNAPPS help to make you feel more part of the team? Yes/No? Why/Why not?

_____
_____
_____
_____
_____
_____

4) Does using SNAPPS on ward rounds improve your self-confidence to manage paediatric patients? Yes/No? Why/Why not?

_____
_____
_____
_____
_____
_____

5) Do you like using SNAPPS? Why/Why not? Would you want to keep using SNAPPS on your other ward rounds? Why/Why not?

_____
_____
_____
_____
_____
_____

APPENDIX C – DATA ANALYSIS

C.1. SIX STEPS OF THEMATIC ANALYSIS (BACK CH. 3)

Six Steps of Thematic Analysis

Braun & Clark

**Note: Only Phase 1 thematic analysis is described in detail below, but all thematic analysis within this study followed the procedure below.*

Step 1: Familiarising yourself with your data

My co-supervisor and I conducted the thematic analysis. I initially became familiar with the qualitative data as it was being collected during the FGDs and interviews. I then reviewed all the audio transcriptions to ensure quality and accuracy of the transcripts, which reinforced my familiarity with the collected data corpus. The transcribed data and observations were then shared with my co-supervisor. We each then independently made ourselves familiar with the data corpus through repeated, active reading. During this time, we each independently took note of potential emerging patterns.

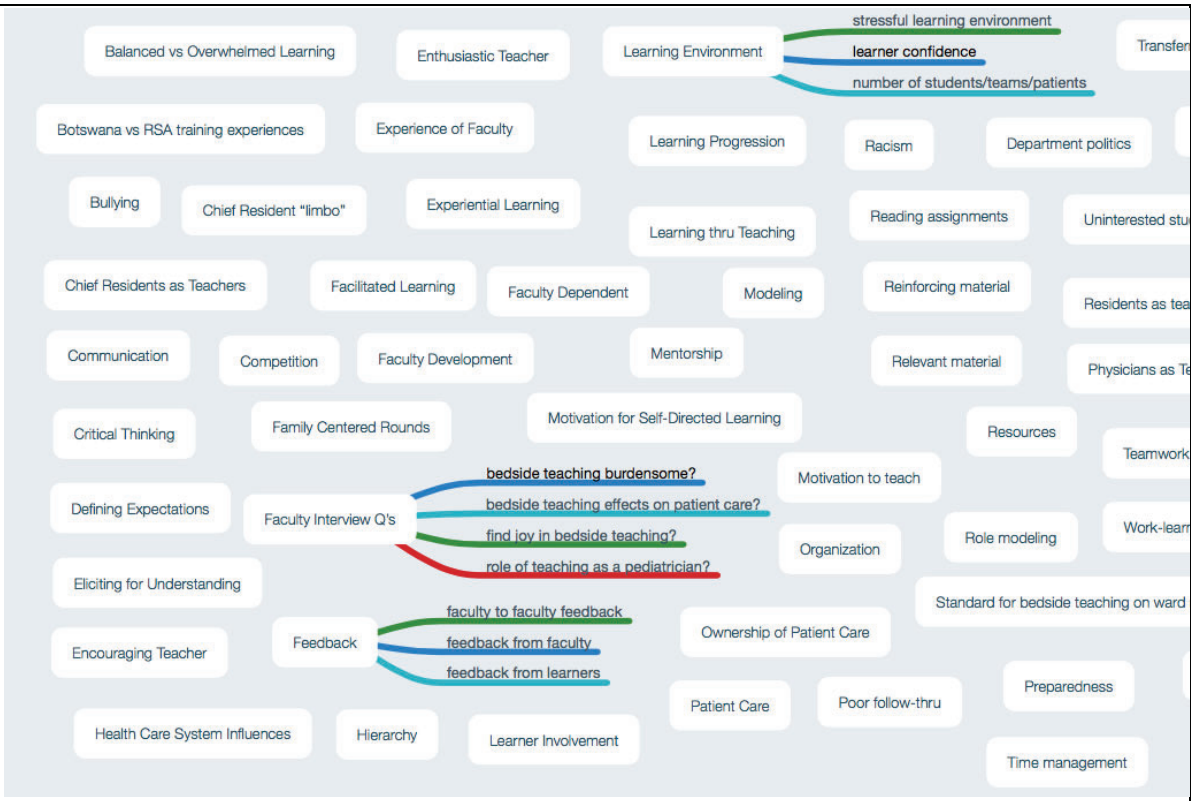
Step 2: Generating initial codes

After becoming familiar with the data corpus, we each independently began to make a more comprehensive list of identified patterns to develop a potential coding scheme. The preliminary coding templates were 'data-driven', often using paraphrased script directly from data extracts to name the code. We continued to make short notes to capture thoughts during this process.

Once preliminary coding schemes were created, we each individually coded based on our initial impressions of the data. Some data extracts were coded with multiple codes based on their relevant content. Where any opposing opinions or experiences came out of the data corpus or a data set, memos were created to highlight these discrepancies. In general, very little was left un-coded.

While NVivo© software allowed us to know from which data set the data extract came from (e.g. student, junior or senior resident FGD or faculty interview), the codes were not generated based on the category of the speaker, only the content of what they said. This resulted in codes which contained extracts from a combination of students, junior residents, senior residents and faculty. The product of Step 2 from me was a list of 52 potential codes. *(Appendix C - Figure 1)* I combined all of the data sets together for two reasons. First, the goal was to get a holistic picture of the department's perceptions of ward rounds – not an 'us' verses 'them' approach. Second, since the senior resident FGD bridged between the junior trainees' FGDs and faculty interviews, it would have created a third 'them', which again, was not the goal of the data. I was still able to reflect on the differences within and between participant groups.

Appendix C - Figure 1: Step 2 – Draft I of coding scheme



After Step 2, my co-supervisor and I met to discuss and review our preliminary coding scheme. Individual codes, organization of codes, similarities, differences and underlying thought processes to coding were discussed. After the discussion, it was agreed to create a refined coding scheme. This scheme removed redundant and irrelevant codes, restructured lists into categories with sub-codes to help organize data, and delineated 'positive' verses 'negative' codes where applicable.

Step 3: Searching for themes

Defining a 'theme'

A theme was generated using both its prevalence within the data corpus, an individual data set, and/or its relevance to the research question.

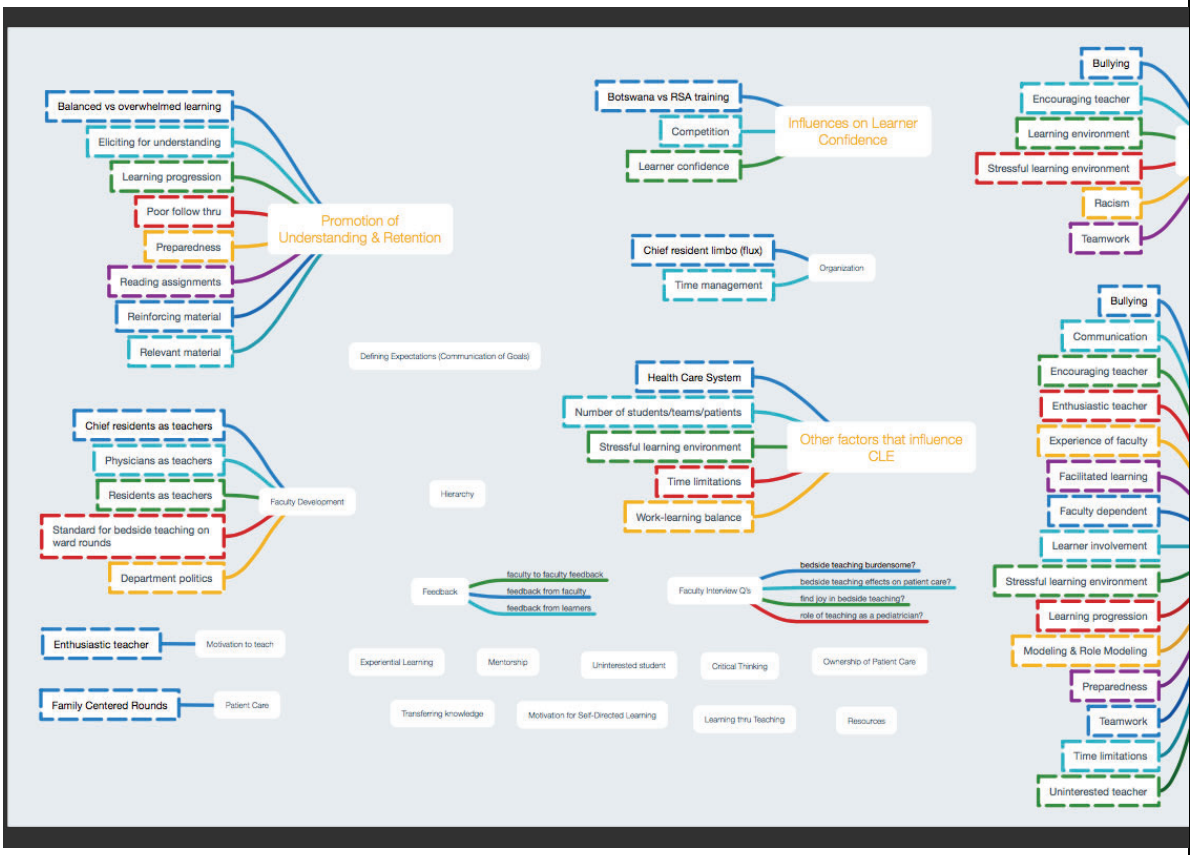
Identifying themes

The preliminary coding scheme was examined and reframed into a new organization of codes with potential emerging themes and subthemes. This resulted in a refined coding scheme. *(Appendix C - Figures 2 & 3)* This was done by referencing my previous literature review for terminology which would be helpful to organize the preliminary code names. For example, the code *'bullying'* was absorbed under the theme *'Unfavourable Clinical Learning Environment'* and became a sub-theme *'Student mistreatment'*. This process did not change the content of codes, only the organization of the previously identified codes.

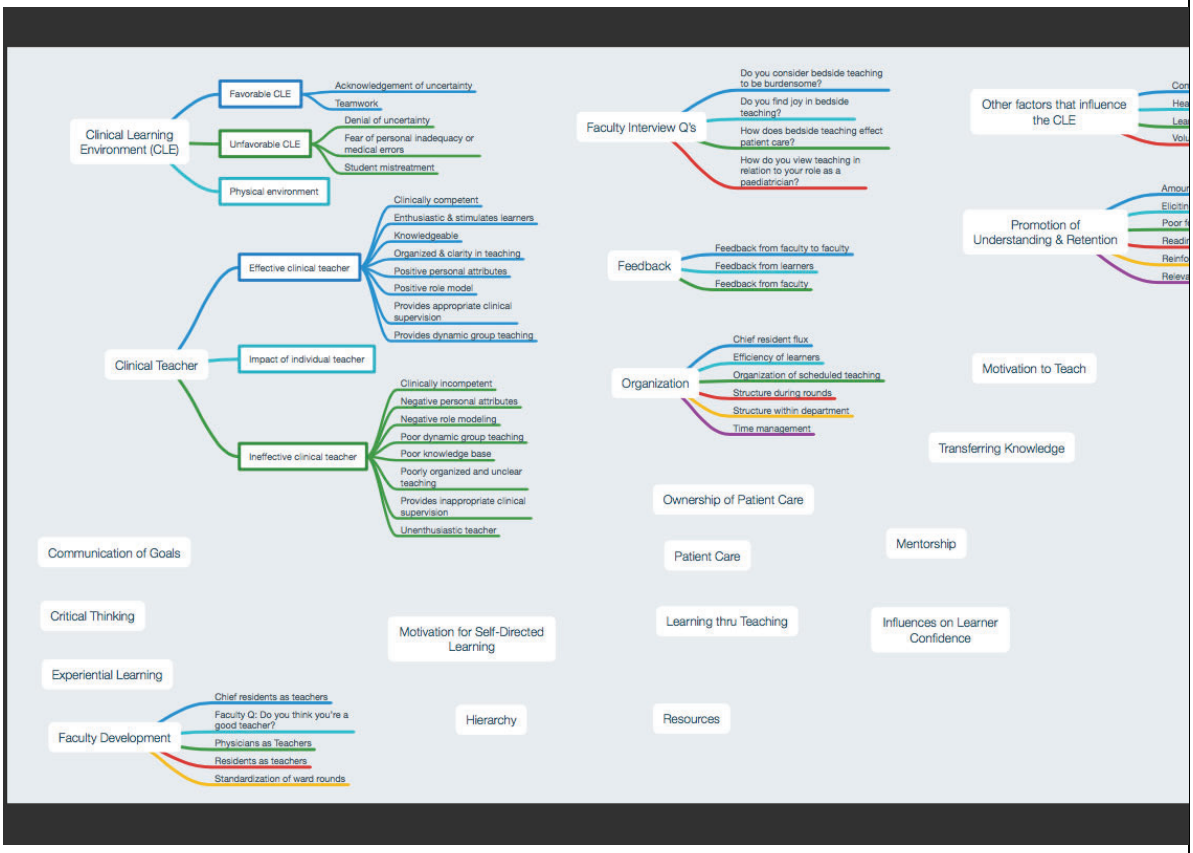
We then discussed the refined coding template for agreement in the organization, naming and emerging potential themes. We then independently went back to the data corpus and used the refined coding scheme

to review their original coding. The data was restructured using the refined coding, making sure extracts moved well into the refined scheme of reorganized codes. Minor modification and recoding was undertaken during this process, with note-taking highlighting any discrepancies between the preliminary and refined coding schemes.

Appendix C - Figure 2: Process of modification of Draft I to Draft II of coding scheme



Appendix C - Figure 3: Step 3 - Draft II coding scheme



Step 4: Reviewing themes

<u>Step 4 - Part I: Reviewing at the level of the coded data extracts</u>

I then reviewed all extracted data within a single code to assess for consistency of and patterns within the code to ensure "internal homogeneity" within the identified theme or sub-theme.[147] To ensure consistency within a code, key words, phrases and/or paraphrases of data extracts were highlighted to capture the essence of the data extracts. *Note:* the highlighted phrases did not change the actual coding or remove it from the speaker's original context, but was merely part of the theme reviewing process. *(Appendix C - Figure 4)* Data extracts were moved as needed when they were found to no longer 'fit' into the code, and themes were modified to best fit the extracted data.

Appendix C - Figure 4: Example of reviewing themes at the level of the coded data extracts

Transferring teaching skills: quotes that describe the influence of previous mentors or teachers on current clinical and/or teaching practice.

"tried to teach like the people I thought were good teachers" "mentorship, the physicians I have learned from along the way that have done a good job" "picked up bits along the way from folks" "it's my background - how I was taught to do ward rounds" "my style of teaching is from the way I was taught" "these skills are passed from your mentors" "you learn from different senior colleagues and develop your own style of teaching" "I do what I do because I had mentors who did it that way"

Step 4 - Part II: Reviewing at the level of the entire data set

Once consensus was achieved for consistency of content within each individual code, the entire data set was reviewed to see if the generated themes fit the data corpus as a whole and whether the themes were relevant to the research question and objectives. This process also ensured that the themes met "external heterogeneity" (i.e. different themes did not overlap).[147] At the same time, the data corpus was reviewed to see if any data were missed or miscoded.

During this step, comments about the overall themes from each data set (student, junior and senior resident FGDs, and faculty interviews) were made to compare and contrast the main themes among the different groups and within a single group, and to reflect on how the discussion between participants evolved.

Also during Step 4, the observation and field notes were reviewed to incorporate the non-verbal elements (interaction of the group, changes in energy, enthusiasm of the group, silences, etc.) into the thematic analysis. The non-verbal elements were compared and contrasted between groups and within a single group. For example, if there was a change in a group's emotional intensity, energy or enthusiasm, I made note of the which question generated the response as a way to underscore the importance of previously determined themes or to identify new themes which were not captured as part of the verbal analysis.

At the end of Step 4, the independent coding from each researcher was merged using NVivo© software. Overall, the merged independent coding generated agreement with only minor variation which was discussed and consensus agreed upon. No modifications in coding or themes was needed after merging the data.

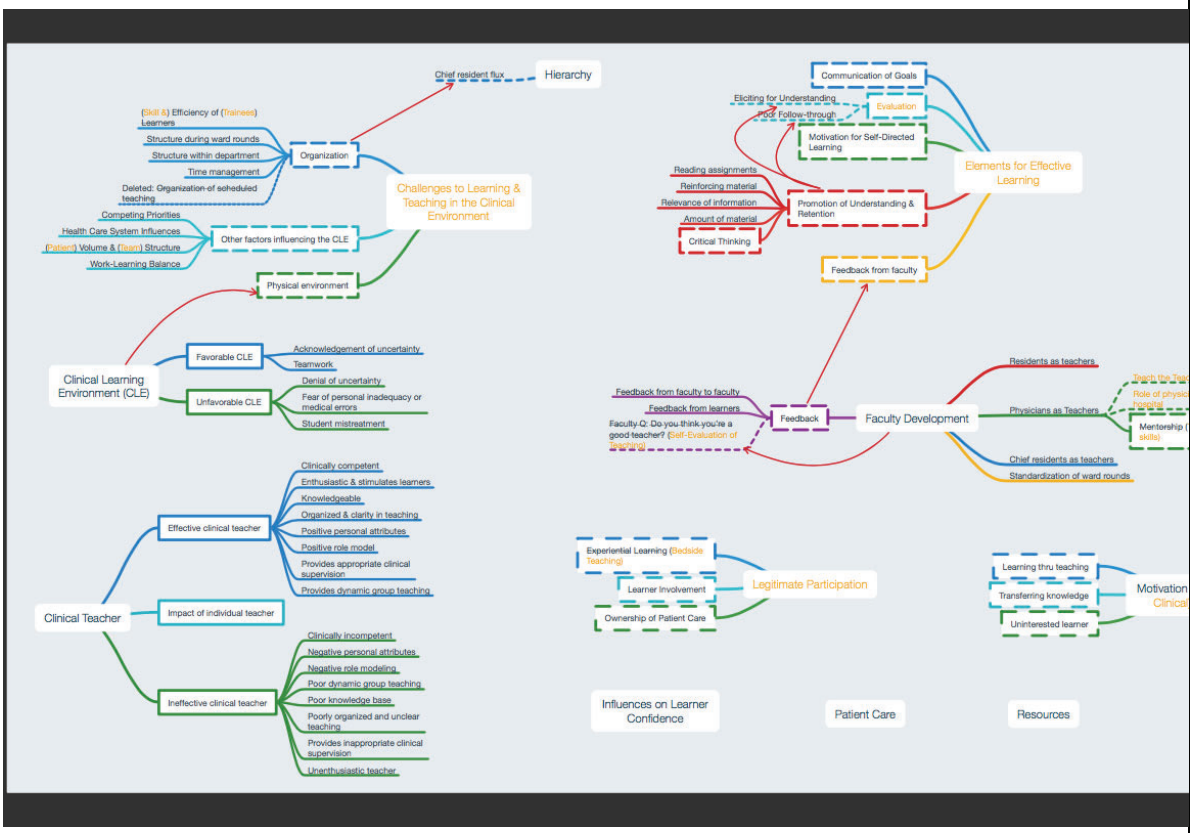
Step 5: Defining and naming themes

According to Braun & Clark, the intention of this step of the analysis is to "identify the 'essence' of what each theme is about, . . . determin[e] what aspect of the data each theme captures," and to answer "what is the overall story the different themes reveal about the topic?"[147] To achieve this, I reviewed the structure and names of the preliminary themes which provided me with an opportunity to adopt recognized terminology in the HPE literature where appropriate to edit theme titles such that they were "concise . . . and immediately [gave] the reader a sense of what the theme [was] about."[147] For example, during an initial draft, one theme was called 'Experiential Learning' which was then changed to 'Bedside Teaching' – changing the theme title allowed for less confusion since both 'experiential learning' and 'bedside teaching' are popular terms used in

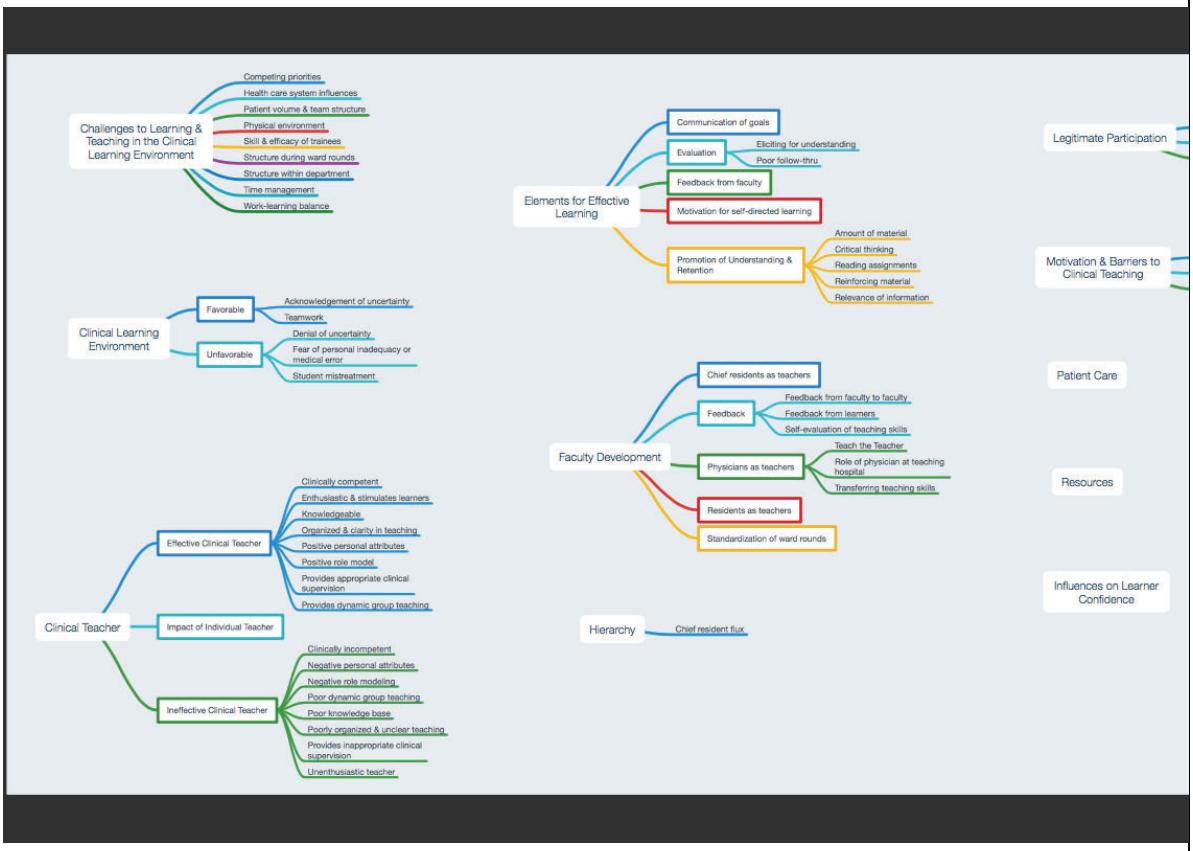
HPE with specific meanings and connotations, I chose the most appropriate term so as to align the terminology used with that in the existing HPE literature. *(Appendix C - Figure 5 & 6)*

It is important to note that this process did *not* result in any recoding of the data corpus, but merely ensured that the semantics of the theme titles appropriately conveyed the theme's content per the larger context of HPE literature. Therefore, a secondary HPE literature review was undertaken to determine whether the generated themes could be better defined using relevant HPE terminology. Note: to ensure the integrity of the inductive process, the additional literature review was limited to review articles to look for general topics in the HPE literature; I did not look at specifics of similar publications in qualitative research which could have influenced the themes.

Appendix C - Figure 5: Process of modification of draft II to draft III of themes

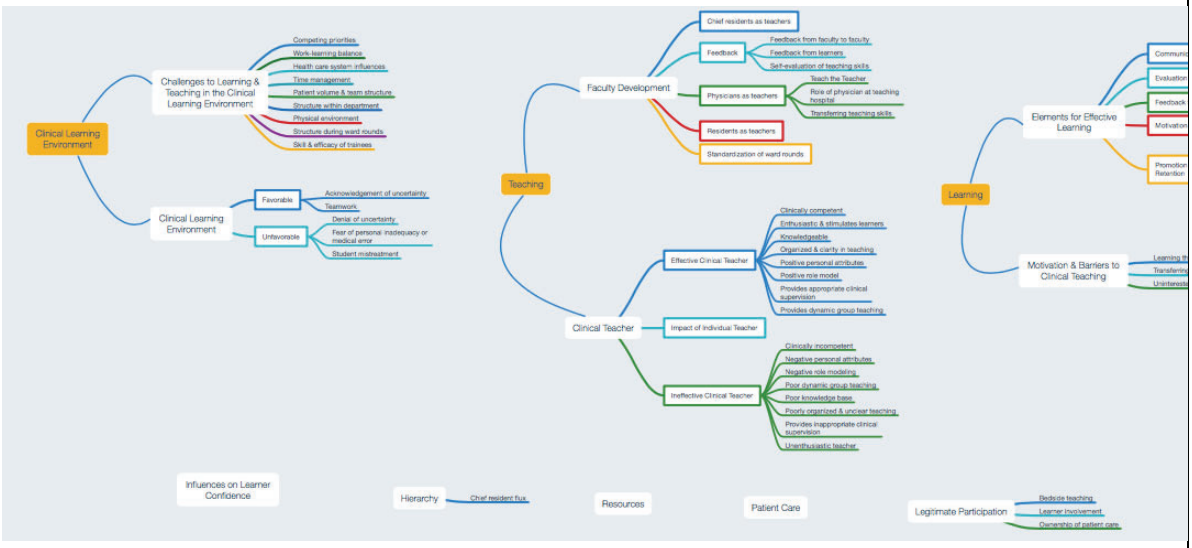


Appendix C – Figure 6: Step 5 – Draft III of themes



At this draft, I was left with eleven themes 31 subthemes and 34 sub-subthemes. In order to provide a simplified model of the overarching themes, the eleven themes were grouped into eight themes. *(Appendix C - Figure 7)*

Appendix C - Figure 7: Step 5 – Draft IV

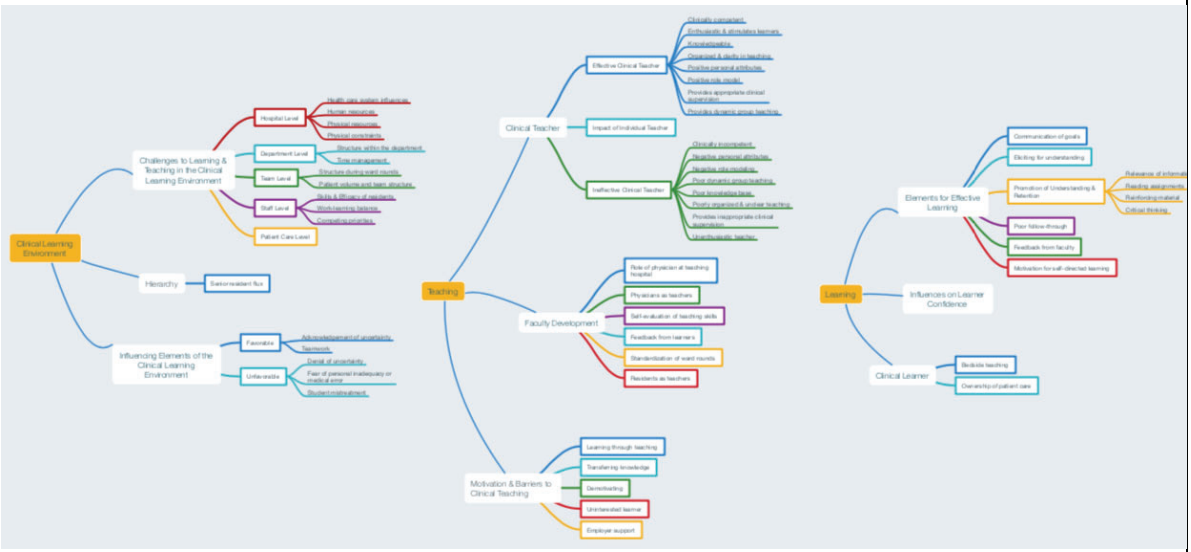


Step 6: Producing the report

For the producing the report, Braun & Clark suggest a series of questions that the researcher should consider when writing the final report. These questions will help stimulate the researcher to think about the data "beyond the surface of the data" and to be able to describe "what is the overall story the different themes reveal about the topic?"[147]

As such, the writing of the Results of Phase 1 was a continuation of the thematic analysis. I went back often to the original data sources and quotes to ensure that the context of the quote aligned with the point being presented. This resulted in minor changes for flow of descriptions, some data extracts were moved, and some item names were changed – these minor changes led to a more succinct and representative analysis which could only be fully achieved when actually writing the results. *(Appendix C – Figure 8)*

Appendix C - Figure 8: Step 6 – Draft V, final draft



C.2. Example of mixed methods joint display diagram (back, Ch. 3)

Joint Display Diagram
Phase 1 – Example

Content Area #1	Related Survey Question		Students n=11 *Median & Range*	Residents n=9 *Median & Range*	QUAL summary	Congruent	Divergent
Feedback	DREEM – Q.13	Teachers are good at providing feedback	1.5 (0-3) (Disagree)		-An important part of training, but delivery, timing and frequency are key elements. -Positive feedback is rare. -Negative feedback potentially damaging. -Not helpful if done poorly. -Timing and frequency are poor. - Overall paucity of feedback. - Recommend more feedback.	*"We don't get enough feedback, so you're left wondering, 'Did I do a good job?'"* *"Scolded in front of the whole department that we were incompetent – that was a bad experience."*	
	DREEM – Q.18	Teachers provide constructive criticism	2.5 (1-4) (Unsure)				
	PHEEM – Q.22	I get regular feedback from my seniors		2.0 (1-4) (Unsure)			
	PHEEM – Q.39	Teachers provide me w/ good feedback on my strengths and weaknesses		2.0 (0-4) (Unsure)			
	EEL – Q.31	I receive frequent feedback	3.0 (0-5) (Somewhat agree)	2.0 (0-4) (Somewhat disagree)			
	EEL – Q.32	The feedback I receive is relevant to specific behavior	3.0 (1-5) (Somewhat agree)	2.0 (0-4) (Somewhat disagree)			
	EEL – Q.33	I am encouraged to self-assess my own performance.	3.0 (0-5) (Somewhat agree)	2.0 (0-5) (Somewhat disagree)			

Supporting document 5: Critical reflection as 'innovative thinking'

The term 'innovative thinking' is taken from Hart (2000). The purpose of the following sets of questions is to help in analysing incidents, events and various types of data in such a way that we learn from them something that we didn't know beforehand. You may find it helpful to combine questions from the different groups below and/or to add your own questions, along similar lines.

1 Welcoming Surprise

- What is there in this (incident, data, etc.) which I find surprising?
- Why am I surprised?
- What was I expecting different?
- What does this tell me?

2 Analysing the Reflexivity of Interpretive Judgements

Given my first interpretation of this (incident, data, etc.):

- What are its origins in:

  my values (general/political/professional)?
  my feelings?
  my general theories about this sort of incident, situation, etc.?
- What personal experiences lie behind these values, feelings, theories?
- If someone else had had quite different personal experiences, they might bring different but equally relevant values, feelings and theories to interpreting this incident, data, etc. So what alternative interpretations might be made?
- Imagine an interpretation from the perspective of another actor within this situation.

3 Thinking Dialectically

Given this situation/event/data:

- What is the *relevant* context, and *how* is it relevant?
- What are the tensions/dilemmas/conflicts of interest/disagreements?
- What is the origin of these tensions, dilemmas, conflicts, etc.?
- What possible lines for future development do these tensions etc. suggest?

4 Five Key Questions for Going Beyond Initial Interpretations

The following series of linked questions (adapted from Hart, 1995) is designed to help in *re-interpreting* events, situations, data, etc., in order to take our thinking forward. In some respects they include and sum up both the reflexive and the dialectical principles.

- What other things are influencing this event, situation, data, etc.?
- How might this event, situation, data, etc. be understood in a contrasting way?
- How might this be understood by the other person/people involved?
- What are my feelings about this and what do these feelings tell me about my original interpretation?
- What else do I need to do/find out about in order to reach an adequate understanding of this?

C.4. CONSOLIDATED FRAMEWORK FOR IMPLEMENTATION RESEARCH CONSTRUCTS (BACK, CH. 3) (BACK, CH.8)

Consolidated Framework for Implementation Research Constructs			
CFIR Website			
Construct		**Short Description**	
I. INTERVENTION CHARACTERISTICS		Original Description	**Our project-specific description**
A	Intervention Source	Perception of key stakeholders about whether the intervention is externally or internally developed.	*Who do faculty, residents & students see as driving the SNAPPS introduction?*
B	Evidence Strength & Quality	Stakeholders' perceptions of the quality and validity of evidence supporting the belief that the intervention will have desired outcomes.	*Do faculty/trainees believe that SNAPPS is a better way to do teaching?*
C	Relative Advantage	Stakeholders' perception of the advantage of implementing the intervention versus an alternative solution.	*Do faculty/trainees see advantages over the current (traditional) standard vs SNAPPS for teaching on ward rounds?*
D	Adaptability	The degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs.	*How easily can faculty/trainees make SNAPPS fit into the PMH setting? (i.e. how adaptable is SNAPPS?)*
E	Trialability	The ability to test the intervention on a small scale in the organization, and to be able to reverse course (undo implementation) if warranted.	*Did faculty/trainees see that SNAPPS could be tried/tested before being a mandatory way to teach?*
F	Complexity	Perceived difficulty of implementation, reflected by duration, scope, radicalness, disruptiveness,	*How difficult was SNAPPS to learn? And how disruptive was SNAPPS? Who was all*

			centrality, and intricacy and number of steps required to implement.	*effected by SNAPPS? How central was SNAPPS to the ward round?*
	G	Design Quality & Packaging	Perceived excellence in how the intervention is bundled, presented, and assembled.	*Perceptions on how it was introduced to the department?*
	H	Cost	Costs of the intervention and costs associated with implementing the intervention including investment, supply, and opportunity costs.	*How much did it/does it cost to implement SNAPPS?*
	II. OUTER SETTING			
	A	Patient Needs & Resources	The extent to which ~~patient~~ learner needs, as well as barriers and facilitators to meet those needs, are accurately known and prioritized by the organization.	*How well are learner's needs known, prioritized and tried to meet those needs?*
	B	Cosmopolitanism	The degree to which an organization is networked with other external organizations.	*How integrated into other institutions in the Department of Paediatrics at PMH and ways of doing things?*
	C	Peer Pressure	Mimetic or competitive pressure to implement an intervention; typically because most or other key peer or competing organizations have already implemented or are in a bid for a competitive edge.	*Is there pressure from other faculty to improve teaching on ward rounds? Or because some faculty started to use SNAPPS, did other faculty feel "mimetic pressure" to do the same?*
	D	External Policy & Incentives	A broad construct that includes external strategies to spread interventions, including policy and regulations (governmental or other central entity), external mandates, recommendations and guidelines, pay-for-performance, collaboratives, and public or benchmark reporting.	*What incentives to improve or change teaching methods on rounds are there outside the department? (i.e. Does UB or MOHW prioritize clinical teaching? If yes, in what ways?)*
	III. INNER SETTING			
	A	Structural Characteristics	The social architecture, age, maturity, and size of an organization.	*What is the social architect of the Department of Paediatrics? And how does this influence clinical teaching?*
	B	Networks & Communications	The nature and quality of webs of social networks and the nature and quality of formal and informal communications within an organization.	*What is the sense of teamwork (shared vision; bonding, etc.) within the Dept and between groups? How effective is communication*

				(common goals; clear goals, etc.) within the Dept and between groups?
	C	Culture	Norms, values, and basic assumptions of a given organization.	*What is the organizational culture within the Dept?*
	D	Implementation Climate	The absorptive capacity for change, shared receptivity of involved individuals to an intervention, and the extent to which use of that intervention will be rewarded, supported, and expected within their organization.	*What is the implementation climate (readiness for change) in the Dept? (See below)*
	1	Tension for Change	The degree to which stakeholders perceive the current situation as intolerable or needing change.	*To what degree did faculty/trainees feel like the traditional ward rounds needed to be changed?*
	2	Compatibility	The degree of tangible fit between meaning and values attached to the intervention by involved individuals, how those align with individuals' own norms, values, and perceived risks and needs, and how the intervention fits with existing workflows and systems.	*How does SNAPPS 'fit' with faculty/trainees' values, risks/needs, and workflow?*
	3	Relative Priority	Individuals' shared perception of the importance of the implementation within the organization.	*How important was implementing SNAPPS to faculty and trainees?*
	4	Organizational Incentives & Rewards	Extrinsic incentives such as goal-sharing awards, performance reviews, promotions, and raises in salary, and less tangible incentives such as increased stature or respect.	*Were there any incentives or rewards for faculty/trainees to learn and use SNAPPS?*
	5	Goals and Feedback	The degree to which goals are clearly communicated, acted upon, and fed back to staff, and alignment of that feedback with goals.	*Did the SNAPPS implementation project have ongoing feedback for faculty/trainees?*
	6	Learning Climate	A climate in which: a) leaders express their own fallibility and need for team members' assistance and input; b) team members feel that they are essential, valued, and knowledgeable partners in the change process; c) individuals feel psychologically safe to try	*What is the Dept's learning climate? (i.e. how safe did faculty and trainees feel to test SNAPPS on their ward rounds?)*

			new methods; and d) there is sufficient time and space for reflective thinking and evaluation.	
	E	Readiness for Implementation	Tangible and immediate indicators of organizational commitment to its decision to implement an intervention.	*What is the Dept's readiness for implementation? (i.e. how ready were faculty/trainees to implement SNAPPS?) (See below)*
	1	Leadership Engagement	Commitment, involvement, and accountability of leaders and managers with the implementation.	*What was the level of commitment from Dept leaders to implementing SNAPPS?*
	2	Available Resources	The level of resources dedicated for implementation and on-going operations, including money, training, education, physical space, and time.	*What resources were available to implement SNAPPS?*
	3	Access to Knowledge & Information	Ease of access to digestible information and knowledge about the intervention and how to incorporate it into work tasks.	*Overall, how "digestible" were the six SNAPPS steps for faculty/trainees to be able to incorporate into their ward round?*
	IV. CHARACTERISTICS OF INDIVIDUALS			
	A	Knowledge & Beliefs about the Intervention	Individuals' attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.	*Were faculty/trainees knowledgeable about SNAPPS? Did they have the skill to use SNAPPS? Did use of SNAPPS result in a positive or negative experience?*
	B	Self-efficacy	Individual belief in their own capabilities to execute courses of action to achieve implementation goals.	*Did faculty/trainees feel confident to use SNAPPS?*
	C	Individual Stage of Change	Characterization of the phase an individual is in, as he or she progresses toward skilled, enthusiastic, and sustained use of the intervention.	*Did faculty/trainees progress through the stages of change (skill, enthusiasm, sustain, etc.) during the SNAPPS project?*
	D	Individual Identification with Organization	A broad construct related to how individuals perceive the organization, and their relationship and degree of commitment with that organization.	*How do faculty and trainees perceive working at PMH within the Dept of Paeds? What is the general level of job satisfaction, commitment to MOHW/UB, and degrees of emotional exhaustion?*

	E	Other Personal Attributes	A broad construct to include other personal traits such as tolerance of ambiguity, intellectual ability, motivation, values, competence, capacity, and learning style.	*Any other individual characteristics or factors that might influence the faculty or trainees to implement SNAPPS on their ward rounds? (i.e. Botswana culture? Perceptions of north-south relationships? etc.?)*
	V. PROCESS			
	A	Planning	The degree to which a scheme or method of behavior and tasks for implementing an intervention are developed in advance, and the quality of those schemes or methods.	*What went into planning the SNAPPS orientation and implementation process for the dept?*
	B	Engaging	Attracting and involving appropriate individuals in the implementation and use of the intervention through a combined strategy of social marketing, education, role modeling, training, and other similar activities.	*How were faculty and trainees engaged in the SNAPPS implementation project?*
	1	Opinion Leaders	Individuals in an organization who have formal or informal influence on the attitudes and beliefs of their colleagues with respect to implementing the intervention.	*Did faculty/trainee "opinion leaders" (expect or peer) emerge during the SNAPPS implementation?*
	2	Formally Appointed Internal Implementation Leaders	Individuals from within the organization who have been formally appointed with responsibility for implementing an intervention as coordinator, project manager, team leader, or other similar role.	*Were there any formally appointed SNAPPS implementation leaders?*
	3	Champions	"Individuals who dedicate themselves to supporting, marketing, and 'driving through' an [implementation]" [101] (p. 182), overcoming indifference or resistance that the intervention may provoke in an organization.	*Were there any identified 'champions' during the SNAPPS implementation*
	4	External Change Agents	Individuals who are affiliated with an outside entity who formally influence or facilitate intervention decisions in a desirable direction.	*Were there any external influencers during the SNAPPS implementation?*
	C	Executing	Carrying out or accomplishing the implementation according to plan.	*Was SNAPPS implemented as planned? Were there things missing from the original plan that would have supported SNAPPS*

				implementation? How was SNAPPS executed on individual ward rounds?
	D	Reflecting & Evaluating	Quantitative and qualitative feedback about the progress and quality of implementation accompanied with regular personal and team debriefing about progress and experience.	*How was the SNAPPS implementation process measured and captured over time?*

APPENDIX D – ETHICS (BACK, CH. 3)

Below are the copies of the original ethic board approvals from:

(1) Republic of Botswana Ministry of Health and Wellness, Health Research and Development Division;

(2) University of Botswana Office of Research and Development;

(3) Princess Marina Hospital Research and Ethics Committee;

(4) University of Cape Town Faculty of Health Sciences Human Research Ethics Committee;

(5) The Children's Hospital of Philadelphia Institutional Review Board;

and (6) University of Pennsylvania Institutional Review Board.

March 2023

TELEPHONE: 363 2766
FAX: 391 0647
TELEGRAMS: RABONGAKA
TELEX: 2818 CARE BD

Republic of Botswana

MINISTRY OF HEALTH
PRIVATE BAG 0038
GABORONE

REFERENCE NO: HPDME: 13/18/1 Vol. X (475) **22 April 2016**

Health Research and Development Division

Dr. Loeto Mazhani
P O Box 80830
Gaborone
Botswana

Dear Dr. Mazhani

PERMIT: **"OPTIMIZING THE LEARNING & TEACHING ENVIRONMENT OF PEDIATRIC ROUNDS"**

Your application for a research permit for the above stated research protocol refers. We note that your proposal has been reviewed and approved by University of Botswana Institutional Review Board.

Permission is therefore granted to conduct the above mentioned study. This approval is valid for a period of 1 year effective 22 April 2016.

This permit does not however give you authority to collect data from the selected site(s) without prior approval from the management. Consent from the identified individuals should be obtained at all times.

The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal must be submitted to the Health Research and Development Division in the Ministry of Health for consideration and approval.

Furthermore, you are requested to submit at least one hardcopy and an electronic copy of the report to the Health Research, Ministry of Health within 3 months of completion of the study. Approval is for academic fulfillment only. Copies should also be submitted to all other relevant authorities.

If you have any questions please do not hesitate to contact Mr. P. Khulumani at pkhulumani@gov.bw, Tel +267-3914467 or Lemphi Moremi at lamoremi@gov.bw or Tel: +267-3632754. Thank you for your cooperation and your commitment to the protection of human subjects in research.

Yours sincerely

P. Khulumani
For /Permanent Secretary

MINISTRY OF HEALTH RESEARCH DIVISION
2016 -04- 22
P. BAG 0038
GABORONE
REPUBLIC OF BOTSWANA

MINISTRY of HEALTH

Vision: *Model of Excellence in Quality Health Services*
Values: *Botho, Equity, Timeliness, Customer Focus, Teamwork, Accountability*

BOTSWANA

UNIVERSITY of BOTSWANA

Office of the Deputy Vice Chancellor (Academic Affairs)

Office of Research and Development

Corner of Notwane and Mobuto Road, Gaborone, Botswana

Pvt Bag 00708 Gaborone Botswana

Tel: [267] 355 2900
Fax: [267] 395 7573
E-mail: research@mopipi.ub.bw

Ref: UBR/RES/IRB/1625
12 April , 2016
The Permanent Secretary
Ministry Of Health
Private Bag 0038
Gaborone
Botswana

RE: EXEMPTION FROM REVIEW OF STUDY BY THE UB INSTITUTIONAL REVIEW BOARD

Since it is a requirement that everyone undertaking research in Botswana should obtain a Research Permit from the relevant arm of Government, The Office of Research and Development at the University of Botswana has been tasked with the responsibility of overseeing research at UB including facilitating the issuance of Research permits for all UB Researchers inclusive of students and staff.

I am writing this letter in support of an application for a research permit for Dr Loeto Mazhani who is the acting head, Department Of Paediatrics and Adolescent Health at the School of Medicine , University Of Botswana. The title of the proposed study is **" OPTIMIZING THE LEARNING & TEACHING ENVIRONMENT OF PAEDIATRIC ROUNDS."** The proposal was reviewed on an expedited basis because the study falls under exempt research category 1 & 2 according to the CFR 45(6) and the Ministry Of Health Standard Operating Procedures (2011) which states that:

> **1. Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.**
>
> **5. Research and demonstration projects which are conducted by or subject to the approval of State/Organization/Department heads, and which are designed to study, evaluate, or otherwise examine: a. public benefit or service programs; b. procedures for obtaining benefits or services under those programs; c. possible changes in or alternatives to those programs or procedures; d. possible changes in methods or levels of payment for benefits or services under those programs.**

The Office of Research and Development is satisfied with the process for data collection, analysis and the intended utilization of findings from this research.

We will appreciate your kind and timely consideration of this application.

We thank you for your usual cooperation and assistance

Sincerely,

2016 -04- 12

Dr. M. Kasule
Assistant Director Research Ethics
Office of Research and Development

PLOT 1836 HOSPITAL WAY
TELEPHONE: 3621400
FAX: 3973776

RE PUBLIC OF BOTSWANA

PRINCESS MARINA HOSPITAL
P. O. BOX 258
GABORONE
BOTSWANA

REF: PMH 5/79(243- 1- 2016) **26th May 2016**

Dr Savarra M. Mantozor
Princess Marina Hospital

Dear Dr Savanna Mantzor

RE: Optimizing the Learning and Teaching Environment of Paediatric Rounds

Reviewers:
Dr J. Mkubwa
Dr M Ookeditse
Mr E Tawanana

Date of Review:
21st April 2016

The research and Ethics Committee of Princess Marina Hospital met and discussed your request to conduct the study with the aforementioned title and have decided to give you a conditional Approval with a condition that you present the approval letter from the Health Research and Development Committee of the Ministry Health.

This approval is valid for a period of 1 year starting from the 26th of May 2016. The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal must be submitted to both the Health Research and Development Division in the Ministry of Health and the Research and Ethics Committee in Princess Marina Hospital for approval.

Thank you.

Sincerely,

Ephraim O. Tawanana
For Secretary Research and Ethics Committee

UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee

Room E53-46 Old Main Building
Groote Schuur Hospital
Observatory 7925
Telephone [021] 406 6626
Email: shuretta.thomas@uct.ac.za
Website: www.health.uct.ac.za/fhs/research/humanethics/forms

28 November 2016

HREC REF: 853/2016

Prof V Burch
Medicine
J-Floor, OMB

Dear Prof Burch

PROJECT TITLE: OPTIMIZING LEARNING AND TEACHING ON PAEDIATRIC WARD ROUNDS

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

Approval is granted for one year until the 30th November 2017.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period. (Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

Please quote the HREC REF in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval before the research may occur.

The HREC acknowledge that the student, Savarra Mantzor will also be involved in this study.

Yours sincerely

PROFESSOR M BLOCKMAN
CHAIRPERSON, FHS HUMAN RESEARCH ETHICS COMMITTEE
Federal Wide Assurance Number: FWA00001637.
Institutional Review Board (IRB) number: IRB00001938
This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical

The Children's Hospital of Philadelphia®
RESEARCH INSTITUTE

INSTITUTIONAL REVIEW BOARD

Date: July 20, 2016

To: Andrew Steenhoff
CC: Savarra Mantzor
From: The Committees for the Protection of Human Subjects (IRB)

Re: IRB 16-012808, **Protocol Title:** "Optimizing the Learning & Teaching Environment of Pediatric Rounds"
Part I: Qualitative Research Proposal
Part II: Quality Improvement Project Proposal

Sponsor or Funder: The Children's Hospital of Philadelphia (CHOP)

IRB SUBMISSION: COOPERATIVE IRB REVIEW ACCEPTED

Dear Dr. Steenhoff,

The study referenced above was reviewed by Dr. Barbara Engel, Chair of the CHOP IRB (or her authorized designee), on 7/20/2016. The CHOP IRB has accepted the University of Pennsylvania IRB's review. The University of Pennsylvania IRB is now the IRB of record for this study.

University of Pennsylvania IRB Approval Date: June 8, 2016
CHOP IRB Acceptance Date: July 20, 2016
IRB Expiration Date: June 7, 2017

The following documents were reviewed**:**

- Protocol (version 2, dated January 2016)
- Appendix E - Information Sheet for Participants (version 1, dated November 2015)
- Appendix C - Recruitment Flyer (version 2, dated January 2016)
- Appendix A - Focus Group Discussion Questions (version 2, dated January 2016)
- Penn-CHOP Determination form (attached April 27, 2016)
- University of Pennsylvania Initial IRB Approval Letter (dated January 20, 2016)
- University of Pennsylvania Final IRB Approval Letter/executed Penn-CHOP determination form (dated June 9, 2016)
- Penn Approval Letter (dated July 15, 2016)
- Savarra Mantzor Support Letter (dated October 16, 2015)
- University of Botswana Exemption Letter (dated April 12, 2016)
- PMH IRB Approval Letter (dated May 26, 2016)

3535 Market Street, Suite 1200, Philadelphia, PA, 19104
Tel: 215-590-2830
Email: IRBOffice@email.chop.edu
Website: https://irb.research.chop.edu/

- HRDC Approval Letter (dated April 22, 2016)

Please refer to the eIRB application for a complete list of all documents submitted to the IRB.

Please note the following conditions for conduct of this study:

1. **IRB CORRESPONDENCE:** Approval documents (i.e. continuing review/progress reports, amendments) from the IRB of record should be forwarded to the CHOP IRB in a timely manner. This includes reporting to CHOP when the study is complete.
2. **MODIFICATIONS:** Changes to study staff at CHOP need to be approved by the CHOP IRB by completing a staff change amendment in eIRB. Non-staff related changes to the study or study materials need to be reported to the CHOP IRB by using the "update study" button and attaching the corresponding approval letter and modified documents.
3. **REPORTABLE EVENTS:** On-site reportable events such as serious adverse events, protocol deviations/violations or any unanticipated problems involving risk to subjects or others, or non-compliance that occur during the conduct of this study must also be reported to the CHOP IRB in a timely manner, as outlined in the CHOP IRB Policy 408: Serious Adverse Events and Unanticipated Problems Related to Research.

If you have any questions, please click on the IRB# (above) and contact the IRB analyst listed in the study workspace.

DHHS Federal Wide Assurance Identifier: FWA0000459

IS_012

**** *This memorandum constitutes official CHOP IRB correspondence.* ****

3535 Market Street, Suite 1200, Philadelphia, PA, 19104
Tel: 215-590-2830
Email: IRBOffice@email.chop.edu
Website: https://irb.research.chop.edu/

University of Pennsylvania
Office of Regulatory Affairs
3624 Market St., Suite 301 S
Philadelphia, PA 19104-6006
Ph: 215-573-2540/ Fax: 215-573-9438
INSTITUTIONAL REVIEW BOARD
(Federalwide Assurance # 00004028)

15-Jul-2016

Tonya K Arscott-Mills
tonyaarscottmills@yahoo.com
Attn: Relebogile Thipe
thre2001@gmail.com
Jennifer Chapman
ChapmanJ1@email.chop.edu
CC: irbcorr@email.chop.edu

PRINCIPAL INVESTIGATOR	: Tonya K Arscott-Mills
TITLE	: Optimizing the Learning & Teaching Environment of Pediatric Rounds
SPONSORING AGENCY	: No Sponsor Number
PROTOCOL #	: 824038
REVIEW BOARD	: IRB #7

Dear Dr. Arscott-Mills:

IRB approval has been given to the above referenced protocol as of 08-Jun-2016. This study will be due for continuing review on or before 07-Jun-2017.

Approval by the IRB does not necessarily constitute authorization to initiate the conduct of a human subject research study.

Principal investigators are responsible for assuring final approval from other applicable school, department, center or institute review committee(s) or boards has been obtained. If any of these committees require changes to the IRB-approved protocol and informed consent/assent document(s), the changes must be submitted to and approved by the IRB prior to beginning the research study.

If this protocol involves cancer research with human subjects, biospecimens, or data, you may not begin the research until you have obtained approval or proof of exemption from the Cancer Center Clinical Trials Review and Monitoring Committee.

The revisions, in response to review by the IRB, were reviewed and approved.

The following documents were included with this review:
- HS-ERA Modification Submission, confirmation cbbfacge, submitted 06/06/2016
- IRB Authorization Agreement between CHOP & PENN, uploaded 06/06/2016
- Health Research and Development Division Approval letter, dated 04/22/2016
- Princess Marina Hospital Approval letter, dated 05/26/2016
- UB Approval letter, dated 04/12/2016

The following documents were submitted with the initial submission under confirmation code: bjjfhbae**and are now approved:**
-CITI Training Report of Completion for Andrew Steenhoff, passed 11/6/15
-Resubmission Cover Letter, dated 1/14/16
-Study Protocol, version 2, dated Jan 2016
-Recruitment Flyers, Emails, & Announcements, uploaded 1/14/16
-Analysis Plan, uploaded 11/19/15
-Student, Resident & Chief Resident Focus Group Discussion Questions, uploaded 11/19/15
-Medical Student Written Questionnaire, uploaded 11/19/15
-Other Study Personnel List, uploaded 11/19/15
-CITI Training Report of Completion for Savarra Mantzor, passed 12/15/13
-Informed Consent Form & Information Sheet, version 1, dated Nov 2015
-Pediatrician Interview Questions, uploaded 11/24/15
-Sign-up Sheet for Focus Group Discussions, uploaded 12/14/15

The IRB reviewed and approved a waiver of written documentation of consent as per HHS 45 CFR 46.117(c)(2) or FDA 21 CFR 56.109(c)(1): That the research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the research context {e.g. Telephone survey}.

When enrolling subjects at a site covered by the University of Pennsylvania's IRB, a copy of the IRB approved informed consent form with the IRB approved from/to stamp must be used unless a waiver of written documentation of consent has been granted.

If you have any questions about the information in this letter, please contact the IRB administrative staff. Contact information is available at our website: http://www.upenn.edu/IRB/directory.

Thank you for your cooperation.

Sincerely,

Renee Crews

Digitally signed by Renee Crews
Date: 2016.07.15 10:32:00 -04'00'

IRB Administrator

APPENDIX E – RESULTS

E.1. DREEM SURVEY RESULTS (BACK, CH. 4)

(n=12 students)
Questions were scored using a 0 to 4 five-point Likert scale, with
0 = Strongly disagree, 1 = Disagree, 2 = Unsure, 3 = Agree, and 4 = Strongly agree.
Negative questions were scored in reverse, (*italicised*).
The maximum possible score is 200 and the minimum score is 0

Question	Mean	Standard deviation	Median	Range
Students' perception of teaching, (max 48)	**28.4 (59%)**	**9.5**	**28.5**	**14-41**
1. I am encouraged to participate on ward rounds	3.3	0.7	3.0	2-4
2. The teaching is sufficiently concerned to develop my confidence	2.6	0.7	3.0	2-4
3. The teaching encourages me to be an active learner	2.7	1.0	2.5	1-4
4. The teaching is well focused	2.2	1.2	2.0	0-4
5. The teaching is sufficiently concerned to develop my competence	2.9	0.9	3.0	1-4
6. I am clear about the learning objectives on ward rounds	1.7	1.1	1.5	0-4
7. The teaching is often stimulating	2.7	0.9	3.0	1-4
8. The teaching time is put to good use	2.5	1.5	3.0	0-4
9. The teaching is student centred	2.2	1.4	2.0	0-4
10. Long-term learning is emphasized over short term	2.6	1.2	3.0	0-4
11. The teaching is too teacher-centred	2.3	1.3	2.0	0-4
12. The teaching over-emphasizes factual learning	1.8	0.7	2.0	1-3
Students' perceptions of teachers, (max 44)	**25.4 (58%)**	**8.1**	**27**	**12-36**
13. The teachers are good at providing feedback to students	1.6	1.1	1.5	0-3
14. The teachers have good communications skills with patients/families	2.7	0.9	3.0	1-4
15. The teachers are knowledgeable	3.3	0.7	3.0	2-4
16. The teachers give clear examples	2.8	1.0	3.0	1-4
17. The teachers are well prepared for ward rounds	2.8	1.1	3.0	1-4
18. The teachers provide constructive criticism	2.4	0.9	2.5	1-4
19. The teachers ridicule the students	1.9	1.3	2.0	0-4
20. The teachers get angry on ward rounds	1.7	1.6	1.5	0-4
21. The teachers are authoritarian	1.5	1.4	1.0	0-4
22. The teachers are patient with patients/families	2.9	1.0	3.0	1-4
23. The students irritate the teachers	2.6	1.2	2.5	1-4
Students' academic self-perceptions, (max 32)	**19.5 (61%)**	**5.0**	**20.5**	**9-27**
24. I am able to memorize all I need	1.5	0.8	2.0	0-3
25. Much of what I have to learn seems relevant to a career in medicine	3.2	0.7	3.0	2-4
26. I feel I am being well prepared for my profession	2.7	1.0	3.0	1-4
27. Last year's work has been a good preparation for this year's work	2.1	1.4	3.0	0-4

28. My problem-solving skills are being well developed here	2.3	1.1	3.0	1-4
29. I am confident about passing this year	2.9	1.0	3.0	1-4
30. I have learned a lot about empathy in my profession	3.0	1.0	3.0	1-4
31. Learning strategies which worked for me before continue to work for me now	2.1	1.2	3.0	0-3
Students' perceptions of atmosphere, (max 48)	**22.5 (47%)**	**11.1**	**21.5**	**4-44**
32. The atmosphere is relaxed during ward rounds	1.5	1.0	1.5	0-3
33. I feel able to ask the questions I want	2.2	1.2	2.5	0-4
34. I feel comfortable on ward rounds socially	1.4	1.1	1.5	0-3
35. There are opportunities for me to develop interpersonal skills	2.1	1.2	2.0	0-4
36. The atmosphere is relaxed during seminars/tutorials	2.2	1.5	3.0	0-4
37. The enjoyment outweighs the stress of studying medicine	1.4	1.4	1.0	0-4
38. The atmosphere motivates me as a learner	2.3	1.1	2.5	0-4
39. I am able to concentrate well	1.4	1.2	1.5	0-3
40. The atmosphere is relaxed during the ward teaching	1.7	1.2	2.0	0-4
41. The paediatric department is well timetabled	1.8	1.2	2.0	0-3
42. I find the experience of paediatric rotation disappointing	2.3	1.3	2.0	0-4
43. Cheating is a problem in the paediatric department	2.3	1.5	2.0	0-4
Student's social self-perceptions, (max 28)	**13.8 (49%)**	**5.3**	**13.5**	**6-22**
44. I have good friends in this school	2.5	1.3	2.0	0-4
45. There is a good support system for students who get stressed	2.0	1.4	2.5	0-4
46. I am too tired to enjoy paediatrics	1.9	1.3	2.0	0-4
47. I am rarely bored of paediatrics	1.4	1.2	1.0	0-3
48. My accommodation is pleasant	2.3	1.3	2.0	0-4
49. My social life is good	2.4	1.2	2.5	0-4
50. I seldom feel lonely	1.6	1.0	1.5	0-4
Total Score (max 200)	**109.6 (55%)**	**32.9**	**111**	**62-157**

E.2. PHEEM SURVEY RESULTS (BACK, CH. 4)

(n=9 residents)
Questions were scored using a 0 to 4 five-point Likert scale, with
0 = Strongly disagree, 1 = Disagree, 2 = Unsure, 3 = Agree, and 4 = Strongly agree.
Negative questions were scored in reverse, (*italicised*).
The maximum possible score is 160 and the minimum score is 0.

Questions	Mean	Standard deviation	Median	Range
Perceptions of role autonomy, (max 52)	**29.6 (57%)**	**6.6**	**31.0**	**18-38**
1. I have a contract of employment that provides information about hours of work	1.0	1.4	0.5	0-4
4. I had an informative induction programme	1.9	0.8	2.0	1-3
5. I have the appropriate level of responsibility in this post	3.3	0.5	3.0	3-4
8. I have to perform inappropriate tasks	2.7	1.1	2.0	1-4
9. There is an informative Junior Doctors Handbook	1.4	1.3	1.0	0-3
11. I am bleeped inappropriately	2.8	1.0	3.0	1-4
14. There are clear clinical protocols in this post	2.1	1.3	2.0	1-4
18. I have the opportunity to provide continuity of care	3.2	0.4	3.0	3-4
29. I feel part of a team working here	2.9	0.8	3.0	2-4
30. I have opportunities to acquire the appropriate practical procedures for my level of training	2.7	1.0	3.0	1-4
32. My workload in this job is fine	1.3	1.1	2.0	0-2
34. The training in this post makes me feel ready to be a Consultant	2.1	0.8	2.0	1-3
40. My clinical teachers promote an atmosphere of mutual respect	2.4	1.3	3.0	0-4
Perceptions of teaching, (max 60)	**34.9 (58%)**	**12.1**	**31.0**	**20-54**
2. My clinical teachers set clear expectations	2.4	1.1	2.0	1-4
3. I have protected educational time in this post	0.3	0.7	0.0	0-2
6. I have good clinical supervision at all times	2.8	0.8	3.0	2-4
10. My clinical teachers have good communication skills	2.3	1.1	2.0	1-4
12. I am able to participate actively in educational events	2.3	1.0	2.0	1-3
15. My clinical teachers are enthusiastic	2.8	1.0	2.0	2-4
21. There is access to an educational programme relevant to my needs	2.0	1.1	2.0	0-4
22. I get regular feedback from seniors	2.2	1.3	2.0	1-4
23. My clinical teachers are well organized	2.2	1.0	2.0	1-4
27. I have enough clinical learning opportunities for my needs	2.3	1.0	2.0	1-3
28. My clinical teachers have good teaching skills	2.6	1.1	3.0	1-4
31. My clinical teachers are accessible	2.9	1.1	3.0	1-4
33. Senior staff utilize learning opportunities effectively	2.1	1.1	2.0	1-3
37. My clinical teachers encourage me to be an independent learner	3.3	0.5	3.0	3-4
39. The clinical teachers provide me with good feedback on my strengths and weaknesses	2.2	1.2	2.0	0-4
Perceptions of social support, (max 44)	**23.6 (54%)**	**5.2**	**25.0**	**17-31**

7. There is racism in this post	3.6	0.7	4.0	2-4
13. There is sex discrimination in this post	3.6	0.5	4.0	3-4
16. I have good collaboration with other doctors in my grade	3.6	0.5	4.0	3-4
19. I have suitable access to careers advice	2.0	1.1	2.0	1-3
20. This hospital has good quality accommodation for junior doctors, especially when on call	0.7	1.1	0.0	0-2
24. I feel physically safe within the hospital environment	2.3	1.3	2.0	0-4
25. There is a no-blame culture in this post	2.3	1.3	2.0	1-4
26. There are adequate catering facilities when I am on call	0.2	0.4	0.0	0-1
35. My clinical teachers have good mentoring skills	2.2	0.8	2.0	1-3
36. I get a lot of enjoyment out of my present job	2.1	1.4	2.0	0-3
38. There are good counselling opportunities for junior doctors who fail to complete their training satisfactorily	1.0	0.7	1.0	0-2
Total Score (max 156)	**88.0 (56%)**	**23.0**	**87.0**	**55-123**

E.3. Elements for Effective Learning survey results; Medical students (back, Ch. 4)(Appendix B.9)

(n=11 students)
Questions were scored using a 0 to 5 six-point Likert scale, with
0 = Strongly disagree, 1 = Disagree, 2 = Somewhat disagree, 3 = Somewhat agree, 4 = Agree, and 5 = Strongly agree.
Negative questions were scored in reverse, (*italicised*).
The maximum possible score is 180 and the minimum score is 0.

Questions	Mean	Standard deviation	Median	Range
Establish a positive learning environment, (max 50)	**35.0 (70%)**	**8.0**	**34.0**	**23-48**
1. Paediatric ward rounds have a learning environment where I feel involved to perform as the presenting medical student or resident.	3.8	0.9	4.0	3-5
2. Paediatric ward rounds have a learning environment where I feel stimulated to perform as the presenting medical student or resident.	3.7	0.6	4.0	3-5
3. Paediatric ward rounds have a learning environment where I feel respected to perform as the presenting medical student or resident.	3.4	1.1	4.0	1-5
4. Paediatric ward rounds have a learning environment where I feel comfortable to perform as the presenting medical student or resident.	3.3	0.8	3.0	2-4
5. Paediatric ward rounds have a learning environment where I feel involved to actively participate as a member of the team.	3.7	1.0	4.0	2-5
6. Paediatric ward rounds have a learning environment where I feel stimulated to actively participate as a member of the team.	3.7	0.6	4.0	3-5
7. Paediatric ward rounds have a learning environment where I feel respected to actively participate as a member of the team.	3.5	0.9	4.0	2-5
8. Paediatric ward rounds have a learning environment where I feel comfortable to actively participate as a member of the team.	3.5	0.8	3.0	2-5
9. Paediatric ward rounds promote an atmosphere where uncertainty is respected.	3.2	1.2	3.0	2-5
10. On paediatric ward rounds, teachers and learners are encouraged to acknowledge their limitations. (I.e. When I do not know an answer, I am not scolded, but instead am encouraged to look-up or discuss the answer.)	3.3	1.6	4.0	1-5
Control of teaching session, (max 30)	**17.0 (57%)**	**4.7**	**18.0**	**8-22**
11. Paediatric ward rounds are well organized for appropriate learning.	3.4	0.9	3.0	2-5
12. There are minimal interruptions during ward rounds.	2.8	1.2	3.0	1-4
13. Ward rounds are well paced and the time spent rounding on each patient is appropriate.	2.3	1.3	2.0	1-4

14. On paediatric ward rounds, there is a clearly defined agenda of learning topics.	2.5	1.2	3.0	0-4
15. Teaching points are focused with minimal deviations.	2.9	0.9	3.0	1-4
16. Learners are encouraged to help focus teaching topics.	3.2	1.1	3.0	2-5
Communication of goals, (max 30)	**14.8 (49%)**	**7.6**	**13.0**	**1-25**
17. The goals and objectives of paediatric ward rounds have been clearly explained to me.	2.1	1.6	2.0	0-4
18. I understand the purpose of paediatric ward rounds.	2.9	1.3	3.0	1-5
19. The goals and objectives of my role as a presenter during paediatric ward rounds have been clearly explained to me.	2.5	1.6	2.0	0-5
20. I understand what is expected of me as a presenter during paediatric ward rounds.	2.5	1.3	2.0	0-4
21. The goals and objectives of my role as a participant during paediatric ward rounds have been clearly explained to me.	2.4	1.2	2.0	0-4
22. I understand what is expected of me as a participant during paediatric ward rounds.	2.5	1.2	3.0	0-4
Promotion of understanding and retention, (max 40)	**26.0 (65%)**	**4.9**	**26.0**	**19-33**
23. During paediatric ward rounds, specific key learning points are identified in a clear manner.	2.7	1.1	3.0	0-4
24. During paediatric ward rounds, I am encouraged to ask questions.	3.9	0.7	4.0	3-5
25. During paediatric ward rounds, I am stimulated to make comparisons and evaluations about my patients' diagnosis.	3.5	1.0	4.0	2-5
26. During paediatric ward rounds, I am encouraged to discuss my differential diagnoses.	3.5	1.2	3.0	2-5
27. During paediatric ward rounds, I am encouraged to discuss my thought process about my management plan.	3.7	1.1	4.0	2-5
28. During paediatric ward rounds, my role is limited to reporting or summarizing the patient case.	2.6	1.2	3.0	1-5
29. During paediatric ward rounds, if I am asked a question, it is usually asking only about facts, not my thinking process.	2.7	1.3	3.0	1-5
30. After paediatric ward rounds, I am able to retain specific key learning points discussed on rounds.	3.3	1.0	3.0	1-5
Feedback, (max 15)	**8.8 (59%)**	**3.9**	**9.0**	**1-15**
31. I receive frequent positive and constructive feedback after paediatric ward rounds.	2.9	1.3	3.0	0-5
32. The feedback I receive relates to a specific behaviour. (i.e. something I did or didn't do and can adjust).	3.2	1.2	3.0	1-5

33. I am encouraged to self-assess my own performance.	2.7	1.6	3.0	0-5
Self-directed learning, (max 15)	**10.1 (67%)**	**3.5**	**11.0**	**3-15**
34. After paediatric ward rounds, I feel motivated or stimulated to read further about cases presented.	3.4	1.1	3.0	2-5
35. I feel confident that I can utilize my available resources to read up on patients and topics after ward rounds.	3.5	1.1	4.0	1-5
36. I feel that those resources are adequate for my learning.	3.2	1.6	4.0	0-5
Total Score (max 180)	**111.7 (62%)**	**27.4**	**123.0**	**73-149**

E.4 Elements for Effective Learning Survey results, Communities of Practice; Medical students (back, Ch. 4)

(n=11 students)
Questions were scored using a 0 to 5 six-point Likert scale, with
0 = Strongly disagree, 1 = Disagree, 2 = Somewhat disagree, 3 = Somewhat agree, 4 = Agree, and 5 = Strongly agree.
Negative questions were scored in reverse, (*italicised*).
The maximum possible score is 120 and the minimum score is 0.

Questions	Mean	Standard deviation	Median	Range
Participation, (max 100)	**63.4 (63%)**	**13.9**	**67.0**	**44-83**
1. Paediatric ward rounds have a learning environment where I feel involved to perform as the presenting medical student or resident.	3.8	0.9	4.0	3-5
2. Paediatric ward rounds have a learning environment where I feel stimulated to perform as the presenting medical student or resident.	3.7	0.6	4.0	3-5
3. Paediatric ward rounds have a learning environment where I feel respected to perform as the presenting medical student or resident.	3.4	1.1	4.0	1-5
4. Paediatric ward rounds have a learning environment where I feel comfortable to perform as the presenting medical student or resident.	3.3	0.8	3.0	2-4
5. Paediatric ward rounds have a learning environment where I feel involved to actively participate as a member of the team.	3.7	1.0	4.0	2-5
6. Paediatric ward rounds have a learning environment where I feel stimulated to actively participate as a member of the team.	3.7	0.6	4.0	3-5
7. Paediatric ward rounds have a learning environment where I feel respected to actively participate as a member of the team.	3.5	0.9	4.0	2-5
8. Paediatric ward rounds have a learning environment where I feel comfortable to actively participate as a member of the team.	3.5	0.8	3.0	2-5
17. The goals and objectives of paediatric ward rounds have been clearly explained to me.	2.1	1.6	2.0	0-4
18. I understand the purpose of paediatric ward rounds.	2.9	1.3	3.0	1-5
19. The goals and objectives of my role as a presenter during paediatric ward rounds have been clearly explained to me.	2.5	1.6	2.0	0-5
20. I understand what is expected of me as a presenter during paediatric ward rounds.	2.5	1.3	2.0	0-4
21. The goals and objectives of my role as a participant during paediatric ward rounds have been clearly explained to me.	2.4	1.2	2.0	0-4
22. I understand what is expected of me as a participant during paediatric ward rounds.	2.5	1.2	3.0	0-4
24. During paediatric ward rounds, I am encouraged to ask questions.	3.9	0.7	4.0	3-5

25. During paediatric ward rounds, I am stimulated to make comparisons and evaluations about my patients' diagnosis.	3.5	1.0	4.0	2-5
26. During paediatric ward rounds, I am encouraged to discuss my differential diagnoses.	3.5	1.2	3.0	2-5
27. During paediatric ward rounds, I am encouraged to discuss my thought process about my management plan.	3.7	1.1	4.0	2-5
28. During paediatric ward rounds, my role is limited to reporting or summarizing the patient case.	2.6	1.2	3.0	1-5
29. During paediatric ward rounds, if I am asked a question, it is usually asking only about facts, not my thinking process.	2.7	1.3	3.0	1-5
Reification, (max 20)	**12.8 (64%)**	**4.6**	**14.0**	**2-19**
31. I receive frequent positive and constructive feedback after paediatric ward rounds.	2.9	1.3	3.0	0-5
32. The feedback I receive relates to a specific behaviour. (i.e. something I did or didn't do and can adjust).	3.2	1.2	3.0	1-5
35. I feel confident that I can utilize my available resources to read up on patients and topics after ward rounds.	3.5	1.1	4.0	1-5
36. I feel that those resources are adequate for my learning.	3.2	1.6	4.0	0-5
Total Score (max 120)	**76.2 (64%)**	**17.7**	**82.0**	**46-101**

E.5. Elements for Effective Learning survey results; Junior residents (back, Ch. 4)

(n=9 residents)
Questions were scored using a 0 to 5 six-point Likert scale, with
0 = Strongly disagree, 1 = Disagree, 2 = Somewhat disagree, 3 = Somewhat agree, 4 = Agree, and 5 = Strongly agree.
Negative questions were scored in reverse, (*italicised*).
The maximum possible score is 180 and the minimum score is 0.

Questions	Mean	Standard deviation	Median	Range
Establish a positive learning environment, (max 50)	**33.1 (66%)**	**10.7**	**32.0**	**14-46**
1. Paediatric ward rounds have a learning environment where I feel involved to perform as the presenting medical student or resident.	4.2	0.7	4.0	3-5
2. Paediatric ward rounds have a learning environment where I feel stimulated to perform as the presenting medical student or resident.	3.7	1.0	4.0	2-5
3. Paediatric ward rounds have a learning environment where I feel respected to perform as the presenting medical student or resident.	3.0	1.2	3.0	1-4
4. Paediatric ward rounds have a learning environment where I feel comfortable to perform as the presenting medical student or resident.	3.2	1.5	3.0	1-5
5. Paediatric ward rounds have a learning environment where I feel involved to actively participate as a member of the team.	4.0	1.3	4.0	1-5
6. Paediatric ward rounds have a learning environment where I feel stimulated to actively participate as a member of the team.	4.0	1.1	4.0	2-5
7. Paediatric ward rounds have a learning environment where I feel respected to actively participate as a member of the team.	3.2	1.2	3.0	1-5
8. Paediatric ward rounds have a learning environment where I feel comfortable to actively participate as a member of the team.	3.1	1.3	3.0	1-5
9. Paediatric ward rounds promote an atmosphere where uncertainty is respected.	2.0	1.7	2.0	0-4
10. On paediatric ward rounds, teachers and learners are encouraged to acknowledge their limitations. (I.e. When I do not know an answer, I am not scolded, but instead am encouraged to look-up or discuss the answer.)	2.7	1.7	3.0	0-5
Control of teaching session, (max 30)	**14.3 (48%)**	**7.2**	**14.0**	**7-29**
11. Paediatric ward rounds are well organized for appropriate learning.	2.7	1.3	3.0	1-5
12. There are minimal interruptions during ward rounds.	2.3	1.4	3.0	0-4
13. Ward rounds are well paced and the time spent rounding on each patient is appropriate.	2.2	1.6	2.0	0-5
14. On paediatric ward rounds, there is a clearly defined agenda of learning topics.	2.0	1.6	2.0	0-5

15. Teaching points are focused with minimal deviations.	2.4	1.1	2.0	1-5
16. Learners are encouraged to help focus teaching topics.	2.7	1.5	2.0	0-5
Communication of goals, (max 30)	**19.3 (64%)**	**7.8**	**20.0**	**6-30**
17. The goals and objectives of paediatric ward rounds have been clearly explained to me.	2.4	2.1	2.0	0-5
18. I understand the purpose of paediatric ward rounds.	3.7	0.7	4.0	3-5
19. The goals and objectives of my role as a presenter during paediatric ward rounds have been clearly explained to me.	3.0	1.7	4.0	0-5
20. I understand what is expected of me as a presenter during paediatric ward rounds.	3.8	0.8	4.0	3-5
21. The goals and objectives of my role as a participant during paediatric ward rounds have been clearly explained to me.	3.1	1.8	4.0	0-5
22. I understand what is expected of me as a participant during paediatric ward rounds.	3.3	1.5	3.0	0-5
Promotion of understanding and retention, (max 40)	**25.4 (64%)**	**6.3**	**23.0**	**18-37**
23. During paediatric ward rounds, specific key learning points are identified in a clear manner.	2.8	1.2	3.0	1-5
24. During paediatric ward rounds, I am encouraged to ask questions.	3.4	1.2	3.0	2-5
25. During paediatric ward rounds, I am stimulated to make comparisons and evaluations about my patients' diagnosis.	3.2	1.5	3.0	0-5
26. During paediatric ward rounds, I am encouraged to discuss my differential diagnoses.	3.8	0.8	4.0	3-5
27. During paediatric ward rounds, I am encouraged to discuss my thought process about my management plan.	3.7	1.0	4.0	2-5
28. During paediatric ward rounds, my role is limited to reporting or summarizing the patient case.	2.3	1.4	2.0	0-4
29. During paediatric ward rounds, if I am asked a question, it is usually asking only about facts, not my thinking process.	3.2	1.1	3.0	2-5
30. After paediatric ward rounds, I am able to retain specific key learning points discussed on rounds.	3.4	0.9	3.0	3-5
Feedback, (max 15)	**6.7 (44%)**	**4.0**	**7.0**	**0-13**
31. I receive frequent positive and constructive feedback after paediatric ward rounds.	2.1	1.2	2.0	0-4
32. The feedback I receive relates to a specific behaviour. (i.e. something I did or didn't do and can adjust).	2.2	1.4	2.0	0-4
33. I am encouraged to self-assess my own performance.	2.3	1.6	2.0	0-5

Self-directed learning, (max 15)	**10.7 (71%)**	**3.4**	**10.0**	**4-15**
34. After paediatric ward rounds, I feel motivated or stimulated to read further about cases presented.	3.3	1.3	3.0	1-5
35. I feel confident that I can utilize my available resources to read up on patients and topics after ward rounds.	3.9	0.9	4.0	2-5
36. I feel that those resources are adequate for my learning.	3.4	1.7	4.0	0-5
Total Score (max 180)	**109.6 (61%)**	**33.2**	**104.0**	**54-159**

E.6. Elements for effective learning survey results, Communities of practice; Junior residents (back, Ch. 4)

(n=9 residents)
Questions were scored using a 0 to 5 six-point Likert scale, with
0 = Strongly disagree, 1 = Disagree, 2 = Somewhat disagree, 3 = Somewhat agree, 4 = Agree, and 5 = Strongly agree.
Negative questions were scored in reverse, (*italicised*).
The maximum possible score is 120 and the minimum score is 0.

Questions	Mean	Standard deviation	Median	Range
Participation, (max 100)	**67.0 (67%)**	**18.4**	**66.0**	**32-93**
1. Paediatric ward rounds have a learning environment where I feel involved to perform as the presenting medical student or resident.	4.2	0.7	4.0	3-5
2. Paediatric ward rounds have a learning environment where I feel stimulated to perform as the presenting medical student or resident.	3.7	1.0	4.0	2-5
3. Paediatric ward rounds have a learning environment where I feel respected to perform as the presenting medical student or resident.	3.0	1.2	3.0	1-4
4. Paediatric ward rounds have a learning environment where I feel comfortable to perform as the presenting medical student or resident.	3.2	1.5	3.0	1-5
5. Paediatric ward rounds have a learning environment where I feel involved to actively participate as a member of the team.	4.0	1.3	4.0	1-5
6. Paediatric ward rounds have a learning environment where I feel stimulated to actively participate as a member of the team.	4.0	1.1	4.0	2-5
7. Paediatric ward rounds have a learning environment where I feel respected to actively participate as a member of the team.	3.2	1.2	3.0	1-5
8. Paediatric ward rounds have a learning environment where I feel comfortable to actively participate as a member of the team.	3.1	1.3	3.0	1-5
17. The goals and objectives of paediatric ward rounds have been clearly explained to me.	2.4	2.1	2.0	0-5
18. I understand the purpose of paediatric ward rounds.	3.7	0.7	4.0	3-5
19. The goals and objectives of my role as a presenter during paediatric ward rounds have been clearly explained to me.	3.0	1.7	4.0	0-5
20. I understand what is expected of me as a presenter during paediatric ward rounds.	3.8	0.8	4.0	3-5
21. The goals and objectives of my role as a participant during paediatric ward rounds have been clearly explained to me.	3.1	1.8	4.0	0-5
22. I understand what is expected of me as a participant during paediatric ward rounds.	3.3	1.5	3.0	0-5
24. During paediatric ward rounds, I am encouraged to ask questions.	3.4	1.2	3.0	2-5

25. During paediatric ward rounds, I am stimulated to make comparisons and evaluations about my patients' diagnosis.	3.2	1.5	3.0	0-5
26. During paediatric ward rounds, I am encouraged to discuss my differential diagnoses.	3.8	0.8	4.0	3-5
27. During paediatric ward rounds, I am encouraged to discuss my thought process about my management plan.	3.7	1.0	4.0	2-5
28. During paediatric ward rounds, my role is limited to reporting or summarizing the patient case.	2.3	1.4	2.0	0-4
29. During paediatric ward rounds, if I am asked a question, it is usually asking only about facts, not my thinking process.	3.2	1.1	3.0	2-5
Reification, (max 20)	**11.7 (58%)**	**3.8**	**11.0**	**5-18**
31. I receive frequent positive and constructive feedback after paediatric ward rounds.	2.1	1.2	2.0	0-4
32. The feedback I receive relates to a specific behaviour. (i.e. something I did or didn't do and can adjust).	2.2	1.4	2.0	0-4
35. I feel confident that I can utilize my available resources to read up on patients and topics after ward rounds.	3.9	0.9	4.0	2-5
36. I feel that those resources are adequate for my learning.	3.4	1.7	4.0	0-5
Total Score (max 120)	**109.6 (61%)**	**33.2**	**104.0**	**54-159**

E.7. Perceived self efficacy survey results, Medical students (back, Ch. 4) (Appendix B.11)

(n=12 students)
Participants were asked to rate their level of certainty to perform a specific task by recording their confidence level from 0 to 10.
The maximum possible score is 210 and the minimum score is 0.

Questions	Mean	Standard deviation	Median	Range
Medical Expert, (max score 130)	**92 (77%)**	**11.5**	**93.3**	**67-109**
1. Elicit accurate, organized and appropriate focused histories for Paediatric patients.	7.4	1.1	7.5	6-9
2. Elicit accurate, organized and appropriate focused histories for Neonatal patients.	5.5	2.2	6.0	0-8
3. Conduct accurate, sensitive and organized physical examinations for Paediatric patients.	7.6	1.2	8.0	5-9
4. Conduct accurate, sensitive and organized physical examinations for Neonatal patients.	5.3	2.4	5.5	1-9
5. Accurately assess the developmental age of a child based on history and physical exam.	7.1	1.4	7.0	5-9
6. Accurately assess the growth of a child given weight, height, and head circumference.	9.0	0.7	9.0	8-10
9. Critically analyse information and interpret test results relevant to Paediatric patients.	8.0	1.0	8.0	6-10
10. Critically analyse information and interpret test results relevant to Neonatal patients.	8.3	1.0	8.0	7-10
11. Generate a meaningful differential diagnosis.	7.2	1.2	8.0	5-8
12. Narrow differential diagnosis in regards to current patient.	5.8	2.3	6.5	1-8
13. Analyse differential (discuss what is more or less likely).	7.1	1.2	7.0	5-9
14. Integrate prior knowledge with new information.	6.9	1.2	7.0	5-9
15. Competently devise a management plan for your patient (that does not require much addendum from consulting physician).	6.9	1.4	7.0	5-9
Communicator, (max score 30)	**20.6 (69%)**	**3.2**	**20.3**	**16-26**
7. Summarize and present the pertinent information obtained from the patient's history on ward rounds in an accurate, organized and thoughtful manner.	7.3	1.4	7.0	5-9
8. Summarize and present the pertinent information obtained from the patient's physical exam on ward rounds in an accurate, organized and thoughtful manner.	6.4	1.1	6.3	5-8
16. Provide clear and thorough explanations to patients/families.	6.9	1.6	7.0	4-9
Collaborator, (max score 10)	**7.6 (76%)**	**1.4**	**8.0**	**4-9**
17. Ask questions or guidance from the consulting physician.	7.6	1.4	8.0	4-9
Professional, (max score 10)	**8.6 (86%)**	**1.7**	**9.0**	**4-10**
18. Seek help when necessary.	8.6	1.7	9.0	4-10

Scholar, (max score 30)	**23.7 (79%)**	**4.5**	**25.0**	**14-30**
19. Choose a case-related topic for further learning.	8.3	1.1	8.0	6-10
20. Utilize available resources to find information about a case-related topic.	7.8	1.6	8.0	4-10
21. Perform self-directed learning, including curiosity and motivation to learn.	7.7	2.3	8.0	3-10
Total Score (max 210)	**152.5 (73%)**	**18.7**	**153.5**	**108-183**

E.8. PERCEIVED SELF EFFICACY SURVEY RESULTS, JUNIOR RESIDENTS (BACK, CH. 4)

(n=9 residents)
Participants were asked to rate their level of certainty to perform a specific task by recording their confidence level from 0 to 10.
The maximum possible score is 210 and the minimum score is 0.

Questions	Mean	Standard deviation	Median	Range
Medical Expert, (max score 130)	**109.6 (84%)**	**8.6**	**108.0**	**98-126**
1. Elicit accurate, organized and appropriate focused histories for Paediatric patients.	8.2	1.0	8.0	7-10
2. Elicit accurate, organized and appropriate focused histories for Neonatal patients.	8.6	0.9	9.0	7-10
3. Conduct accurate, sensitive and organized physical examinations for Paediatric patients.	8.2	1.2	8.0	6-10
4. Conduct accurate, sensitive and organized physical examinations for Neonatal patients.	8.6	0.9	9.0	7-10
5. Accurately assess the developmental age of a child based on history and physical exam.	8.3	1.4	8.0	6-10
6. Accurately assess the growth of a child given weight, height, and head circumference.	9.8	0.7	10.0	8-10
9. Critically analyse information and interpret test results relevant to Paediatric patients.	8.5	0.9	8.5	7-10
10. Critically analyse information and interpret test results relevant to Neonatal patients.	8.5	0.9	8.5	7-10
11. Generate a meaningful differential diagnosis.	8.3	0.8	8.0	7-10
12. Narrow differential diagnosis in regards to current patient.	8.1	1.0	8.0	7-10
13. Analyse differential (discuss what is more or less likely).	7.8	1.2	8.0	6-10
14. Integrate prior knowledge with new information.	8.2	1.0	8.0	7-10
15. Competently devise a management plan for your patient (that does not require much addendum from consulting physician).	8.6	0.7	8.0	8-10
Communicator, (max score 30)	**24.7 (82%)**	**3.1**	**24.0**	**20-30**
7. Summarize and present the pertinent information obtained from the patient's history on ward rounds in an accurate, organized and thoughtful manner.	8.1	1.1	8.0	7-10
8. Summarize and present the pertinent information obtained from the patient's physical exam on ward rounds in an accurate, organized and thoughtful manner.	8.1	1.1	8.0	7-10
16. Provide clear and thorough explanations to patients/families.	8.4	1.3	9.0	6-10
Collaborator, (max score 10)	**8.7 (87%)**	**1.7**	**9.0**	**6-10**
17. Ask questions or guidance from the consulting physician.	8.7	1.7	9.0	6-10
Professional, (max score 10)	**9.2 (92%)**	**1.4**	**10.0**	**6-10**
18. Seek help when necessary.	9.2	1.4	10.0	6-10

Scholar, (max score 30)	**24.7 (82%)**	**3.8**	**24.0**	**19-30**
19. Choose a case-related topic for further learning.	8.3	1.3	8.0	6-10
20. Utilize available resources to find information about a case-related topic.	8.3	1.3	8.0	6-10
21. Perform self-directed learning, including curiosity and motivation to learn.	8.1	1.4	8.0	6-10
Total Score (max 210)	**176.9 (84%)**	**16.1**	**173.0**	**158.5-206**

E.9. PHASE 1 – JOINT DISPLAY DIAGRAM (BACK, CH. 4)

Phase 1 - Mixed Method Results - Joint Display Diagram

Survey Scales

DREEM: Questions are scored using a 0 to 4 five-point Likert scale, with 0 = Strongly disagree, 1 = Disagree, 2 = Unsure, 3 = Agree, and 4 = Strongly agree

PHEEM: Questions are scored using a 0 to 4 five-point Likert scale, with 0 = Strongly disagree, 1 = Disagree, 2 = Unsure, 3 = Agree, and 4 = Strongly agree.

EEL: Questions were scored using a 0 to 5 six-point Likert scale, with 0 = Strongly disagree, 1 = Disagree, 2 = Somewhat disagree, 3 = Somewhat agree, 4 = Agree, and 5 = Strongly agree.

PSE: 0 = Cannot do at all; 50 = Moderately can do; 100 = Highly certain can do

Content Area #1	**Related Survey Question**		**Students n=11** *Median & Range*	**Residents n=9** *Median & Range*	**QUAL summary**	**Congruent**	**Divergent**
Feedback	DREEM – Q.13	Teachers are good at providing feedback	1.5 (0-3) (Disagree)		-An important part of training, but delivery, timing and frequency are key elements. -Positive feedback is rare. -Negative feedback potentially damaging. -Not helpful if done poorly. -Timing and frequency are poor. - Overall paucity of feedback. - Recommend more feedback.	*"We don't get enough feedback, so you're left wondering, 'Did I do a good job?'"* *"Scolded in front of the whole department that we were incompetent – that was a bad experience."*	
	DREEM – Q.18	Teachers provide constructive criticism	2.5 (1-4) (Unsure)				
	PHEEM – Q.22	I get regular feedback from my seniors		2.0 (1-4) (Unsure)			
	PHEEM – Q.39	Teachers provide me w/ good feedback on my strengths and weaknesses		2.0 (0-4) (Unsure)			
	EEL – Q.31	I receive frequent feedback	3.0 (0-5) (Somewhat agree)	2.0 (0-4) (Somewhat disagree)			

	EEL – Q.32	The feedback I receive is relevant to specific behavior	3.0 (1-5) (Somewhat agree)	2.0 (0-4) (Somewhat disagree)			
	EEL – Q.33	I am encouraged to self-assess my own performance.	3.0 (0-5) (Somewhat agree)	2.0 (0-5) (Somewhat disagree)			

Content Area #2	**Related Survey Question**		**Students n=11** *Median & Range*	**Residents n=9** *Median & Range*	**QUAL summary**	**Congruent**	**Divergent**
Communication of Goals (CoG)	DREEM - Q.6	I am clear about the learning objectives on ward rounds.	1.5 (0-4) (Disagree)		-CoG is welcomed and essential for learning and growth -Without CoG, trainees feel lost - CoG are not clear in Paeds - Creates a disconnect btwn faculty and trainees - Then trainees get in trouble and unsure what for - Need standardized & clear goals and objectives for ward rounds	*"Just standing in the ward, we don't know what to do."* *"Expectations of students on ward rounds not clear; never know what's expected of us; different people bring different approach, so never sure what to do."* *"My first call, I didn't know what I was supposed to do, then*	
	PHEEM – Q.1	I have information about work hours		0.5 (0-4) (Strongly disagree)			
	PHEEM – Q.2	Clinical teachers set clear expectations		2.0 (1-4) (Unsure)			
	PHEEM – Q.4	I had an informative induction programme		2.0 (1-3) (Unsure)			
	PHEEM – Q.9	There is an informative Jr. Doctors handbook		1.0 (0-3) (Disagree)			

	PHEEM – Q.14	There are clear clinical protocols		2.0 (1-4) (Unsure)		*the specialist was unhappy with me."*		
	EEL – Q.14	There is clearly defined agenda of learning topics	3.0 (0-4) (Somewhat agree)	2.0 (0-5) (Somewhat disagree)				
	EEL – Q.17	The goals and objectives of ward rounds have been explained to me	2.0 (0-4) (Somewhat disagree)	2.0 (0-5) (Somewhat disagree)				
	EEL – Q.18	I understand the purpose of ward rounds	3.0 (1-5) (Somewhat agree)	4.0 (3-5) (Agree)				
	EEL - Q.19	The goals and objectives of my role as presenter have been explained to me	2.0 (0-5) (Somewhat disagree)	4.0 (0-5) (Agree)				
	EEL – Q.20	I understand what is expected of me as presenter	2.0 (0-4) (Somewhat disagree)	4.0 (3-5) (Agree)				
	EEL – Q.21	The goals and objectives of my role as participant on ward rounds have been explained to me	2.0 (0-4) (Somewhat disagree)	4.0 (0-5) (Agree)				
	EEL – Q.22	I understand what is expected of me as participant	3.0 (0-4) (Somewhat agree)	3.0 (0-5) (Somewhat agree)				

	EEL – Q.23	Specific learning points defined during rounds	3.0 (0-4) (Somewhat agree)	3.0 (1-5) (Somewhat agree)			

Content Area #3	**Related Survey Question**		**Students n=11** *Median & Range*	**Residents n=9** *Median & Range*	**QUAL summary**	**Congruent**	**Divergent**
Respect for uncertainty	DREEM – Q.33	I feel I am able to ask questions	2.5 (0-4) (Neutral)		- A positive CLE is a space where learners are free to ask questions and not afraid to make mistakes - A negative CLE is a space where trainees are either not allowed to ask questions or are afraid to ask questions & not knowing the answer resulted in punishment	*"And she was very practical and also, she . . . she provided a conducive environment for you to ask questions and also promoted learning as well. So, that was a very nice experience in NNU."*	*"A good example was a point in time we were not allowed to ask any questions during ward rounds. . . .So, that was a bad experience for me."* *"If a student makes a mistake it's such a big deal . . . I feel like ward rounds, like he said, it depends who you are with."* Look at their PSE results! How can they feel confident to ask questions in an environment where uncertainty isn't respected.
	PHEEM – Q.25	There is a no-blame culture in this post.		2.0 (1-4) (Unsure)			
	EEL – Q.9	Ward rounds has an atmosphere where uncertainty is respected.	3.0 (2-5) (Somewhat agree)	2.0 (0-4) (Somewhat disagree)			
	EEL – Q.10	Learners are encouraged to acknowledge limitations.	4.0 (1-5) (Agree)	3.0 (0-5) (Somewhat agree)			
	EEL – Q.24	I am encouraged to ask questions	4.0 (3-5) (Agree)	3.0 (2-5) (Somewhat agree)			
	PSE – Q.17	I can ask questions	8.0 (4-9)	9.0 (6-10)			
	PSE – Q.18	I seek help when needed	9.0 (4-10)	10.0 (6-10)			

Content Area #4	Related Survey Question		Students n=11 *Median & Range*	Residents n=9 *Median & Range*	QUAL summary	Congruent	Divergent	
Critical Thinking	DREEM – Q.12	*Teaching over emphasizes factual learning.*	2.0 (1-3) (Unsure)		-Trainees gave examples of when they did critical thinking and valued it - Not a 'drill session', but guiding of students - Appreciated when allowed to engage in critical thinking - Noted missed opportunities to do so	*"Good when given the chance to think for yourself, instead of just dictated to."* *"Given a chance to express your thoughts, not just told the plan by the specialist."*	*"Sometimes, especially on business rounds, I just recite my plan and feel like a secretary."*	
	DREEM – Q.28	My problem solving skills are being well developed	3.0 (1-4) (Agree)					
	EEL – Q.25	I am stimulated to make comparisons about my diagnosis	4.0 (2-5) (Agree)	3.0 (0-5) (Somewhat agree)				
	EEL – Q.26	I am encouraged to discuss my differential diagnosis	3.0 (2-5) (Somewhat agree)	4.0 (3-5) (Agree)				
	EEL – Q.27	I am encouraged to discuss my thought process about my plan.	4.0 (2-5) (Agree)	4.0 (2-5) (Agree)				
	EEL – Q.28	*My role is limited to reporting.*	3.0 (1-5) *(Somewhat disagree)*	2.0 (0-4) *(Somewhat agree)*				
	EEL – Q.29	*Questions ask about facts, not my thought process.*	3.0 (1-5) *(Somewhat disagree)*	3.0 (2-5) *(Somewhat disagree)*				

	PSE – Q.9	I can critically analyze info & test results in Paeds	8.0 (6-10)	8.5 (7-10)			
	PSE – Q.10	I can critically analyze info & test results in NNU	8.0 (7-10)	8.5 (7-10)			
	PSE – Q.11	I can make differential diagnosis	8.0 (5-8)	8.0 (7-10)			
	PSE – Q.12	I can narrow differential diagnosis	6.5 (1-8)	8.0 (7-10)			
	PSE – Q.13	I can analyze differential diagnosis	7.0 (5-9)	8.0 (6-10)			
	PSE – Q.14	I can integrate prior knowledge w/ new info	7.0 (5-9)	8.0 (7-10)			

Content Area #5	**Related Survey Question**		**Students n=11** *Median & Range*	**Residents n=9** *Median & Range*	**QUAL summary**	**Congruent**	**Divergent**
Control of session	DREEM – Q.41	The Paeds Dept is well time-tabled.	2.0 (0-3) (Unsure)		-Paeds is poorly organized, especially w/ time management; the late start of rounds effects learning and ward work	Note: There were <u>no</u> positive comments about the organization or time	*"Punctuality and time management were my biggest issues with Paeds."*
	EEL – Q.11	Rounds are well organized for learning.	3.0 (2-5) (Somewhat agree)	3.0 (1-5) (Somewhat agree)			

	EEL – Q.12	There are minimal interruptions during ward rounds.	3.0 (1-4) (Somewhat agree)	3.0 (0-4) (Somewhat agree)	- Frequent interruptions on rounds - Size of team, number of pts, and length of rounds all effects learning	management of rounds.	*"Say they'll start at 8 or 9am, but they don't start until 2pm, so then we don't get time for self-directed study in the afternoons."* *"[In] Paeds, very long ward rounds, not even listening by the end."*
	EEL – Q.13	Rounds are well paced & time spent on each pt is good.	2.0 (1-4) (Somewhat disagree)	2.0 (0-5) (Somewhat disagree)			

Content Area #6	**Related Survey Question**		**Students n=11** *Median & Range*	**Residents n=9** *Median & Range*	**QUAL summary**	**Congruent**	**Divergent**
Work-learning balance	PHEEM – Q.3	I have protected educational time.		0.0 (0-2) (Strongly disagree)	Description of basic tension between ward work and learning; feeling of being treated as 'staff' not learners; exhausted from ward work means no energy for learning	*"End up concentrating more on trying to get the ward work done than trying to understand what you are doing."* *"When you're post-call and then somebody wants to teach – feel exhausted, so much ward work, not there*	
	PHEEM – Q.8	*I have to perform inappropriate tasks.*		2.0 (1-4) (Unsure)			
	PHEEM – Q.12	I am able to participate in educational events.		2.0 (1-3) (Unsure)			
	PHEEM – Q.32	My workload is fine.		2.0 (0-2) (Unsure)			

						mentally for teaching."	

Content Area #7	**Related Survey Question**		**Students n=11** *Median & Range*	**Residents n=9** *Median & Range*	**QUAL summary**	**Congruent**	**Divergent**
Directed self-learning (DSL)	DREEM – Q.38	The atmosphere motivates me as a learner	2.5 (0-4) (Unsure)		Extrinsic factors that promoted DSL were stimulating teacher; the impact of the individual teacher here was important; questions on rounds, reading assignments, and the patient also promoted DSL	*"If there isn't teaching on rounds, then there's not incentive to read; but if you're in a team where you know there's going to be teaching, then there's a greater focus on wanting to understand more about your patient."*	
	PHEEM – Q.37	My teachers encourage me to be an independent learner.		3.0 (3-4) (Agree)			
	EEL – Q.34	After rounds, I feel motivated to read further about the pt cases.	3.0 (2-5) (Somewhat agree)	3.0 (1-5) (Somewhat agree)			
	EEL – Q.35	I feel confident I can utilize my resources to read up on pts after rounds.	4.0 (1-5) (Agree)	4.0 (2-5) (Agree)			

	PSE – Q.19	I can choose a case-related topic for further reading.	8.0 (6-10)	8.0 (6-10)			
	PSE – Q.20	I can utilize available resources to find info about cases.	8.0 (4-10)	8.0 (6-10)			
	PSE – Q.21	I can perform SDL, including curiosity & motivation to learn.	8.0 (3-10)	8.0 (6-10)			

Content Area #8	**Related Survey Question**		**Students n=11** *Median & Range*	**Residents n=9** *Median & Range*	**QUAL summary**	**Congruent**	**Divergent**
Engagement of learner	DREEM – Q.1	I am encouraged to participate on rounds	3.0 (2-4) (Agree)		There was lots of description of a positive CLE as one that encouraged and engaged leaners; that was interactive, student-driven, and learners could make contributions. Likewise, an effective clinical teacher was one who was enthusiastic and stimulating. The opposite	*"Stimulate or encourage you; helps students stay motivated despite being tired."*	*"Not involved in patient's plan; specialists makes their own plan – 'why did I even do this in the first place?"'* *"Just go around and not appreciating we're in a teaching environment."*
	DREEM – Q.3	The teaching encourages me to be an active learner.	2.5 (1-4) (Unsure)				
	DREEM – Q.7	The teaching is stimulating.	3.0 (1-4) (Agree)				

	DREEM – Q.9	The teaching is student centered.	2.0 (0-4) (Unsure)		was true of a negative CLE and ineffective clinical teacher. They provided examples of both – highlighting the 'impact of the individual teacher' theme.			
	DREEM – Q.11	*The teaching is too teacher-centered.*	2.0 (0-4) *(Unsure)*					
	PHEEM – Q.15	My teachers are enthusiastic.		2.0 (2-4) (Unsure)				
	EEL – Q.1	Rounds have learning environment where I feel involved to present.	4.0 (3-5) (Agree)	4.0 (3-5) (Agree)				
	EEL – Q.2	Rounds have learning environment where I feel stimulated to present.	4.0 (3-5) (Agree)	4.0 (2-5) (Agree)				
	EEL – Q.5	Rounds has learning environment where I feel involved to participate as	4.0 (2-5) (Agree)	4.0 (1-5) (Agree)				

		member of team.					
	EEL- Q.6	Rounds has learning environment where I feel stimulated to participate as member of team.	4.0 (3-5) (Agree)	4.0 (2-5) (Agree)			
	EEL – Q.16	Learners are encouraged to help focus teaching topics.	3.0 (2-5) (Somewhat agree)	2.0 (0-5) (Somewhat disagree)			

Content Area #9	**Related Survey Question**		**Students n=11** *Median & Range*	**Residents n=9** *Median & Range*	**QUAL summary**	**Congruent**	**Divergent**
Clinical learning environment	DREEM – Q.19	*Teachers ridicule the students.*	2.0 (0-4) *(Unsure)*		Trainees described a positive CLE as one that was safe and they felt respected, and focus on team work. A negative CLE made trainees feel afraid, nervous, and develop thoughts of self-doubt in a	*"My mood going into a ward round is highly dependent on who's conducting the ward round on that day. Such that you'll find a group of students asking 'who's in the*	*"In Paeds you're going to be crucified in that meeting!"* *"With some people, we feel nervous the whole time because we don't know*
	DREEM – Q.20	*Teachers get angry on ward rounds.*	1.5 (0-4) *(Agree)*				

	DREEM – Q.21	*Teachers are authoritarian.*	1.0 (0-4) *(Agree)*		hostile or personal attack environment. The impact of the individual teacher was very important for the CLE. Also evident in the Hierarchy theme.	*team today, who's in the team?' So that if it's someone everyone knows is a drill sergeant, you're carrying pieces of paper, you're carrying textbooks, things are falling, you're constantly petrified that he doesn't look or he/she doesn't go 'you in the red top.' Because everything that goes down from there is nothing constructive and when you look retrospectively at the end of the day; you felt as if you were not smart enough the whole day. . . . So and you find that there are other people who are constantly saying 'good job, good job' during your presentations . . . If they have been*	*whether you are going to be scolded for not doing something or for missing something. So, most of the time you'll just be hoping and praying that you didn't miss something."*	
	DREEM – Q.23	*Students irritate the teachers.*	2.5 (1-4) *(Unsure)*					
	DREEM – Q.32	The atmosphere is relaxed during ward rounds.	1.5 (0-3) (Disagree)					
	DREEM – Q.34	I feel comfortable on ward rounds socially.	1.5 (0-3) (Disagree)					
	DREEM – Q.40	The atmosphere is relaxed during ward rounds.	2.0 (0-4) (Unsure)					
	PHEEM – Q.11	*I am bleeped inappropriately.*		3.0 (1-4) *(Disagree)*				
	PHEEM – Q.29	I feel part of a team working here.		3.0 (2-4) (Agree)				

	PHEEM – Q.40	My teachers promote an atmosphere of mutual respect.		3.0 (0-4) (Agree)		*encouraging all along you go out of your way to come earlier to work to follow up everything so that you impress whoever is more encouraging during ward round."*		
	EEL – Q.3	Rounds have learning environment where I feel respected to present.	4.0 (1-5) (Agree)	3.0 (1-4) (Somewhat agree)				
	EEL – Q.4	Rounds have learning environment where I feel comfortable to present.	3.0 (2-4) (Somewhat agree)	3.0 (1-5) (Somewhat agree)				
	EEL – Q.7	Rounds has learning environment where I feel respected to participate as member of team.	4.0 (2-5) (Agree)	3.0 (1-5) (Somewhat agree)				
	EEL- Q.8	Rounds has learning environment where I feel comfortable to participate as member of team.	3.0 (2-5) (Somewhat agree)	3.0 (1-5) (Somewhat agree)				

Content Area #10	Related Survey Question		Students n=11 *Median & Range*	Residents n=9 *Median & Range*	QUAL summary	Congruent	Divergent
Effectiveness of clinical teacher	DREEM – Q.4	Teaching is well focused.	2.0 (0-4) (Unsure)		Effective clinical teacher described as clinically competent, knowledgeable, organized, with clarity in teaching, and provides appropriate clinical supervision. An ineffective clinical teacher is the opposite.	*"[They] leave you with the responsibility, but support you as back-up"*	*"Just focuses on the management, but students don't know the underlying pathology, so all gets jumbled"*
	DREEM – Q.15	Teachers are knowledgeable.	3.0 (2-4) (Agree)				
	DREEM – Q.16	Teacher give clear examples.	3.0 (1-4) (Agree)				
	DREEM – Q.17	Teachers are well prepared for rounds.	3.0 (1-4) (Agree)				
	PHEEM – Q.6	I have good clinical supervision at all time.		3.0 (2-4) (Agree)			
	PHEEM – Q.10	My teachers have good communication skills.		2.0 (1-4) (Unsure)			
	PHEEM – Q.23	My teachers are well organized.		2.0 (1-4) (Unsure)			

	PHEEM – Q.28	My teachers have good teaching skills		3.0 (1-4) (Agree)			
	PHEEM – Q.31	My teachers are accessible		3.0 (1-4) (Agree)			
	PHEEM – Q.33	Teachers utilize learning opportunities effectively.		2.0 (1-3) (Unsure)			
	EEL – Q.15	Teaching points are focused.	3.0 (1-4) (Somewhat agree)	2.0 (1-5) (Somewhat disagree)			

E.10. EEL-ORIGINAL DEC 2016 VS EEL-ORIGINAL FEB 2018 SURVEY RESULTS (BACK CH.5) (APPENDIX B.9)

Phase 1 & 2 ELEMENTS FOR EFFECTIVE LEARNING	Students Dec 2016 (n=11)		Students Feb 2018 (n=20)		Students All (n=31)	
Establish a positive learning environment (n=10) Max score 50	Mean	35.0 (70%)	Mean	29.9 (60%)	Mean	31.7 (63%)
	SD	8.0	SD	14.0	SD	12.3
	Median	34	Median	32.5	Median	33.0
	Range	23-48	Range	5-50	Range	5-50
Control of Session (n=6) Max score 30	Mean	17.0 (57%)	Mean	12.5 (42%)	Mean	14.1 (47%)
	SD	4.7	SD	8.3	SD	7.5
	Median	18	Median	12.5	Median	14.0
	Range	8-22	Range	1-27	Range	1-27
Communication of Goals (n=6) Max score 30	Mean	14.8 (49%)	Mean	19.5 (65%)	Mean	17.8 (60%)
	SD	7.6	SD	5.6	SD	6.6
	Median	13	Median	20.5	Median	18.0
	Range	1-25	Range	11-30	Range	1-30
Promotion of understanding and retention (n=8) Max score 40	Mean	26.0 (65%)	Mean	24.7 (62%)	Mean	25.2 (63%)
	SD	4.9	SD	9.0	SD	7.7
	Median	26	Median	27	Median	26.0
	Range	19-33	Range	4-40	Range	4-40
Feedback (n=3) Max score 15	Mean	8.8 (59%)	Mean	7.8 (52%)	Mean	8.2 (54%)
	SD	3.9	SD	4.4	SD	4.2
	Median	9	Median	8.0	Median	8.0
	Range	1-15	Range	0-15	Range	0-15
Promotion of self-directed learning (n=3) Max score 15	Mean	10.1 (67%)	Mean	9.2 (61%)	Mean	9.5 (63%)
	SD	3.5	SD	4.4	SD	4.0
	Median	11	Median	9.0	Median	9.0
	Range	3-15	Range	1-15	Range	1-15
Total (n=36) Max score 180	Mean	111.7 (62%)	Mean	95.8 (53%)	Mean	101.5 (56%)
	SD	27.4	SD	35.4	SD	33.2
	Median	123	Median	96	Median	105
	Range	73-149	Range	45-161	Range	45-161

E.11. PSE-ORIGINAL DEC 2016 VS PSE-ORIGINAL FEB 2018 SURVEY RESULTS (BACK CH.5) (APPENDIX B.11)

Phase 1 & 2 PSE	Students Dec 2016 (n=12)		Students Feb 2018 (n=20)		Students All (n=31)	
Medical Expert (n=13) Max score 130	Mean	92 (71%)	Mean	98 (75%)	Mean	95.8 (74%)
	SD	11.5	SD	12.2	SD	12.1
	Median	93.3	Median	97.9	Median	96.5
	Range	67-109	Range	73-116	Range	67-116
Communicator (n=3) Max score 30	Mean	20.6 (69%)	Mean	22.5 (75%)	Mean	21.8 (73%)
	SD	3.2	SD	4.3	SD	4.0
	Median	20.3	Median	23.0	Median	22.0
	Range	16-26	Range	12-29	Range	12-29
Collaborator (n=1) Max score 10	Mean	7.6 (76%)	Mean	8.3 (83%)	Mean	8.0 (80%)
	SD	1.4	SD	1.6	SD	1.6
	Median	8.0	Median	8.5	Median	8.0
	Range	4-9	Range	4-10	Range	4-10
Professionalism (n=1) Max score 10	Mean	8.6 (86%)	Mean	8.9 (89%)	Mean	8.8 (89%)
	SD	1.7	SD	1.2	SD	1.4
	Median	9.0	Median	9.0	Median	9.0
	Range	4-10	Range	6-10	Range	4-10
Scholar (n-3) Max score 30	Mean	23.7 (79%)	Mean	23.3 (78%)	Mean	23.3 (78%)
	SD	4.5	SD	5.4	SD	5.0
	Median	25.0	Median	23.8	Median	24.5
	Range	14-30	Range	12-30	Range	12-30
Total (n=21) Max score 210	Mean	152.5 (73%)	Mean	160.9 (77%)	Mean	157.8 (75%)
	SD	18.7	SD	18.9	SD	19.0
	Median	153.5	Median	161.0	Median	156.4
	Range	108-183	Range	129-193	Range	108-193

E.12. Resident perceived self-efficacy leadership survey results (back Ch.5) (back Ch.6) (Appendix B.14)

Question	Phase 2; 31 May, 2018 n = 5 junior residents		Phase 3, Cycle 1; 25 July, 2018 n = 7 junior residents	
1) I effectively **manage a team** so that **pre-rounds** are conducted in an organized and efficient manner.	Mean	5.2 (74%)	Mean	5.3 (76%)
	SD	0.8	SD	0.8
	Median	5 (Often)	Median	5 (Often)
	Range	4-6	Range	4-6
2) I effectively **supervise a team** so that all patients on the team are known to me and I am ultimately responsible for their care.	Mean	5.6 (80%)	Mean	5.6 (80%)
	SD	1.3	SD	1.0
	Median	5 (Often)	Median	6 (Almost always)
	Range	4-7	Range	4-7
3) I effectively **delegate tasks** so that ward work is conducted in an organized and efficient manner.	Mean	5.6 (80%)	Mean	5.3 (76%)
	SD	1.1	SD	1.1
	Median	6 (Almost always)	Median	5 (Often)
	Range	4-7	Range	4-7
4) I effectively **prioritize and organize** ward work so that patient care is effective and efficient.	Mean	5.6 (80%)	Mean	5.4 (78%)
	SD	0.9	SD	0.8
	Median	5 (Often)	Median	5 (Often)
	Range	5-7	Range	5-7
PSE sub-category Mastery Experience n = 4; max = 28	Mean	22 (79%)	Mean	21.6 (77%)
	SD	4.0	SD	3.0
	Median	21	Median	22
	Range	17-27	Range	18-26
5) Compared with other residents, I am a good team manager.	Mean	2.8 (55%)	Mean	3.7 (74%)
	SD	1.3	SD	0.5
	Median	3 (Somewhat like me)	Median	4 (Mostly like me)
	Range	1-4	Range	3-4
6) Compared with other residents, I am a good team supervisor.	Mean	3.3 (65%)	Mean	4.0 (80%)
	SD	1.0	SD	0.6
	Median	3.5 (Somewhat like me)	Median	4 (Mostly like me)
	Range	2-4	Range	3-5
7) Compared with other residents, I am good at delegating tasks.	Mean	3.8 (75%)	Mean	3.9 (55%)
	SD	0.5	SD	0.9
	Median	4 (Mostly like me)	Median	4 (Mostly like me)
	Range	3-4	Range	3-5
8) Compared with other residents, I am a good at prioritizing and organizing.	Mean	3.5 (70%)	Mean	3.9 (77%)
	SD	1.3	SD	0.7
	Median	3.5 (Somewhat like me)	Median	4 (Mostly like me)
	Range	2-5	Range	3-5
PSE sub-category Vicarious Experience n = 4; max = 20	Mean	13.3 (66%)	Mean	14.9 (74%)
	SD	2.9	SD	3.2
	Median	13	Median	15
	Range	10-17	Range	9-19
9) I get easily overwhelmed and am unsure where to prioritize ward work and patient care.	Mean	3.8 (76%)	Mean	3.1 (63%)
	SD	1.6	SD	0.9
	Median	*4 (Mostly not like me)*	Median	*3 (Somewhat like me)*
	Range	1-5	Range	2-4

10) I worry a great deal about being a good resident team supervisor.	Mean	2.8 (56%)		Mean	2.4 (49%)
	SD	1.6		SD	0.8
	Median	*2 (Mostly like me)*		Median	*2 (Mostly like me)*
	Range	1-5		Range	2-4
PSE sub-category Psychological Experience n = 2; max = 10	Mean	6.6 (66%)		Mean	5.6 (56%)
	SD	3.1		SD	1.5
	Median	6		Median	5
	Range	2-10		Range	4-8
Total Score n=10 max score = 58	Mean	34 (59%)		Mean	36.7 (63%)
	SD	10.7		SD	5.9
	Median	38		Median	38
	Range	19-44		Range	27-43

E.13. FACULTY PERSPECTIVE OF RESIDENT LEADERSHIP SKILLS SURVEY RESULTS (BACK CH.5) (BACK CH.6) (APPENDIX B.15)

Question	Phase 2; 14 June, 2018 n = 5 faculty		Phase 3, Cycle 1; 3 Aug, 2018 n = 3 faculty	
1) The resident effectively **managed** the team so that rounds were conducted in an organized and efficient manner.	Mean	3.0 (60%)	Mean	3.7 (73%)
	SD	1.3	SD	0.6
	Median	3 (Somewhat)	Median	4 (Quite a bit)
	Range	1-5	Range	3-4
2) The resident effectively **supervised** the team so that all patients on the team were known to him/her and not just by individuals on the team.	Mean	4.2 (60%)	Mean	4.3 (62%)
	SD	1.2	SD	0.6
	Median	4 (Sometimes)	Median	4 (Sometimes)
	Range	3-6	Range	4-5
3) The resident effectively **delegated tasks** so that ward work was conducted in an organized and efficient manner.	Mean	4.5 (64%)	Mean	5.0 (71%)
	SD	0.8	SD	0.0
	Median	5 (Often)	Median	5 (Often)
	Range	3-5	Range	5-5
4) The resident effectively **prioritized and organized** ward work so that patient care was effective and efficient.	Mean	4.2 (60%)	Mean	4.7 (67%)
	SD	0.8	SD	0.6
	Median	4 (Sometimes)	Median	5 (Often)
	Range	3-5	Range	4-5
Total Score ***n=4*** ***max score = 26***	Mean	15.8 (61%)	Mean	17.7 (63%)
	SD	3.7	SD	1.5
	Median	16.5	Median	18
	Range	10-21	Range	16-19

E.14 RESIDENT PERCEIVED SELF-EFFICACY OF PATIENT CARE AT PMH RESULTS (BACK CH.5) (BACK CH.6) (APPENDIX B.16)

Question	Phase 2; 14 June, 2018 n = 9 junior residents		Phase 3, Cycle 1; 25 July, 2018 n = 7 junior residents	
1) At Princess Marina Hospital, I am certain that I can make the 'Plan' written in the chart happen exactly as written for all of my patients by the end of the working day.	Mean	5.1 (73%)	Mean	4.4 (63%)
	SD	1.8	SD	0.8
	Median	5 (Often)	Median	4 (Sometimes)
	Range	2-7	Range	4-6
2) If a chest x-ray is ordered for my patient, I am sure that I can get a chest x-ray for my patient by the end of my shift.	Mean	3.2 (46%)	Mean	2.6 (37%)
	SD	1.8	SD	1.1
	Median	4 (Sometimes)	Median	2 (Almost never)
	Range	1-6	Range	1-4
3) If packed red blood cells are ordered for my patient, I am certain that my patient will receive his/her transfusion by the end of my shift.	Mean	3.7 (52%)	Mean	2.7 (39%)
	SD	1.7	SD	1.1
	Median	4 (Sometimes)	Median	3 (Once in a while)
	Range	1-6	Range	1-4
4) If a certain medication for my patient is ordered, I am certain that my patient will receive it as indicated on the drug sheet.	Mean	4.3 (62%)	Mean	4.3 (61%)
	SD	2.1	SD	0.8
	Median	5 (Often)	Median	4 (Sometimes)
	Range	1-7	Range	3-5
5) Circumstances at Princes Marina Hospital influence my ability to complete ward work as discussed on ward rounds.	Mean	4.0 (57%)	Mean	2.7 (39%)
	SD	2.5	SD	1.6
	Median	4 *(Sometimes)*	Median	2 (Almost always)
	Range	1-7	Range	1-5
Total Score n=5 max score = 28	Mean	20.3 (73%)	Mean	16.7 (60%)
	SD	7.0	SD	2.3
	Median	20	Median	18
	Range	10-28	Range	13-19

E.15 EDUCATIONAL CLIMATE INVENTORY SURVEY RESULTS, PHASE 2 (BACK CH.5) (APPENDIX B.17, B.18, B.19, B.20, B.21)

ECI Phase 2	MBBS 5 PHO (n=23 surveys)		Students PMW/NNU (n=55 surveys)		Students All (n=78 surveys)		Residents All (n=12 surveys)		All/All (n=90 surveys)	
CENTRALITY OF LEARNING & MUTUAL RESPECT (n=10) total possible score 40	Mean	33.2 83%	Mean	26.8 67%	Mean	28.3 72%	Mean	25.2 64%	Mean	28.2 71%
	SD	4.37	SD	5.70	SD	6.04	SD	5.25	SD	6.06
	Median	33.0	Median	27.0	Median	29.0	Median	24.5	Median	29.0
	Range	24.0-40.0	Range	14.0-37.0	Range	14.0-40.0	Range	19.0-34.0	Range	14.0-40.0
COMPETITIVE-NESS & STRESS (n= 3) total possible score 12	Mean	8.6 72%	Mean	6.6 55%	Mean	7.2 60%	Mean	7.2 60%	Mean	7.2 60%
	SD	1.57	SD	1.48	SD	1.70	SD	1.23	SD	1.69
	Median	9.0	Median	6.5	Median	7.0	Median	7.0	Median	7.0
	Range	6.0-12.0	Range	3.0-10.0	Range	3.0-12.0	Range	6.0-10.0	Range	3.0-12.0
PASSIVE LEARNING & MEMORIZA-TION (n=4) total possible score 16	Mean	12.8 80%	Mean	10.2 64%	Mean	11.1 68%	Mean	11.8 75%	Mean	11.1 69%
	SD	2.33	SD	2.57	SD	2.70	SD	2.04	SD	2.68
	Median	12.0	Median	10.0	Median	11.0	Median	11.5	Median	11.0
	Range	7.0-16.0	Range	4.0-16.0	Range	4.0-16.0	Range	9.0-15.0	Range	4.0-16.0
TOTAL (n=17) total possible score 68	Mean	54.6 80%	Mean	43.6 64%	Mean	46.6 69%	Mean	44.2 66%	Mean	46.5 68%
	SD	6.41	SD	7.75	SD	8.65	SD	6.55	SD	8.64
	Median	53.0	Median	44.0	Median	47.0	Median	43.3	Median	47.0
	Range	43.0-65.0	Range	26.0-68.0	Range	26.0-65.0	Range	34.0-55.0	Range	26.0-65.0

E.16 EDUCATIONAL CLIMATE INVENTORY SURVEY RESULTS, PHASE 3-CYCLE 1 (BACK CH.6) (APPENDIX B.17, B.18, B.19, B.20, B.21)

ECI Phase 3-Cycle 1	Residents PMW/NNU (n=8 residents)	
CENTRALITY OF LEARNING & MUTUAL RESPECT (n=10) total possible score 40	Mean	22.0 (55%)
	SD	3.8
	Median	22.0
	Range	17-27
COMPETITIVENESS & STRESS (n= 3*) total possible score 12	Mean	6.4 (53%)
	SD	1.1
	Median	6.5
	Range	5-8
PASSIVE LEARNING & MEMORIZATION (n=4) total possible score 16	Mean	11.0 (69%)
	SD	0.8
	Median	11.0
	Range	10-12
TOTAL (n=17) total possible score 68	Mean	39.4 (58%)
	SD	3.9
	Median	39.5
	Range	34-44

E.17 EDUCATIONAL CLIMATE INVENTORY SURVEY RESULTS, PHASE 3-CYCLE 2 (BACK, CH.7) (APPENDIX B.17, B.18, B.19, B.20, B.21)

ECI Phase 3 – Cycle 2	MBBS 5 PHO (n=17 surveys)		Students PMW/NNU (n=35 surveys)		Students All (n=52 surveys)	
CENTRALITY OF LEARNING & MUTUAL RESPECT (n=10) total possible score 40	Mean	32.5 81%	Mean	25.8 64%	Mean	28.0 70%
	SD	4.9	SD	5.5	SD	6.2
	Median	32.0	Median	26.0	Median	30.0
	Range	19.0-39.0	Range	14.0-35.0	Range	14.0-39.0
COMPETITIVE-NESS & STRESS (n= 3) total possible score 12	Mean	8.2 69%	Mean	7.0 58%	Mean	7.4 62%
	SD	1.6	SD	1.7	SD	1.7
	Median	8.0	Median	7.0	Median	8.0
	Range	5.0-11.0	Range	4.0-10.0	Range	4.0-11.0
PASSIVE LEARNING & MEMORIZA-TION (n=4) total possible score 16	Mean	12.2 76%	Mean	10.2 64%	Mean	10.8 68%
	SD	2.0	SD	2.1	SD	2.2
	Median	12.0	Median	11.0	Median	11.0
	Range	9.0-16.0	Range	7.0-15.0	Range	7.0-16.0
TOTAL (n=17) total possible score 68	Mean	52.9 78%	Mean	42.9 63%	Mean	46.2 68%
	SD	6.8	SD	8.1	SD	9.0
	Median	53.0	Median	44.0	Median	47.5
	Range	37.0-64.0	Range	30.0-59.0	Range	30.0-64.0

E.18 OBSERVATION & LEARNING TOOL FOR CLINICAL SUPERVISION SURVEY RESULTS (BACK CH.5)

(APPENDIX B.22, B.23)

SAT & PAT Phase 2	Self-Assessment Tool Faculty & Senior Residents April & May 2018 (n=17 faculty/senior residents)		Peer-Assessment Tool Faculty & Senior Residents May 2018 (n=7 faculty/senior residents)	
Step 1: Organizes the supervision (n=2) Max score 6	Mean	4.6 (77%)	Mean	3.0 (50%)
	SD	0.8	SD	1.6
	Median	5.0	Median	2.0
	Range	3-6	Range	1-5
Step 2: Helps the learner to learn from the case (n=7) Max score 21	Mean	17.4 (83%)	Mean	11.9 (57%)
	SD	2.5	SD	2.3
	Median	18.0	Median	11.0
	Range	13-21	Range	8-14
Step 3: Ends the supervision (n=4) Max score 12	Mean	9.2 (76%)	Mean	5.4 (45%)
	SD	1.5	SD	1.4
	Median	10.0	Median	6.0
	Range	6-11	Range	4-7
Total Score (n=13) Max Score 39	Mean	29.0 (74%)	Mean	20.3 (52%)
	SD	5.5	SD	4.5
	Median	30.5	Median	20.0
	Range	18-37	Range	13-26

E.19 ELEMENTS FOR EFFECTIVE LEARNING (MODIFIED) SURVEY RESULTS, PHASE 2 (BACK CH.5) (APPENDIX B.24, B.25)

Phase 2 EEL *modified*	PMW Students (n=15 surveys)		NNU Residents, n=2 Student, n=1 (n=3 surveys)		PHO Resident, n=1 Student, n=2 (n=3 surveys)		All (n=21 surveys)	
Communication of Goals (n=3) (max 15)	Mean	12.5 (83%)	Mean	11.7 (78%)	Mean	10.3 (69%)	Mean	12.1 (81%)
	SD	2.5	SD	3.2	SD	1.5	SD	2.5
	Median	13.0	Median	13.0	Median	10.0	Median	13.0
	Range	6-15	Range	8-14	Range	9-12	Range	6-15
Evaluation (n=6) (max 30)	Mean	23.3 (78%)	Mean	23.3 (78%)	Mean	26.0 (87%)	Mean	23.7 (79%)
	SD	3.8	SD	1.5	SD	2.6	SD	3.4
	Median	23	Median	23.0	Median	25.0	Median	24
	Range	17-28	Range	22-25	Range	24-29	Range	17-29
Promotion of Understanding & Retention (n=3) (max 15)	Mean	11.8 (79%)	Mean	12.7 (84%)	Mean	13.3 (89%)	Mean	12.1 (81%)
	SD	2.7	SD	2.5	SD	0.6	SD	2.5
	Median	12	Median	13.0	Median	13	Median	13.0
	Range	5-15	Range	10-15	Range	13-14	Range	5-15
Elements of Effective Teaching (n=5) (max 25)	Mean	13.6 (54%)	Mean	19.0 (76%)	Mean	18.0 (72%)	Mean	15.0 (60%)
	SD	4.1	SD	2.0	SD	6.0	SD	4.6
	Median	13	Median	19.0	Median	18.0	Median	14
	Range	6-23	Range	17-21	Range	12-24	Range	6-24
Motivation for Self-directed learning (n=1) (max 5)	Mean	4.4 (88%)	Mean	4.3 (87%)	Mean	4.0 (80%)	Mean	4.3 (87%)
	SD	0.9	SD	0.6	SD	1.7	SD	1.0
	Median	5	Median	4.0	Median	5.0	Median	5.0
	Range	2-5	Range	4-5	Range	2-5	Range	2-5
Total (n=18) Max score = 90	Mean	65.6 (73%)	Mean	71.0 (79%)	Mean	71.7 (80%)	Mean	67.2 (75%)
	SD	10.4	SD	8.5	SD	9.0	SD	9.9
	Median	65	Median	72.0	Median	71	Median	68.0
	Range	49-83	Range	62-79	Range	63-81	Range	49-83

E.20 ELEMENTS FOR EFFECTIVE LEARNING (MODIFIED) SURVEY RESULTS, PHASE 3 (BACK CH.6) (APPENDIX B.24, B.25)

Phase 3-Cycle 1 EEL *modified*	PMW (n=8 surveys)		NNU (n=4 surveys)		PHO Resident, n=1 Students, n=3 (n=4 surveys)		All (n=16 surveys)	
Communication of Goals (n=3) (max 15)	Mean	10.8 (72%)	Mean	10.3 (68%)	Mean	13.0 (87%)	Mean	11.2 (75%)
	SD	3.0	SD	3.2	SD	2.2	SD	2.9
	Median	10.5	Median	9.0	Median	13.5	Median	10.5
	Range	7-15	Range	8-15	Range	10-15	Range	7-15
Evaluation (n=6) (max 30)	Mean	20.3 (68%)	Mean	19.5 (65%)	Mean	24.0 (80%)	Mean	21.0 (70%)
	SD	4.8	SD	7.6	SD	3.9	SD	5.4
	Median	20.5	Median	19.5	Median	24.5	Median	22.5
	Range	14-28	Range	12-27	Range	19-28	Range	12-28
Promotion of Understanding & Retention (n=3) (max 15)	Mean	9.8 (65%)	Mean	9.5 (64%)	Mean	13.5 (90%)	Mean	10.6 (71%)
	SD	2.9	SD	1.7	SD	1.9	SD	2.8
	Median	10.5	Median	9.0	Median	14.0	Median	11.0
	Range	5-13	Range	8-12	Range	11-15	Range	5-15
Elements of Effective Teaching (n=5) (max 25)	Mean	15.4 (61%)	Mean	13.5 (54%)	Mean	18.3 (73%)	Mean	15.6 (63%)
	SD	4.4	SD	7.3	SD	1.5	SD	4.8
	Median	17.5	Median	14	Median	18.0	Median	17.5
	Range	9-19	Range	5-21	Range	17-20	Range	5-21
Motivation for Self-directed learning (n=1) (max 5)	Mean	3.9 (78%)	Mean	3.5 (70%)	Mean	3.8 (75%)	Mean	3.8 (75%)
	SD	1.0	SD	1.9	SD	1.3	SD	1.2
	Median	4	Median	4	Median	4.0	Median	4.0
	Range	2-5	Range	1-5	Range	2-5	Range	1-5
Total (n=18) Max score = 90	Mean	60.0 (67%)	Mean	56.3 (63%)	Mean	72.5 (81%)	Mean	62.2 (69%)
	SD	12.2	SD	20.4	SD	9.0	SD	14.5
	Median	60.5	Median	54.5	Median	74	Median	66.0
	Range	42-80	Range	36-80	Range	61-81	Range	36-81

E.21 Motivated Strategies for Learning Questionnaire results – Phase 2 (back Ch.5)

(Appendix B.26, B.27, B.28)

MSLQ	Phase 2 Students (n=38)		Phase 2 Residents (n=11)		Phase 2 All (n=49)	
Test Anxiety (n=4) (max 28)	Mean	15.7 (56%)	Mean	19.5 (69%)	Mean	16.5 (59%)
	SD	7.1	SD	5.3	SD	6.9
	Median	14.0	Median	20.0	Median	16.0
	Range	4-28	Range	12-27	Range	4-28
Self-regulation (n=6) (max 42)	Mean	29.4 (70%)	Mean	30.5 (73%)	Mean	29.7 (71%)
	SD	6.3	SD	6.0	SD	6.2
	Median	29.0	Median	30.0	Median	29.0
	Range	10-40	Range	22-40	Range	10-40
Self-efficacy (n=7) (max 49)	Mean	34.6 (71%)	Mean	37.3 (76%)	Mean	35.2 (72%)
	SD	8.6	SD	7.4	SD	8.3
	Median	36.0	Median	39.0	Median	37.0
	Range	11-47	Range	17-43	Range	11-47
Intrinsic value (n=9) (max 63)	Mean	54.3 (86%)	Mean	56.3 (89%)	Mean	54.7 (87%)
	SD	6.4	SD	3.9	SD	5.9
	Median	56.0	Median	57.0	Median	56.0
	Range	42-63	Range	49-62	Range	42-63
Cognitive strategy (n=9) (max 63)	Mean	47.3 (75%)	Mean	47.1 (75%)	Mean	47.3 (75%)
	SD	6.9	SD	5.3	SD	6.5
	Median	48.0	Median	48.0	Median	48.0
	Range	27-57	Range	37-54	Range	27-57
Total (n=35) Max score = 245	Mean	183.1 (75%)	Mean	193.9 (79%)	Mean	185.5 (76%)
	SD	27.0	SD	20.9	SD	25.9
	Median	186.0	Median	199.0	Median	190.0
	Range	97-228	Range	143-217	Range	97-228

E.22 Motivated Strategies for Learning Questionnaire results – Phase 3-Cycle 1 (back Ch.6)

(Appendix B.26, B.27, B.28)

MSLQ	Phase 3-Cycle 1 Residents (n=8)	
Test Anxiety (n=4) (max 28)	Mean	22.9 (82%)
	SD	5.7
	Median	24.0
	Range	13-28
Self-regulation (n=6) (max 42)	Mean	33.6 (80%)
	SD	6.8
	Median	33.5
	Range	23-42
Self-efficacy (n=7) (max 49)	Mean	37.9 (77%)
	SD	7.5
	Median	39.5
	Range	21-45
Intrinsic value (n=9) (max 63)	Mean	57.6 (91%)
	SD	7.2
	Median	60.0
	Range	42-63
Cognitive strategy (n=9) (max 63)	Mean	49.5 (79%)
	SD	4.0
	Median	49.5
	Range	43-56
Total (n=35) Max score = 245	Mean	205.5 (84%)
	SD	28.4
	Median	211.0
	Range	150-235

E.23 MOTIVATED STRATEGIES FOR LEARNING QUESTIONNAIRE RESULTS – PHASE 3-CYCLE 2 (BACK, CH. 7)

(APPENDIX B.26, B.27, B.28)

MSLQ	Phase 3-Cycle 2 Students (n=25)	
Test Anxiety (n=4) (max 28)	Mean	16.5 (59%)
	SD	6.3
	Median	14.0
	Range	9-26
Self-regulation (n=6) (max 42)	Mean	29.9 (71%)
	SD	7.1
	Median	32.0
	Range	16-42
Self-efficacy (n=7) (max 49)	Mean	39.1 (80%)
	SD	8.8
	Median	41.0
	Range	16-53
Intrinsic value (n=9) (max 63)	Mean	52.9 (84%)
	SD	7.2
	Median	54.0
	Range	37-61
Cognitive strategy (n=9) (max 63)	Mean	45.0 (71%)
	SD	7.2
	Median	46.0
	Range	31-56
Total (n=35) Max score = 245	Mean	183.3 (73%)
	SD	26.4
	Median	191.0
	Range	130-221

E.24 DAILY ROUNDS: PERCEIVED SELF-EFFICACY – ALL SURVEY RESULTS, PHASE 2 (BACK CH.5) (APPENDIX B.29-B.36)

Phase 2 Daily PSE MBBS 3 survey	Phase 2 Daily PSE MBBS 5 & Resident survey	Phase 2-All MBBS 3 (May 21, 31) n=20 PMW surveys n=0 NNU surveys		Phase 2-All MBBS 5 (May 21, 31) n=11 PMW surveys n= 4 NNU surveys n=2 PHO surveys		Phase 2-All Residents (May 31, June 25) n=5 PMW surveys n=5 NNU surveys n=1 PHO survey	
Mastery experience n=4 max = 20	**Mastery experience n=3 max = 15**	Mean	15.1 (75%)	Mean	11.5 (76%)	Mean	12.7 (85%)
		SD	2.6	SD	1.2	SD	2.2
		Median	16	Median	12	Median	12
		Range	10-19	Range	9-13	Range	9-15
Vicarious experience n=1 max = 5	**Vicarious experience n=1 max = 5**	Mean	3.0 (59%)	Mean	3.4 (67%)	Mean	3.1 (62%)
		SD	1.1	SD	0.9	SD	0.9
		Median	3	Median	3	Median	3
		Range	1-4	Range	1-5	Range	1-4
Psychological experience n=2 max = 10	**Psychological experience n=2 max = 10**	Mean	6.6 (66%)	Mean	6.8 (68%)	Mean	8.0 (80%)
		SD	2.1	SD	1.8	SD	1.1
		Median	6	Median	7	Median	8
		Range	3-10	Range	4-10	Range	6-9
Total Daily PSE Score n=7 max score 35	**Total Daily PSE Score n=6 max score 30**	Mean	24.6 (70%)	Mean	21.6 (72%)	Mean	23.3 (78%)
		SD	4.8	SD	2.8	SD	3.3
		Median	26	Median	22	Median	24
		Range	15-32	Range	16-28	Range	18-28

E.25 DAILY ROUNDS: PERCEIVED SELF-EFFICACY – ALL SURVEY RESULTS, PHASE 3 (BACK CH.6) (APPENDIX B.29-B.36)

Phase 3-Cycle 1 Daily PSE MBBS 3 survey	Phase 3-Cycle 1 Daily PSE MBBS 5 & Resident survey	MBBS 3 (15,23 & 30 Aug) n=8 PMW surveys n=2 NNU surveys		MBBS 5 (15,23 & 30 Aug) n=14 PMW surveys n= 9 NNU surveys n=9 PHO surveys		Residents (15,23 & 30 Aug) n=3 PMW surveys n=6 NNU surveys n=2 PHO survey	
Mastery experience n=4 max = 20	**Mastery experience n=3 max = 15**	Mean	12.1 (61%)	Mean	10.7 (71%)	Mean	13.1 (87%)
		SD	2.9	SD	2.7	SD	1.7
		Median	12	Median	12	Median	13
		Range	7-16	Range	5-15	Range	10-15
Vicarious experience n=1 max = 5	**Vicarious experience n=1 max = 5**	Mean	2.4 (48%)	Mean	2.5 (50%)	Mean	3.6 (72%)
		SD	0.8	SD	1.1	SD	0.5
		Median	2	Median	3	Median	4
		Range	1-4	Range	1-5	Range	3-4
Psychological experience n=2 max = 10	**Psychological experience n=2 max = 10**	Mean	6.5 (65%)	Mean	7.7 (77%)	Mean	7.7 (77%)
		SD	1.5	SD	1.7	SD	1.5
		Median	6	Median	8	Median	8
		Range	5-10	Range	4-10	Range	5-10
Total Daily PSE Score n=7 max score 35	**Total Daily PSE Score n=6 max score 30**	Mean	21.0 (60%)	Mean	20.9 (70%)	Mean	24.1 (80%)
		SD	3.7	SD	4.1	SD	3.0
		Median	21.5	Median	21.5	Median	24
		Range	14-25	Range	14-28	Range	20-28

E.26 DAILY ROUNDS: PERCEIVED SELF-EFFICACY – MBBS 5 SURVEY RESULTS, PHASE 2 (BACK CH.5)

(APPENDIX B.29-B.36)

Phase 2 Daily PSE MBBS 5 surveys	**PMW MBBS 5 (May 21, 31) n=11 surveys**		**NNU MBBS 5 (21 & 31 May) n=4 surveys**		**PHO MBBS 5 (21 May) n=2 surveys**	
Mastery experience n=3 max = 15	Mean	11.6 (78%)	Mean	10.5 (70%)	Mean	12.5 (83%)
	SD	1.1	SD	1.0	SD	0.7
	Median	12.0	Median	10.0	Median	12.5
	Range	9-13	Range	10-12	Range	12-13
Vicarious experience n=1 max = 5	Mean	3.3 (65%)	Mean	3.0 (60%)	Mean	4.5 (90%)
	SD	0.9	SD	0.0	SD	0.7
	Median	3.0	Median	3.0	Median	4.5
	Range	1-4	Range	3-3	Range	4-5
Psychological experience n=2 max = 10	Mean	7.0 (70%)	Mean	5.5 (55%)	Mean	8.0 (80%)
	SD	1.7	SD	1.3	SD	2.8
	Median	7.0	Median	5.5	Median	8.0
	Range	4-10	Range	4-7	Range	6-10
Total Daily PSE Score n=6 max score 30	Mean	21.9 (73%)	Mean	19 (63%)	Mean	25.0 (83%)
	SD	2.4	SD	0.8	SD	4.2
	Median	22	Median	19	Median	25
	Range	16-26	Range	18-20	Range	22-28

E.27 DAILY ROUNDS: PERCEIVED SELF-EFFICACY – MBBS 5 SURVEY RESULTS, PHASE 3 (BACK CH.6)

(APPENDIX B.29-B.36)

Phase 3-Cycle 1 Daily PSE MBBS 5 surveys	PMW MBBS 5 (15,23 & 30 Aug) n=14 surveys		NNU MBBS 5 (15, 23, & 30 Aug) n=9 surveys		PHO MBBS 5 (15,23 & 30 Aug) n=9 surveys	
Mastery experience n=3 max = 15	Mean	11.1 (74%)	Mean	10.2 (68%)	Mean	10.7 (71%)
	SD	2.4	SD	3.2	SD	2.7
	Median	12.0	Median	11.0	Median	12.0
	Range	6-15	Range	5-15	Range	7-14
Vicarious experience n=1 max = 5	Mean	2.1 (43%)	Mean	2.7 (53%)	Mean	2.9 (58%)
	SD	0.9	SD	1.2	SD	1.4
	Median	2.0	Median	3.0	Median	3.0
	Range	1-3	Range	1-4	Range	1-5
Psychological experience n=2 max = 10	Mean	7.8 (78%)	Mean	7.0 (70%)	Mean	8.2 (82%)
	SD	1.8	SD	1.6	SD	1.4
	Median	7.5	Median	7.0	Median	8.0
	Range	4-10	Range	5-9	Range	6-10
Total Daily PSE Score n=6 max score 30	Mean	21 (70%)	Mean	19.9 (66%)	Mean	21.8 (73%)
	SD	3.5	SD	4.6	SD	4.7
	Median	22	Median	20	Median	22
	Range	15-28	Range	14-28	Range	15-28

E.28 DAILY ROUNDS: PERCEIVED SELF-EFFICACY – RESIDENT SURVEY RESULTS, PHASE 2 (BACK CH.5)

(APPENDIX B.29-B.36)

Phase 2 Daily PSE Resident surveys	PMW Residents (May 31 June 25) n=5 surveys		NNU Residents (31 May, 25 June) n=5 surveys		PHO Residents (31 May) n=1 *not completed filled in	
Mastery experience n=3 max = 15	Mean	13.2 (88%)	Mean	13.0 (87%)	Mean	9.0 (60%)
	SD	2.2	SD	1.9	SD	0.0
	Median	14.0	Median	12.0	Median	9.0
	Range	10-15	Range	11-15	Range	9-9
Vicarious experience n=1 max = 5	Mean	2.8 (56%)	Mean	3.5 (70%)	Mean	-
	SD	1.1	SD	0.6	SD	-
	Median	3.0	Median	3.5	Median	-
	Range	1-4	Range	3-4	Range	-
Psychological experience n=2 max = 10	Mean	8.2 (82%)	Mean	7.6 (76%)	Mean	9.0 (90%)
	SD	0.8	SD	1.3	SD	0.0
	Median	8.0	Median	7.0	Median	9.0
	Range	7-9	Range	6-9	Range	9-9
Total Daily PSE Score n=6 max score 30	Mean	24.2 (81%)	Mean	23.4 (78%)	Mean	18 (60%)
	SD	2.4	SD	3.7	SD	0.0
	Median	24	Median	24	Median	18.0
	Range	21-27	Range	18-28	Range	18-18

E.29 DAILY ROUNDS: COMMUNITIES OF PRACTICE SURVEY RESULTS, PHASE 2 (BACK CH.5) (APPENDIX B.37, B.38)

Phase 2 COP (31 May)	MBBS 3 (n=9)		MBBS 5 (n=8)		Students (n=17)		Residents (n=2)		All (n=19)	
Participation (n=13) (max = 65)	Mean	45.4 (70%)	Mean	46.3 (71%)	Mean	45.8 (70%)	Mean	39.5 (60%)	Mean	45.2 (70%)
	SD	7.4	SD	9.2	SD	8.0	SD	6.4	SD	8.0
	Median	46.0	Median	46.0	Median	46.0	Median	39.5	Median	46.0
	Range	28-52	Range	33-59	Range	28-59	Range	35-44	Range	28-59
Reitification (n=6) (max = 30)	Mean	22.4 (75%)	Mean	20.8 (69%)	Mean	21.6 (72%)	Mean	15.5 (52%)	Mean	21.0 (70%)
	SD	4.5	SD	4.5	SD	4.5	SD	0.7	SD	4.6
	Median	22.0	Median	22.0	Median	22.0	Median	15.5	Median	20.0
	Range	15-28	Range	16-27	Range	15-28	Range	15-16	Range	15-28
Total (n=19) (Max = 95)	Mean	67.9 (71%)	Mean	67.0 (71%)	Mean	67.5 (71%)	Mean	55.0 (58%)	Mean	66.2 (70%)
	SD	11.3	SD	13.3	SD	11.9	SD	5.7	SD	12.0
	Median	69.0	Median	68.0	Median	68.0	Median	55.0	Median	68.0
	Range	43-80	Range	49-86	Range	43-86	Range	51-59	Range	43-86

E.30 DAILY ROUNDS: COMMUNITIES OF PRACTICE SURVEY RESULTS, PHASE 3 (BACK CH.6) (APPENDIX B.37, B.38)

Phase 3 – Cycle 1 COP (30 Aug)	MBBS 3 (n=5)		MBBS 5 (n=11)		Students (n=16)		Residents (n=5)		All (n=21)	
Participation (n=13) (max = 65)	Mean	33.8 (52%)	Mean	44.9 (69%)	Mean	41.4 (64%)	Mean	44.8 (69%)	Mean	42.2 (65%)
	SD	10.5	SD	10.9	SD	11.7	SD	5.2	SD	10.5
	Median	35.0	Median	52.0	Median	43.5	Median	47.0	Median	44.0
	Range	19-44	Range	28-57	Range	19-57	Range	38-51	Range	19-57
Reitification (n=6) (max = 30)	Mean	14.0 (47%)	Mean	20.3 (68%)	Mean	18.3 (61%)	Mean	20.6 (69%)	Mean	18.9 (63%)
	SD	12.3	SD	7.1	SD	9.1	SD	3.8	SD	8.1
	Median	18.0	Median	21.0	Median	20.5	Median	19.0	Median	20.0
	Range	1.0-27	Range	4.0-29	Range	1-29	Range	17-26	Range	1-29
Total (n=19) (Max = 95)	Mean	47.8 (50%)	Mean	65.2 (69%)	Mean	59.8 (63%)	Mean	65.4 (69%)	Mean	61.1 (64%)
	SD	22.5	SD	17.2	SD	20.1	SD	8.6	SD	18.0
	Median	53.0	Median	74	Median	66.0	Median	66.0	Median	66.0
	Range	20-71	Range	37-86	Range	20-86	Range	56-77	Range	20-86

E.31 PHASE 3-CYCLE 1: JOINT DISPLAY DIAGRAM (BACK CH.6)

Phase 3 – Cycle 1 – Mixed Method Results
Joint Display Diagram

Content Area #1	Related Survey Question		Trainees & Faculty Responses	Attendance	QUAL summary	Congruent	Divergent
Summarize	MSLQ – Q.11	I am sure I can do an excellent job of presenting my patient when on ward rounds.	Residents, n=8 Mean: 6.6 (95%) SD: 0.5 Median: 7.0 Range: 6-7 'Very true of me'	n/a	- Summarize would be too difficult for MBBS 3 - Concern for changing from the traditional reading of the medical record on ward rounds to summarizing - When would the logbook case presentations occur? - Summarize was a difficult step for trainees		While the qualitative data suggests that 'Summarizing' may be too difficult a step for the students, especially MBBS 3, we saw in Phase 1 (original PSE survey) that students rated themselves to be 80% confident in summarizing the history of a patient, and 70% confident to summarize the physical exam findings. Here in Phase 3, cycle 1, survey questions generally reflect this continued confidence. And faculty and trainees alike expressed that they 'knew how' to summarize and found it 'helpful' to summarize 'quite a bit'.
	MSLQ – Q.26	When I prepare for ward rounds, I put important ideas into my own words.	Residents, n=8 Mean: 5.3 (75%) SD: 1.6 Median: 6.0 Range: 2-7 'Very true of me'				
	MBBS 3 – Daily PSE – Q.3	How self-confident are you to summarize the pertinent information from a paediatric patient's history on ward rounds in an accurate and organized manner?	MBBS 3, n=10 Mean: 3.6 (71%) SD: 0.7 Median: 4.0 Range: 2-4 'Slightly more confident'				

	MBBS 3 – Daily PSE – Q.4	How self-confident are you to summarize the pertinent information from a <u>paediatric</u> patient's physical exam on ward rounds in an accurate and organized manner?	MBBS 3, n=10 Mean: 3.0 (60%) SD: 0.9 Median: 3 Range: 2-4 'Confidence unchanged'				
	SNAPPS 'How To?' Q.1	Did you know how to *Summarize briefly the history and physical exam* for this patient today?	Faculty, n=9; pt encounters = 9 Mean: 3.8 (76%) SD: 0.7 Median: 4 Range: 3-5 'Quite a bit'				
	SNAPPS 'Helpful?' Q.1	1) Did you find it helpful for the trainee to ***Summarize*** *briefly the history and physical exam* for this patient today? 1) Did you find it helpful to ***Summarize*** *briefly the history and physical exam* for this patient today?	Faculty: n= 30 patient encounters Mean: 4.2 (84%) SD: 0.8 Median: 4 Range: 2-5 'Quite a bit' Trainees: n=23 patient encounters				

			Mean: 4.2 (84%) SD: 0.9 Median: 4 Range: 2-5 'Quite a bit'				

Content Area #2	Related Survey Question		Trainees & Faculty Responses	Attendance	QUAL summary	Congruent	Divergent
Narrow	MSLQ – Q.22	When I prepare to present a patient on ward rounds, I try to put together information I've learned from previous patients and my text books.	Residents, n=8 Mean: 6.5 (93%) SD: 0.8 Median: 7.0 Range: 5-7 'Very true of me'	n/a	- Faculty and trainees found Narrow to be a difficult step, especially when the patient's diagnosis was already known.	Survey questions from Daily PSE and COP reflect a more guarded perspective of 'Narrowing' or discussing a differential on rounds; trainees answered that they are only 'Somewhat' encouraged to discuss a differential or make comparisons about patient's problems. And MBBS 5 confidence to generate differentials is not very high. These	From the resident's MSLQ survey, they answered questions which describe the critically thinking involved in the 'Narrow' step very positively as something that is 'very true of me'. In addition, faculty and trainees felt that they knew 'how to Narrow' and found it 'helpful' to Narrow 'quite a bit'; yet the qualitative data suggests that this was not as simple as the surveys described.
	MSLQ – Q.31	I use what I have learned from previous patients and the textbook to care for new patients.	Residents, n=8 Mean: 6.4 (91%) SD: 0.7 Median: 6.5 Range: 5-7 'Very true of me'				
	MSLQ – Q.34	When I am taking care of a patient, I try to make everything fit together.	Residents, n=8 Mean: 6.1 (88%) SD: 0.4 Median: 6.0 Range: 6-7 'Very true of me'				

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<tr>
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<td>MSLQ – Q.36</td>
<td>When taking care of a patient I try to connect the things I am seeing with what I already know.</td>
<td>Residents, n=8
<table><tr><td>Mean</td><td>6.3 (89%)</td></tr><tr><td>SD</td><td>0.5</td></tr><tr><td>Median</td><td>6.0</td></tr><tr><td>Range</td><td>6-7</td></tr></table></td>
<td></td>
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<td>slightly middle of the range responses are more in line with the QUAL data.</td>
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<td>COP Daily (All wards) – Q.1</td>
<td>During ward rounds today, when you presented your patient, how much were you encouraged to discuss your differential diagnosis?</td>
<td>Trainees, n=21
<table><tr><td>Mean</td><td>3.4 (68%)</td></tr><tr><td>SD</td><td>1.3</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>1-5</td></tr></table>‘Somewhat’</td>
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<td>COP Daily (All wards) – Q.2</td>
<td>During ward rounds today, when you presented your patient, how much were you stimulated to make comparisons about your patient’s differential?</td>
<td>Trainees, n=21
<table><tr><td>Mean</td><td>3.2 (64%)</td></tr><tr><td>SD</td><td>1.2</td></tr><tr><td>Median</td><td>3.5</td></tr><tr><td>Range</td><td>1-5</td></tr></table>‘Somewhat’</td>
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<td>MBBS 5/R (All wards) – Daily PSE – Q.1</td>
<td>How self-confident are you to generate and narrow a meaningful differential diagnosis for a paediatric patient?</td>
<td>MBBS 5, n=32
<table><tr><td>Mean</td><td>3.8 (75%)</td></tr><tr><td>SD</td><td>0.8</td></tr><tr><td>Median</td><td>4</td></tr><tr><td>Range</td><td>2-5</td></tr></table>‘Slightly more confident’

Resident, n=11</td>
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			<table><tr><td>Mean</td><td>4.5 (89%)</td></tr><tr><td>SD</td><td>0.7</td></tr><tr><td>Median</td><td>5</td></tr><tr><td>Range</td><td>3-5</td></tr></table> 'Much more confident'				
	SNAPPS 'How To?' Q.2	Did you know how to ***Narrow*** *the differential to 2-3 possibilities* for this patient today?	Faculty, n=9; pt encounters = 9 <table><tr><td>Mean</td><td>3.4 (68%)</td></tr><tr><td>SD</td><td>1.3</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>1-5</td></tr></table> 'Quite a bit'				
	SNAPPS 'Helpful?' Q.2	Did you find it helpful for the trainee to ***Narrow*** *the differential to 2-3 possibilities* for this patient today? Did you find it helpful to ***Narrow*** *the differential to 2-3 possibilities* for this patient today?	Faculty: n= 30 patient encounters <table><tr><td>Mean</td><td>4.4 (88%)</td></tr><tr><td>SD</td><td>0.7</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>3-5</td></tr></table> 'Quite a bit' Trainees: n=23 patient encounters <table><tr><td>Mean</td><td>4.1 (82%)</td></tr><tr><td>SD</td><td>1.0</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>2-5</td></tr></table> 'Quite a bit'				

Content Area #3	Related Survey Question		Trainees & Faculty Responses	Attendance	QUAL summary	Congruent	Divergent
Probe	ECI – Q.6	Residents here are encouraged to embrace uncertainty rather than be afraid of it.	Residents, n=8 Mean: 2.1 (53%) SD: 0.4 Median: 2.0 Range: 2-3 'Disagree'	n/a	- Trainees had lots of questions about what they could/n't Probe about - Trainees were nervous that if they 'probed' the consultant, they would be asked questions in return they couldn't answer - Trainees needed prompting to probe and felt uncomfortable - When used, was found to be helpful to the discussion/ teaching on rounds	Lots of convergence here between the QUAL and QUAN data. The survey questions reflect some of the general lack of being questioned 'somewhat' and the overall tapered respect for uncertainly held on the ward round. But when Probing did occur using SNAPPS, both faculty and trainees found it to be 'quite a bit' helpful.	
	ECI – Q.10	The faculty here react well when residents question or challenge them.	Residents, n=8 Mean: 2.6 (64%) SD: 0.5 Median: 3.0 Range: 2-3 'Disagree'				
	COP Daily (All wards) – Q.4	During ward rounds today, when you presented your patient, how much were you encouraged to ask the consultant questions?	Trainees, n=21 Mean: 3.3 (66%) SD: 1.3 Median: 4.0 Range: 1-5 'Somewhat'				
	EEL-mod (All wards) – Q.6	During ward rounds today, did the consultant expect you to answer questions you didn't know the answers to?*	Trainees, n=16 Mean: 3.7 (74%) SD: 1.4 Median: 4.0				

			Range: 1-5 'A little bit' **Item scored in reverse.*				
	EEL-mod (All wards) – Q.10	During ward rounds today, when you asked a question, did you feel that the consultant adequately answered it?	Trainees, n=16 Mean: 4.1 (81%) SD: 1.1 Median: 5.0 Range: 2-5 'A great amount'				
	EEL-mod (All wards) – Q.12	During ward rounds today, when discussing a case, did the discussion feel like a 'drill session'?*	Trainees, n=16 Mean: 3.6 (73%) SD: 1.4 Median: 4.0 Range: 1-5 'A little bit' **Item scored in reverse.*				
	SNAPPS 'How To?' Q.4	Did you know how to ***Probe*** *the consultant with questions* related to this patient today?	Faculty, n=9; pt encounters = 9 Mean: 3.1 (62%) SD: 1.3 Median: 3.0 Range: 1-5 'Somewhat'				

	SNAPPS 'Helpful?' Q.4	Did you find it helpful for the trainee to ***Probe*** *the consultant with questions* related to this patient today? Did you find it helpful to ***Probe*** *the consultant with questions* related to this patient today?	Faculty: n= 30 patient encounters Mean: 4.0 (80%) SD: 1.1 Median: 4.0 Range: 1-5 'Quite a bit' Trainees: n=23 patient encounters Mean: 4.0 (80%) SD: 1.1 Median: 4.0 Range: 1-5 'Quite a bit'				

Content Area #4	**Related Survey Question**		**Trainees & Faculty Responses**	**Attendance**	**QUAL summary**	**Congruent**	**Divergent**
Plan	MSLQ – Q.12	I am sure I can do an excellent job of generating an assessment and plan for my patient when on ward rounds.	Residents, n=8 Mean: 6.4 (91%) SD: 0.5 Median: 6.0 Range: 6-7	n/a	- 'Plan' was noted to be quite intuitive and straight forward without issue during the training or testing of SNAPPS	Most of the survey questions aligned with the qualitative data. Residents were especially confident to generate their own plan for a patient and trainees agreed that they are encouraged to come up with their own plan.	There was less alignment around the scope of Plan when it came to eliciting for thought processes or including trainees in the addendum.
	MBBS 5/R, PSE Daily – Q.3	How self-confident are you to competently **devise a management plan** for a paediatric patient that does not require much addendum	MBBS 5, n=32 Mean: 3.3 (67%) SD: 1.2 Median: 4				

		from the consulting physician?	<table><tr><td>Range</td><td>2-5</td></tr></table> 'Slightly more confident' Resident, n=11 <table><tr><td>Mean</td><td>4.5 (91%)</td></tr><tr><td>SD</td><td>0.5</td></tr><tr><td>Median</td><td>5</td></tr><tr><td>Range</td><td>3-5</td></tr></table> 'Much more confident'				
	COP (All wards) – Q.5	During ward rounds today, when you presented your patient, how much did the consultant encourage you to discuss your thought process about your management plan?	Trainees, n=21 <table><tr><td>Mean</td><td>3.3 (66%)</td></tr><tr><td>SD</td><td>1.3</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>1-5</td></tr></table> 'Quite a bit'				
	COP (All wards) – Q.7	During ward rounds today, when the consultant created the addendum, how much you were involved in the new plan.	Trainees, n=21 <table><tr><td>Mean</td><td>3.2 (64%)</td></tr><tr><td>SD</td><td>1.7</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>1-5</td></tr></table> 'Quite a bit'				
	EEL Mod – Q.15	During ward rounds today, did the consultant encourage you to come up with your own patient plan?	Trainees, n=16 <table><tr><td>Mean</td><td>4.3 (87%)</td></tr><tr><td>SD</td><td>1.2</td></tr><tr><td>Median</td><td>5.0</td></tr><tr><td>Range</td><td>1-5</td></tr></table>				

<table>
<tr><td></td><td></td><td></td><td>'A great amount'</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>SNAPPS 'How To?' Q.5</td><td>Did you know how to make a Plan for this patient today?</td><td>Faculty, n=9; pt encounters = 9<table><tr><td>Mean</td><td>3.8 (76%)</td></tr><tr><td>SD</td><td>0.7</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>3-5</td></tr></table>'Quite a bit'</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>SNAPPS 'Helpful?' Q.5</td><td>Did you find it helpful for the trainee to make a Plan for this patient today?

Did you find it helpful to make a Plan for this patient today?</td><td>Faculty: n= 30 patient encounters<table><tr><td>Mean</td><td>3.9 (78%)</td></tr><tr><td>SD</td><td>0.8</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>3-5</td></tr></table>'Quite a bit'

Trainees: n=23 patient encounters<table><tr><td>Mean</td><td>4.3 (86%)</td></tr><tr><td>SD</td><td>0.9</td></tr><tr><td>Median</td><td>5.0</td></tr><tr><td>Range</td><td>2-5</td></tr></table>'A great amount'</td><td></td><td></td><td></td><td></td></tr>
</table>

Content Area #5	Related Survey Question	Trainees & Faculty Responses	Attendance	QUAL summary	Congruent	Divergent

<table>
<tr>
<td>Select</td>
<td>MSLQ – Q.29</td>
<td>I continue to read up on patients and their conditions even when I don’t have to.</td>
<td>Residents, n=8
<table><tr><td>Mean</td><td>5.3 (75%)</td></tr><tr><td>SD</td><td>1.8</td></tr><tr><td>Median</td><td>6.0</td></tr><tr><td>Range</td><td>2-7</td></tr></table></td>
<td rowspan="4">n/a</td>
<td rowspan="4">- Trainees were reported to have difficulty with ‘Select’
- Faculty thought it was helpful for further learning</td>
<td rowspan="4">The QUAL data mostly reflects the QUAN data, in that residents admit to not always reading up on patients, and trainees express ‘somewhat’ to ‘quite a bit’ for being stimulated to read further.</td>
<td rowspan="4">Faculty reported that trainees know ‘how to’ Select, and the difficulty described wasn’t captured.</td>
</tr>
<tr>
<td>EEL Mod – Q.18</td>
<td>During ward rounds today, did you feel stimulated by the consultant to read about the case(s) you presented?</td>
<td>Trainees, n=16
<table><tr><td>Mean</td><td>3.8 (75%)</td></tr><tr><td>SD</td><td>1.2</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>1-5</td></tr></table>‘Quite a bit’</td>
</tr>
<tr>
<td>SNAPPS ‘How To?’ Q.6</td>
<td>6) Did you know how to Select a case related question for this patient today?</td>
<td>Faculty, n=9; pt encounters = 9
<table><tr><td>Mean</td><td>3.6 (72%)</td></tr><tr><td>SD</td><td>0.9</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>2-5</td></tr></table>‘Quite a bit’</td>
</tr>
<tr>
<td>SNAPPS ‘Helpful?’ Q.6</td>
<td>6) Did you find it helpful for the trainee to Select a case related question for this patient today?

Did you find it helpful to Select a case related question for this patient today?</td>
<td>Faculty: n= 30 patient encounters
<table><tr><td>Mean</td><td>4.0 (80%)</td></tr><tr><td>SD</td><td>0.9</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>2-5</td></tr></table>‘Quite a bit’

Trainees: n=23 patient encounters</td>
</tr>
</table>

			<table><tr><td>Mean</td><td>4.0 (80%)</td></tr><tr><td>SD</td><td>1.1</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>2-5</td></tr></table> 'A great amount'				

Content Area #6	**Related Survey Question**		**Trainees & Faculty Responses**	**Attendance**	**QUAL summary**	**Congruent**	**Divergent**
Early Adopters	SNAPPS 'How To?' *Total Score*	Faculty's understanding of 'how to' use SNAPPS	Faculty, n=9; patient encounters n= 9 <table><tr><td>Mean</td><td>24.4 (70%)</td></tr><tr><td>SD</td><td>5.2</td></tr><tr><td>Median</td><td>24</td></tr><tr><td>Range</td><td>17-35</td></tr></table> Scored lowest in Narrow (3.4), Analyze (3.3), Probe (3.1) and future use Confidence (3.4)	Of those invited to participate in the Teach-the-Teacher workshop series, 26% did not attend any sessions, 17% attended one session, 26% attended two sessions, 17% attended three sessions, 9% attended four sessions, and only 4% (i.e. one faculty member) attended all five sessions.	- Difficult to recruit faculty to practice SNAPPS on their ward rounds - Looked for faculty who were part of the project or my PHO service - Discovered two faculty as 'early adopters' and were trying SNAPPS based on educational sessions alone	The data seem congruent in that without proper participation in the SNAPPS educational sessions, understanding, using and practicing SNAPPS was lower.	

Content Area #7	Related Survey Question		Trainees & Faculty Responses	Attendance	QUAL summary	Congruent	Divergent
Testing of SNAPPS	SNAPPS 'How To?' *Total Score*	Faculty's understanding of 'how to' use SNAPPS	Faculty, n=9; patient encounters n = 9 Mean: 24.4 (70%) SD: 5.2 Median: 24 Range: 17-35 Scored lowest in Narrow (3.4), Analyze (3.3), Probe (3.1) and future use Confidence (3.4)	Of those who volunteered to test SNAPPS on their ward round, only 1 had completed all five, 100% of the sessions. Two had completed 80% of the sessions; 1 had completed 60%; 2 had completed 40%; and 2 had each attended the 'catch-up' session. *(Note: I was the ninth testing faculty member.)*	- SNAPPS required a stepwise introduction onto the ward round - New skill set from both faculty and trainees that required practice	- These data sets converge well. The QUAL and QUAN data paint a description of the newness of some of the steps of SNAPPS (specifically N-A-P) – indicating that there is indeed a difference between using SNAPPS from traditional rounds. At the same time, neither describe it being too abstract or too difficult to use, just a 'newness' to it that needs practice.	

Content Area #8	Related Survey Question	Trainees & Faculty Responses	Attendance	QUAL summary	Congruent	Divergent

<table>
<tr>
<td>First impressions</td>
<td>SNAPPS ‘Helpful?’ <u>Total</u> Score</td>
<td>Faculty’s & trainees’ evaluation of the ‘helpfulness’ to use SNAPPS for learning and teaching on ward rounds</td>
<td>Faculty: patient encounters n=30
<table>
<tr><td>Mean</td><td>29.1 (83%)</td></tr>
<tr><td>SD</td><td>4.2</td></tr>
<tr><td>Median</td><td>30</td></tr>
<tr><td>Range</td><td>17-35</td></tr>
</table>
Scored lowest in Plan (3.9), scored highest in likelihood of future use (4.7)

Trainees: n=23 patient encounters
<table>
<tr><td>Mean</td><td>28.4 (81%)</td></tr>
<tr><td>SD</td><td>28.4</td></tr>
<tr><td>Median</td><td>5.9</td></tr>
<tr><td>Range</td><td>16-35</td></tr>
</table>
Scored highest in Plan (4.3), and lowest in Probe (4.0)</td>
<td>n/a</td>
<td>- Good first impressions, especially from trainees
- Trainees felt that it improved their learning on ward rounds
- Faculty more guarded, but optimistic on the use of SNAPPS with more practice</td>
<td>Both the QUAL and QUAN data suggest that faculty and trainees alike found SNAPPS to be ‘quite a bit’ to ‘a great amount’ ‘helpful’ to the learning and teaching on ward rounds and even enthusiastic to use it.</td>
<td></td>
</tr>
</table>

Content Area #9	Related Survey Question	Trainees & Faculty Responses	Attendance	QUAL summary	Congruent	Divergent

<table>
<tr>
<td rowspan="3">MBBS 3 Clinical Naivety</td>
<td>MBBS 3 – Daily PSE – Q.1</td>
<td>How self-confident are you about obtaining an accurate and organized history for a <u>paediatric</u> patient?</td>
<td>MBBS 3, n=8
<table><tr><td>Mean</td><td>3.3 (66%)</td></tr><tr><td>SD</td><td>0.9</td></tr><tr><td>Median</td><td>4</td></tr><tr><td>Range</td><td>2-4</td></tr></table>‘Slightly more confident’</td>
<td rowspan="3">n/a</td>
<td rowspan="3">- Faculty complained that MBBS 3 students are not equipped with basic presentation skills to use SNAPPS.
- Time needed to prepare the MBBS 3 for regular ward rounds took away from the rest of the team practicing SNAPPS.</td>
<td rowspan="3">The two data sets appear to be supportive of each other – low confidence perceived by MBBS 3 and faculty for obtaining and summarizing history and physical exam findings.</td>
<td rowspan="3"></td>
</tr>
<tr>
<td>MBBS 3 – Daily PSE – Q.2</td>
<td>How self-confident are you about obtaining an accurate and organized physical exam for a <u>paediatric</u> patient?</td>
<td>MBBS 3, n=8
<table><tr><td>Mean</td><td>2.9 (58%)</td></tr><tr><td>SD</td><td>1.1</td></tr><tr><td>Median</td><td>3</td></tr><tr><td>Range</td><td>1-4</td></tr></table>‘Confidence unchanged’</td>
</tr>
<tr>
<td>MBBS 3 – Daily PSE – Q.3</td>
<td>How self-confident are you to summarize the pertinent information from a <u>paediatric</u> patient’s history on ward rounds in an accurate and organized manner?</td>
<td>MBBS 3, n=10
<table><tr><td>Mean</td><td>3.6 (71%)</td></tr><tr><td>SD</td><td>0.7</td></tr><tr><td>Median</td><td>4</td></tr><tr><td>Range</td><td>2-4</td></tr></table>‘Slightly more confident’</td>
</tr>
</table>

	MBBS 3 – Daily PSE – Q.4	How self-confident are you to summarize the pertinent information from a paediatric patient's physical exam on ward rounds in an accurate and organized manner?	MBBS 3, n=10 Mean: 3.0 (60%) SD: 0.9 Median: 3 Range: 2-4 'Confidence unchanged'				

Content Area #10	Related Survey Question		Trainees & Faculty Responses	Attendance	QUAL summary	Congruent	Divergent
Residents as Team Leaders	Trainee PSE of Leadership Skills - Residents *Total Score* n=10 max score = 58	Evaluate junior resident's perceptions of their mastery self-efficacy to fulfill the CanMED physician roles related to running a ward round; and other influences on trainee perceptions of their self-efficacy, including vicarious and psychological aspects of running a ward round.	n=7 residents Mean: 36.7 (63%) SD: 5.9 Median: 38 Range: 27-43	n/a	- Faculty complained that the junior residents were not supporting the students during the pre-round for traditional rounds or SNAPPS rounds	Faculty and resident surveys results were nearly identical in their response to the capability of residents to lead the ward round. Compared to other resident PSE surveys, this one scores generally lower with only a 63% confidence overall, indicating that residents acknowledge their limitations in their ward round leadership role.	

	PSE sub-category Mastery Experience n = 4; max = 28		Residents, n=7 Mean: 21.6 (77%) SD: 3.0 Median: 22 Range: 18-26				
	PSE sub-category Psychological Experience n = 2; max = 10		Residents, n=7 Mean: 5.6 (56%) SD: 1.5 Median: 5 Range: 4-8				
	Trainee Leadership Skills – Faculty Evaluation *Total Score* n=4 max score = 26	Evaluate faculty's perspective on junior resident's capacity to fulfill the CanMEDS physician roles related to running a ward round.	Faculty, n=3 Mean: 17.7 (63%) SD: 1.5 Median: 18 Range: 16-19				

Content Area #11	**Related Survey Question**		**Trainees & Faculty Responses**	**Attendance**	**QUAL summary**	**Congruent**	**Divergent**
Built-in Teaching	EEL-mod – Q.7	During ward rounds today, were you mainly just told what to do?	n=16 Mean: 3.5 (70%) SD: 1.4 Median: 4.0		- SNAPPS took the pressure off of 'preparing for teaching rounds'		The QUAL data reflects on the helpful aspects of SNAPPS to support the teaching process on the ward round, but the QUAN data suggests that things are

			Range 1-5 'Somewhat' **Item scored in reverse.*		- Learner role now the active role, and teacher role now as facilitator - Built-in teaching moments during the ward round presentation & created moments of teaching when likely this would not have occurred.		just 'ok' – with most questions related to actively engaging in a teaching round vs a more traditional 'working' round is 'Somewhat'.
	COP – Q.1	During ward rounds today, when you presented your patient, how much were you encouraged to discuss your differential diagnosis?	n=21 Mean 3.4 (69%) SD 1.3 Median 4.0 Range 1-5 'Somewhat'				
	COP – Q.2	During ward rounds today, when you presented your patient, how much were you stimulated to make comparisons about your patient's differential?	n=21 Mean 3.2 (63%) SD 1.2 Median 3.5 Range 1-5 'Somewhat'				
	COP – Q.4	During ward rounds today, when you presented your patient, how much were you encouraged to ask the consultant questions?	n=21 Mean 3.3 (66%) SD 1.3 Median 4.0 Range 1-5 'Somewhat'				
	COP – Q.5	During ward rounds today, when you presented your patient, how much did the consultant encourage you to discuss your thought process about your management plan?	n=21 Mean 3.3 (66%) SD 1.3 Median 4.0 Range 1-5 'Somewhat'				

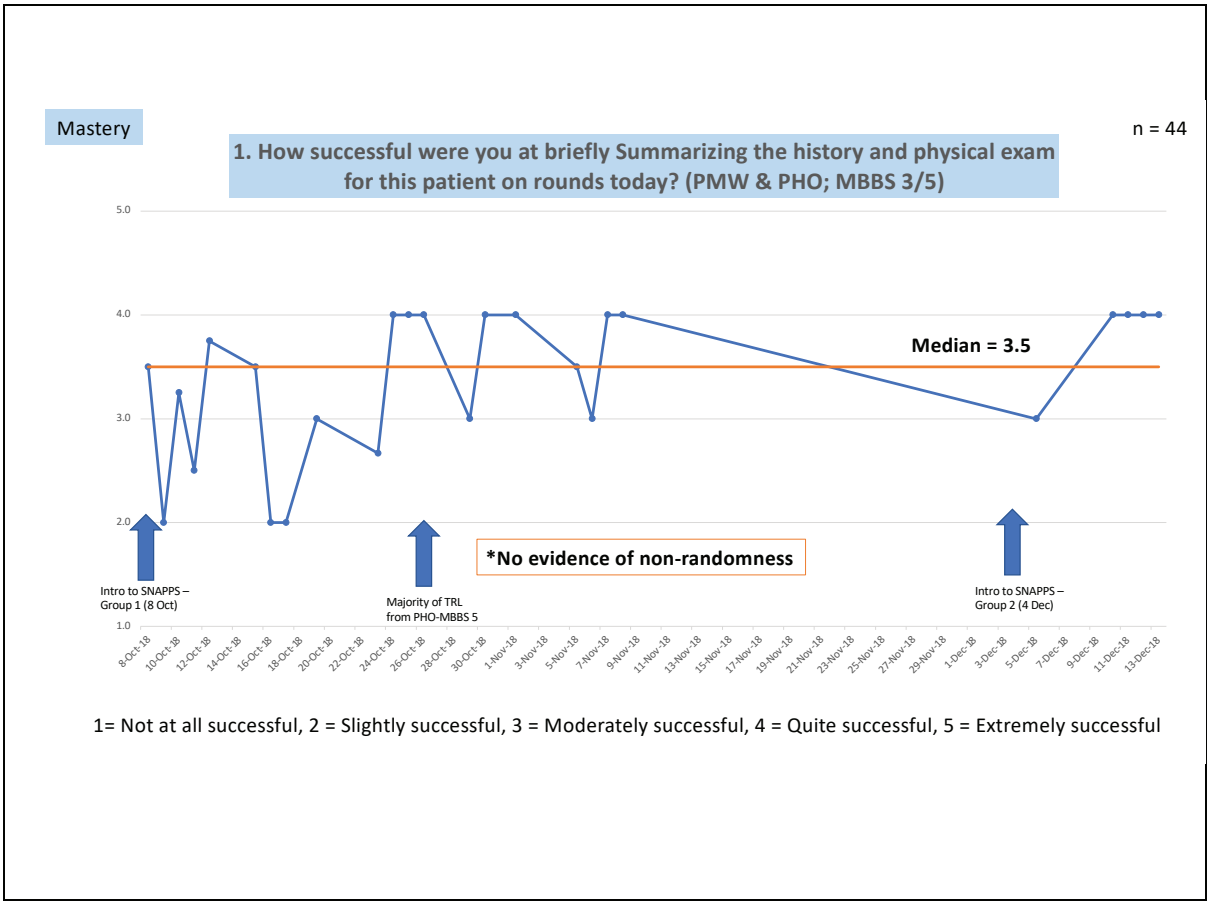
<table>
<tr>
<td></td>
<td>COP – Q.6</td>
<td>During ward rounds today, when you presented your patient, how much was your role limited to reporting the patient case.</td>
<td>n=21
<table><tr><td>Mean</td><td>3.8 (75%)</td></tr><tr><td>SD</td><td>1.2</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>2-5</td></tr></table>‘Somewhat’
*Item scored in reverse.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>COP – Q.8</td>
<td>How often did you feel ignored on the ward round today?</td>
<td>Trainees: n=21
<table><tr><td>Mean</td><td>4.0 (81%)</td></tr><tr><td>SD</td><td>1.4</td></tr><tr><td>Median</td><td>5.0</td></tr><tr><td>Range</td><td>1-5</td></tr></table>‘A little bit’
*Item scored in reverse.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SNAPPS ‘Helpful?’ <u>Total</u> Score</td>
<td>Trainees’ evaluation of the ‘helpfulness’ to use SNAPPS for learning and teaching on ward rounds</td>
<td>Trainees: n=23 patient encounters
<table><tr><td>Mean</td><td>28.4 (81%)</td></tr><tr><td>SD</td><td>28.4</td></tr><tr><td>Median</td><td>5.9</td></tr><tr><td>Range</td><td>16-35</td></tr></table>Scored highest in Plan (4.3), and lowest in Probe (4.0)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</table>

Content Area #12	**Related Survey Questions**	**Trainees & Faculty Responses**	**Attendance**	**QUAL summary**	**Congruent**	**Divergent**

<table>
<tr>
<td>Guided Teaching</td>
<td>ECI – Q.5</td>
<td>The faculty care about how I think, not simply about whether I get the right answer.</td>
<td>Residents, n=8
<table><tr><td>Mean</td><td>2.1 (54%)</td></tr><tr><td>SD</td><td>0.9</td></tr><tr><td>Median</td><td>2.0</td></tr><tr><td>Range</td><td>1-4</td></tr></table>‘Agree’</td>
<td rowspan="5"></td>
<td rowspan="5">- ‘NAP’ = learning pause, created safe space for the faculty to hear what the learner is thinking
- Allowed trainee to ‘think aloud’
- Helped faculty know where learner was at in their knowledge base, this guided the learning to address those gaps
- Used SNAPPS to role model critical thinking</td>
<td rowspan="5"></td>
<td rowspan="5">Here the resident-only QUAN data is a bit mixed – they both ‘agree’ and ‘disagree’ about the faculty’s value of their thought processes; the remaining QUAN data describes a ward rounds that promotes critical thinking ‘Somewhat’; this diverges from the QUAL data of the experience of testing SNAPPS</td>
</tr>
<tr>
<td>ECI – Q.14</td>
<td>Most of what we do here is focused on the passive transfer of knowledge, (i.e. we are expected to just listen and absorb knowledge, not interactive learning).</td>
<td>Residents, n=8
<table><tr><td>Mean</td><td>3.1 (78%)</td></tr><tr><td>SD</td><td>0.6</td></tr><tr><td>Median</td><td>3.0</td></tr><tr><td>Range</td><td>2-4</td></tr></table>‘Disagree’
*Item scored in reverse.</td>
</tr>
<tr>
<td>ECI – Q.16</td>
<td>The faculty tell us that they are interested in our thinking, but their actions on rounds suggest otherwise.</td>
<td>Residents, n=8
<table><tr><td>Mean</td><td>2.3 (56%)</td></tr><tr><td>SD</td><td>0.7</td></tr><tr><td>Median</td><td>2.0</td></tr><tr><td>Range</td><td>1-3</td></tr></table>‘Agree’
*Item scored in reverse.</td>
</tr>
<tr>
<td>EEL-mod – Q.4</td>
<td>During ward rounds today, did the consultant take the time to assess for your understanding?</td>
<td>Trainees: n=16
<table><tr><td>Mean</td><td>3.5 (70%)</td></tr><tr><td>SD</td><td>1.2</td></tr><tr><td>Median</td><td>3.5</td></tr><tr><td>Range</td><td>1-5</td></tr></table>‘Somewhat’</td>
</tr>
<tr>
<td>EEL-mod – Q.5</td>
<td>During ward rounds today, did you feel like the consultant just</td>
<td>Trainees: n=16
<table><tr><td>Mean</td><td>3.2 (64%)</td></tr><tr><td>SD</td><td>1.1</td></tr><tr><td>Median</td><td>3.5</td></tr></table></td>
</tr>
</table>

		assumed you knew stuff you didn't know?	Range 2-5 'Somewhat' **Item scored in reverse.*				
	EEL-mod – Q.8	During ward rounds today, did you feel like you were able to understand the thought process of the consultant when he/she discussed the case or management plan?	Trainees: n=16 Mean 3.5 (70%) SD 1.0 Median 4.0 Range 2-5 'Somewhat' **Item scored in reverse.*				
	EEL-mod – Q.9	During ward rounds today, did you feel the consultant helped you identify your knowledge gaps?	Trainees: n=16 Mean 3.4 (69%) SD 1.2 Median 4.0 Range 1-5 'Somewhat' **Item scored in reverse.*				

E.32 TRAINEE ROUNDING LOG – SNAPPS 'YES' RUN CHART RESULTS (BACK, CH.7)

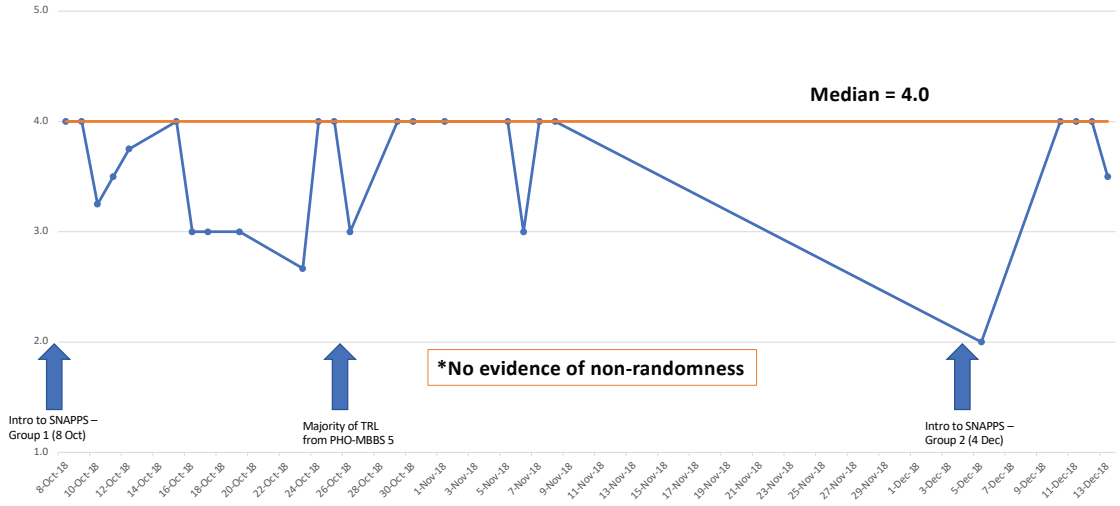


1= Not at all successful, 2 = Slightly successful, 3 = Moderately successful, 4 = Quite successful, 5 = Extremely successful

Mastery

n = 44

2. How successful were you at Narrowing the patient's differential to 2-3 possibilities? (PMW & PHO; MBBS 3/5)

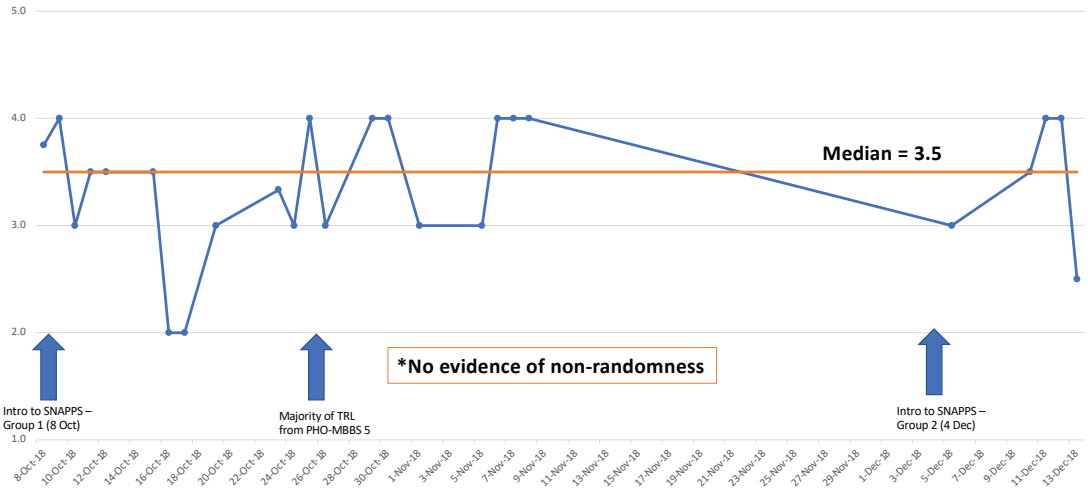


1= Not at all successful, 2 = Slightly successful, 3 = Moderately successful, 4 = Quite successful, 5 = Extremely successful

Mastery

n = 44

3. How successful were you at Analyzing the patient's narrowed differential or problem? (PMW & PHO; MBBS 3/5)

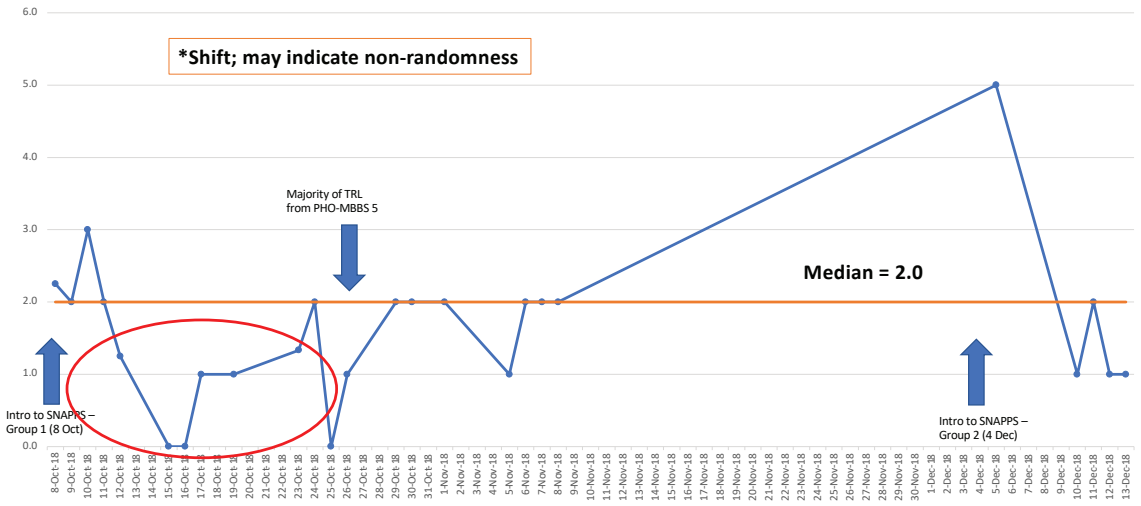


1= Not at all successful, 2 = Slightly successful, 3 = Moderately successful, 4 = Quite successful, 5 = Extremely successful

Mastery

n = 44

4. How many questions did you Probe the consultant with on rounds when presenting the patient today? (PMW & PHO; MBBS 3/5)

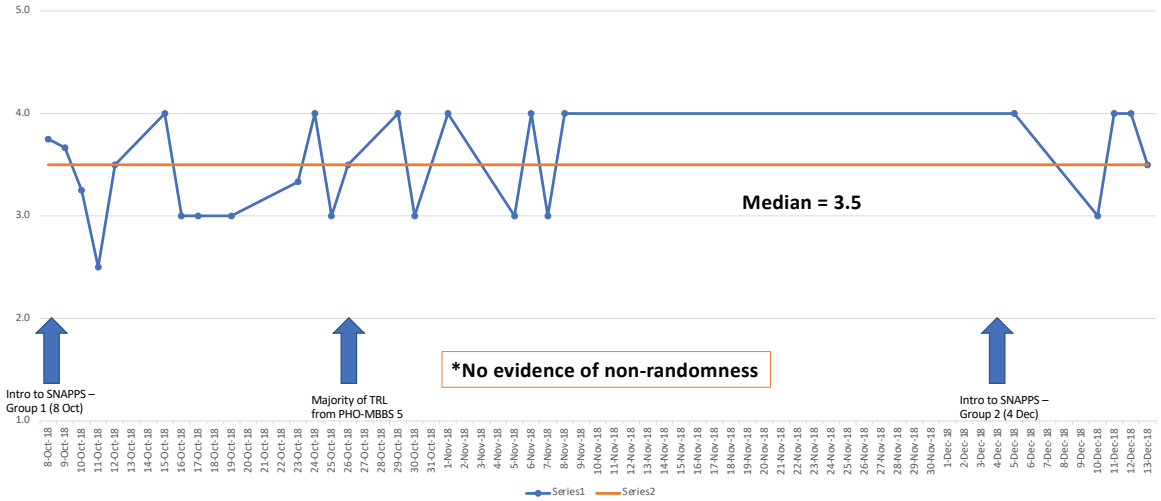


Direct correlation between number of questions asked and number charted.

Mastery

n = 44

5. How successful were you at making a Plan for this patient today? (PMW & PHO; MBBS 3/5)

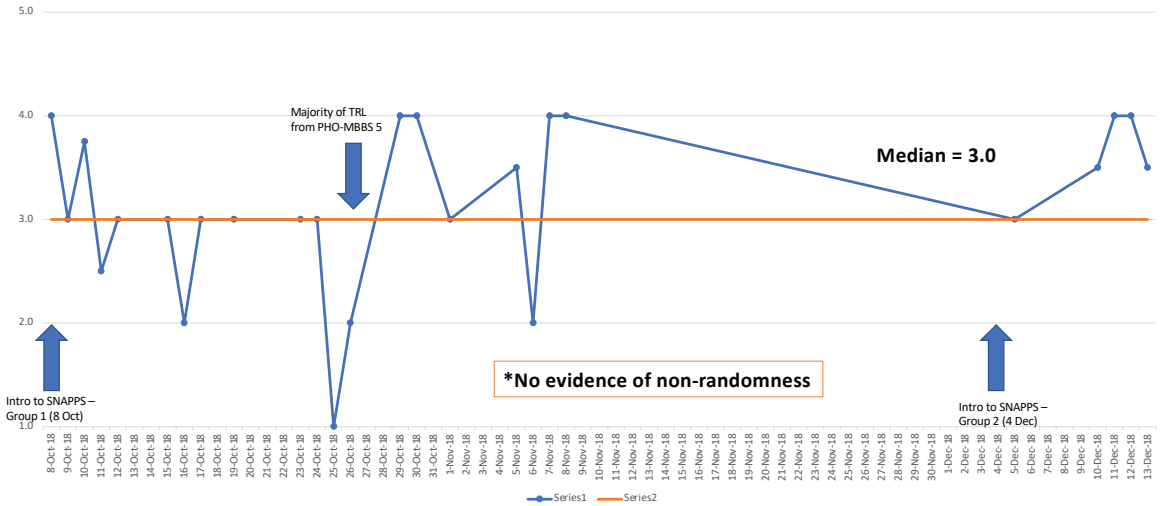


1= Not at all successful, 2 = Slightly successful, 3 = Moderately successful, 4 = Quite successful, 5 = Extremely successful

Mastery

n = 44

6. How successful were you at Selecting a case related question for this patient today? (PMW & PHO; MBBS 3/5)

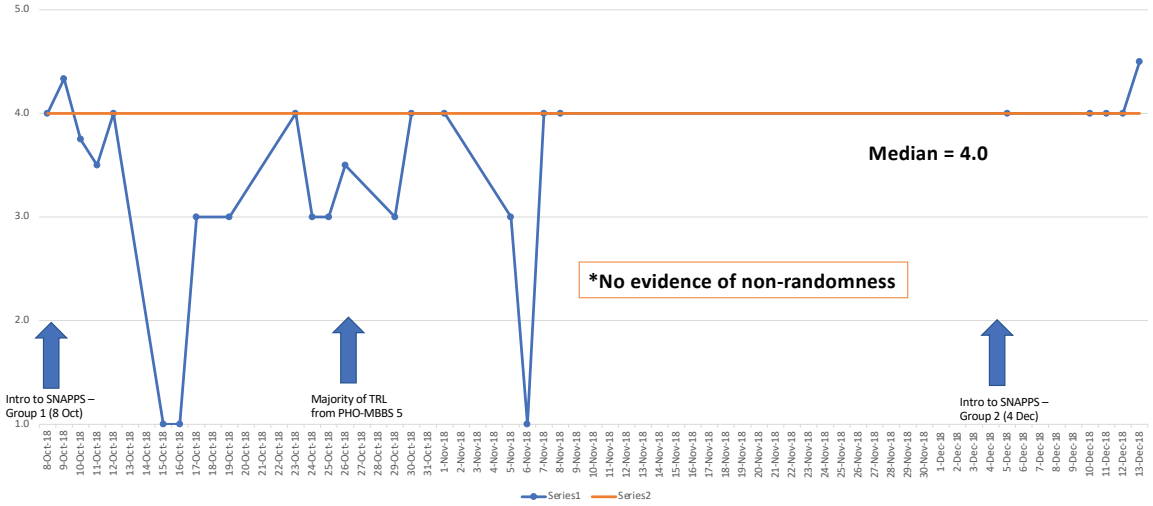


1= Not at all successful, 2 = Slightly successful, 3 = Moderately successful, 4 = Quite successful, 5 = Extremely successful

Mastery & COP

7. During ward rounds today, when you presented your patient, how much were you encouraged to discuss your differential diagnosis? (PMW & PHO; MBBS 3/5)

n = 44

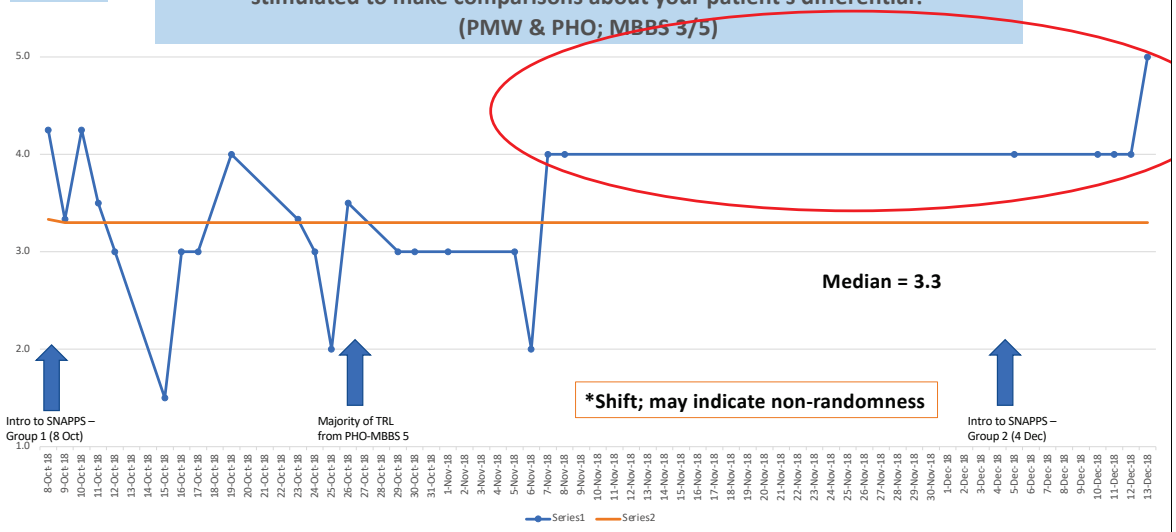


1= Not at all, 2 = A little bit, 3= Somewhat, 4 = Quite a bit, 5 = A great amount

Mastery & COP

8. During ward rounds today, when you presented your patient, how much were you stimulated to make comparisons about your patient's differential? (PMW & PHO; MBBS 3/5)

n = 44

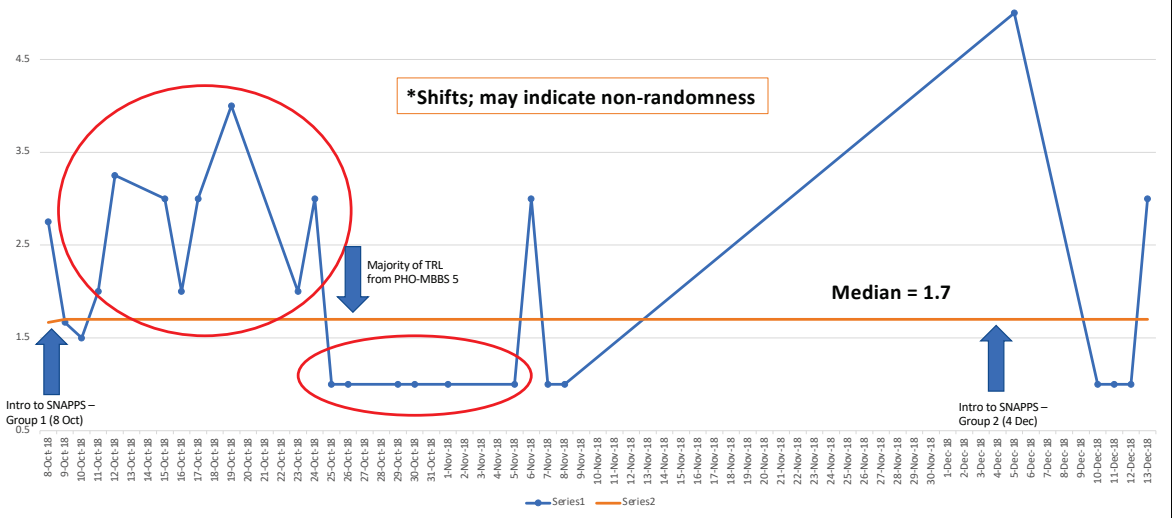


1= Not at all, 2 = A little bit, 3= Somewhat, 4 = Quite a bit, 5 = A great amount

Psychological

9. During ward rounds today, when discussing a case, did the discussion feel like a 'drill session'? (PMW & PHO; MBBS 3/5)

n = 44

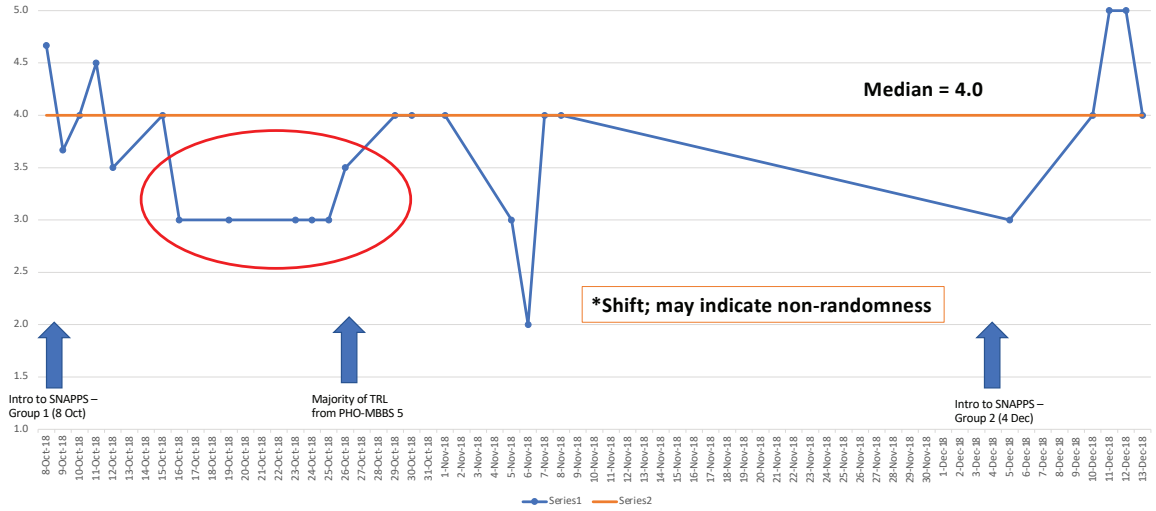


1= Not at all, 2 = A little bit, 3= Somewhat, 4 = Quite a bit, 5 = A great amount

Verbal

10. During ward rounds today, did you feel the consultant guided you through the learning point so that you could understand? (PMW & PHO; MBBS 3/5)

n = 44

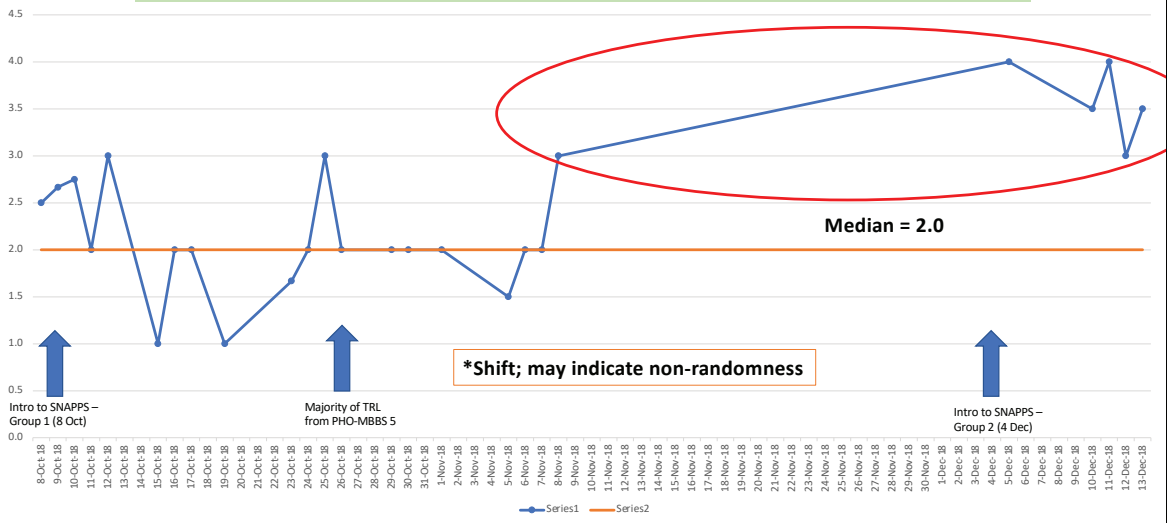


1= Not at all, 2 = A little bit, 3= Somewhat, 4 = Quite a bit, 5 = A great amount

Vicarious

11. During ward rounds today, did the consultant express his/her uncertainty about the case? (PMW & PHO; MBBS 3/5)

n = 44

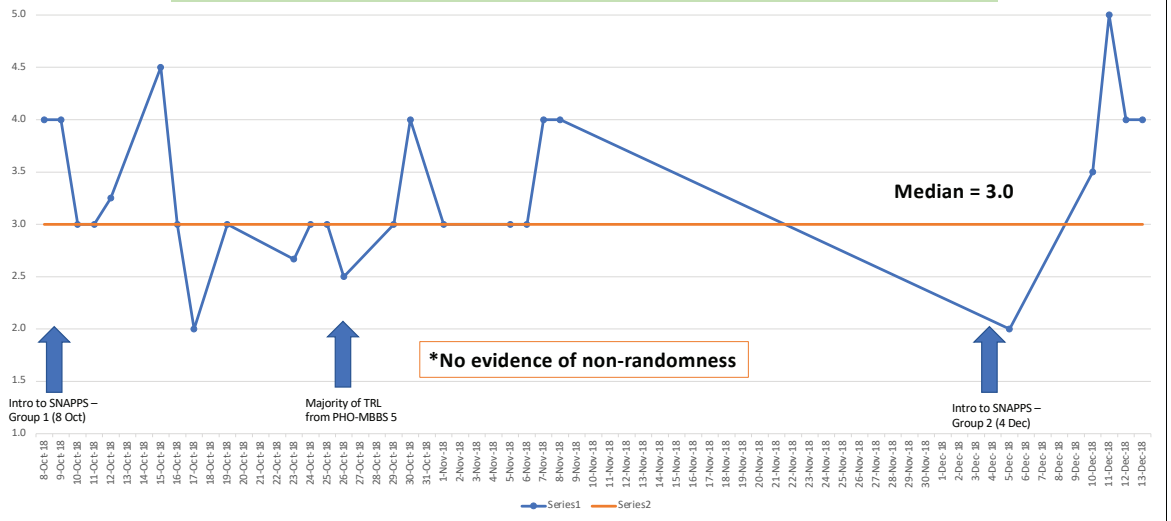


1= Not at all, 2 = A little bit, 3= Somewhat, 4 = Quite a bit, 5 = A great amount

Vicarious

12. Compared with other trainees, how well did you present your patient today? (PMW & PHO; MBBS 3/5)

n = 44

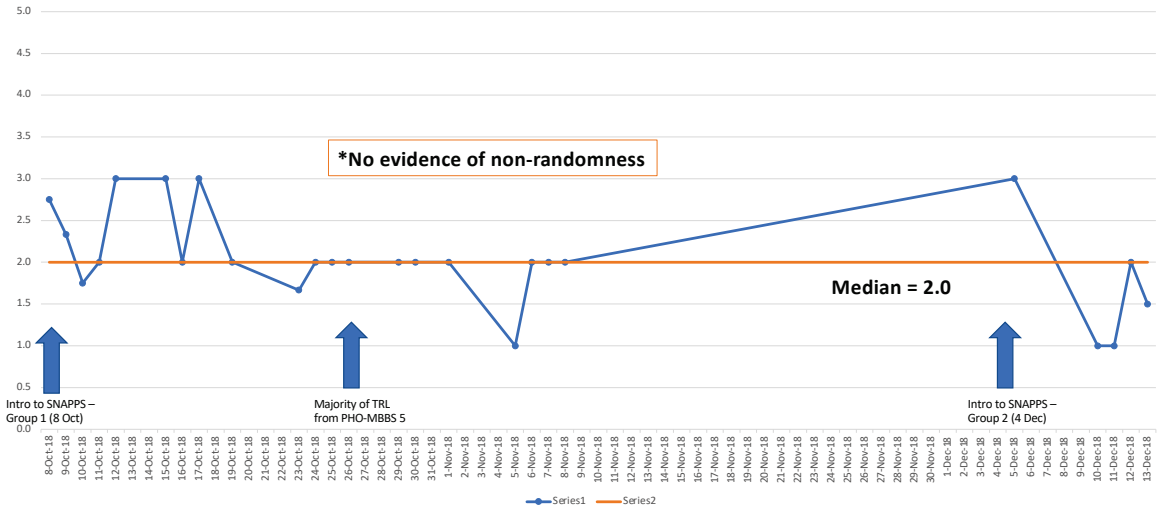


1= Not well at all, 2 = Not well, 3 = Similar, 4 = Better, 5 = Much better

Psychological

13. I had an uneasy, upset feeling when I presented my case today. (PMW & PHO; MBBS 3/5)

n = 44



1= Not at all, 2 = A little bit, 3= Somewhat, 4 = Quite a bit, 5 = A great amount

E.33 Trainee Rounding Log – SNAPPS 'Yes' Descriptive results (back, Ch.7)

Group 1 Students *(8 Oct – 15 Nov 2018)* *x15 total MBBS3/5* *n=# of patient presentations*	**SNAPPS, Yes ALL (n=37)**	**MBBS 3, Yes (n=13)**	**MBBS 5, Yes (n=24)**	**PMW, Yes (n=23)**	**PHO, Yes (n=14)**
1. How successful were you at briefly Summarizing the history and physical exam for this patient on rounds today?	Median 4 Range 2-5 Mean 3.3 SD 0.9 *'Moderately successful'*	Median 3 Range 2-4 Mean 2.8 SD 0.8 *'Slightly successful'*	Median 4 Range 2-5 Mean 3.6 SD 0.8 *'Quite successful'*	Median 3 Range 2-4 Mean 3.1 SD 0.8 *'Moderately successful'*	Median 4 Range 2-5 Mean 3.6 SD 0.8 *'Quite successful'*
2. How successful were you at Narrowing the patient's differential to 2-3 possibilities?	Median 4 Range 2-5 Mean 3.6 SD 0.7 *'Quite successful'*	Median 3 Range 2-4 Mean 3.2 SD 0.7 *'Moderately successful'*	Median 4 Range 2-5 Mean 3.8 SD 0.7 *'Quite successful'*	Median 4 Range 2-5 Mean 3.5 SD 0.7 *'Quite successful'*	Median 4 Range 2-5 Mean 3.7 SD 0.7 *'Quite successful'*
3. How successful were you at Analyzing the patient's narrowed differential or problem?	Median 3 Range 2-5 Mean 3.4 SD 0.8 *'Quite successful'*	Median 3 Range 2-4 Mean 3.0 SD 0.8 *'Moderately successful'*	Median 4 Range 2-5 Mean 3.6 SD 0.7 *'Quite successful'*	Median 3 Range 2-5 Mean 3.3 SD 0.8 *'Moderately successful'*	Median 4 Range 2-5 Mean 3.6 SD 0.7 *'Quite successful'*
4. How many questions did you Probe the consultant with on rounds when presenting the patient today?	Median 2 Range 0-5 Mean 1.6 SD 1.1	Median 2 Range 0-5 Mean 1.7 SD 1.4	Median 2 Range 0-4 Mean 1.6 SD 0.9	Median 1 Range 0-5 Mean 1.5 SD 1.3	Median 2 Range 1-3 Mean 1.8 SD 0.6
5. How successful were you at making a Plan for this patient today?	Median 3 Range 2-4 Mean 3.4 SD 0.6 *'Quite successful'*	Median 3 Range 2-4 Mean 3.2 SD 0.6 *'Moderately successful'*	Median 4 Range 3-4 Mean 3.5 SD 0.5 *'Quite successful'*	Median 3 Range 2-4 Mean 3.4 SD 0.6 *'Quite successful'*	Median 3.5 Range 3-4 Mean 3.5 SD 0.5 *'Quite successful'*
6. How successful were you at Selecting a case related question for this patient today?	Median 3 Range 1-5 Mean 3.1 SD 0.9 *'Moderately successful'*	Median 3 Range 1-4 Mean 2.8 SD 0.9 *'Moderately successful'*	Median 3 Range 2-5 Mean 3.3 SD 1.0 *'Moderately successful'*	Median 3 Range 1-5 Mean 3.1 SD 1.0 *'Moderately successful'*	Median 3.5 Range 2-4 Mean 3.1 SD 0.9 *'Moderately successful'*
7. During ward rounds today, when you presented your patient, how much were you encouraged to discuss your differential diagnosis?	Median 4 Range 1-5 Mean 3.4 SD 1.2 *'Quite a bit'*	Median 3 Range 1-5 Mean 2.9 1.3 *'Somewhat'*	Median 4 Range 1-5 Mean 3.7 SD 1.0 *'Quite a bit'*	Median 3 Range 1-5 Mean 3.1 SD 1.3 *'Somewhat'*	Median 4 Range 3-5 Mean 4.0 SD 0.7 *'Quite a bit'*

8. During ward rounds today, when you presented your patient, how much were you stimulated to make comparisons about your patient's differential?	Median 3 Range 1-5 Mean 3.3 SD 1.0 *'Somewhat'*	Median 3 Range 2-5 Mean 3.2 SD 1.0 *'Somewhat'*	Median 3 Range 1-5 Mean 3.4 SD 1.1 *'Quite a bit'*	Median 3 Range 1-5 Mean 3.2 SD 1.1 *'Somewhat'*	Median 3 Range 2-5 Mean 3.5 SD 0.9 *'Quite a bit'*
9. During ward rounds today, when discussing a case, did the discussion feel like a 'drill session'?	Median 2 Range 1-4 Mean 1.1 SD 1.2 *'Not at all'*	Median 2 Range 1-3 Mean 2.1 SD 0.9 *'A little bit'*	Median 1 Range 1-4 Mean 2.0 SD 1.4 *'A little bit'*	Median 3 Range 1-4 Mean 2.6 SD 1.2 *'Somewhat'*	Median 1 Range 1-3 Mean 1.1 SD 0.5 *'Not at all'*
10. During ward rounds today, did you feel the consultant guided you through the learning point so that you could understand?	Median 4 Range 1-5 Mean 3.7 SD 0.9 *'Quite a bit'*	Median 3 Range 1-5 Mean 3.2 SD 1.1 *'Somewhat'*	Median 4 Range 2-5 Mean 3.9 SD 0.7 *'Quite a bit'*	Median 4 Range 1-5 Mean 3.5 SD 1.0 *'Quite a bit'*	Median 4 Range 2-5 Mean 3.9 SD 0.7 *'Quite a bit'*
11. During ward rounds today, did the consultant express his/her uncertainty about the case?	Median 2 Range 1-5 Mean 2.2 SD 1.2 *'A little bit'*	Median 2 Range 1-4 Mean 2.1 SD 1.0 *'A little bit'*	Median 2 Range 1-5 Mean 2.3 SD 1.3 *'A little bit'*	Median 2 Range 1-5 Mean 2.2 SD 1.2 *'A little bit'*	Median 2 Range 1-4 Mean 2.2 SD 1.1 *'A little bit'*
12. Compared with other trainees, how well did you present your patient today?	Median 3 Range 2-5 Mean 3.3 SD 0.7 *'Similar'*	Median 3 Range 2-3 Mean 2.9 SD 0.3 *'Similar'*	Median 3 Range 2-5 Mean 3.5 SD 0.8 *'Better'*	Median 3 Range 2-5 Mean 3.3 SD 0.7 *'Similar'*	Median 3 Range 2-5 Mean 3.4 SD 0.8 *'Better'*
13. I had an uneasy, upset feeling when I presented my case today.	Median 2 Range 1-4 Mean 1.2 SD 0.9 *'Not at all'*	Median 2 Range 1-3 Mean 1.8 SD 0.7 *'A little bit'*	Median 2 Range 1-4 Mean 2.4 SD 1.0 *'A little bit'*	Median 2 Range 1-4 Mean 2.3 SD 0.9 *'A little bit'*	Median 2 Range 1-4 Mean 1.9 SD 0.8 *'A little bit'*
Total PSE Score **(n=12 questions; excluded Q.4)** **Q.9 & 13 reverse scored for total** **Max possible score = 60**	Median 40 Range 29-51 Mean 40.4 SD 5.6 *67%*	Median 38 Range 29-48 Mean 37.3 SD 5.8 *62%*	Median 43 Range 35-51 Mean 42.0 SD 4.8 *70%*	Median 39 Range 29-48 Mean 38.4 SD 5.1 *64%*	Median 44.5 Range 35-51 Mean 43.6 SD 5.0 *73%*

E.34 Trainee Rounding Log – SNAPPS 'No' Descriptive results (back, Ch.7)

Group 1 Students *(8 Oct – 15 Nov 2018)* *x15 total MBBS3/5* *n=# of patient presentations*	**SNAPPS, No (n=98)**	**MBBS 3, No (n=44)**	**MBBS 5, No (n=54)**	**PMW, No (n=68)**	**NNU, No (n=27)**	**PHO, No (n=3)**
4. How many questions did you Probe the consultant with on rounds when presenting the patient today?	Median 1 Range 0-6 Mean 1.6 SD 1.4	Median 2 Range 0-4 Mean 1.6 SD 1.3	Median 1 Range 0-6 Mean 1.6 SD 1.5	Median 1 Range 0-4 Mean 1.1 SD 1.2	Median 2 Range 0-6 Mean 2.6 SD 1.5	Median 3 Range 2-3 Mean 2.7 SD 0.6
7. During ward rounds today, when you presented your patient, how much were you encouraged to discuss your differential diagnosis?	Median 3 Range 1-5 Mean 2.7 SD 1.3 *'Somewhat'*	Median 2 Range 1-5 Mean 2.6 SD 1.4 *'Somewhat'*	Median 3 Range 1-5 Mean 2.9 SD 1.2 *'Somewhat'*	Median 2 Range 1-5 Mean 2.6 SD 1.3 *'Somewhat'*	Median 3 Range 1-5 Mean 3.1 SD 1.2 *'Somewhat'*	Median 4 Range 3-4 Mean 3.7 SD 0.6 *'Quite a bit'*
8. During ward rounds today, when you presented your patient, how much were you stimulated to make comparisons about your patient's differential?	Median 3 Range 1-5 Mean 2.7 SD 1.2 *'Somewhat'*	Median 2 Range 1-5 Mean 2.5 SD 1.3 *'A little bit'*	Median 3 Range 1-5 Mean 2.8 SD 1.1 *'Somewhat'*	Median 3 Range 1-5 Mean 2.6 SD 1.2 *'Somewhat'*	Median 3 Range 1-5 Mean 2.8 SD 1.2 *'Somewhat'*	Median 3 Range 3-4 Mean 3.3 SD 0.6 *'Somewhat'*
9. During ward rounds today, when discussing a case, did the discussion feel like a 'drill session'?	Median 1 Range 1-5 Mean 1.9 SD 1.3 *'A little bit'*	Median 1 Range 1-5 Mean 1.9 SD 1.4 *'A little bit'*	Median 1 Range 1-5 Mean 1.9 SD 1.2 *'A little bit'*	Median 1 Range 1-5 Mean 1.9 SD 1.3 *'A little bit'*	Median 1 Range 1-5 Mean 2.0 SD 1.4 *'A little bit'*	Median 1 Range 1-1 Mean 1.0 SD 0.0 *'Not at all'*
10. During ward rounds today, did you feel the consultant guided you through the learning point so that you could understand?	Median 3 Range 1-5 Mean 3.1 SD 1.3 *'Somewhat'*	Median 3 Range 1-5 Mean 3.1 SD 1.4 *'Somewhat'*	Median 3 Range 1-5 Mean 3.1 SD 1.2 *'Somewhat'*	Median 3 Range 1-5 Mean 2.9 SD 1.2 *'Somewhat'*	Median 4 Range 1-5 Mean 3.4 SD 1.4 *'Quite a bit'*	Median 4 Range 3-4 Mean 3.7 SD 0.6 *'Quite a bit'*
11. During ward rounds today, did the consultant express his/her uncertainty about the case?	Median 2 Range 1-4 Mean 2.0 SD 1.1 *'A little bit'*	Median 2 Range 1-4 Mean 2.0 SD 1.1 *'A little bit'*	Median 2 Range 1-4 Mean 2.1 SD 1.1 *'A little bit'*	Median 2 Range 1-4 Mean 2.1 SD 1.1 *'A little bit'*	Median 1.5 Range 1-4 Mean 1.9 SD 1.1 *'A little bit'*	Median 2 Range 1-2 Mean 1.7 SD 0.6 *'Not at all'*
12. Compared with other trainees, how well did you present your patient today?	Median 3 Range 2-4 Mean 3.2 SD 0.6 *'Similar'*	Median 3 Range 2-4 Mean 3.2 SD 0.6 *'Similar'*	Median 3 Range 2-4 Mean 3.3 SD 0.5 *'Similar'*	Median 3 Range 2-4 Mean 3.2 SD 0.6 *'Similar'*	Median 3 Range 2-4 Mean 3.3 SD 0.5 *'Similar'*	Median 3 Range 3-4 Mean 3.3 SD 0.6 *'Similar'*
13. I had an uneasy, upset feeling when I presented my case today.*	Median 1 Range 1-5 Mean 1.8 SD 1.0	Median 1 Range 1-4 Mean 1.5 SD 0.8	Median 2 Range 1-5 Mean 2.2 SD 1.1	Median 2 Range 1-4 Mean 1.9 SD 1.0	Median 1 Range 1-5 Mean 1.7 SD 1.1	Median 2 Range 1-2 Mean 2.0 SD 1.0

	'A little bit'	*'Not at all'*	*'A little bit'*	*'A little bit'*	*'Not at all'*	*'A little bit'*
Total Score **(n=7 questions; excluded Q.4)** **Q.9 & 13 reverse scored for total** **Max possible score = 35** (n=95)	Median 21 Range 12-32 Mean 21.6 SD 4.6 62%	Median 20 Range 12-32 Mean 21.3 SD 5.3 *61%*	Median 23 Range 14-30 Mean 21.8 SD 4.0 *62%*	Median 20 Range 12-32 Mean 21.1 SD 4.8 *60%*	Median 23 Range 14-28 Mean 22.3 SD 4.1 *64%*	Median 25 Range 23-26 Mean 24.7 SD 1.5 *70%*

E.35 PHASE 3-CYCLE 2: JOINT DISPLAY DIAGRAM (BACK, CH.7)

Content Area #1	Related Survey Question	Trainees & Faculty Responses	QUAL summary	Congruent	Divergent
Faculty uptake of SNAPPS	Faculty Rounding Log (FRL)	Average percent of presentations using SNAPPS for faculty was 15%. Average percent of my own use of SNAPPS was 86%.	- Trainees reported not having much opportunity to use SNAPPS. - The use of SNAPPS was reported to have waned from the first group of trained students to the second. - Faculty listed several reasons for not using SNAPPS, including: lack of training, requiring additional training, additional burden on clinical teaching, lack of motivation, competing clinical duties, and busy service. - A divergent thematic analysis was revealed: My SNAPPS Story.	The feedback from the FRL and TRL is congruent with the qualitative data – i.e. that despite the previous educational series offered for faculty, there remained several challenges to using SNAPPS. While the FRL and TRL could only give us an idea of the percentage of SNAPPS use, the qualitative data described the reasons for the poor uptake in greater detail. The fact that my own use of SNAPPS was much greater than other faculty also corresponds as to why my qualitative data was so divergent than other faculty over the course of cycle 2.	Some faculty expressed that time was a limiting factor for their use of SNAPPS on ward rounds, but this was not found on the FRL.
	Trainee Rounding Log (TRL)	Of total submitted TRL during cycle 2, only 25% had used SNAPPS.			
	Faculty Rounding Log (FRL)	No difference in length of rounds or time spent per patient when SNAPPS was used or not used.			

<table>
<tr><th>Content Area #2</th><th>Related Survey Question</th><th>Trainees & Faculty Responses</th><th>QUAL summary</th><th>Congruent</th><th>Divergent</th></tr>
<tr>
<td>Variation in the use of SNAPPS</td>
<td>Trainee Rounding Log</td>
<td>Group 1:
SNAPPS Yes vs No Total

SNAPPS Yes, n=37
<table>
<tr><td>Mean</td><td>23.5 (67%)</td></tr>
<tr><td>SD</td><td>3.8</td></tr>
<tr><td>Median</td><td>23</td></tr>
<tr><td>Range</td><td>16-31</td></tr>
</table>
SNAPPS No, n=95
<table>
<tr><td>Mean</td><td>21.6 (62%)</td></tr>
<tr><td>SD</td><td>4.6</td></tr>
<tr><td>Median</td><td>21</td></tr>
<tr><td>Range</td><td>12-32</td></tr>
</table>
Group 2:
SNAPPS Yes vs No Total
SNAPPS Yes, n=7
<table>
<tr><td>Mean</td><td>27.4 (78%)</td></tr>
<tr><td>SD</td><td>3.4</td></tr>
<tr><td>Median</td><td>28</td></tr>
<tr><td>Range</td><td>21-32</td></tr>
</table>
SNAPPS No, n=27
<table>
<tr><td>Mean</td><td>23.1 (66%)</td></tr>
<tr><td>SD</td><td>4.9</td></tr>
<tr><td>Median</td><td>23</td></tr>
<tr><td>Range</td><td>14-32</td></tr>
</table>
</td>
<td>- Several comments about the misinterpretation or various uses of SNAPPS.
- Overall concern that many faculty were not using SNAPPS correctly, but were continuing to use the traditional ward round, but calling it ‘SNAPPS’ rounds.</td>
<td>The lack of difference in PSE for the first group of students could have been explained by the misinterpretation or lack of training to properly use SNAPPS by other faculty.

Whereas the second group of trainees did show some difference in their level of PSE when using SNAPPS and not using SNAPPS. This could possibly be explained by the fact that from the second group, the majority of those who had used SNAPPS were commenting on their use of SNAPPS on PHO, where it is likely that they were being exposed to a ‘correct’ use of SNAPPS. (Faculty 5 had a use of SNAPPS to 35%, and I had gone on to her rounds for additional observation and training, where it was noted that she was indeed using SNAPPS correctly.) The only other faculty using SNAPPS regularly on PHO was myself, with an 86% use rate and well versed in the ‘how to’ of SNAPPS. (For all the SNAPPS-yes in the second group, it was with me as Primary)

*PHO continued to score better overall than PMW/NNU – was this because of SNAPPS or because of better ECI or more confident MBBS 5 or other?</td>
<td></td>
</tr>
</table>

<table>
<tr><th>Content Area #3</th><th colspan="2">Related Survey Question</th><th>Trainees & Faculty Responses</th><th>QUAL summary</th><th>Congruent</th><th>Divergent</th></tr>
<tr><td rowspan="3">Faculty expression of uncertainty on rounds</td><td>TRL – Q.11</td><td>During ward rounds today, did the consultant express his/her uncertainty about the case?</td><td>Group 1 – TRL for all SNAPPS Yes/No, and all wards ‘A little bit’

Group 2 – SNAPPS-Yes
<table><tr><td>Mean</td><td>3.6 (72%)</td></tr><tr><td>SD</td><td>0.5</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>3-4</td></tr></table>‘Quite a bit’

Group 2 – SNAPPS-No
<table><tr><td>Mean</td><td>2.2 (44%)</td></tr><tr><td>SD</td><td>1.0</td></tr><tr><td>Median</td><td>2.5</td></tr><tr><td>Range</td><td>1-4</td></tr></table>‘A little bit’</td><td rowspan="3">- Several quotes referenced faculty learning from the Probe and the Select steps of SNAPPS.

- Some quotes described scenarios where the faculty didn’t know the answer and would look it up along with the group.

“I learn more because of SNAPPS; it also sets it up that it’s ok if I (as the attending) also don’t know – I felt freer on rounds, which was an unexpected benefit.” (MD)</td><td rowspan="3">TRL – Group 2, do see a difference in SNAPPS-Yes vs SNAPPS-No from “strongly agree” to “disagree” → meaning that the use of SNAPPS helped the faculty express his/her uncertainty on ward rounds

ECI questions a bit mixed: Q. 4, 6 & 16 are positive reflections of the ECI, but Q. 11 is very negative; could be Q. 11 was negatively worded?</td><td rowspan="3">TRL – Group 1: only “a little bit”</td></tr>
<tr><td>ECI – Q.4</td><td>4. When you make an error here, it is seen as an opportunity for learning and growth.</td><td>Students, n=52 surveys; n=25 students
<table><tr><td>Mean</td><td>3.0 (75%)</td></tr><tr><td>SD</td><td>0.7</td></tr><tr><td>Median</td><td>3.0</td></tr><tr><td>Range</td><td>1-4</td></tr></table>‘Agree’</td></tr>
<tr><td>ECI – Q.6</td><td>6. Students here are encouraged to embrace</td><td>Students, n=52 surveys; n=25 students</td></tr>
</table>

		uncertainty rather than be afraid of it.	<table><tr><td>Mean</td><td>2.8 (69%)</td></tr><tr><td>SD</td><td>0.8</td></tr><tr><td>Median</td><td>3.0</td></tr><tr><td>Range</td><td>1-4</td></tr></table> 'Agree'			
	ECI – Q.11	11. Around here you have to act confidently even if you have little idea what you are doing.	Students, n=52 surveys; n=25 students <table><tr><td>Mean</td><td>2.1 (51%)</td></tr><tr><td>SD</td><td>0.6</td></tr><tr><td>Median</td><td>2.0</td></tr><tr><td>Range</td><td>1-3</td></tr></table> 'Agree' **Item scored in reverse.*			
	ECI – Q.16	16. The faculty tell us that they are interested in our thinking, but their actions on rounds suggest otherwise.	Students, n=52 surveys; n=25 students <table><tr><td>Mean</td><td>2.8 (69%)</td></tr><tr><td>SD</td><td>0.8</td></tr><tr><td>Median</td><td>3.0</td></tr><tr><td>Range</td><td>1-4</td></tr></table> 'Disagree' **Item reverse scored*			

<table>
<tr><th>Content Area #4</th><th colspan="2">Related Survey Question</th><th>Trainees & Faculty Responses</th><th>QUAL summary</th><th>Congruent</th><th>Divergent</th></tr>
<tr><td rowspan="2">Encouraging trainee critical thinking</td><td>TRL – Q.7</td><td>7. During ward rounds today, when you presented your patient, how much were you <u>encouraged to discuss</u> your differential diagnosis?</td><td>Group 1: SNAPPS - Yes
<table><tr><td>Mean</td><td>3.4 (68%)</td></tr><tr><td>SD</td><td>1.2</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>1-5</td></tr></table>‘Quite a bit’

Group 1: SNAPPS - No
<table><tr><td>Mean</td><td>2.7 (54%)</td></tr><tr><td>SD</td><td>1.3</td></tr><tr><td>Median</td><td>3.0</td></tr><tr><td>Range</td><td>1-5</td></tr></table>‘Somewhat’

Group 2: SNAPPS - Yes
<table><tr><td>Mean</td><td>4.1 (82%)</td></tr><tr><td>SD</td><td>0.7</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>3-5</td></tr></table>‘Quite a bit’

Group 2: SNAPPS - No
<table><tr><td>Mean</td><td>3.1 (62%)</td></tr><tr><td>SD</td><td>1.3</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>1-5</td></tr></table>‘Somewhat’</td><td rowspan="2">“I felt each patient had a much richer discussion than the standard rounds approach.” (SM)

“encouraged more thought process about their patients.” (Group 2 students debrief, end of rotation) (Students, Group 2, mid-rotation)

From My SNAPPS Debrief, you hear a lot of language and terms about “as a team”; how we use SNAPPS, how it changed the dialogue of student presenting to attending, to team figuring out what was going on with a patient; even my own role modeling and thought processes shared – that sharing is essentially inviting the trainees into the COP of medicine – SNAPPS gave me the tools to do that; and these questions that were originally COP questions support that (7,8 & 10)</td><td rowspan="2">Except for TRL Q.10 Group 2, it looks like the use of SNAPPS builds COP among the trainees – in both Group 1 and 2, they score higher for Questions 7, 8 and 10 which are questions that relate to the COP of medicine for trainees.</td><td rowspan="2"></td></tr>
<tr><td>TRL – Q.8</td><td>8. During ward rounds today, when you presented</td><td>Group 1: SNAPPS - Yes
<table><tr><td>Mean</td><td>3.3 (66%)</td></tr></table></td></tr>
</table>

		your patient, how much were you <u>stimulated to make comparisons</u> about your patient's differential?	SD 1.0 Median 3.0 Range 1-5 *'Somewhat'* Group 1: SNAPPS - No Mean 2.7 (54%) SD 1.2 Median 3.0 Range 1-5 *'Somewhat'* Group 2: SNAPPS - Yes Mean 4.3 (86%) SD 0.8 Median 4.0 Range 3-5 *'A great amount'* Group 2: SNAPPS - No Mean 2.7 (54%) SD 1.2 Median 3.0 Range 1-4 *'Somewhat'*			
	TRL – Q.10	10. During ward rounds today, did you feel the consultant guided you through the learning point so that you could understand?	Group 1: SNAPPS - Yes Mean 3.7 (74%) SD 0.9 Median 4.0 Range 1-5			

<table>
<tr>
<td></td>
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<td></td>
<td>‘Quite a bit’

Group 1: SNAPPS - No
<table><tr><td>Mean</td><td>3.1 (62%)</td></tr><tr><td>SD</td><td>1.3</td></tr><tr><td>Median</td><td>3.0</td></tr><tr><td>Range</td><td>1-5</td></tr></table>‘Somewhat’

Group 2: SNAPPS - Yes
<table><tr><td>Mean</td><td>4.1 (82%)</td></tr><tr><td>SD</td><td>0.9</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>3-5</td></tr></table>‘Quite a bit’

Group 2: SNAPPS - No
<table><tr><td>Mean</td><td>4.0 (80%)</td></tr><tr><td>SD</td><td>0.9</td></tr><tr><td>Median</td><td>4.0</td></tr><tr><td>Range</td><td>2-5</td></tr></table>‘Quite a bit’</td>
<td></td>
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<td></td>
<td>ECI – Q.5</td>
<td>The faculty care about how I think, not simply about whether I get the right answer.</td>
<td>Students, n=52 surveys; n=25 students

<table><tr><td>Mean</td><td>2.8 (71%)</td></tr><tr><td>SD</td><td>0.9</td></tr><tr><td>Median</td><td>3.0</td></tr><tr><td>Range</td><td>1-4</td></tr></table>‘Agree’</td>
<td></td>
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<tr>
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<td>ECI – Q.14</td>
<td>Most of what we do here is focused on the passive transfer of knowledge, (i.e.</td>
<td>Students, n=52 surveys; n=25 students</td>
<td></td>
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<table>
<tr>
<td></td>
<td></td>
<td>we are expected to just listen and absorb knowledge, not interactive learning).</td>
<td>
<table>
<tr><td>Mean</td><td>3.0 (75%)</td></tr>
<tr><td>SD</td><td>0.7</td></tr>
<tr><td>Median</td><td>3.0</td></tr>
<tr><td>Range</td><td>1-4</td></tr>
</table>
‘Disagree’
*Item reverse scored
</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>ECI – Q.16</td>
<td>The faculty tell us that they are interested in our thinking, but their actions on rounds suggest otherwise.</td>
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</table>
‘Disagree’
*Item reverse scored
</td>
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</table>

APPENDIX F – PHASE 2 ACTIVITIES & REFLECTIONS (BACK, CH. 5) (BACK, CH.8)

F.1. EVOLUTION OF PHASE 2 DRIVER DIAGRAM

March 2023

Appendix F
Phase 2 - Activities & Reflections

Appendix F

- F.1. Evolution of Phase 2 driver diagram
- F.2. Evolution of Phase 2 project measures, data collection tools & surveys
- F.3. Evolution of Phase 2 change ideas

Appendix F.1
Evolution of the Phase 2 Driver Diagram

August 2017 – April 2018

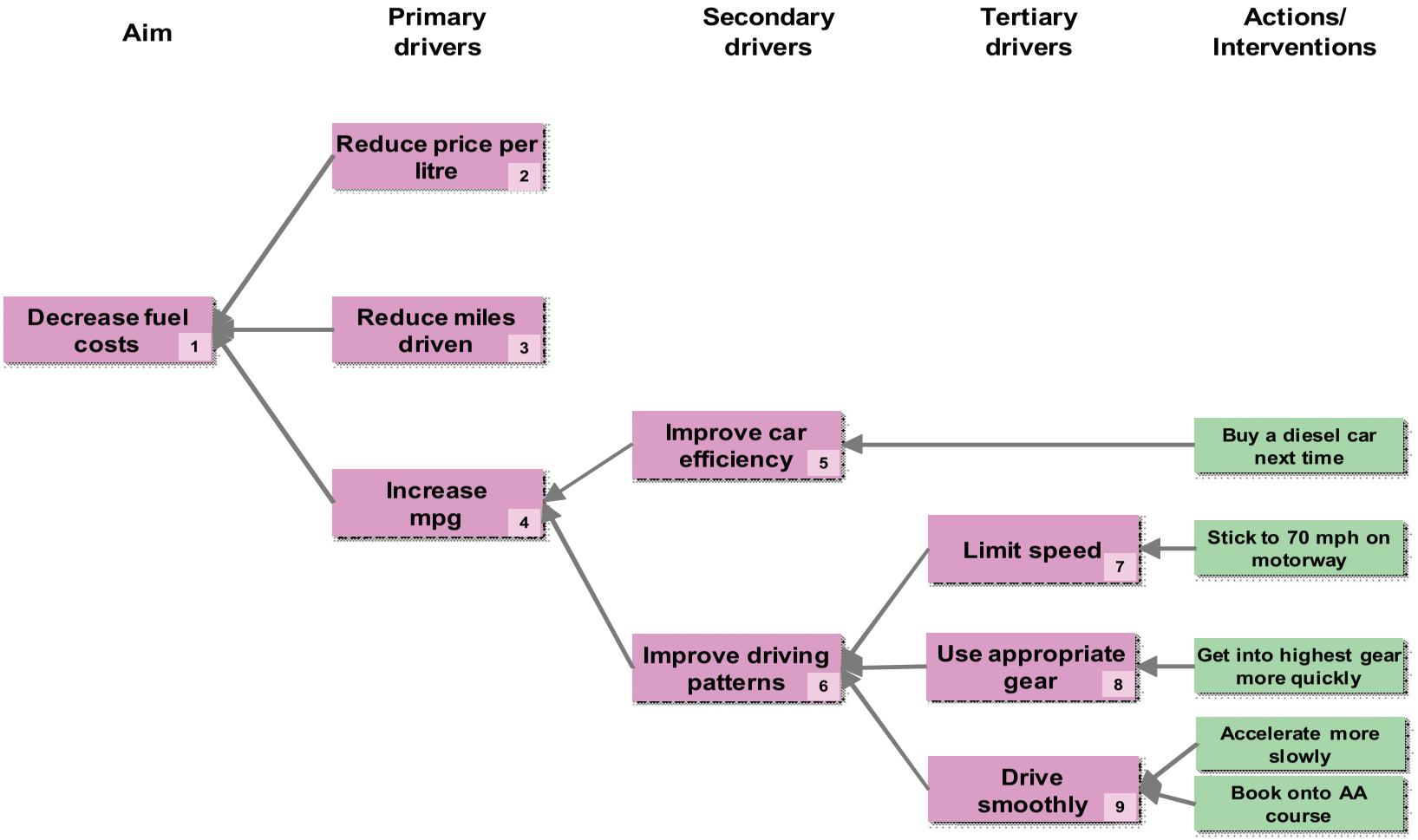
Definition of Driver Diagram

- A driver diagram (DD) is a quality improvement (QI) tool used to "describe theories of improvement."[154] The driver diagram offers an organized approach to answer fundamental QI project questions, such as: *'What are we trying to accomplish?'*, *'How will we know that a change is an improvement?'* and *'What changes can we make that will result in improvement?'*[154,178] The driver diagram is a "simple, linear, visual tool" that represents the 'cause-and-effect' relationship within a given QI project.[178] The DD is meant to be dynamic and should be updated over the course of the project.[178]

Definition of Driver Diagram

- Specifically, a DD is composed of several parts: the aim (or vision statement), primary drivers, secondary drivers, and possible interventions (commonly known as ‘change ideas’). These are all linked by relationship arrows that describe a unidirectional influence on the aim of the project – i.e. the list of ‘change ideas’ may possibly influence the drivers, and in turn, the aim.
- The aim statement should be *SMART*: specific, measurable, attainable, relevant, and time-bound. Embedded in each DD are project measures which determine what you will measure over time to see if your change ideas do in fact change or influence your primary and/or secondary drivers (either positively, negatively, or no change at all). For completeness, the DD often includes a brief description of the overall problem and the names of the team working on the project.

Examples of Driver Diagrams[158]



Approach to the driver diagram

- The following is a description of our eight-month dynamic process to develop our driver diagram during Phase 2. There were a total of nine drafts with several ongoing events that influenced the iterative and final version used in Phase 3 of the project.
- Ultimately, we set out to create a driver diagram that would incorporate the overall project's goals, the main influences on that goal, and provide insight to how we would achieve this.

Generating an Aim Statement

- Our first step was to generate an aim statement.
- We started with our previously developed research aim which had been outlined in Phase 1 of the project:

The aim of this study is to improve the quality of ward rounds teaching and learning for University of Botswana medical trainees working in the Department of Paediatircs at Princess Marina Hospital in order to improve their participation in, and sense of belonging to, a local community of clinical practice and enhance their self-efficacy beliefs regarding their ability to provide paediatric patient care.

Generating an Aim Statement

- In an attempt to make the aim statement more '*SMART'* and accessible to everyone on the team and in the department, we removed the theoretical framework terminology of the research project from the DD project aim. When we removed the statement related to the original research aim concerning the perceived self-efficacy and sense of belonging to a clinical community of practice for the trainees, we replaced this with the term 'optimize'.

As a means to ensure access to quality clinical education for UB trainees, our aim is to optimize the learning and teaching on paediatric ward rounds (PMW, NNU & PHO) for the faculty and learners (residents, students) by utilizing quality improvement methods over the next six months.

Generating an Aim Statement

- While this aim statement reflected the overall project aim, it wasn't very specific as to what 'optimize' meant in this context. We had removed the specific, measurable terminology and replaced it with a non-specific verb, leaving us with no operational definition of "optimize" (i.e. what does it mean to "optimize the learning and teaching on ward rounds?)
- I struggled with the vagueness of our aim statement, but decided that while we investigate better ways to be more specific, we could proceed to selecting our primary drivers.

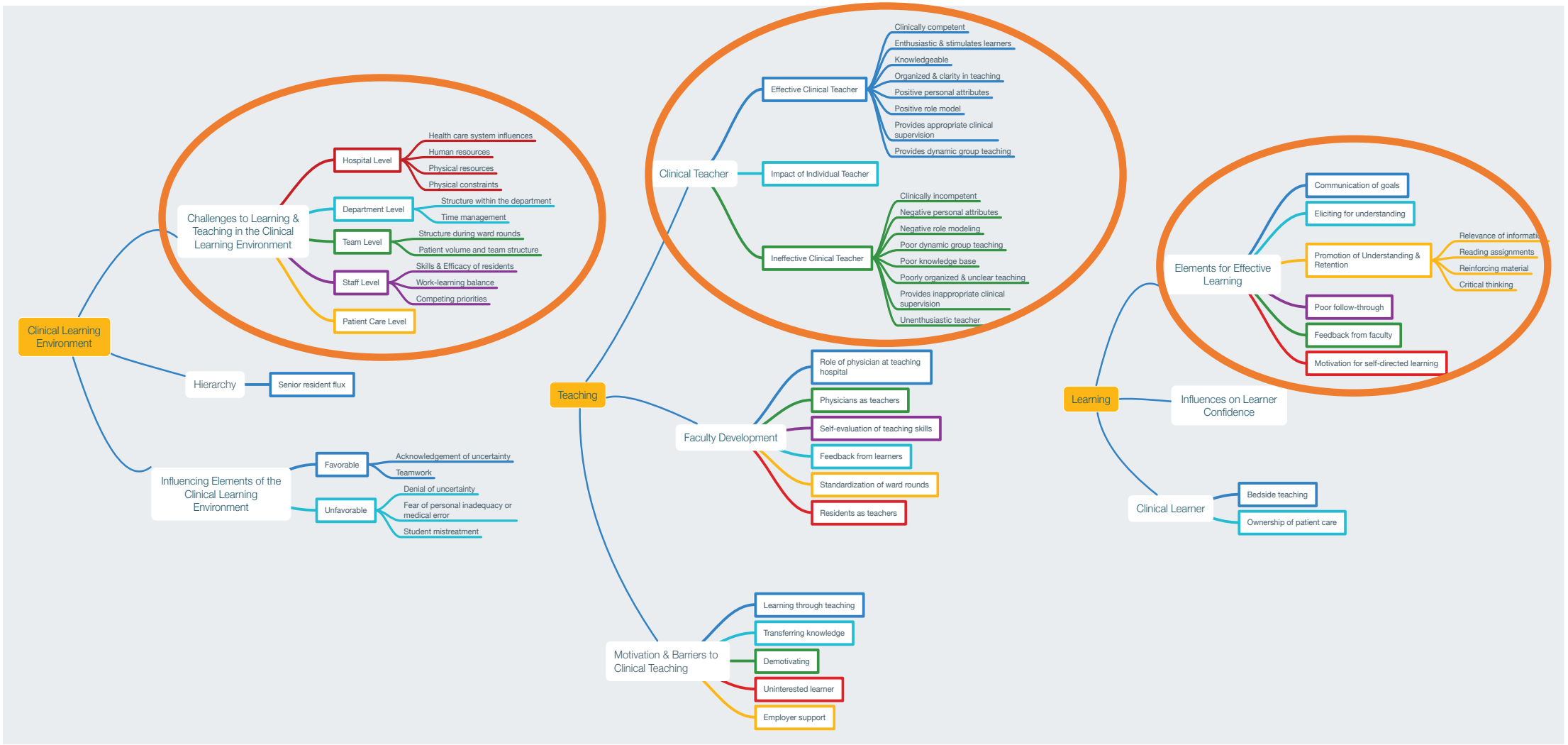
Generating Primary Drivers

- As a group, we generated our primary drivers by selecting three areas identified in Phase 1 thematic analysis results to focus on.
- We chose what to focus on by:
  - 1) its relevance to the department,
  - 2) its perceived ‘change-ability’ (i.e. was there a possible solution to this problem that we could improve?), and
  - 3) by what we felt was to be most pressing from the Phase 1 data.

Generating Primary Drivers

- After reviewing Phase 1 data, the group agreed that the biggest challenges to provide high quality teaching and learning on ward rounds were:
  - 1) The daily challenges faced to conduct academic ward rounds at PMH – structure, time management, etc.
  - 2) The lack of standardization among our paediatricians to teach and conduct ward rounds, and
  - 3) The lack of elements that promote effective learning – lack of communication of goals, poor feedback, and lack of providing learner-centred teaching (i.e. need to meet the learner where he/she is at).

Generating Primary Drivers



Generating Primary Drivers

- Therefore, the three primary drivers the group chose were:
  - 1) Challenges to learning and teaching in the clinical learning environment
  - 2) Clinical teacher; and
  - 3) Elements for effective learning

Draft 1 – Driver Diagram

- Therefore, our first draft of our driver diagram included:

As a means to ensure access to quality clinical education for UB trainees, our aim is to optimize the learning and teaching on paediatric ward rounds (PMW, NNU & PHO) for the faculty and learners (residents, students) by utilizing quality improvement methods over the next six months.

Specifically, we would like to optimize the learning and teaching by:

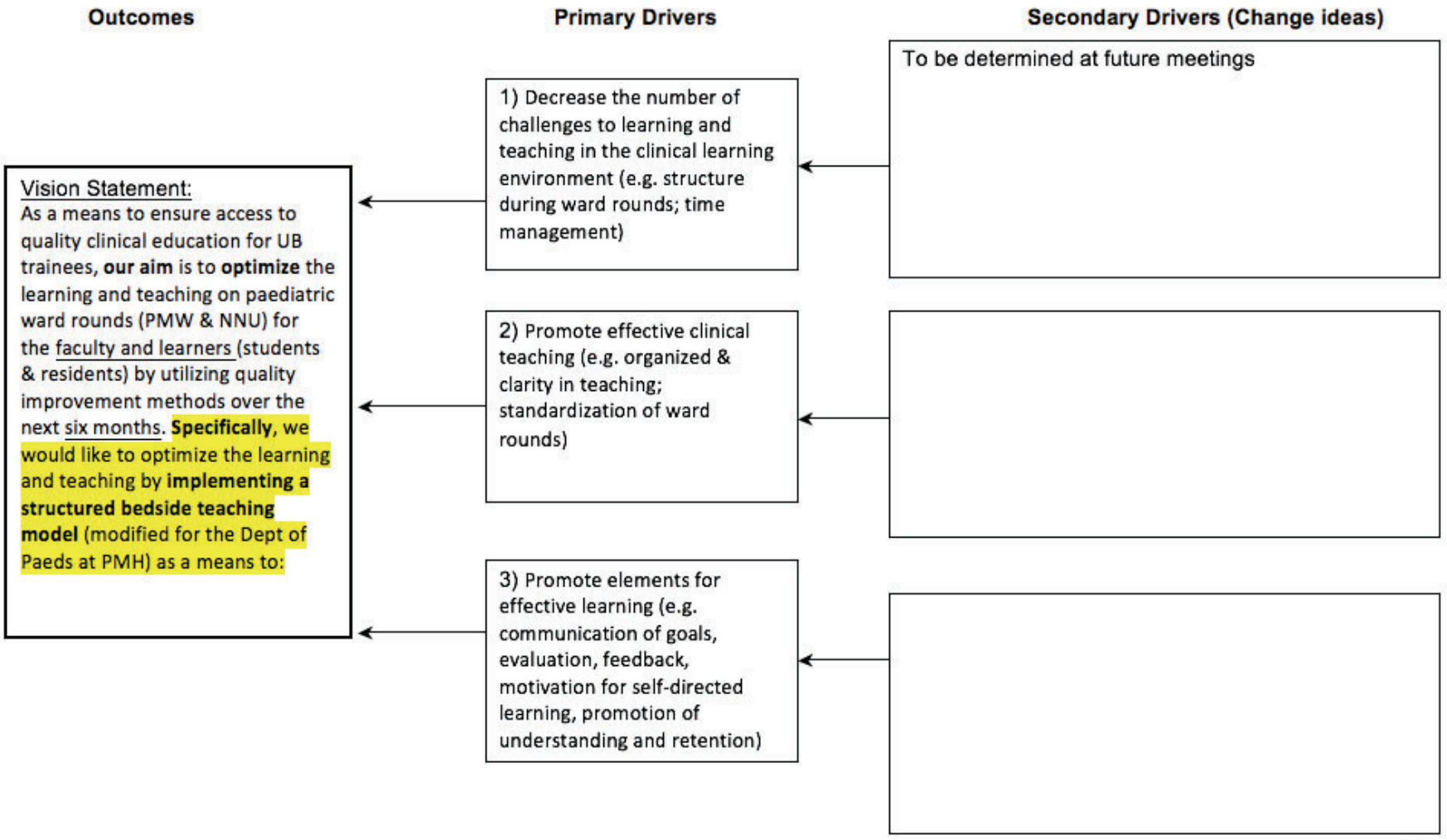
1) Decreasing the number of challenges to learning and teaching in the clinical learning environment
2) Promote effective clinical teaching
3) Promote elements for effective learning

Draft 2 – Driver Diagram

- I shared our first draft of our drive diagram with QI expert, MP. She provided us with a driver diagram template that we used moving forward.
- I was still worried about the specificity of the aim statement, so I asked if it was possible to embed our priority change idea (the introduction of SNAPPS bedside teaching model) into the aim statement. She thought since there was already evidence of SNAPPS being an effective tool to improve bedside teaching in the literature, then it could be included within the aim statement as what we hope to accomplish.
- She also recommended that for each primary driver that we include three project measures to keep things simple moving forward.

Draft 2

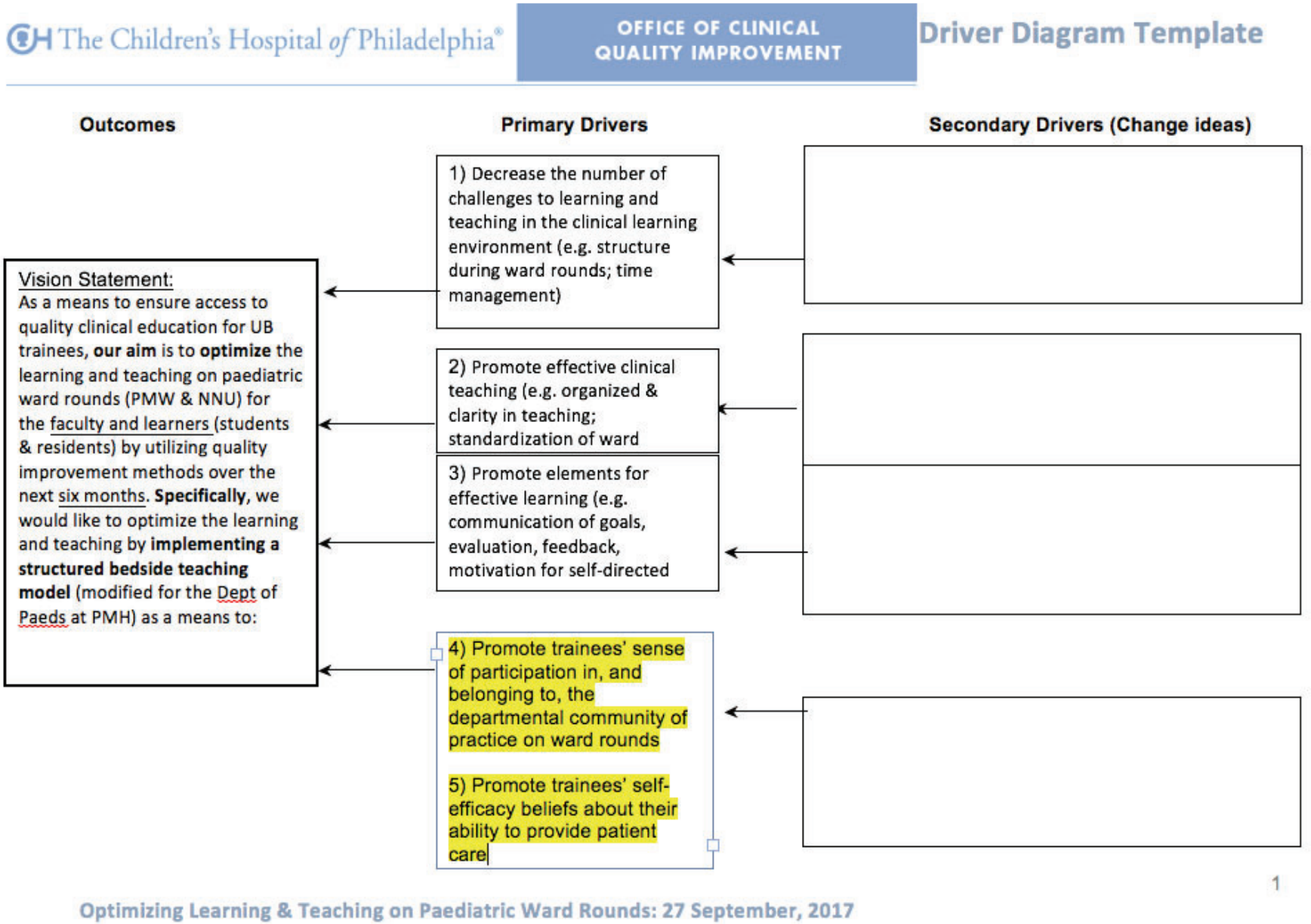
The Children's Hospital *of* Philadelphia® | OFFICE OF CLINICAL QUALITY IMPROVEMENT | **Driver Diagram Template**



Draft 3 – Driver Diagram

- Over the next week, I continued to ruminate on the fact that our current aim statement no longer contained the educational theoretical framework aspects of the project.
- My thought was that I could add them back in the form of primary drivers. But I struggled to find this helpful, so after adding them, I quickly removed them from the driver diagram.

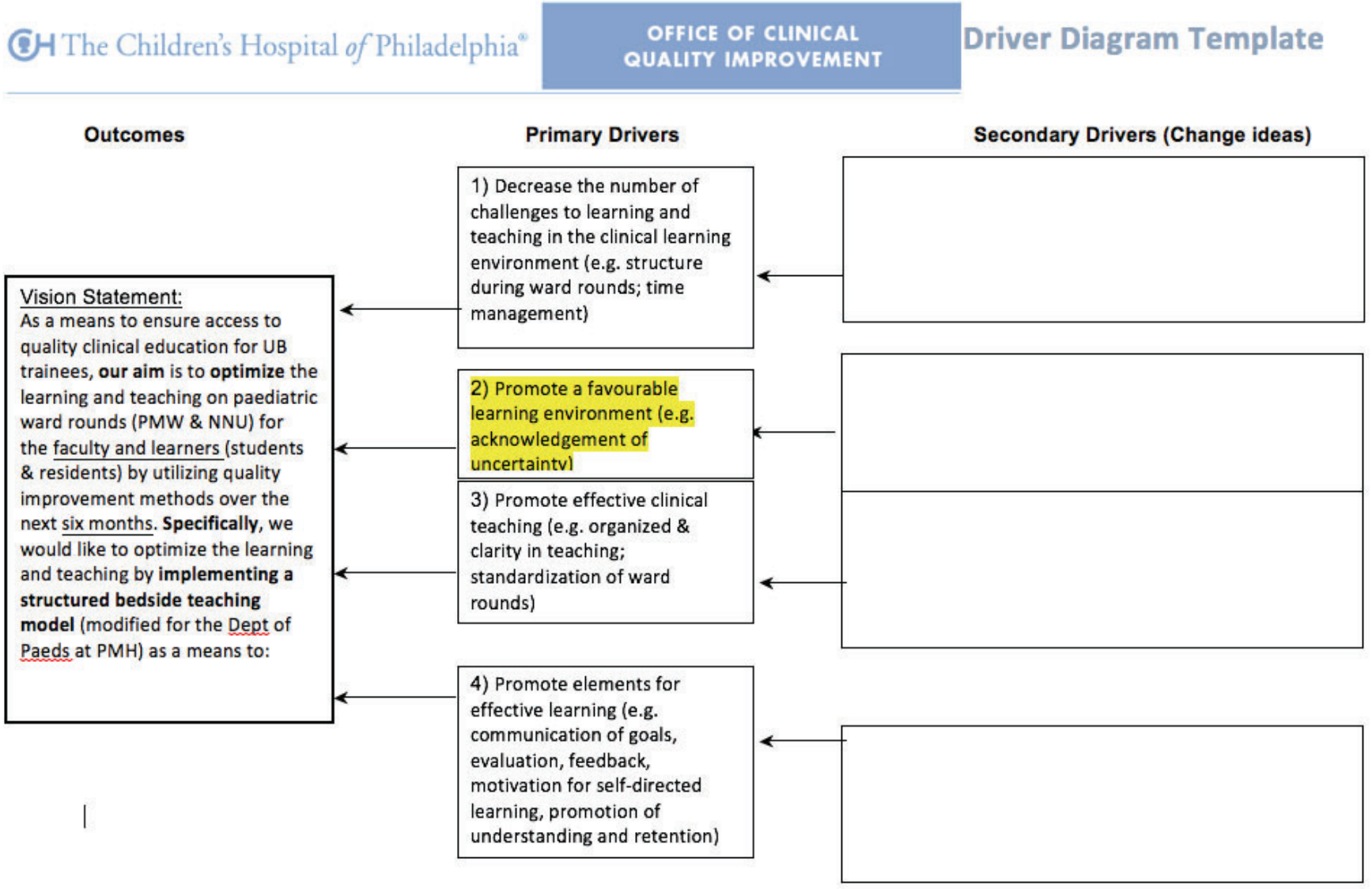
Draft 3


The Children's Hospital of Philadelphia
OFFICE OF CLINICAL QUALITY IMPROVEMENT
Driver Diagram Template
Outcomes
Primary Drivers
Secondary Drivers (Change ideas)
Vision Statement:
As a means to ensure access to quality clinical education for UB trainees, our aim is to optimize the learning and teaching on paediatric ward rounds (PMW & NNU) for the faculty and learners (students & residents) by utilizing quality improvement methods over the next six months. Specifically, we would like to optimize the learning and teaching by implementing a structured bedside teaching model (modified for the Dept of Paeds at PMH) as a means to:
1) Decrease the number of challenges to learning and teaching in the clinical learning environment (e.g. structure during ward rounds; time management)
2) Promote effective clinical teaching (e.g. organized & clarity in teaching; standardization of ward
3) Promote elements for effective learning (e.g. communication of goals, evaluation, feedback, motivation for self-directed
4) Promote trainees' sense of participation in, and belonging to, the departmental community of practice on ward rounds
5) Promote trainees' self-efficacy beliefs about their ability to provide patient care
1
Optimizing Learning & Teaching on Paediatric Ward Rounds: 27 September, 2017

Draft 4 – Driver Diagram

- Instead, I ended up reconsidering which aspects of the project would be important to measure moving forward and thought that it would be important to add the ‘promotion of a favorable clinical learning environment’ as a primary driver in light of the overall impact on the clinical learning environment during educational activities.
- I met with the project group again and showed them they updated DD. They agreed that it was important to directly consider the effects on the clinical learning environment on ward rounds and accepted the inclusion of a fourth primary driver.

Draft 4


The Children's Hospital of Philadelphia
OFFICE OF CLINICAL QUALITY IMPROVEMENT
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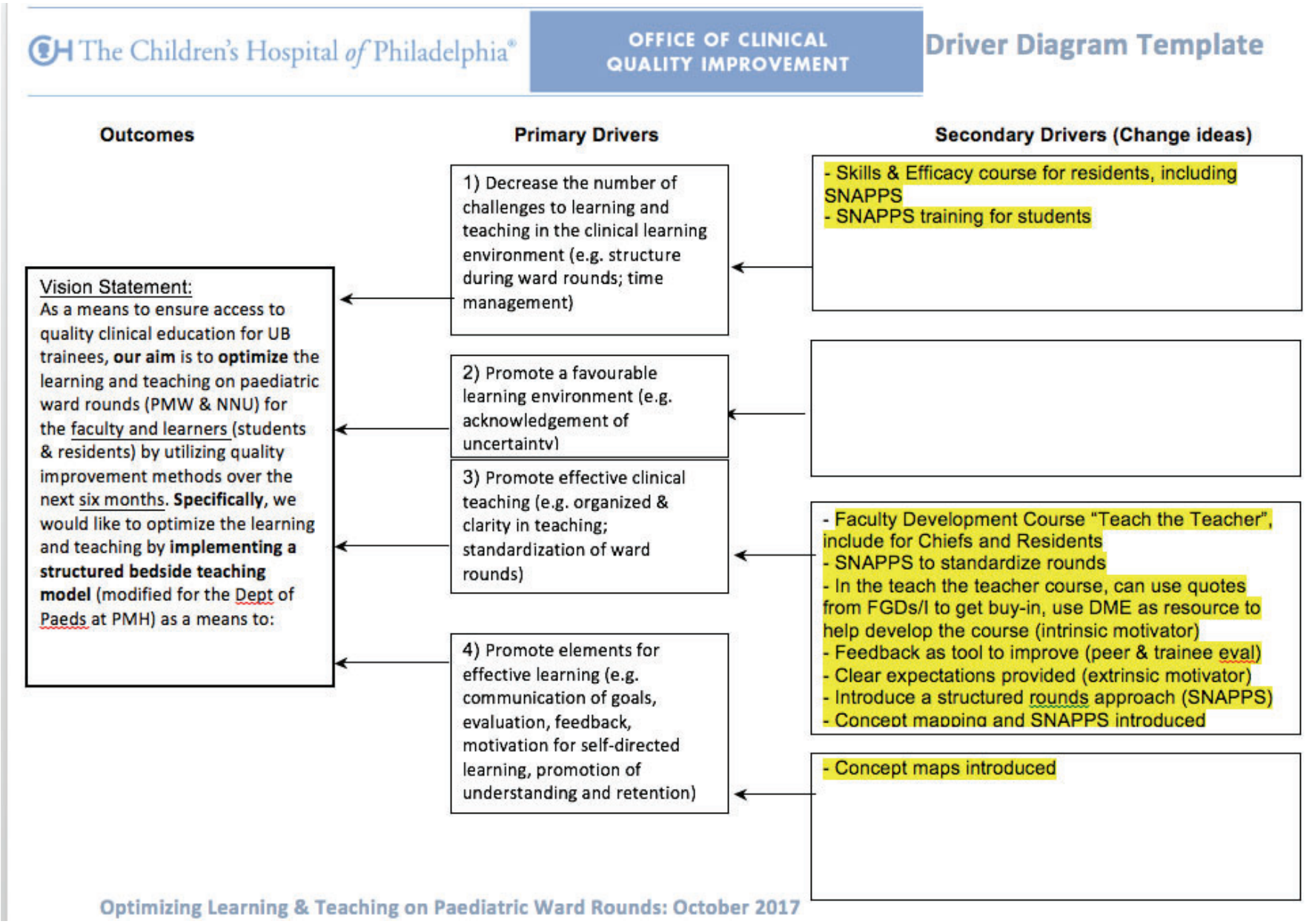
1) Decrease the number of challenges to learning and teaching in the clinical learning environment (e.g. structure during ward rounds; time management)
2) Promote a favourable learning environment (e.g. acknowledgement of uncertainty)
3) Promote effective clinical teaching (e.g. organized & clarity in teaching; standardization of ward rounds)
4) Promote elements for effective learning (e.g. communication of goals, evaluation, feedback, motivation for self-directed learning, promotion of understanding and retention)

Draft 5 – Driver Diagram

- During our project meetings, brainstorming potential change ideas naturally came up during the conversations; these were noted and eventually added to the growing driver diagram. *(See Appendix 2.4: Evolution of Change Ideas for more details*).

Draft 5


The Children's Hospital of Philadelphia
OFFICE OF CLINICAL QUALITY IMPROVEMENT
Driver Diagram Template
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Primary Drivers
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1) Decrease the number of challenges to learning and teaching in the clinical learning environment (e.g. structure during ward rounds; time management)
- Skills & Efficacy course for residents, including SNAPPS
- SNAPPS training for students
2) Promote a favourable learning environment (e.g. acknowledgement of uncertainty)
3) Promote effective clinical teaching (e.g. organized & clarity in teaching; standardization of ward rounds)
- Faculty Development Course "Teach the Teacher", include for Chiefs and Residents
- SNAPPS to standardize rounds
- In the teach the teacher course, can use quotes from FGDs/I to get buy-in, use DME as resource to help develop the course (intrinsic motivator)
- Feedback as tool to improve (peer & trainee eval)
- Clear expectations provided (extrinsic motivator)
- Introduce a structured rounds approach (SNAPPS)
- Concept mapping and SNAPPS introduced
4) Promote elements for effective learning (e.g. communication of goals, evaluation, feedback, motivation for self-directed learning, promotion of understanding and retention)
- Concept maps introduced
Optimizing Learning & Teaching on Paediatric Ward Rounds: October 2017

Draft 6 – Driver Diagram

- The main influence on the sixth version of our driver diagram was an opportunity to apply for an educational grant under my employer which could be used toward our Phase 3 activities.
- Since the grant application due date was coming up, I wanted to make our previous DD appear more professional and appealing to the grant reviewers. In this version, I used a new software to add visual appeal and formalized each part of the driver diagram.

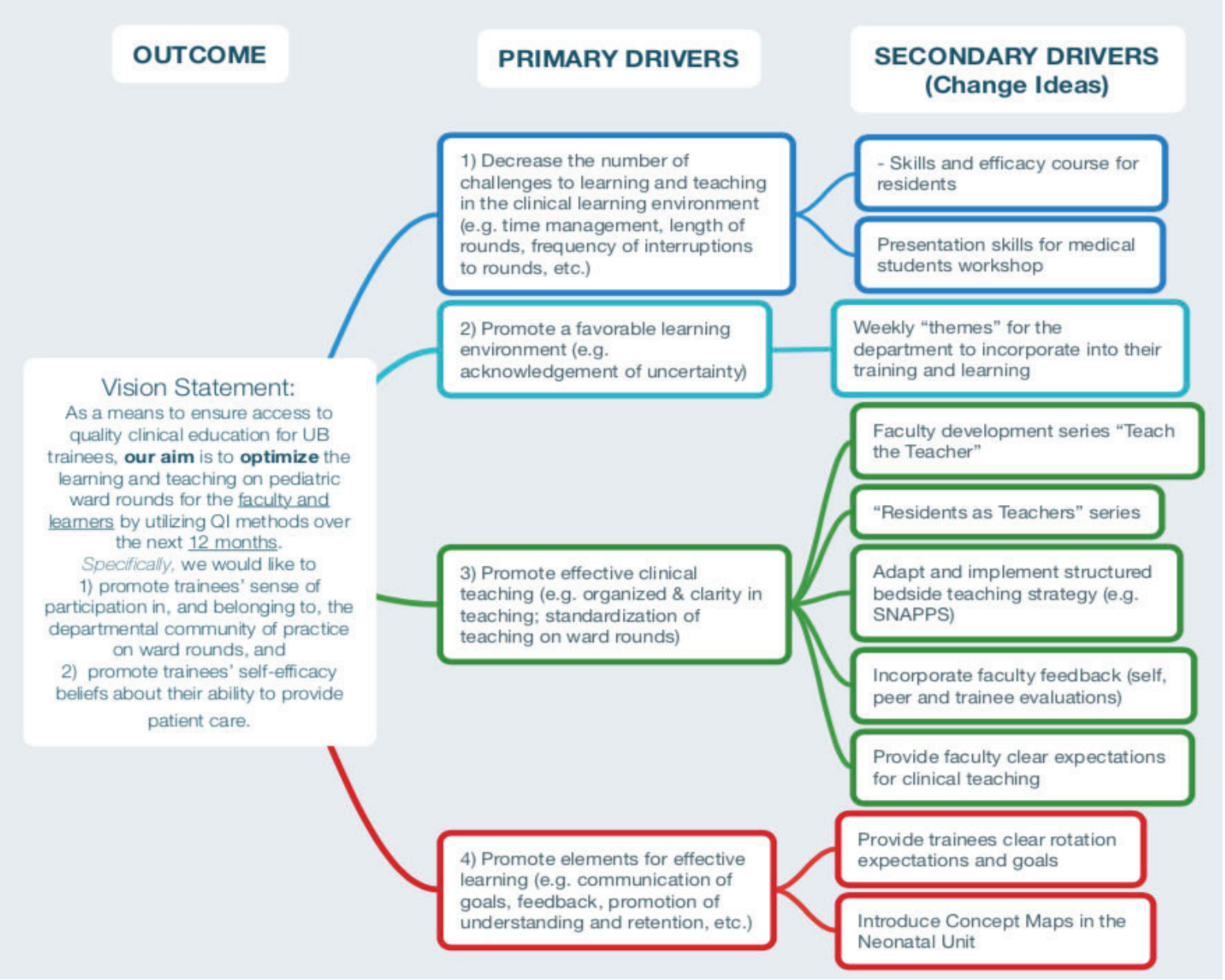
Draft 6 – Driver Diagram

- The main change for this version was readjusting the aim statement to be more reflective of the overall project, which included our health professional education theoretical framework.
- Therefore, I went back to the aim statement and specified ‘optimize’ by reintroducing the original theoretical framework aim.
- This allowed me to remove ‘introduction of a bedside teaching model’ from the aim statement, and allowed it to remain a change idea, not the aim of the project.
- These changes helped to focus the aim statement to be more in line with the original overall study aim and make the aim statement more ‘SMART’.

Draft 6 – Driver Diagram

- The Primary Drivers stayed the same, but were just now colour-coded.
- The change ideas were generally the same from previous project group meetings, but now just teased out a little bit.
- The timeframe of the aim statement was changed because we needed it to be in align with the grant project timeline.
- Unfortunately, I was unable to apply for the grant due to inter-departmental political issues at my home-institution. But this version was shared with the project group for their input and they approved of the changes, so we kept the modifications moving forward.

Draft 6

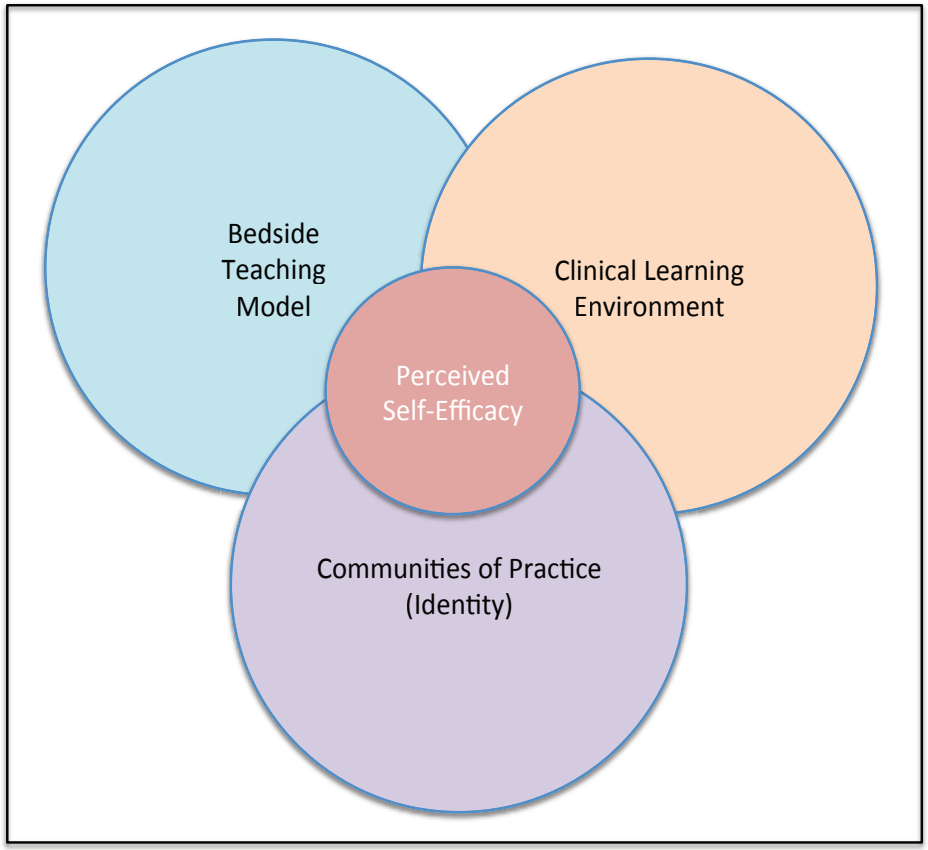

OUTCOME
PRIMARY DRIVERS
SECONDARY DRIVERS (Change Ideas)
Vision Statement:
As a means to ensure access to quality clinical education for UB trainees, our aim is to optimize the learning and teaching on pediatric ward rounds for the faculty and learners by utilizing QI methods over the next 12 months.
Specifically, we would like to
1) promote trainees' sense of participation in, and belonging to, the departmental community of practice on ward rounds, and
2) promote trainees' self-efficacy beliefs about their ability to provide patient care.
1) Decrease the number of challenges to learning and teaching in the clinical learning environment (e.g. time management, length of rounds, frequency of interruptions to rounds, etc.)
- Skills and efficacy course for residents
Presentation skills for medical students workshop
2) Promote a favorable learning environment (e.g. acknowledgement of uncertainty)
Weekly "themes" for the department to incorporate into their training and learning
3) Promote effective clinical teaching (e.g. organized & clarity in teaching; standardization of teaching on ward rounds)
Faculty development series "Teach the Teacher"
"Residents as Teachers" series
Adapt and implement structured bedside teaching strategy (e.g. SNAPPS)
Incorporate faculty feedback (self, peer and trainee evaluations)
Provide faculty clear expectations for clinical teaching
4) Promote elements for effective learning (e.g. communication of goals, feedback, promotion of understanding and retention, etc.)
Provide trainees clear rotation expectations and goals
Introduce Concept Maps in the Neonatal Unit

Drafts 7, 8 & 9 – Driver Diagram

- Drafts 7, 8 and 9 were focused on ensuring that our driver diagram accurately captured our "theories of improvement," and explored how to define the 'system' of our improvement project in terms of our conceptual framework of the overall project.[154] These DD modifications were made based on my PhD supervisor meetings and ongoing literature review.

Drafts 7, 8 & 9 – Driver Diagram

- As discussed in Chapter 1, the underlying conceptual framework for this project was looking at the effects of a structured bedside teaching model, clinical learning environment, and communities of practice on the perceived self-efficacy of trainees.



Drafts 7, 8 & 9 – Driver Diagram

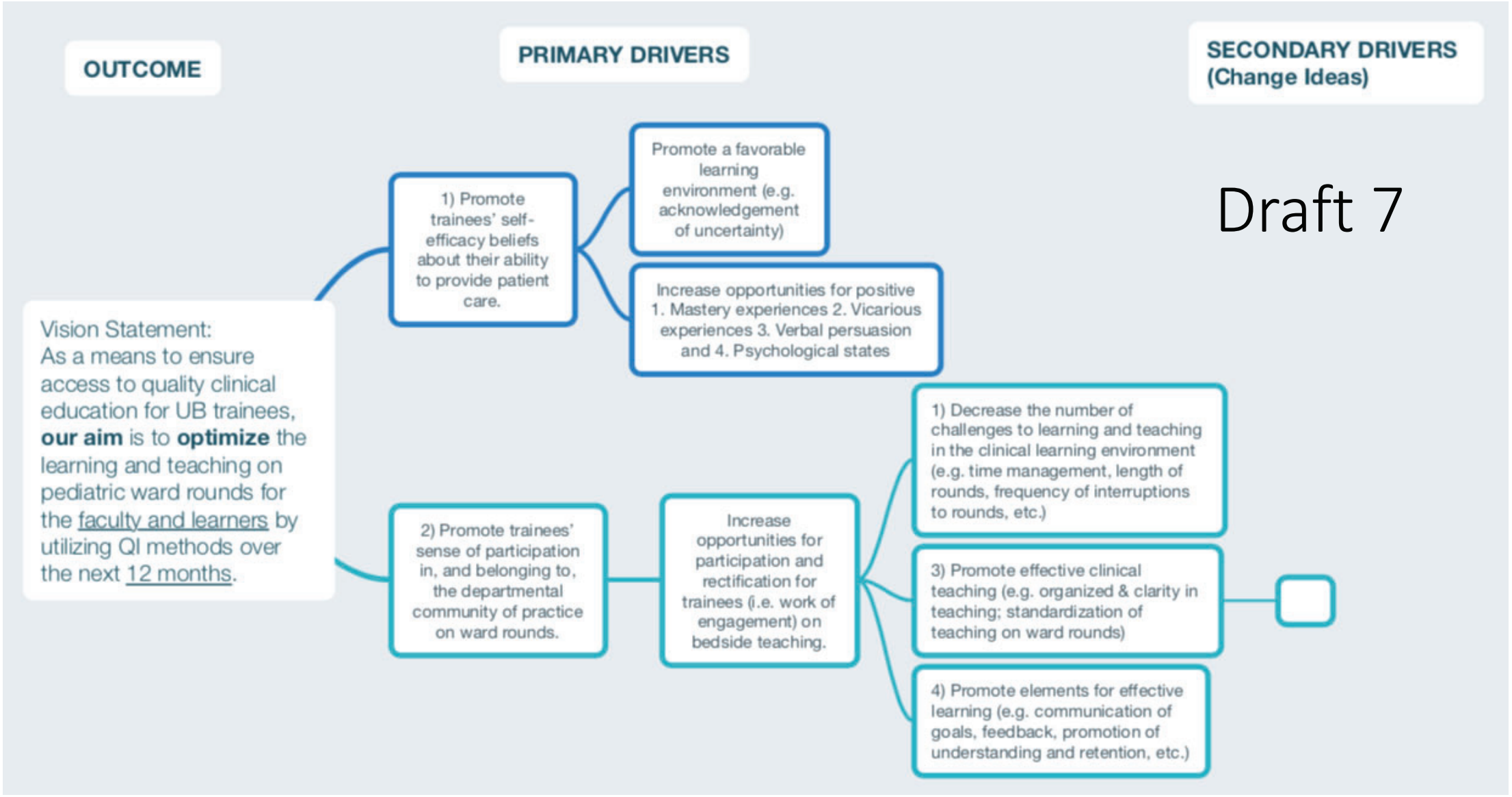
- The ultimate goal of the project was to address the problem that in order to improve childhood healthcare in Botswana, the nation needs a sustainable healthcare workforce competent in providing paediatric care.
- The underlying hypothesis was that this healthcare workforce will need to have high perceived self-efficacy of their paediatric care in order to apply their skills and knowledge to achieve success in challenging clinical circumstances.
- As a means to potentially enhance the perceived self-efficacy of trainees, we sought to ensure access to quality paediatirc clinical education for University of Botswana trainees.
- As a group, we set out to take advantage of the most historic and central aspect of the clinical learning experience – the ward round and bedside teaching in an attempt to optimize the learning and teaching on the paediatric ward round.

Drafts 7, 8 & 9 – Driver Diagram

- Specifically, our hypothesis, based on the social learning theories of Bandura & Wegner was that if we promote opportunities for:
    - learning as experience, learning as doing, learning as belonging, and learning as becoming (essentially the participation and re-itification required for COP)
    - and increased positive mastery experiences, positive vicarious experiences, positive verbal persuasion and positive psychological state of trainees (essentially enhancing the PSE of the trainee),
    - then this would optimize the learning and teaching on paediatric ward rounds.
- But in terms of the DD, this was a very complex processes of trying to determine what educational component would drive the next and consider how to measure this.

Drafts 7, 8 & 9 – Driver Diagram

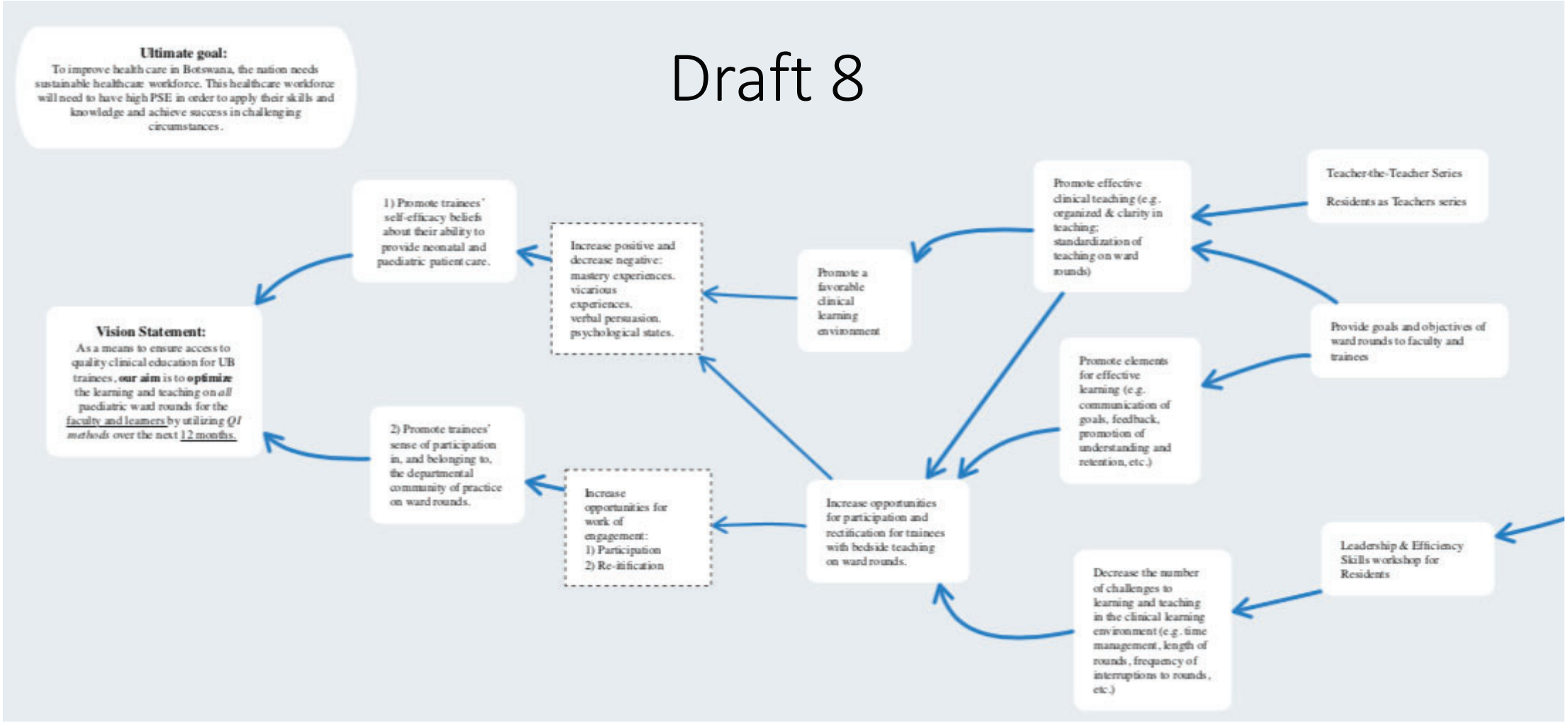
- These three versions of the driver diagram reflect my own understanding of both the underlying educational conceptual framework and its effect on the overall aim to optimize the learning and teaching on ward rounds.
- It also reflects my difficulty with ensuring that this framework continued to be compatible with the Phase 1 results, and my ongoing tension of allowing the project to be data-driven, not theory-driven, but at the same time, not abandoning all educational theory in the process.


OUTCOME
PRIMARY DRIVERS
SECONDARY DRIVERS (Change Ideas)
Draft 7
Vision Statement:
As a means to ensure access to quality clinical education for UB trainees, our aim is to optimize the learning and teaching on pediatric ward rounds for the faculty and learners by utilizing QI methods over the next 12 months.
1) Promote trainees' self-efficacy beliefs about their ability to provide patient care.
Promote a favorable learning environment (e.g. acknowledgement of uncertainty)
Increase opportunities for positive 1. Mastery experiences 2. Vicarious experiences 3. Verbal persuasion and 4. Psychological states
2) Promote trainees' sense of participation in, and belonging to, the departmental community of practice on ward rounds.
Increase opportunities for participation and rectification for trainees (i.e. work of engagement) on bedside teaching.
1) Decrease the number of challenges to learning and teaching in the clinical learning environment (e.g. time management, length of rounds, frequency of interruptions to rounds, etc.)
3) Promote effective clinical teaching (e.g. organized & clarity in teaching; standardization of teaching on ward rounds)
4) Promote elements for effective learning (e.g. communication of goals, feedback, promotion of understanding and retention, etc.)

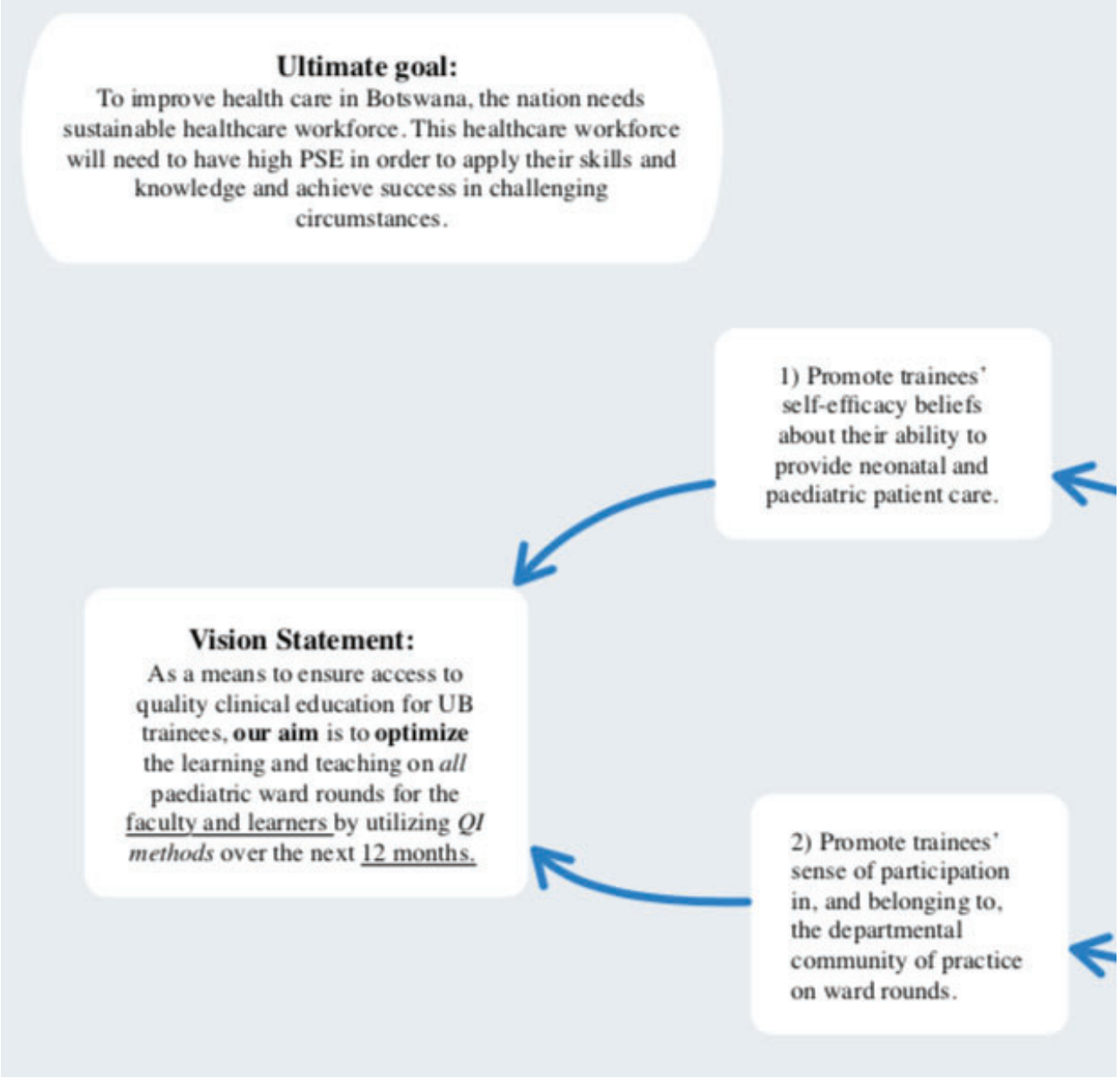
Draft 8 – Driver Diagram

- This draft focused on creating more relationship arrows between drivers.

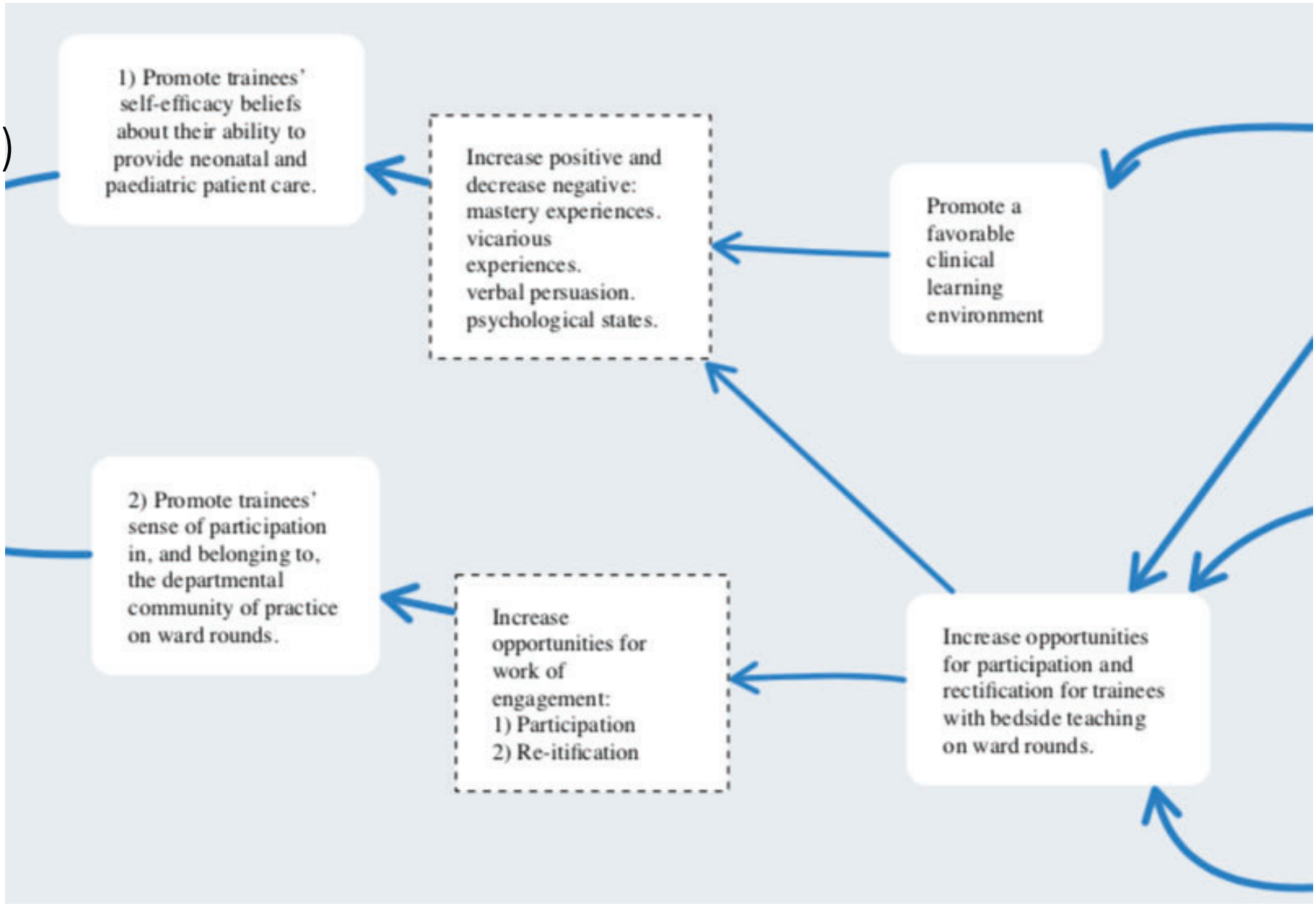
Draft 8


Ultimate goal:
To improve health care in Botswana, the nation needs sustainable healthcare workforce. This healthcare workforce will need to have high PSE in order to apply their skills and knowledge and achieve success in challenging circumstances.
Vision Statement:
As a means to ensure access to quality clinical education for UB trainees, our aim is to optimize the learning and teaching on all paediatric ward rounds for the faculty and learners by utilizing QI methods over the next 12 months.
1) Promote trainees' self-efficacy beliefs about their ability to provide neonatal and paediatric patient care.
2) Promote trainees' sense of participation in, and belonging to, the departmental community of practice on ward rounds.
Increase positive and decrease negative: mastery experiences. vicarious experiences. verbal persuasion. psychological states.
Increase opportunities for work of engagement: 1) Participation 2) Re-itification
Promote a favorable clinical learning environment
Increase opportunities for participation and rectification for trainees with bedside teaching on ward rounds.
Promote effective clinical teaching (e.g. organized & clarity in teaching; standardization of teaching on ward rounds)
Promote elements for effective learning (e.g. communication of goals, feedback, promotion of understanding and retention, etc.)
Decrease the number of challenges to learning and teaching in the clinical learning environment (e.g. time management, length of rounds, frequency of interruptions to rounds, etc.)
Teacher-the-Teacher Series
Residents as Teachers series
Provide goals and objectives of ward rounds to faculty and trainees
Leadership & Efficiency Skills workshop for Residents

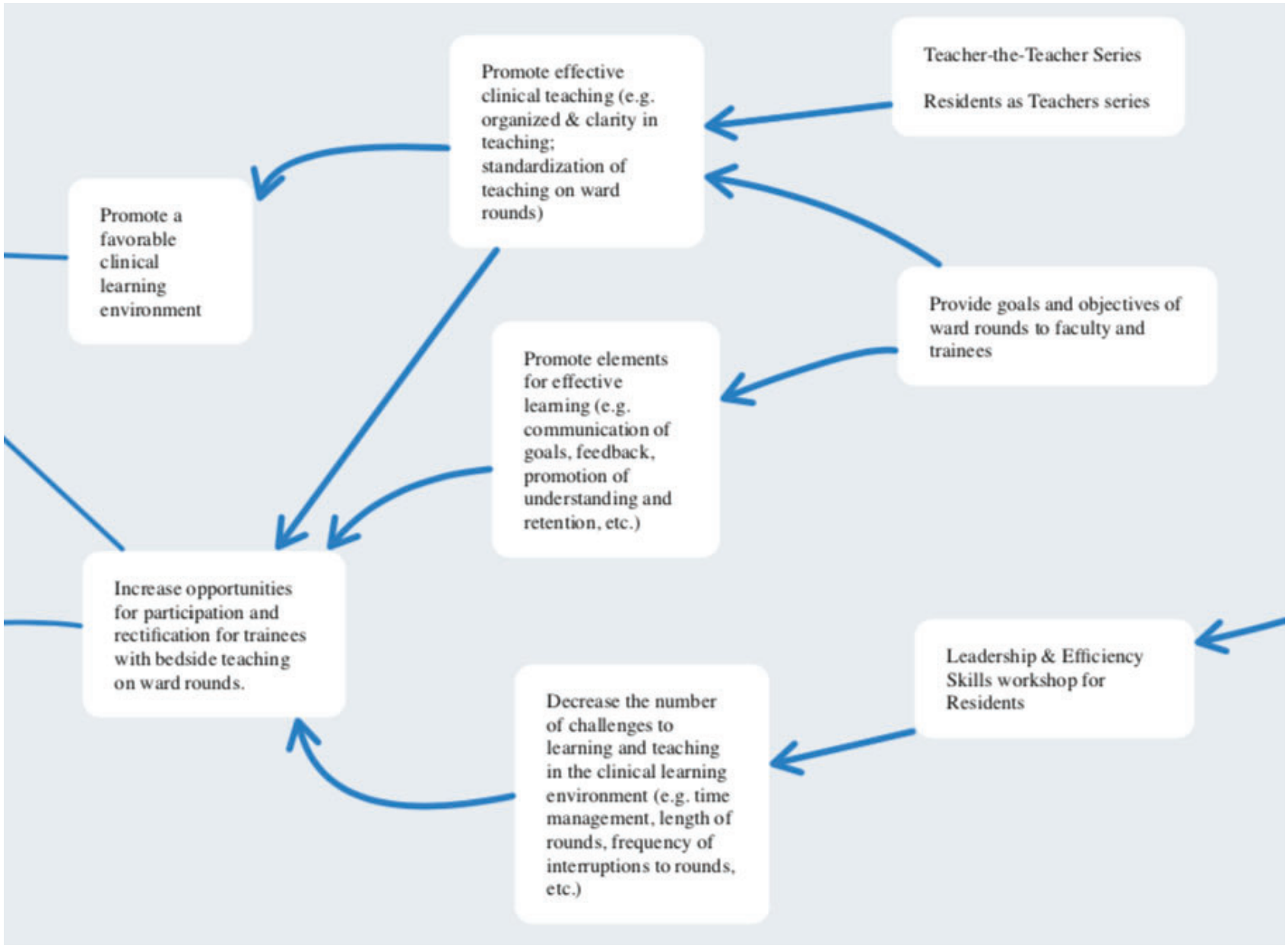
Draft 8
(zoomed in)



Draft 8
(zoomed in)



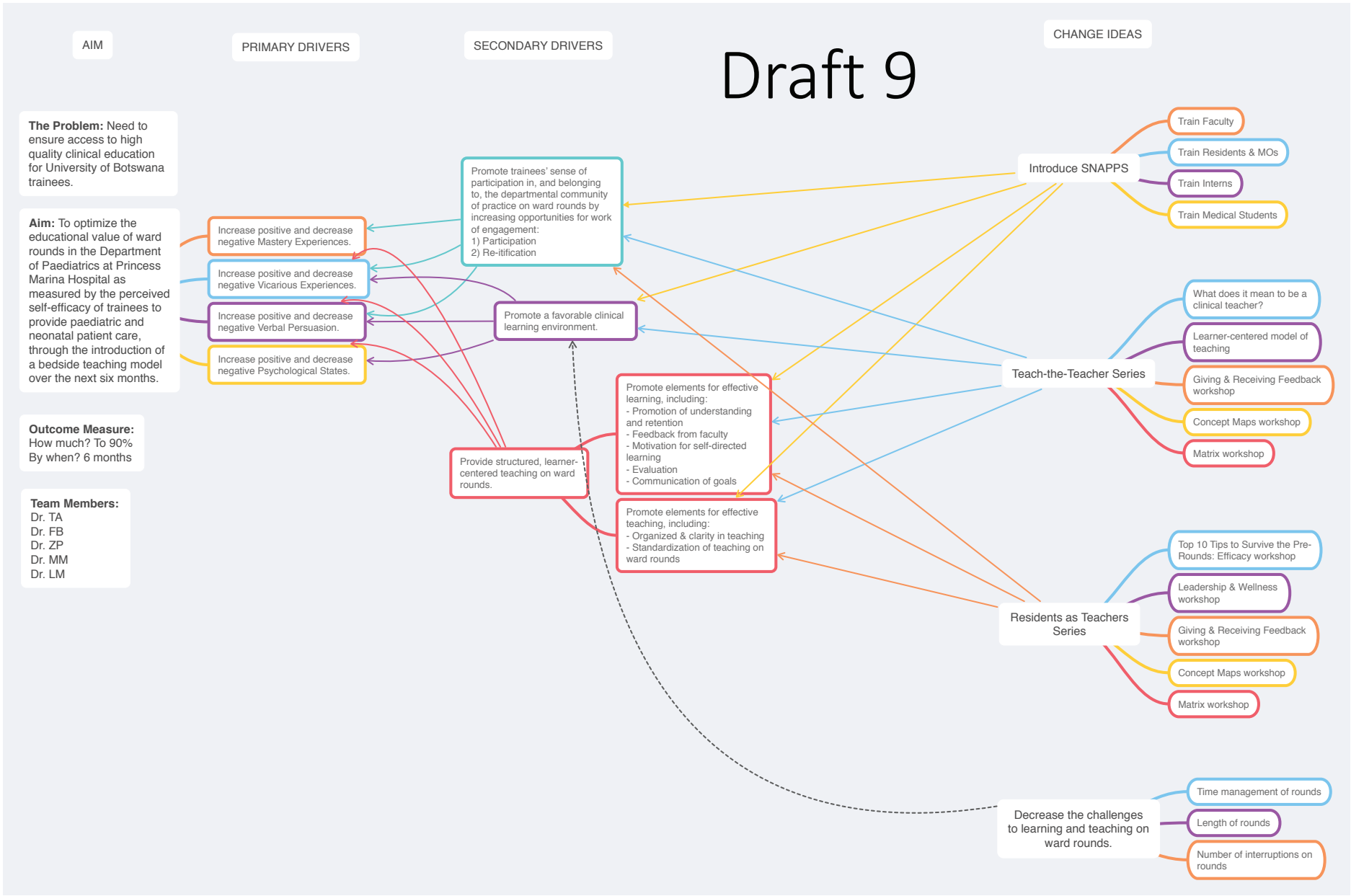
Draft 8
(zoomed in)



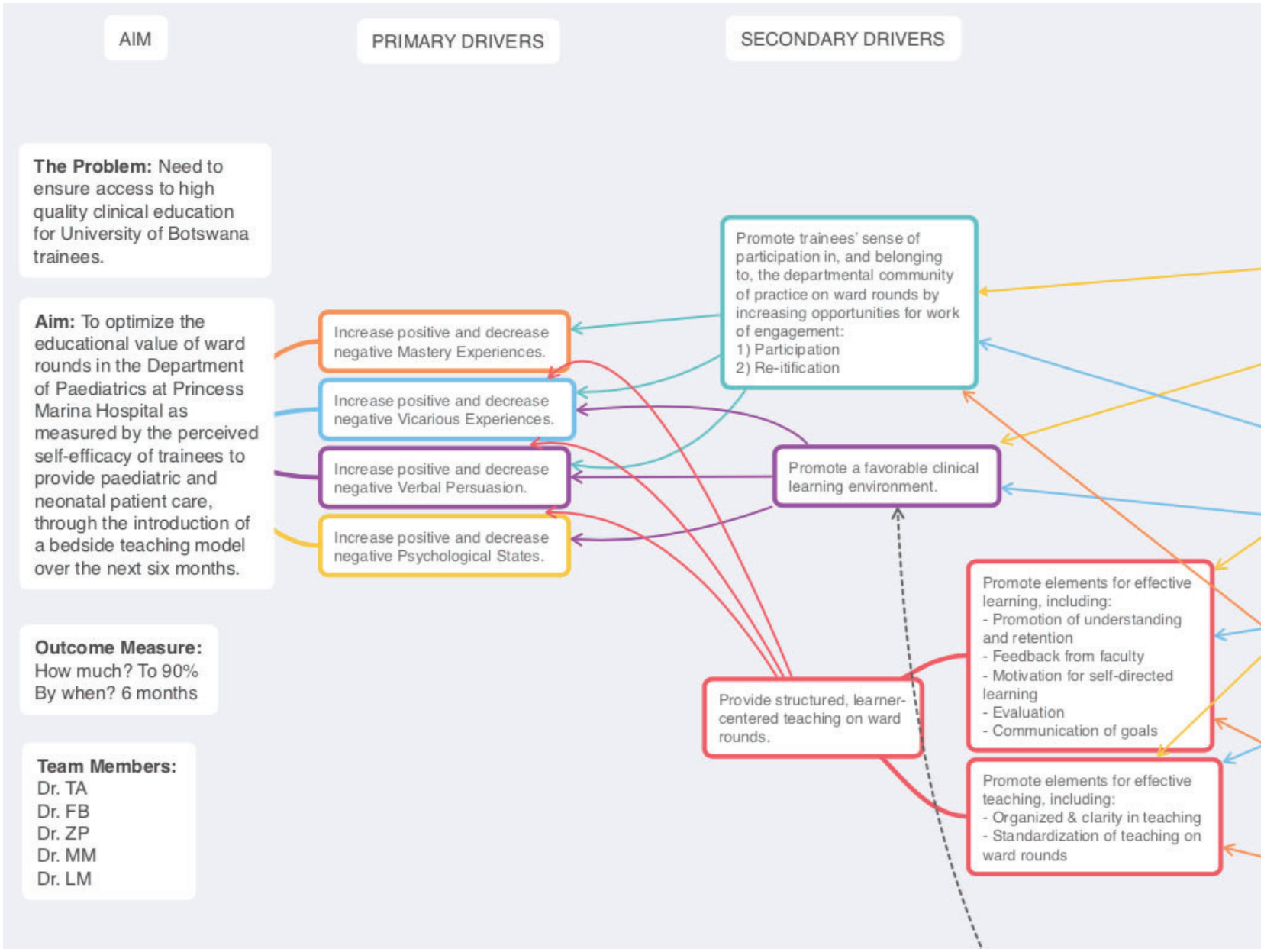
Draft 9 – Driver Diagram

- This version was an accumulation of all of the above versions, plus more time spent looking at QI methods. I attended the Institute of Health Improvement (IHI) Africa QI conference where I learned additional information about how best to create a driver diagram.
- My hope with this version of the DD was that it would both be adhering to QI methods *and* still would reflect our educational conceptual framework.
- This version more clearly spelled out our change ideas (after more thought had been placed into the impact and feasibility of each idea) and was placed into a format that would be useful for creating the Phase 3 timeline.

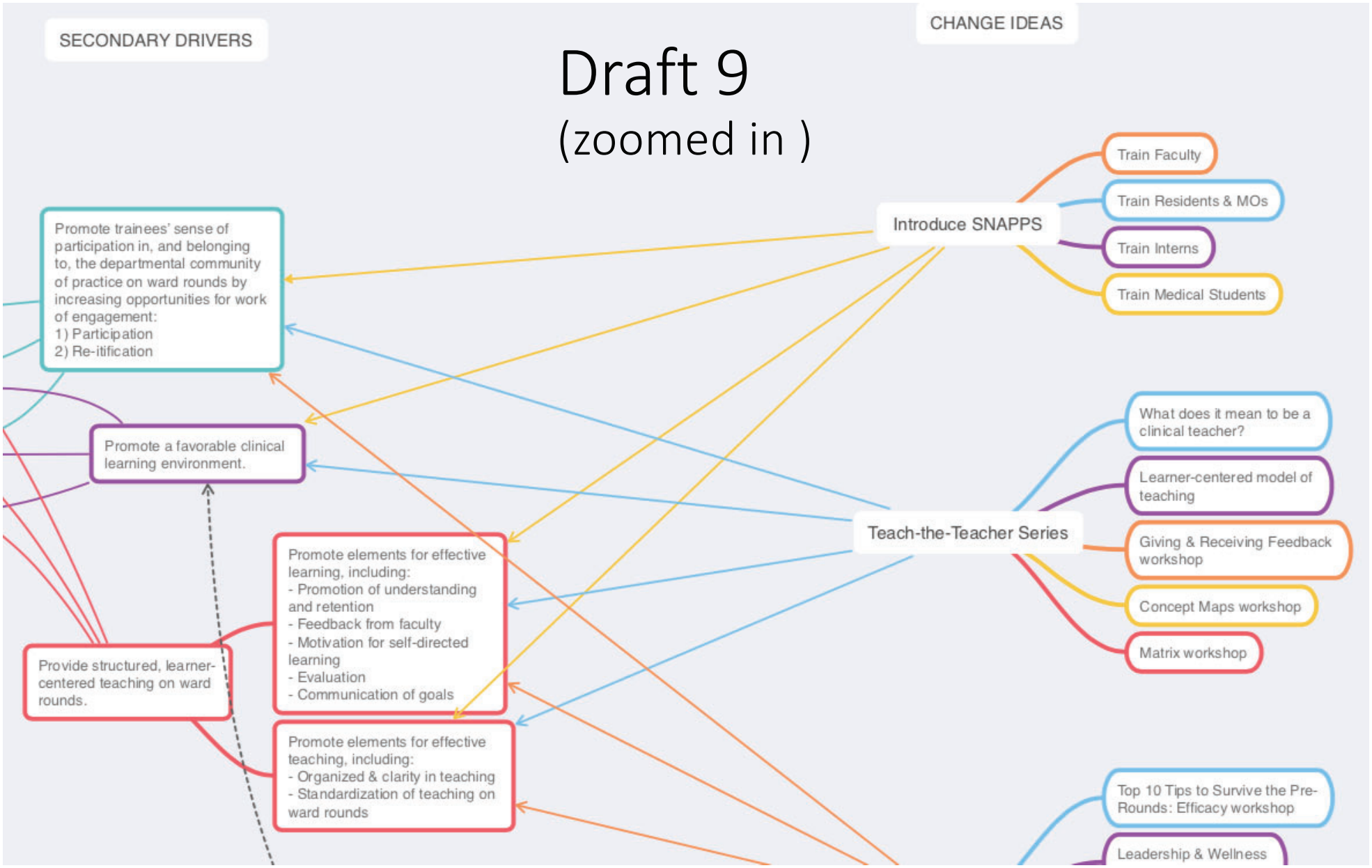
Draft 9

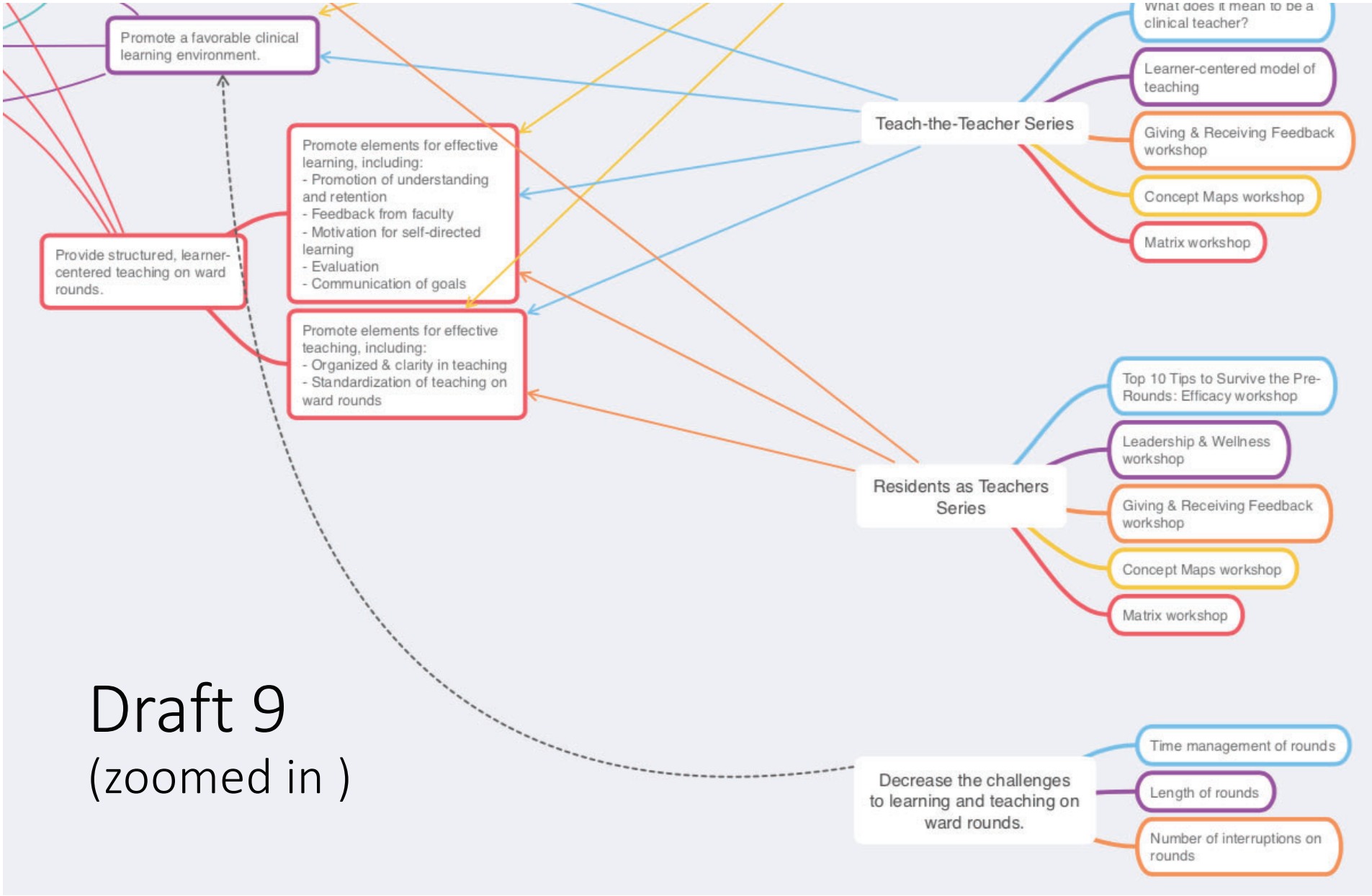

AIM
PRIMARY DRIVERS
SECONDARY DRIVERS
CHANGE IDEAS
The Problem: Need to ensure access to high quality clinical education for University of Botswana trainees.
Aim: To optimize the educational value of ward rounds in the Department of Paediatrics at Princess Marina Hospital as measured by the perceived self-efficacy of trainees to provide paediatric and neonatal patient care, through the introduction of a bedside teaching model over the next six months.
Outcome Measure:
How much? To 90%
By when? 6 months
Team Members:
Dr. TA
Dr. FB
Dr. ZP
Dr. MM
Dr. LM
Increase positive and decrease negative Mastery Experiences.
Increase positive and decrease negative Vicarious Experiences.
Increase positive and decrease negative Verbal Persuasion.
Increase positive and decrease negative Psychological States.
Promote trainees' sense of participation in, and belonging to, the departmental community of practice on ward rounds by increasing opportunities for work of engagement:
1) Participation
2) Re-itification
Promote a favorable clinical learning environment.
Provide structured, learner-centered teaching on ward rounds.
Promote elements for effective learning, including:
- Promotion of understanding and retention
- Feedback from faculty
- Motivation for self-directed learning
- Evaluation
- Communication of goals
Promote elements for effective teaching, including:
- Organized & clarity in teaching
- Standardization of teaching on ward rounds
Introduce SNAPPS
Train Faculty
Train Residents & MOs
Train Interns
Train Medical Students
Teach-the-Teacher Series
What does it mean to be a clinical teacher?
Learner-centered model of teaching
Giving & Receiving Feedback workshop
Concept Maps workshop
Matrix workshop
Residents as Teachers Series
Top 10 Tips to Survive the Pre-Rounds: Efficacy workshop
Leadership & Wellness workshop
Giving & Receiving Feedback workshop
Concept Maps workshop
Matrix workshop
Decrease the challenges to learning and teaching on ward rounds.
Time management of rounds
Length of rounds
Number of interruptions on rounds

Draft 9
(zoomed in)



Draft 9
(zoomed in)





Draft 9

(zoomed in)

Final draft – Driver Diagram

- I had wanted to continue to work on the DD and create a final version which merged all aspects of Drafts 1-6 with Drafts 7-9, but our timeframe to start Phase 3 was coming up and so, as a group, we went with the Draft 9 version into Phase 3.
- In retrospect, this was likely a limitation, because the draft 9 DD was not finalized – it lacked several QI aspects that make DD helpful, such as an overall agreed upon measurable goal.

F.2. Evolution of Phase 2 project measures, data collection tools, and surveys

Appendix F.2
Evolution of Project Measures
and
Data Collection Tools & Surveys

September 2017 – June 2018

Definition of Project Measures

- Project measures are intrinsically linked with the primary drivers of a driver diagram. An easy way to conceptualize project measures on a driver diagram is to picture a project measure ‘hanging’ from each primary driver.[178]
- Therefore, as the driver diagram was modified, the project measures were also modified.
- Project measures should be a combination of outcome, process, and balancing measures.

Definition of Data Collection Tools vs Surveys

- In quality improvement, data collection tools (DCTs) are any type of instrument used to collect information about the system in relation to a specified project measure.
- For the purposes of our study, 'data collection tool' refers specifically to *objective* information gathered about an event (e.g. length of ward rounds), whereas 'survey' refers to *subjective* information from an individual about their personal experiences (e.g. feelings of discomfort on ward rounds). I.e. it doesn't matter *who* completes the DCT because it is not a personal response versus for the survey it does matter who is completing the survey because it is intended to capture that individual's personal reflection.
- For Phase 2, we created a combination of data collection tools and surveys.

Approach to the Project Measures & DCTs/surveys

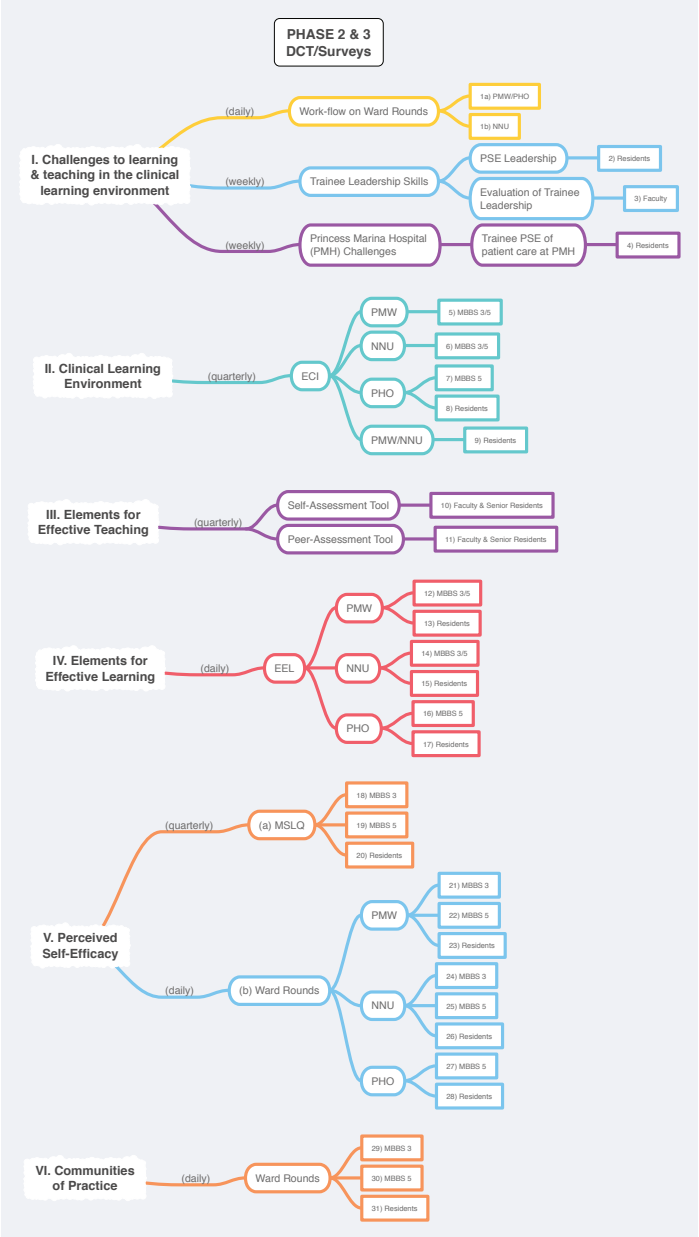
- The following is a description of our eleven-month dynamic process to determine our Phase 3 project measures and create and test our data collection tools and surveys.
- Ultimately, we set out to determine *what* we would measure in Phase 3 and *how* we would measure it. Our decisions were based on the results of Phase 1, ongoing literature review, and guided by our collectively created driver diagram.
- We kept two main questions at the forefront for each project measure and subsequent DCT/survey:

  1) What do we know from Phase 1 results?

  2) What do we know from the literature?

Project Measures & DCTs/surveys

- By the end of this process, we had six project measures being captured by a total of 2 DCTs and 30 surveys:
  1) Challenges to learning and teaching in the clinical learning environment
  2) Clinical learning environment
  3) Elements for effective teaching
  4) Elements for effective learning
  5) Perceived self-efficacy
  6) Communities of practice



Approach to the Project Measures & DCTs/surveys

- Since project measures are intrinsically linked with primary drivers on a driver diagram, as our driver diagram underwent modifications, so too did our project measures.
- While the driver diagram underwent a total of 9 drafts, in regards to the project measures, draft 1-6 were quite similar, as were drafts 7-9. Therefore, we are able to describe the evolution of our project measures in terms of the two main driver diagram drafts: drafts 1-6 (August – Feb 2018) and drafts 7-9 (March – May 2018).

Driver Diagram (drafts 1-6)
(August 2017 – March 2018)

Project Measures & DCTs/surveys

- By the end of August 2017, we had a basic aim statement and three identified primary drivers to use as our starting off point to develop project measures; within the subsequent weeks, a fourth primary driver was added (*Draft 4 of driver diagram*):

  1) Decrease the number of challenges to learning and teaching in the clinical learning environment

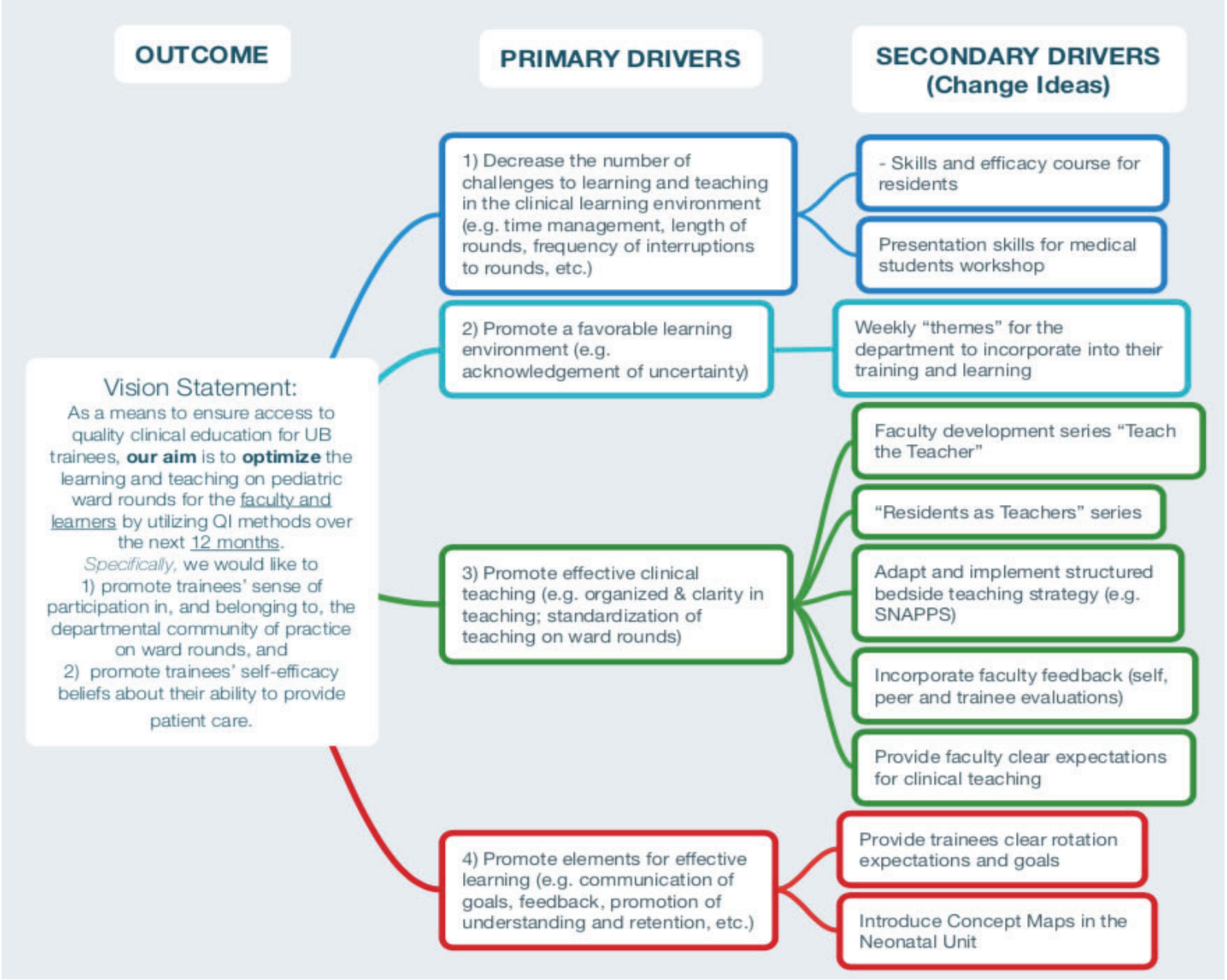
  2) Promote a favourable learning environment

  2) Promote effective clinical teaching

  3) Promote elements for effective learning

- Our goal was to include three project measures for each primary driver.
- Of note, our aim statement was changed over the course of several months.

Driver Diagram Draft 6

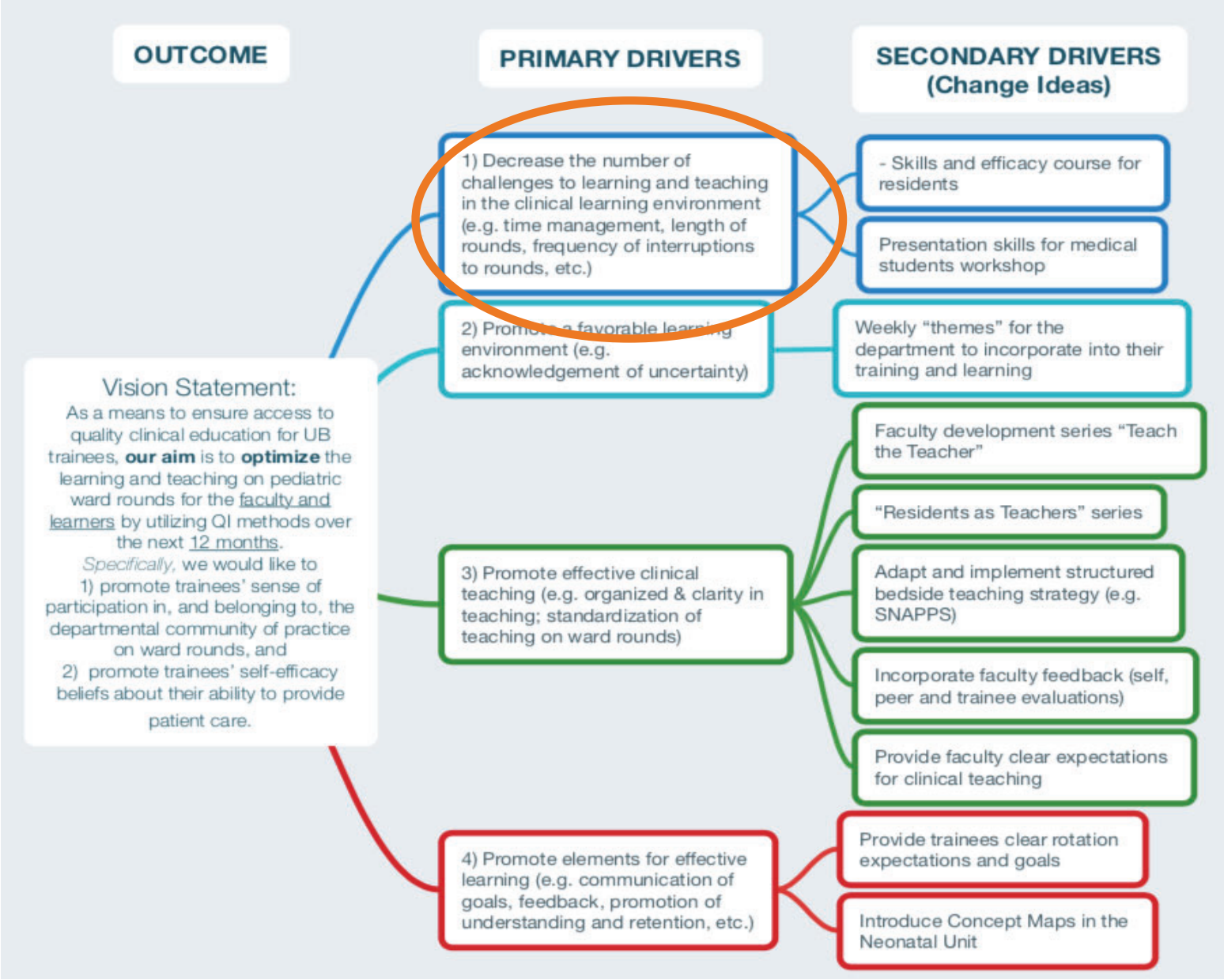


Project Measures & DCTs/surveys

- We started by looking at our first primary driver:

  #1) Decrease the number of challenges to the learning and teaching in the clinical learning environment.

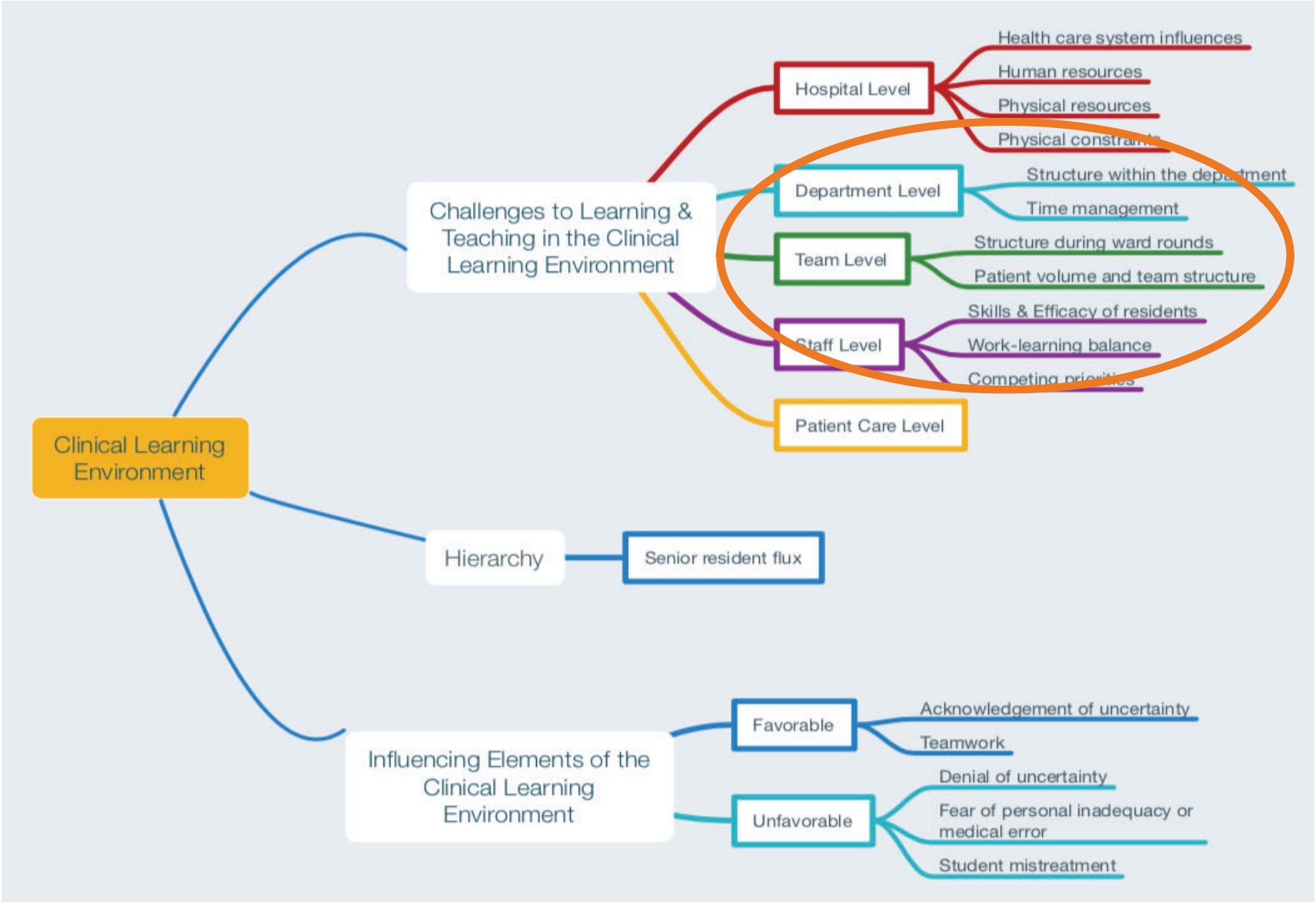
Primary Driver #1
Decrease the number of challenges to learning and teaching in the clinical environment



Approach to the Project Measures & DCTs/surveys

- When determining *what* to measure, we wanted to be sure that we were being inclusive of the 'voice' of the department. So we went back and reviewed the Phase 1 findings. This gave us some broad strokes direction in the beginning.
- We then narrowed down based on the project measures' ability to be
  - 1) easy to track over time,
  - 2) would likely be influenced or changed over time by our potential change ideas, and
  - 3) relevant to our primary drivers.

Phase 1 Results



Measuring Primary Driver #1

Decrease the number of challenges to learning and teaching in the clinical learning environment

- From the Phase 1 results, we were able to induce that some of the main challenges to learning and teaching in the clinical learning environment at the **Department** and **Team** level were issues related to time management, patient volume, team size, and overall structure of the ward round, including the frequent number of interruptions: "*always being pulled away*".
- And from the **Staff** level, we were able to extrapolate that the main issues related to residents' skills and efficacy to prepare for rounds were related to lack of: leadership, team management, organization, efficiency, and basic presenting skills.

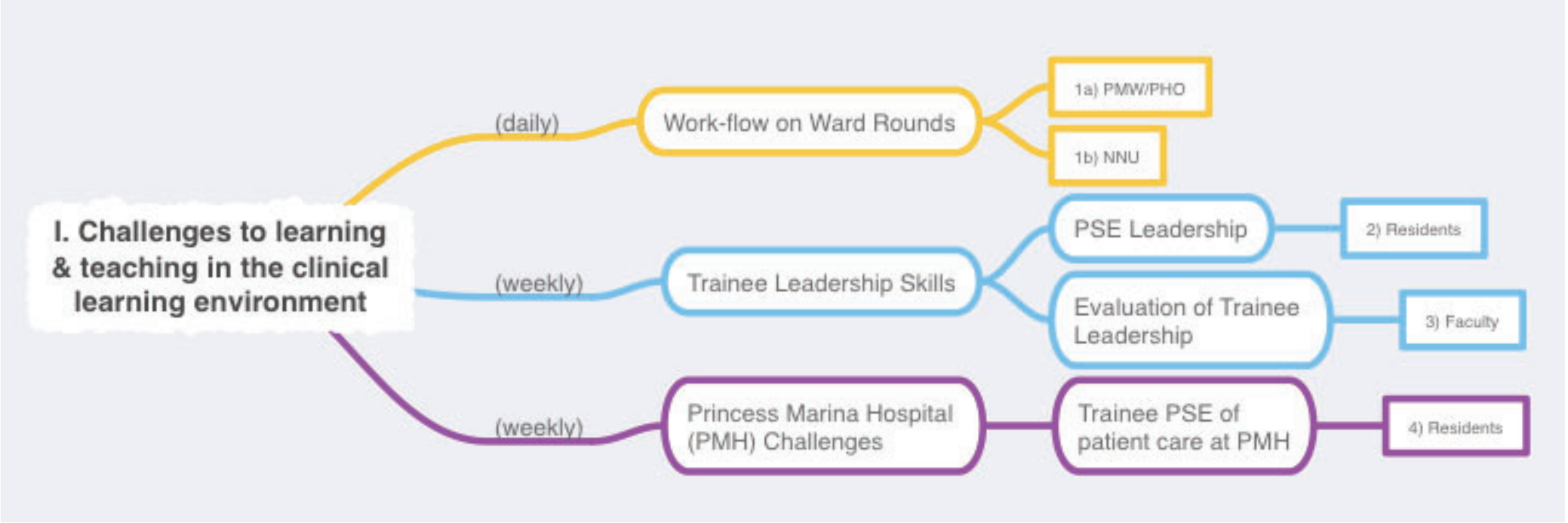
Measuring Primary Driver #1

Decrease the number of challenges to learning and teaching in the clinical learning environment

- From a **Department** and **Team** level, this information allowed us to focus on areas that we might be able to measure during a ward round, including start/end time of rounds, length of ward rounds, patient volume, time spent per patient, team size, and also the number and type of interruptions experienced on a ward round.
- From a **staff** level, we referred to the literature, specifically CanMEDS, which is a "physician competency framework" divided into seven 'roles' that "lead to optimal physician performance, care delivery and health care outcomes." We used this to determine in what ways we could evaluate our residents' skills and efficacy to prepare for and lead a ward round. We also drew from the Motivated Strategies for Learning Questionnaire (MSLQ) to measure residents' PSE about their ability to prepare for and lead a ward round.[104,131]

Project Measures & DCTs/Surveys

- Our reflections resulted in the creation of 2 DCTs and 3 surveys.
- The following is an individual description of how each DCT and survey were created for primary driver #1.



Project Measures & DCTs/Surveys

Primary Driver #1: Decrease the number of challenges to learning and teaching in the clinical learning environment

Project Measures:

A. (i). Time management *(Process/Balancing)*

- length of ward rounds

- start/end times

(ii). Patient Volume & Team structure *(Process/Balancing)*

- count number of students on a team

- patient volume

(iii) Structure during ward rounds *(Process)*

- number of interruptions on rounds & list* of what they are about

B. Skill & Efficacy of Trainees *(Outcome)*

- consider if trainees are adequately prepared/organized for rounds

Primary Driver #1
Decrease the number of challenges to learning and teaching in the clinical learning environment

- To begin, we reviewed pertinent Phase 1 results and correlated with further literature as available. Based on this, notes for possible questions were generated. This was followed by the creation of our first draft.
- This was then subsequently reviewed by the project group for feedback.

Primary Driver	Related Phase 1 QUAL Themes	Related Phase 1 QUAN Surveys	Further Literature Review	Notes for possible data collection ideas
#1) Decrease the number of challenges to learning and teaching in the clinical learning environment (e.g. structure during ward rounds; time management)	Competing Priorities			- Likert scale: faculty/chiefs: "on a scale of 1-6, did you feel like you had adequate time to teach on ward rounds, or did you feel pressured by competing priorities?"
	Health Care System Influences			- On a scale of 1-6, did the inefficiency of the PMH health care system effect your ability to teach?
	Patient Volume & Team structure			- count number of students on a team - patient volume (i.e. length of rounds divided by # of patients; time spent per patient on rounds)
	Physical Environment			- could you hear on rounds today? Y/N
	Structure during ward rounds	EEL 11. Paediatric ward rounds are well organized for appropriate learning. (median = 3.0, S; 3.0 R) 12. There are minimal interruptions during ward rounds. (median = 3.0, S; 2.3, R)		- number of interruptions on rounds & list of what they are about; outpatient #'s and time spent away from rounds reviewing outpatient visits
	Structure within department	DREEM 41. The paediatric department is well timetabled (median = 2.0, S)		- look at the student/faculty schedules and see how often people are rotated (i.e. continuity of teaching)
	Time management	EEL 13. Ward rounds are well paced and the time spent rounding on each patient is appropriate. (median = 2.0, S; 2.0 R)		- length of ward rounds - start/end times
	Work-Learning Balance			- Scale 1-6, did you feel that there was a good balance between the amount of ward work needing to get done and learning (either self-study or on rounds or bedside teaching, etc.?)

DRAFT 1: 1a) Work-flow on a Ward Round Data Collection Tool - PMW/PHO

PMW/PHO

Date _____

Team _____

Was your team post-intake today? Yes/No

Time Rounds Started _____

Time Rounds Ended _____

Number of patients seen _____

Number of team members (i.e. students + interns + MO/Res) _____

Tally number of times rounds was interrupted _____

Reason for interruption *(circle all that apply):*

Nurse Phone call Bench Attending Patient Emergency Other: *specify*_____

Reflecting on ***this week's*** ward rounds, please rate your level of agreement with the statement based on a scale of:

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
0	1	2	3	4	5

1. Paediatric ward rounds were well organized for appropriate learning. _____

2. There were minimal interruptions during ward rounds. _____

3. Ward rounds were well paced and the time spent rounding on each patient was appropriate. _____

4. The paediatric department is well time-tabled. _____

DRAFT 1: 1b) Work-flow on a Ward Round Data Collection Tool - NNU

NNU

Date _____

Cubicle _____

Time Rounds Started _____

Time Rounds Ended _____

Number of patients seen _____

Number of team members (i.e. students + interns + MO/Res) _____

Tally number of times rounds was interrupted _____

Reason for interruption *(circle all that apply):*

Nurse Phone call Bench Attending Patient Emergency Other: *specify*_____

Reflecting on ***this week's*** ward rounds, please rate your level of agreement with the statement based on a scale of:

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
0	1	2	3	4	5

1. Paediatric ward rounds were well organized for appropriate learning. _____

2. There were minimal interruptions during ward rounds. _____

3. Ward rounds were well paced and the time spent rounding on each patient was appropriate. _____

4. The paediatric department is well time-tabled. _____

DRAFT 1 → DRAFT 2:
1a/b) Work-flow on a Ward Round Data Collection Tool

- Draft 2 included minor modifications to formatting and language.
- We also removed subjective questions generated from the EEL and DREEM surveys about the ward round time management and organization, because we thought it best to keep this information ‘unbiased’ and wanted this DCT to be solely focused on objective data.[118]

DRAFT 2: 1a) Work-flow on a Ward Round Data Collection Tool - PMW/PHO

PMW/PHO

Date _____

Team _____

Was your team today, *please circle one*: Admitting Post-intake Neither

Time Rounds Started _____

Time Rounds Ended _____

Number of patients seen _____

Number of team members:

MBBS3	MBBS5	Intern	MO/Resident	Chief

Reason and number of times rounds was interrupted:

Nurse	Phone call	Bench	Pt Emergency	Other*

*Specify 'Other' Reason(s): _____

Tally the number of times a team member was pulled away: _____

List reason(s) team member(s) is/are pulled away: _____

DRAFT 2: 1b) Work-flow on a Ward Round Data Collection Tool - NNU

NNU

Date _____

Team _____

Time Rounds Started _____

Time Rounds Ended _____

Number of patients seen _____

Number of team members:

MBBS3	MBBS5	Intern	MO/Resident	Chief

Reason and number of times rounds was interrupted:

Nurse	Phone call	Covering L&D/T	Pt Emergency	Other*

*Specify 'Other' Reason(s): _____

Tally the number of times a team member was pulled away: _____

List reason(s) team member(s) is/are pulled away: _____

DRAFT 2 → FINAL:

1a/b) Work-flow on a Ward Round Data Collection Tool

- The final draft included minor modifications to the tally of interruptions for ease of understanding.

FINAL: 1a) Work-flow on a Ward Round Data Collection Tool - PMW/PHO

PMW/PHO

Date _____

Team _____

Was your team today, *please circle one*: Admitting Post-intake Neither

Time Rounds Started _____

Time Rounds Ended _____

Number of patients seen _____

Number of team members:

MBBS3	MBBS5	Intern	MO/Resident	Chief

Reason and number of times rounds was interrupted and/or a team member was pulled away:

Nurse	Phone call	Bench	Pt Emergency	Other*

*Specify 'Other' Reason(s): _____

_____

_____

FINAL: 1b) Work-flow on a Ward Round Data Collection Tool - NNU

NNU

Date _____

Team _____

Time Rounds Started _____

Time Rounds Ended _____

Number of patients seen _____

Number of team members:

MBBS3	MBBS5	Intern	MO/Resident	Chief

Reason and number of times rounds was interrupted and/or a team member was pulled away:

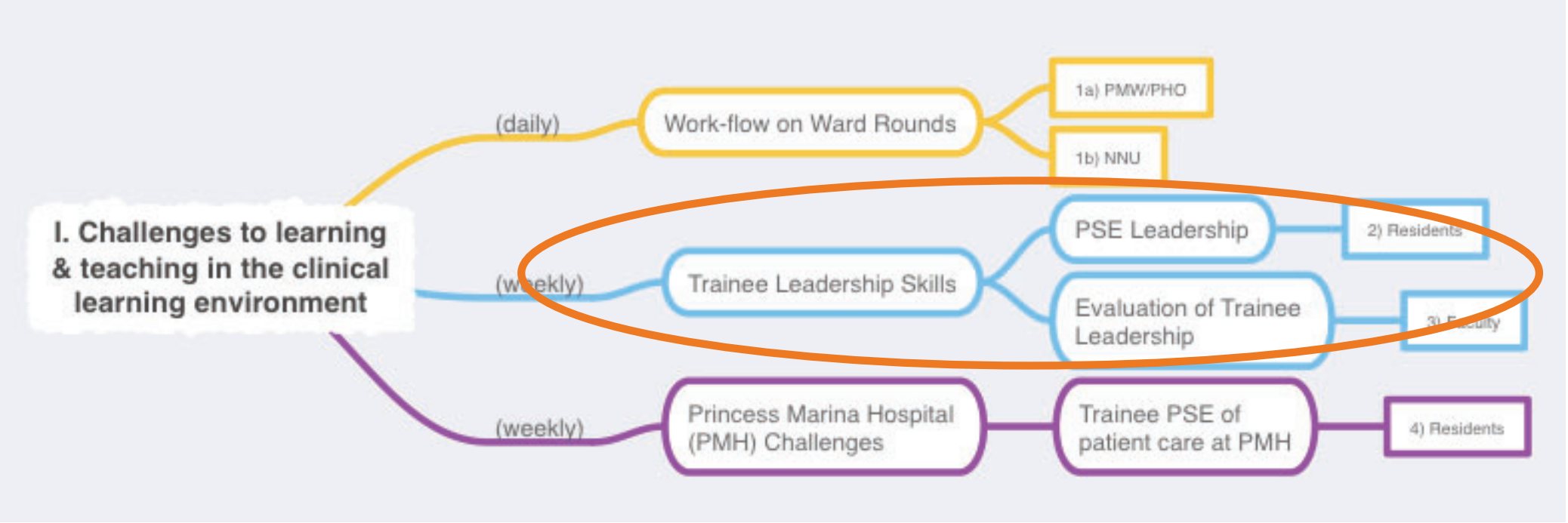
Nurse	Phone call	Covering L&D/T	Pt Emergency	Other*

*Specify 'Other' Reason(s): _____

_____

_____

Project Measures & DCTs/Surveys



Primary Driver #1: Decrease the number of challenges to learning and teaching in the clinical learning environment

Measure:

A. (i). Time management *(Process/Balancing)*

- length of ward rounds

- start/end times

(ii). Patient Volume & Team structure *(Process/Balancing)*

- count number of students on a team

- patient volume

(iii) Structure during ward rounds *(Process)*

- number of interruptions on rounds & list* of what they are about

B. Skill & Efficacy of Trainees *(Outcome)*

- consider if trainees are adequately prepared/organized for rounds

Primary Driver #1
Decrease the number of challenges to learning and teaching in the clinical learning environment

- To begin, we reviewed pertinent Phase 1 results and correlated with further literature as available. Based on this, notes for possible questions were generated. This was followed by the creation of our first draft.
- This was then subsequently reviewed by the project group for feedback.

Primary Driver	Related Phase 1 QUAL Themes	Related Phase 1 QUAN Surveys	Further Literature Review	Notes & Possible data collection ideas
#1) Decrease the number of challenges to learning and teaching in the clinical learning environment (e.g. skills & efficacy of trainees)	Skill & Efficacy of Trainees: Residents aren't prepared for rounds; specifically, trainees are lacking in leadership/team management, organization, professionalism, efficiency, and basic presenting and critical thinking skills. Other challenges: overwork of people, "can't teach on CXR that hasn't been done"; system failure that leads to too much work, end of up with chaos because labs aren't ready, off running a code, run around, place cannulas, doctors having to do everything: porting patients, labs, things not working: blood gas, EKG, portable O2; interruptions, etc.	PSE 7. Summarize and present the pertinent information obtained from the patient's history on ward rounds in an accurate, organized and thoughtful manner. (median = 7.0, S; 8.0 R) PSE 8. Summarize and present the pertinent information obtained from the patient's physical exam on ward rounds in an accurate, organized and thoughtful manner. (median = 6.3, S; 8.0 R)	CanMEDS (University of Botswana residency program evaluations) - Scholar: Demonstrates Effective Teaching & Supervisory Skills - Communicator: Presents cases in accurate, organized and thoughtful manner - Collaborator: Consults and Delegates Appropriately - Manager: Effectively Sets Priorities and Organizes Work - Professionalism: Demonstrates Reliability, Responsibility & Conscientiousness	Questions for Residents/Students: On a scale from 1 to 6 (1 = lowest, 6 – highest), how prepared did you feel for rounds? (I.e. did you feel like you were able to adequately pre-round in preparation for rounds?) Question for Faculty: On a scale from 1 to 6 (1 = lowest, 6 = highest), how prepared and organized were the resident and students this week for rounds? (i.e. did they pre-round efficiently?)

DRAFT 1: 2 & 3) Trainee Leadership Skills

- For this aspect of the Primary Driver "skills and efficacy of residents" we thought it would be helpful to obtain the perspective from both faculty and junior residents.

Question for Residents:
On a scale from 1 to 6 (1 = lowest, 6 – highest), how prepared did you feel for rounds? (I.e. did you feel like you were able to adequately pre-round in preparation for rounds?) _____

Question for Faculty:
On a scale from 1 to 6 (1 = lowest, 6 = highest), how prepared and organized were the resident and students this week for rounds? (i.e. did they pre-round efficiently?) _____

DRAFT 1 → DRAFT 2:
2 & 3) Trainee Leadership Skills

- For Draft 2, we decided to measure the resident's perceived self-efficacy of their ability to manage and lead a team for ward rounds. We therefore changed the scale to allow us to measure PSE similarly to how we did in the previous Phase 1 PSE surveys.
- We also flushed out the specific CanMEDS activities and roles to help guide the survey questions.[104]

CanMEDS

- The CanMEDS evaluation form assesses the trainees' competence to master each of these roles: medical expert, scholar, communicator, collaborator, manager, health advocate and professional.
- Since the UB residents are evaluated based on these and the UB medical school used this to guide their undergraduate curriculum, we felt it was relevant to relate to aspects trainees needed to achieve these physician roles.

CanMEDS

- To do this, I reviewed the CanMEDS resident evaluation to look for specific areas which the Phase 1 results noted deficiencies and then created resident PSE surveys related to their perceived ability to do those types of activities/tasks/roles.
- CanMEDS:[104]
  - - Scholar: Demonstrates Effective Teaching & Supervisory Skills
  - - Communicator: Presents cases in accurate, organized and thoughtful manner
  - - Collaborator: Consults and Delegates Appropriately
  - - Manager: Effectively Sets Priorities and Organizes Work
  - - Professionalism: Demonstrates Reliability, Responsibility & Conscientiousness

DRAFT 2: 2) Trainee PSE of Leadership Skills - Residents

Resident Survey:

Reflecting on ***this past week's*** ward rounds, please rate your degree of confidence by recording a number 0 to 100 using the scale given below:

0	10	20	30	40	50	60	70	80	90	100
Cannot do at all can do				Moderately can do					Highly certain	

Question	Confidence
1. *Demonstrates Effective Teaching & Supervisory Skills* Q. How confident are you in your ability to effectively manage a team comprised of interns and/or medical students so that pre-rounds, rounds, and ward work are conducted in an organized and efficient manner? Q. How confident are you in your ability to effectively supervise a team comprised of interns and/or medical students so that ***all*** patients on the team are known to you and ultimately managed by you?	
2. *Consults and Delegates Appropriately* Q. How confident are you in your ability to effectively delegate tasks to your interns and/or medical students so that pre-rounds, rounds, and ward work is conducted in an organized and efficient manner?	
3. *Effectively Sets Priorities and Organizes Work* Q. How confident are you in your ability to effectively prioritize and organize the pre-round and ward work so that patient care is conducted in an organized and efficient manner?	

DRAFT 2: 2) Trainee PSE of Leadership Skills – Residents cont.

4. *Demonstrates Reliability, Responsibility & Conscientiousness* Q. How confident are you in your ability to be a reliable, responsible and conscientiousness resident?	
5. *Presents cases in accurate, organized and thoughtful manner* Q. How confident are you in your ability to summarize and present the pertinent information obtained from a patient's history on ward rounds in an accurate, organized and thoughtful manner? Q. How confident are you in your ability to summarize and present the pertinent information obtained from a patient's physical exam on ward rounds in an accurate, organized and thoughtful manner?	

DRAFT 2: 3) Trainee Leadership Skills – Faculty Evaluation

Faculty Survey:

Reflecting on ***this past week's*** ward rounds, please rate your level of agreement with the statement based on a scale of:

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	Unsure
0	1	2	3	4	5	

Question:	**0**	**1**	**2**	**3**	**4**	**5**	**Unsure**
1. *Demonstrates Effective Teaching & Supervisory Skills* Q. The resident effectively managed the team so that pre-rounds, rounds, and ward work were conducted in an organized and efficient manner. Q. The resident effectively supervised the team in such a way that ***all*** patients on the team were managed effectively by him/her, not just by individuals on the team.							
2. *Consults and Delegates Appropriately* Q. The resident effectively delegated tasks so that pre-rounds, rounds, and ward work was conducted in an organized and efficient manner.							
3. *Effectively Sets Priorities and Organizes Work* Q. The resident effectively prioritized and organized the pre-round and ward work so that patient care was conducted in an organized and efficient manner.							

DRAFT 2: 3) Trainee Leadership Skills – Faculty Evaluation cont.

4. *Demonstrates Reliability, Responsibility & Conscientiousness* Q. The resident was reliable, responsible and conscientiousness.							
5. *Presents cases in accurate, organized and thoughtful manner* Q. The resident was able to summarize and present the pertinent information obtained from the patient's history on ward rounds in an accurate, organized and thoughtful manner. Q. The resident was able to summarize and present the pertinent information obtained from the patient's physical exam on ward rounds in an accurate, organized and thoughtful manner.							

DRAFT 2 → DRAFT 3:
2 & 3) Trainee Leadership Skills

- For Draft 3 of the residents' survey, we removed the direct CanMEDS role description and added an open comment space.
- For Draft 3 of the faculty survey, we modified the numbering responses from 0-5 to 1-6, and removed 'unsure' as a response option, and added an open comment space.

DRAFT 3: 2) Trainee PSE of Leadership Skills - Residents

Resident Survey

Reflecting on ***this past week's*** ward rounds, please rate your degree of confidence by recording a number 0 to 100 using the scale given below:

0	10	20	30	40	50	60	70	80	90	100
Cannot do at all can do				Moderately can do					Highly certain	

Question	Confidence
1. How confident are you in your ability to effectively manage a team comprised of interns and/or medical students so that pre-rounds, rounds, and ward work are conducted in an organized and efficient manner.	
2. How confident are you in your ability to effectively supervise a team comprised of interns and/or medical students so that ***all*** patients on the team are known to you and ultimately managed by you.	
3. How confident are you in your ability to effectively delegate tasks to your interns and/or medical students so that pre-rounds, rounds, and ward work is conducted in an organized and efficient manner.	
4. How confident are you in your ability to effectively prioritize and organize the pre-round and ward work so that patient care is conducted in an organized and efficient manner.	
5. How confident are you in your ability to be a reliable, responsible and conscientiousness resident.	
6. How confident are you in your ability to summarize and present the pertinent information obtained from a patient's history on ward rounds in an accurate, organized and thoughtful manner.	

DRAFT 3: 2) Trainee PSE of Leadership Skills – Residents cont.

7. How confident are you in your ability to summarize and present the pertinent information obtained from a patient's physical exam on ward rounds in an accurate, organized and thoughtful manner.	

Any comments you'd like to add about managing your team this week:

_____

_____

DRAFT 3: 3) Trainee Leadership Skills – Faculty Evaluation

Faculty Survey

Reflecting on ***this past week's*** ward rounds, please rate your level of agreement with the statement based on a scale of:

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6

Question:	**1**	**2**	**3**	**4**	**5**	**6**
1. The resident effectively managed the team so that pre-rounds, rounds, and ward work were conducted in an organized and efficient manner.						
2. The resident effectively supervised the team in such a way that ***all*** patients on the team were managed effectively by him/her, not just by individuals on the team.						
3. The resident effectively delegated tasks so that pre-rounds, rounds, and ward work was conducted in an organized and efficient manner.						
4. The resident effectively prioritized and organized the pre-round and ward work so that patient care was conducted in an organized and efficient manner.						
5. The resident was reliable, responsible and conscientiousness.						
5. The resident was able to summarize and present the pertinent information obtained from the patient's history on ward rounds in an accurate, organized and thoughtful manner.						

DRAFT 3: 3) Trainee Leadership Skills – Faculty Evaluation cont.

6. The resident was able to summarize and present the pertinent information obtained from the patient's physical exam on ward rounds in an accurate, organized and thoughtful manner.						

Any comments you'd like to add about your team's management this week: to the team's performance this week that would be relevant

_____

_____

DRAFT 3 → DRAFT 4:
2 & 3) Trainee Leadership Skills

- The Draft 4 changes were influenced by the MSLQ survey. Based on how the MSLQ measures PSE, we modified our question format and scale to more resemble the MSLQ framework. We also added questions which considered specifically the verbal, vicarious and psychological aspects of PSE. Some of these additional question were directly related to patient care at Princess Marina Hospital.[131]
- The formatting and language of this draft was also influenced by the article, “Developing questionnaires for educational research: AMEE Guide No. 87.” This article provided a step-by-step guide of how best to generate questionnaires.[164]
- No changes to the faculty survey were made at this time.

DRAFT 4: 2) Trainee PSE of Leadership Skills - Residents

Weekly PSE of Resident Leadership & Efficiency at PMH

Please rate the following items based on your behavior *over the past week*. Your rating should be on a 7-point scale:

1 = not like me at all, never
2 = mostly not like me, almost never
3 = somewhat not like me; once in a while
4 = neither like me or not like me, sometimes
5 = somewhat like me, often
6 = mostly like me, almost always
7 = very much like me, all the time

1. I am certain I can effectively **manage a team** so that **pre-rounds** are conducted in an organized and efficient manner.
2. I am certain I can effectively **supervise a team** so that all patients on the team are known to me and ultimately managed by me.
3. I am certain I can effectively **delegate tasks** so that **ward work** is conducted in an organized and efficient manner.
4. I am sure I can effectively **prioritize and organize** ward work so that patient care is conducted in an organized and efficient manner.
5. Others think I am a reliable resident.
6. Others think I am an organized resident.
7. Others think I am an efficient resident.

DRAFT 4: 2) Trainee PSE of Leadership Skills – Residents cont.

8. Compared with other residents, I am a good team leader.

9. Compared with other residents, I am well organized and efficient.

10. I get easily overwhelmed and am unsure where to prioritize ward work and patient care.

11. I worry a great deal about being a good resident team leader.

12. When I am assigned to a team or cubicle, I think about how poorly I am managing the team.

13. At Princess Marina Hospital, I am certain that I can make the 'Plan' written in the chart happen *exactly as written* for all of my patients by the end of the working day.

(For example, if "Get CXR" is written as part of the plan, I am sure that I can get a CXR for my patient that day.)

14. I receive helpful feedback from my consultant about how to improve my team management skills?

DRAFT 4 → DRAFT 5:
2 & 3) Trainee Leadership Skills

- The major change from Draft 4 to 5 was the removal of several questions, which were later built into a separate survey. It became apparent that our questions were crossing two constructs: 1) residents' leadership and efficacy skills to prepare for and run ward rounds, *and* 2) residents' perceived challenges of working at PMH and its influence on their ability to provide patient care.
- In addition, some questions were re-worded to combine them into a single question.
- For the faculty survey, it was modified to better reflect the resident survey (specifically the four mastery components) so that these could be compared more easily; and the scale was modified slightly.

DRAFT 5: 2) Trainee PSE of Leadership Skills - Residents

Weekly Leadership: Perceived Self-Efficacy – Residents

Please rate the following items based on your behavior ***over the past week*****.** Your rating should be on a 7-point scale:

1 = not like me at all, never
2 = mostly not like me, almost never
3 = somewhat not like me; once in a while
4 = neither like me or not like me, sometimes
5 = somewhat like me, often
6 = mostly like me, almost always
7 = very much like me, all the time

1. I am certain I do effectively **manage a team** so that **pre-rounds** are conducted in an organized and efficient manner.

2. I am certain I do effectively **supervise a team** so that all patients on the team are known to me and I am ultimately responsible for their care.

3. I am certain I do effectively **delegate tasks** so that **ward work** is conducted in an organized and efficient manner.

4. I am sure I do effectively **prioritize and organize** ward work so that patient care is effective and efficient.

~~5. Others think I am a reliable resident~~ . . . change to who effectively manages a team so that pre-rounds are conducted in an organized and efficient manner.

~~6. Others think I am an organized resident.~~

~~7. Others think I am an efficient resident.~~

DRAFT 5: 2) Trainee PSE of Leadership Skills – Residents cont.

8. Compared with other residents, I am a good team ~~leader~~ manager.

. . . I am a good team supervisor, I am good at delegating tasks; I am good at prioritizing & organizing

~~9. Compared with other residents, I am well organized and efficient.~~

10. I get easily overwhelmed and am unsure where to prioritize ward work and patient care.

11. I worry a great deal about being a good resident team ~~leader~~ supervisor.

12. When I conduct pre-rounds, I think about how poorly I am managing the team.

13. At Princess Marina Hospital, I am certain that I can make the 'Plan' written in the chart happen *exactly as written* for all of my patients by the end of the working day.

(For example, if "Get CXR" is written as part of the plan, I am sure that I can get a CXR for my patient that day.) → take out and make a different survey; my ability to manage the team is influenced by the efficiency in the hospital; the circumstances at PMH influence my ability to; to what extent to the circumstances at PMH influence my ability to: where circumstances mean for example: which challenge my ability are . . . Not at all/A little bit/Somewhat/Quite a bit/A great amount

14. How much helpful feedback do you receive from your consultant about how to improve your team management skills. in those 4 domains; some or none

Not at all/A little bit/Somewhat/Quite a bit/A great amount

DRAFT 5: 3) Trainee Leadership Skills – Faculty Evaluation

Faculty Survey of Resident Leadership Skills

Reflecting on ***this past week's*** ward rounds, please rate your level of agreement with the statement.

Strongly Disagree - Moderately Disagree - Slightly Agree - Moderately Agree - Strongly Agree

1. The resident effectively managed the team so that rounds were conducted in an organized and efficient manner.
2. The resident effectively supervised the team in such a way that all patients on the team were managed effectively by him/her, not just by individuals on the team.
3. The resident effectively delegated tasks so that ward work was conducted in an organized and efficient manner.
4. The resident effectively prioritized and organized the ward work so that patient care was conducted in an organized and efficient manner.
5. ~~The resident was reliable.~~
6. ~~The resident was organized.~~
7. ~~The resident was efficient.~~

DRAFT 5 → FINAL:
2 & 3) Trainee Leadership Skills

- The formatting and language of these drafts were influenced by the article, “Developing questionnaires for educational research: AMEE Guide No. 87.”[164]

FINAL: 2) Trainee PSE of Leadership Skills - Residents

Weekly: Resident Perceived Self-Efficacy Leadership

*Please answer the following based on your behavior **over the past week.***

1) I effectively **manage a team** so that **pre-rounds** are conducted in an organized and efficient manner.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
o	o	o	o	o	o	o

2) I effectively **supervise a team** so that all patients on the team are known to me and I am ultimately responsible for their care.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
o	o	o	o	o	o	o

3) I effectively **delegate tasks** so that **ward work** is conducted in an organized and efficient manner.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
o	o	o	o	o	o	o

4) I effectively **prioritize and organize** ward work so that patient care is effective and efficient.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
o	o	o	o	o	o	o

5) Compared with other residents, I am a good team manager.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

6) Compared with other residents, I am a good team supervisor.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

FINAL: 2) Trainee PSE of Leadership Skills – Residents cont.

	Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
7) Compared with other residents, I am good at delegating tasks.	o	o	o	o	o
8) Compared with other residents, I am a good at prioritizing and organizing.	o	o	o	o	o
9) I get easily overwhelmed and am unsure where to prioritize ward work and patient care.	o	o	o	o	o
10) I worry a great deal about being a good resident team supervisor.	o	o	o	o	o

FINAL: 3) Trainee Leadership Skills – Faculty Evaluation

Weekly: Faculty Perspective of Resident Leadership Skills

Please answer the following based on your observations of the resident's behavior ***over the past week.***

1) The resident effectively **managed the team** so that **rounds** were conducted in an organized and efficient manner.

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

2) The resident effectively **supervised the team** so that all patients on the team were known to him/her and not just by individuals on the team.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
o	o	o	o	o	o	o

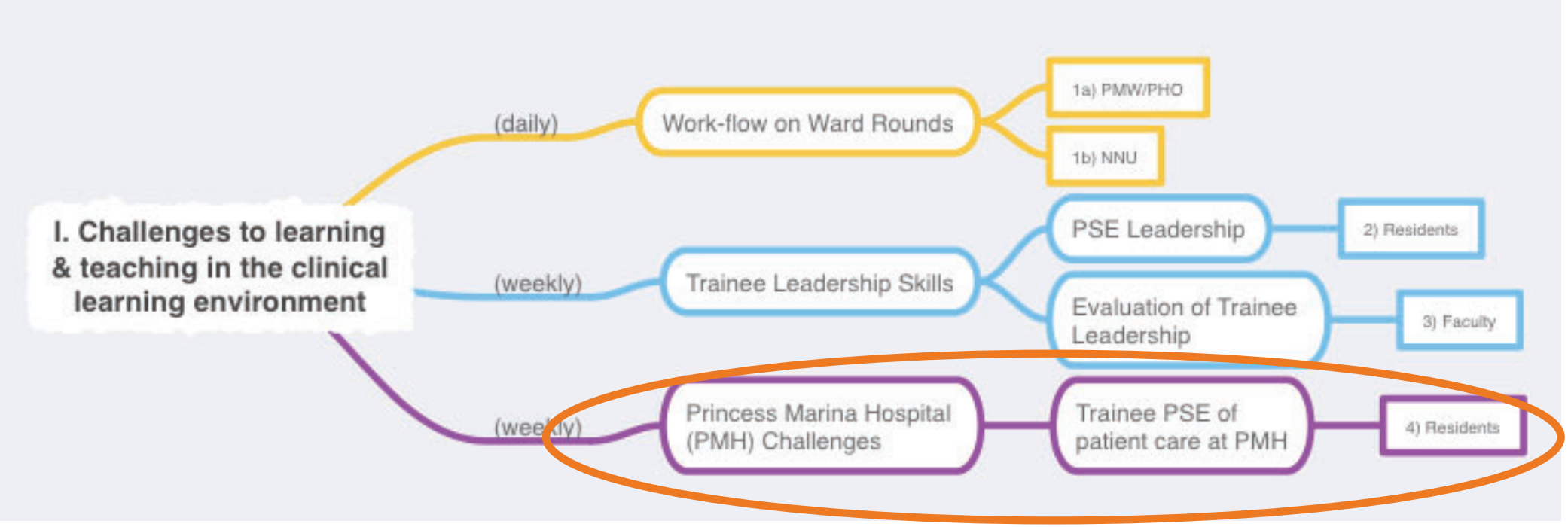
3) The resident effectively **delegated tasks** so that **ward work** was conducted in an organized and efficient manner.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
o	o	o	o	o	o	o

4) The resident effectively **prioritized and organized** ward work so that patient care was effective and efficient.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
o	o	o	o	o	o	o

Project Measures & DCTs/Surveys



4) Resident Perceived Self-Efficacy at Princess Marina Hospital

- Based on the above reflections about two different constructs being asked within the same survey, questions related to resident PSE to provide patient care at Princess Marina Hospital were removed and placed into a new survey.
- Since the questions had already gone multiple iterations, there was only one draft of this survey.

FINAL: 4) Resident Perceived Self-Efficacy at Princess Marina Hospital

Weekly: Resident Perceived Self-Efficacy at PMH

Please answer the following based on your behavior ***over the past week.***

1) At Princess Marina Hospital, I am certain that I can make the 'Plan' written in the chart happen ***exactly as written*** for all of my patients by the end of the working day.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
o	o	o	o	o	o	o

2) If a chest x-ray is ordered for my patient, I am sure that I can get a chest x-ray for my patient by the end of my shift.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
o	o	o	o	o	o	o

3) If packed red blood cells are ordered for my patient, I am certain that my patient will receive his/her transfusion by the end of my shift.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
o	o	o	o	o	o	o

4) If a certain medication for my patient is ordered, I am certain that my patient will receive it as indicated on the drug sheet.

Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
o	o	o	o	o	o	o

5) Circumstances at Princes Marina Hospital influence my ability to complete ward work as discussed on ward rounds.

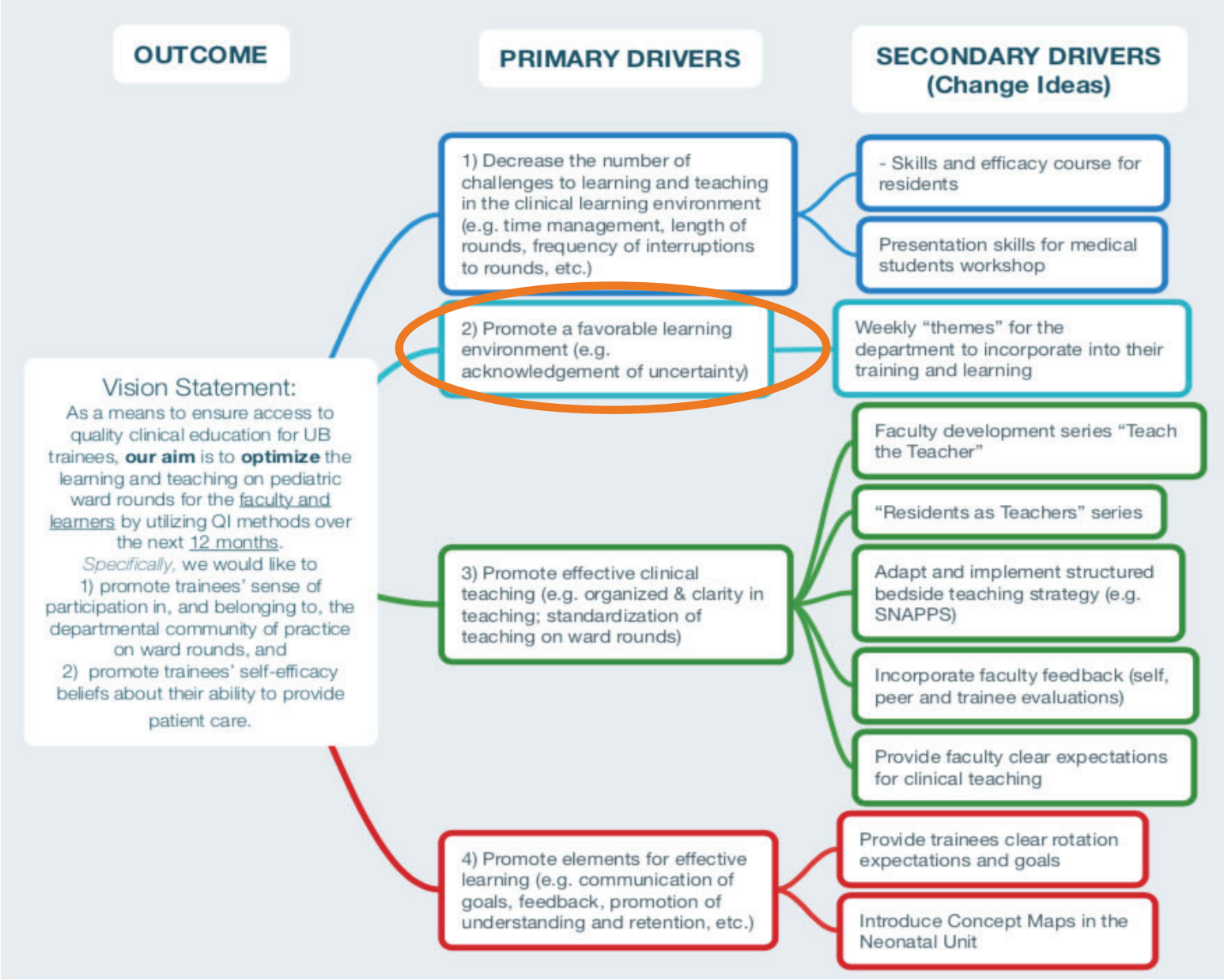
Never	Almost never	Once in a while	Sometimes	Often	Almost always	All the time
o	o	o	o	o	o	o

Project Measures & DCTs/surveys

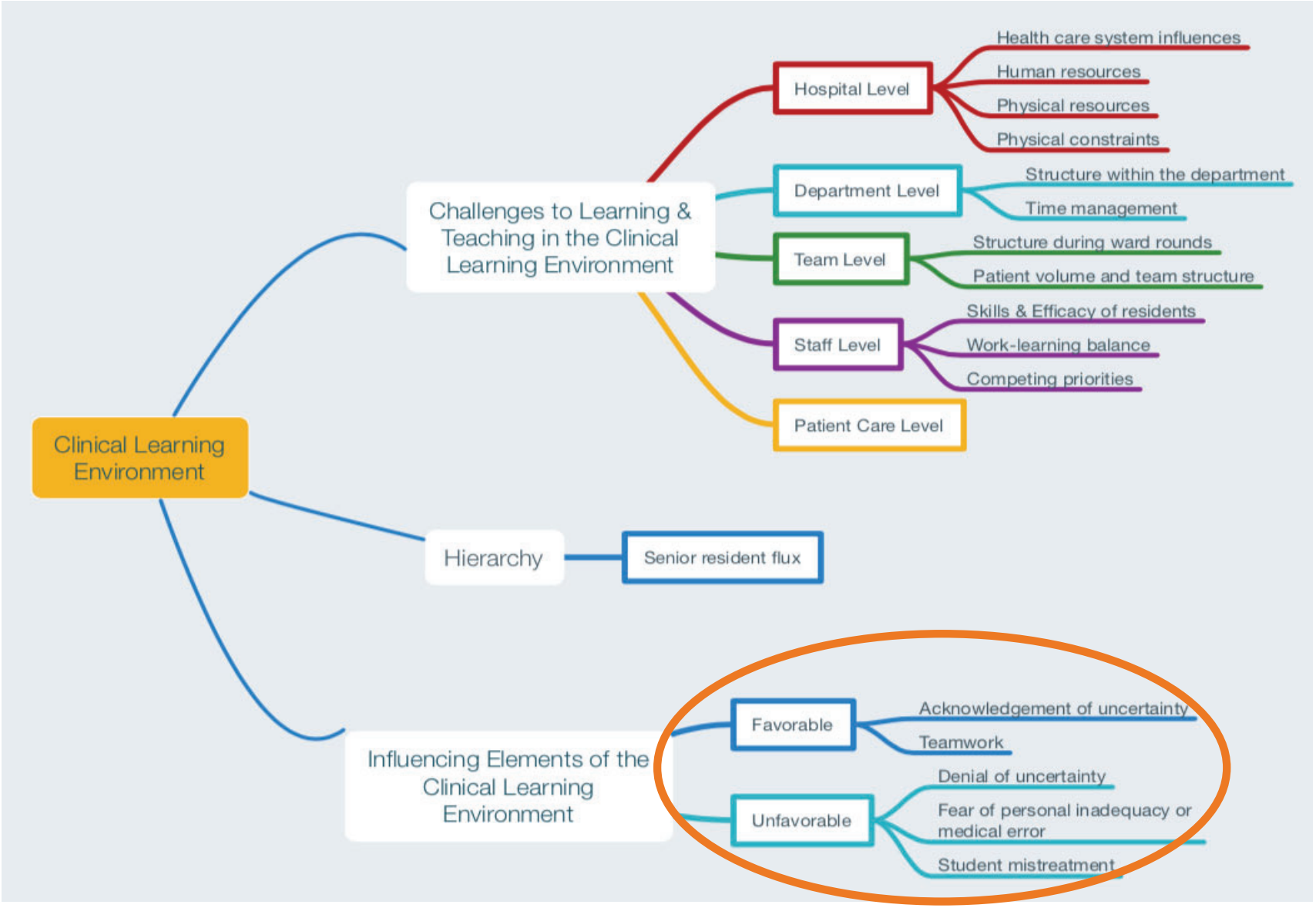
- We continued this process by now considering our second primary driver:

  #2) Promote a favorable learning environment

Primary Driver #2
Promote a favorable learning environment



Phase 1 Results



Measuring Primary Driver #2
Promote a favorable learning environment

- From the Phase 1 results, in regards to the clinical learning environment, we had some congruent and some divergent results.
- The qualitative data was able to describe both a favorable and unfavorable learning environment on paediatric ward rounds, mostly indicating that the CLE on rounds was heavily influenced by the individual clinical teacher. But the embedded hierarchy within the department as a whole gave the general perception that the CLE in the Dept of Paediatrics was poor.
- The quantitative data was interesting that while we had used three different instruments (DREEM, PHEEM, EEL) to try and quantitatively capture the CLE, only DREEM generally agreed with the qualitative data.

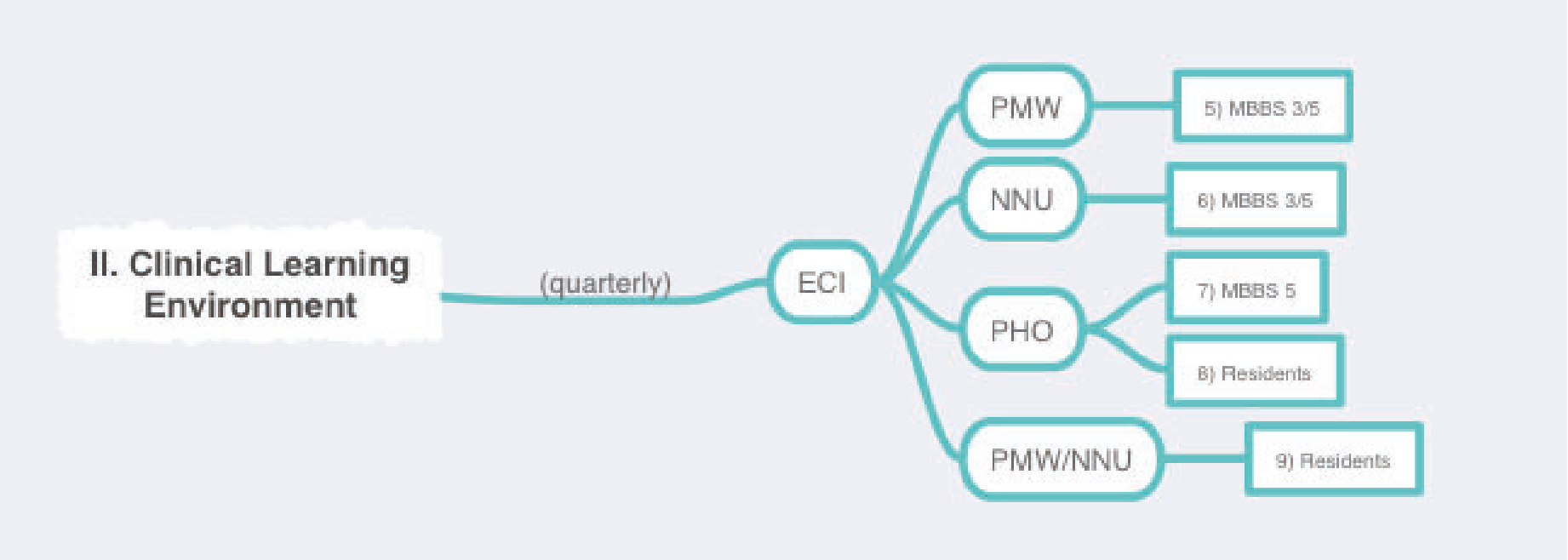
Measuring Primary Driver #2
Promote a favorable learning environment

- Based on the discrepancies between the DREEM, PHEEM and EEL surveys, and the length of the DREEM survey, it was decided that we should consider another survey tool to measure the CLE.
- We therefore reviewed the literature and found a recently published article *The Educational Climate Inventory: Measuring Students' Perceptions of the Pre-clerkship and Clerkship Settings* by Krupat et al.[86]
- As a group, we read the article and reviewed the survey questions. The questions within the ECI seemed to better reflect the qualitative data in Phase 1 – particularly the wording of the questions and seemed more related to other identified themes. We therefore chose to test the ECI as a means to assess the CLE on ward rounds.

Primary Driver	Related Phase 1 QUAL Themes	Related Phase 1 QUAN Surveys	Further Literature Review	Notes & Possible data collection ideas
#2) Promote a favorable clinical learning environment	The clinical learning environment was described as either 'favorable' or 'unfavorable'; related to the 'impact of the individual teacher'	DREEM: 3. The teaching encourages me to be an active learner (median = 2.5, S) 19. The teachers ridicule the students (median = 2.0, S) 20. The teachers get angry on ward rounds (median = 1.5, S) 21. The teachers are authoritarian (median = 1.0, S) 33. I feel able to ask the questions I want (median = 2.5, S) 38. The atmosphere motivates me as a learner (median = 2.5, S) 40. The atmosphere is relaxed during the ward teaching (median = 2.0, S) PHEEM: 11. I am bleeped inappropriately (median = 3.0, R) 25. There is a no-blame culture in this post (median = 2.0, R) 29. I feel part of a team working here (median = 3.0, R) 40. My clinical teachers promote an atmosphere of mutual respect (median = 3.0, R) EEL: While there were 8 questions related to the CLE in the EEL, only one of them scored low. 9. Paediatric ward rounds promote an atmosphere where uncertainty is respected. (median = 3.0, S; 2.0, R)	Educational Climate Inventory (ECI) published in Academic Medicine, Vol. 92, No. 12 / December 2017. The Educational Climate Inventory: Measuring Students' Perceptions of the Preclerkship and Clerkship Settings Edward Krupat, PhD, Nicole J. Borges, PhD, Richard D. Brower, MD, Paul M. Haidet, MD, MPH, W. Scott Schroth, MD, MPH, Thomas J. Fleenor Jr, MEd, and Sebastian Uijtdehaage, PhD	The questions within this newly published survey seem to better reflect the qualitative data in Phase 1 than the DREEM and PHEEM surveys. Moving forward, this might be a better survey to measure the CLE in the department.

Project Measures & DCTs/Surveys

- Our reflections resulted in the minor modification of the ECI survey, which was then stratified by ward and level of training, resulting in five versions of the same survey.



- The following is a description of how the ECI survey was modified to measure our second project measure (primary driver #2).

ORIGINAL: Educational Climate Inventory (ECI)

Educational Climate Inventory (ECI)

[Likert Scale: 1 – 4: Strongly Disagree – Disagree – Agree – Strongly Agree]

1. In this medical school, we focus on a sense of discovery and the excitement of inquiry.

2. I often get valuable and supportive advice from faculty on how to improve.

3. Most faculty here are deeply interested in the welfare of their students.

4. When you make an error here, it is seen as an opportunity for learning and growth.

5. The faculty care about how I think, not simply about whether I get the right answer.

6. Students here are encouraged to embrace uncertainty rather than be afraid of it.

7. There is a great deal of trust and respect between students and faculty here.

8. Faculty and students here see themselves as partners in learning.

9. Faculty here are more interested in building up students' confidence rather than tearing them down.

10. The faculty here react well when students question or challenge them.

ORIGINAL: Educational Climate Inventory (ECI) – cont.

11. The atmosphere here is highly competitive.

12. Around here you have to act confidently even if you have little idea what you are doing.

13. Most students worry more about how they did compared to their classmates than whether they mastered the material.

14. Faculty here tell us not to be competitive, then pit students against one another.

15. Faculty tell us they are concerned with our welfare, but then put us under great stress.

16. When students are having difficulties here, it is best if they hide these from anyone else.

17. Most of what we do here is focused on the passive transfer of knowledge.

18. Education here is all about memorizing as much content as you can.

19. The faculty tell us that they are interested in our thinking, but their tests suggest otherwise.

20. The goal of most students here is to figure out what we will be tested on and to study that material.

ORIGINAL → MODIFIED version 1:
5, 6, 7, 8 & 9) Educational Climate Inventory

- The published ECI was modified to be more specific for the University of Botswana medical students' paediatric rotation, and again for University of Botswana paediatric residents, rather than a medical school in general.
- Of note, while the original ECI was created for medical students only, the article does indicate that the survey could likely be used in post-graduate education.[86]
- We also took out questions which were related to peer competitiveness which hadn't been found in the Phase 1 qualitative data.

MODIFIED version 1:
5, 6, & 7) Educational Climate Inventory - Students

Modified for UB Students on their Paediatric rotation
Educational Climate Inventory (ECI)

[Likert Scale: 1 – 4: Strongly Disagree – Disagree – Agree – Strongly Agree]

Please answer the following questions in relation to your current or most recent Paediatric rotation.

1. In the Department of Paediatrics ~~this medical school~~, we focus on a sense of discovery and the excitement of inquiry.

2. I often get valuable and supportive advice from faculty on how to improve.

3. Most faculty here are deeply interested in the welfare of their students.

4. When you make an error here, it is seen as an opportunity for learning and growth.

5. The faculty care about how I think, not simply about whether I get the right answer.

6. Students here are encouraged to embrace uncertainty rather than be afraid of it.

7. There is a great deal of trust and respect between students and faculty here.

8. Faculty and students here see themselves as partners in learning.

9. Faculty here are more interested in building up students' confidence rather than tearing them down.

10. The faculty here react well when students question or challenge them.

MODIFIED version 1:

5, 6, & 7) Educational Climate Inventory – Students cont.

~~11. The atmosphere here is highly competitive.~~

12. Around here you have to act confidently even if you have little idea what you are doing.

~~13. Most students worry more about how they did compared to their classmates than whether they mastered the material.~~

~~14. Faculty here tell us not to be competitive, then pit students against one another.~~

15. Faculty tell us they are concerned with our welfare, but then put us under great stress.

16. When students are having difficulties here, it is best if they hide these from anyone else.

17. Most of what we do here is focused on the passive transfer of knowledge. (i.e. we are expected to just listen and absorb knowledge, not interactive learning).

18. Education here is all about memorizing as much content as you can.

19. The faculty tell us that they are interested in our thinking, but their actions on rounds ~~tests~~ suggest otherwise.

20. The goal of most students here is to figure out what we will be tested on and to study that material.

MODIFIED version 1:
8 & 9) Educational Climate Inventory - Residents

Modified for Paediatric Residents
Educational Climate Inventory (ECI)

[Likert Scale: 1 – 4: Strongly Disagree – Disagree – Agree – Strongly Agree]

1. In this residency program ~~medical school~~, we focus on a sense of discovery and the excitement of inquiry.

2. I often get valuable and supportive advice from faculty on how to improve.

3. Most faculty here are deeply interested in the welfare of their residents ~~students~~.

4. When you make an error here, it is seen as an opportunity for learning and growth.

5. The faculty care about how I think, not simply about whether I get the right answer.

6. Residents ~~Students~~ here are encouraged to embrace uncertainty rather than be afraid of it.

7. There is a great deal of trust and respect between residents ~~students~~ and faculty here.

8. Faculty and residents ~~students~~ here see themselves as partners in learning.

9. Faculty here are more interested in building up residents' ~~students~~' confidence rather than tearing them down.

10. The faculty here react well when residents ~~students~~ question or challenge them.

MODIFIED version 1:

8 & 9) Educational Climate Inventory – Residents cont.

11. The atmosphere here is highly competitive.

12. Around here you have to act confidently even if you have little idea what you are doing.

~~13. Most students worry more about how they did compared to their classmates than whether they mastered the material.~~

14. Faculty here tell us not to be competitive, then pit residents ~~students~~ against one another.

15. Faculty tell us they are concerned with our welfare, but then put us under great stress.

16. When residents ~~students~~ are having difficulties here, it is best if they hide these from anyone else.

17. Most of what we do here is focused on the passive transfer of knowledge. (i.e. we are expected to just listen and absorb knowledge, not interactive learning).

18. Education here is all about memorizing as much content as you can.

19. The faculty tell us that they are interested in our thinking, but their actions on rounds ~~tests~~ suggest otherwise.

20. The goal of most residents ~~students~~ here is to figure out what we will be tested on and to study that material.

MODIFIED version 1 → MODIFIED FINAL:
5, 6, 7, 8 & 9) Educational Climate Inventory

- The surveys were further modified to be stratified per ward: PMW, PHO and NNU.
- And response space was provided.

MODIFIED FINAL:

5) Educational Climate Inventory – PMW Students

Educational Climate Inventory
Paediatric Medical Ward – Students (MBBS 3 & 5)

Please answer the following questions in relation to your current or most recent Paediatric rotation in the **Paediatric Medical Ward.** Your answers will be kept ***strictly confidential*** and will ***not*** be identified by name.

Please rate your level of agreement with the statement below.

Question:	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
1. In the **Paediatric Medical Ward**, we focus on a sense of discovery and the excitement of inquiry.				
2. I often get valuable and supportive advice from faculty on how to improve.				
3. Most faculty here are deeply interested in the welfare of the students.				
4. When you make an error here, it is seen as an opportunity for learning and growth.				
5. The faculty care about how I think, not simply about whether I get the right answer.				
6. Students here are encouraged to embrace uncertainty rather than be afraid of it.				
7. There is a great deal of trust and respect between students and faculty here.				
8. Faculty and students here see themselves as partners in learning.				
9. Faculty here are more interested in building up students' confidence rather than tearing them down.				
10. The faculty here react well when students question or challenge them.				

MODIFIED FINAL:

5) Educational Climate Inventory – PMW Students cont.

	11. Around here you have to act confidently even if you have little idea what you are doing.				
	12. Faculty tell us they are concerned with our welfare, but then put us under great stress.				
	13. When students are having difficulties here, it is best if they hide these from anyone else.				
	14. Most of what we do here is focused on the passive transfer of knowledge, (i.e. we are expected to just listen and absorb knowledge, not interactive learning).				
	15. Education here is all about memorizing as much content as you can.				
	16. The faculty tell us that they are interested in our thinking, but their actions on rounds suggest otherwise.				
	17. The goal of most students here is to figure out what we will be tested on and to study that material.				

MODIFIED FINAL:

6) Educational Climate Inventory – NNU Students

Educational Climate Inventory
Neonatal Unit – Students (MBBS 3 & 5)

Please answer the following questions in relation to your current or most recent Paediatric rotation in the **Neonatal Unit.** Your answers will be kept ***strictly confidential*** and will ***not*** be identified by name.

Please rate your level of agreement with the statement below.

Question:	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
1. In the **Neonatal Unit**, we focus on a sense of discovery and the excitement of inquiry.				
2. I often get valuable and supportive advice from faculty on how to improve.				
3. Most faculty here are deeply interested in the welfare of the students.				
4. When you make an error here, it is seen as an opportunity for learning and growth.				
5. The faculty care about how I think, not simply about whether I get the right answer.				
6. Students here are encouraged to embrace uncertainty rather than be afraid of it.				
7. There is a great deal of trust and respect between students and faculty here.				
8. Faculty and students here see themselves as partners in learning.				
9. Faculty here are more interested in building up students' confidence rather than tearing them down.				
10. The faculty here react well when students question or challenge them.				

MODIFIED FINAL:

6) Educational Climate Inventory – NNU Students cont.

11. Around here you have to act confidently even if you have little idea what you are doing.				
12. Faculty tell us they are concerned with our welfare, but then put us under great stress.				
13. When students are having difficulties here, it is best if they hide these from anyone else.				
14. Most of what we do here is focused on the passive transfer of knowledge, (i.e. we are expected to just listen and absorb knowledge, not interactive learning).				
15. Education here is all about memorizing as much content as you can.				
16. The faculty tell us that they are interested in our thinking, but their actions on rounds suggest otherwise.				
17. The goal of most students here is to figure out what we will be tested on and to study that material.				

MODIFIED FINAL:

7) Educational Climate Inventory – PHO – MBBS 5 Students

Educational Climate Inventory
Paediatric Haematology-Oncology – MBBS 5

Please answer the following questions in relation to your most recent Paediatric rotation in **Paediatric Haematology-Oncology.** Your answers will be kept ***strictly confidential*** and will ***not*** be identified by name.

Please rate your level of agreement with the statement below.

Question:	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
1. In **Paediatric Haematology-Oncology**, we focus on a sense of discovery and the excitement of inquiry.				
2. I often get valuable and supportive advice from faculty on how to improve.				
3. Most faculty here are deeply interested in the welfare of the students.				
4. When you make an error here, it is seen as an opportunity for learning and growth.				
5. The faculty care about how I think, not simply about whether I get the right answer.				
6. Students here are encouraged to embrace uncertainty rather than be afraid of it.				
7. There is a great deal of trust and respect between students and faculty here.				
8. Faculty and students here see themselves as partners in learning.				
9. Faculty here are more interested in building up students' confidence rather than tearing them down.				
10. The faculty here react well when students question or challenge them.				

MODIFIED FINAL:

7) Educational Climate Inventory – PHO – MBBS 5 Students cont.

11. Around here you have to act confidently even if you have little idea what you are doing.				
12. Faculty tell us they are concerned with our welfare, but then put us under great stress.				
13. When students are having difficulties here, it is best if they hide these from anyone else.				
14. Most of what we do here is focused on the passive transfer of knowledge, (i.e. we are expected to just listen and absorb knowledge, not interactive learning).				
15. Education here is all about memorizing as much content as you can.				
16. The faculty tell us that they are interested in our thinking, but their actions on rounds suggest otherwise.				
17. The goal of most students here is to figure out what we will be tested on and to study that material.				

MODIFIED FINAL:

8) Educational Climate Inventory – PHO Residents

Educational Climate Inventory
Paediatric Haematology-Oncology - Residents

Please answer the following questions in relation to your most recent rotation on **Paediatric Haematology-Oncology.** Your answers will be kept ***strictly confidential*** and will ***not*** be identified by name.

Please rate your level of agreement with the statement below.

Question:	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
1. On the Paediatric Haematology-Oncology rotation, we focus on a sense of discovery and the excitement of inquiry.				
2. I often get valuable and supportive advice from faculty on how to improve.				
3. Most faculty here are deeply interested in the welfare of the residents.				
4. When you make an error here, it is seen as an opportunity for learning and growth.				
5. The faculty care about how I think, not simply about whether I get the right answer.				
6. Residents here are encouraged to embrace uncertainty rather than be afraid of it.				
7. There is a great deal of trust and respect between residents and faculty here.				
8. Faculty and residents here see themselves as partners in learning.				
9. Faculty here are more interested in building up residents' confidence rather than tearing them down.				
10. The faculty here react well when residents question or challenge them.				

MODIFIED FINAL:

8) Educational Climate Inventory – PHO Residents cont.

11. Around here you have to act confidently even if you have little idea what you are doing.				
12. Faculty tell us they are concerned with our welfare, but then put us under great stress.				
13. When residents are having difficulties here, it is best if they hide these from anyone else.				
14. Most of what we do here is focused on the passive transfer of knowledge, (i.e. we are expected to just listen and absorb knowledge, not interactive learning).				
15. Education here is all about memorizing as much content as you can.				
16. The faculty tell us that they are interested in our thinking, but their actions on rounds suggest otherwise.				
17. The goal of most residents here is to figure out what we will be tested on and to study that material.				

MODIFIED FINAL:

9) Educational Climate Inventory – PMW/NNU Residents

Educational Climate Inventory
Department of Paediatrics - Residents

Please answer the following questions in relation to your experiences working in the **Department of Paediatrics**. Your answers will be kept ***strictly confidential*** and will ***not*** be identified by name.

Please rate your level of agreement with the statement below.

Question:	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
1. In the **Department of Paediatrics**, we focus on a sense of discovery and the excitement of inquiry.				
2. I often get valuable and supportive advice from faculty on how to improve.				
3. Most faculty here are deeply interested in the welfare of the residents.				
4. When you make an error here, it is seen as an opportunity for learning and growth.				
5. The faculty care about how I think, not simply about whether I get the right answer.				
6. Residents here are encouraged to embrace uncertainty rather than be afraid of it.				
7. There is a great deal of trust and respect between residents and faculty here.				
8. Faculty and residents here see themselves as partners in learning.				
9. Faculty here are more interested in building up residents' confidence rather than tearing them down.				
10. The faculty here react well when residents question or challenge them.				

MODIFIED FINAL:

9) Educational Climate Inventory – PMW/NNU Residents cont.

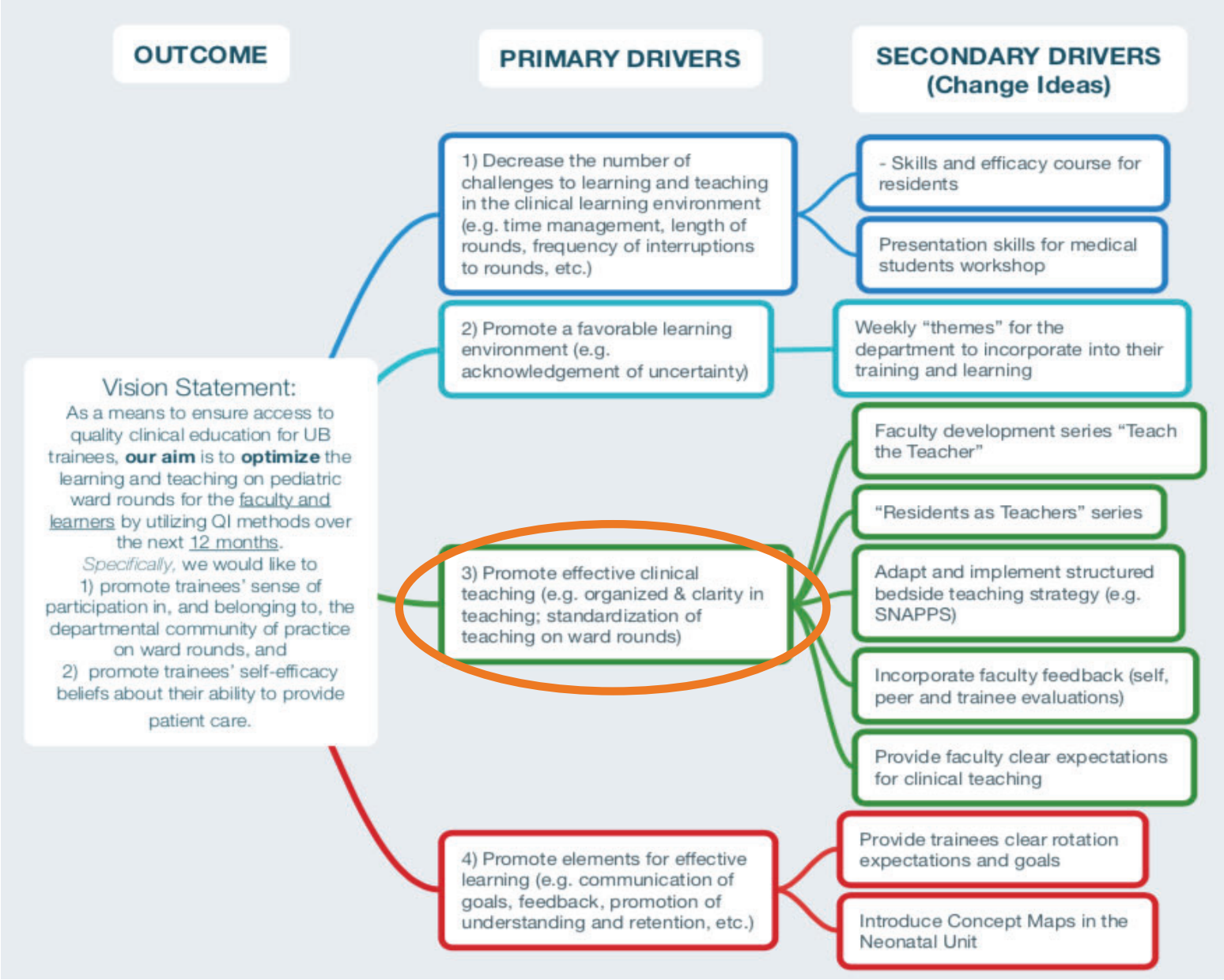
11. Around here you have to act confidently even if you have little idea what you are doing.				
12. Faculty tell us they are concerned with our welfare, but then put us under great stress.				
13. When residents are having difficulties here, it is best if they hide these from anyone else.				
14. Most of what we do here is focused on the passive transfer of knowledge, (i.e. we are expected to just listen and absorb knowledge, not interactive learning).				
15. Education here is all about memorizing as much content as you can.				
16. The faculty tell us that they are interested in our thinking, but their actions on rounds suggest otherwise.				
17. The goal of most residents here is to figure out what we will be tested on and to study that material.				

Project Measures & DCTs/surveys

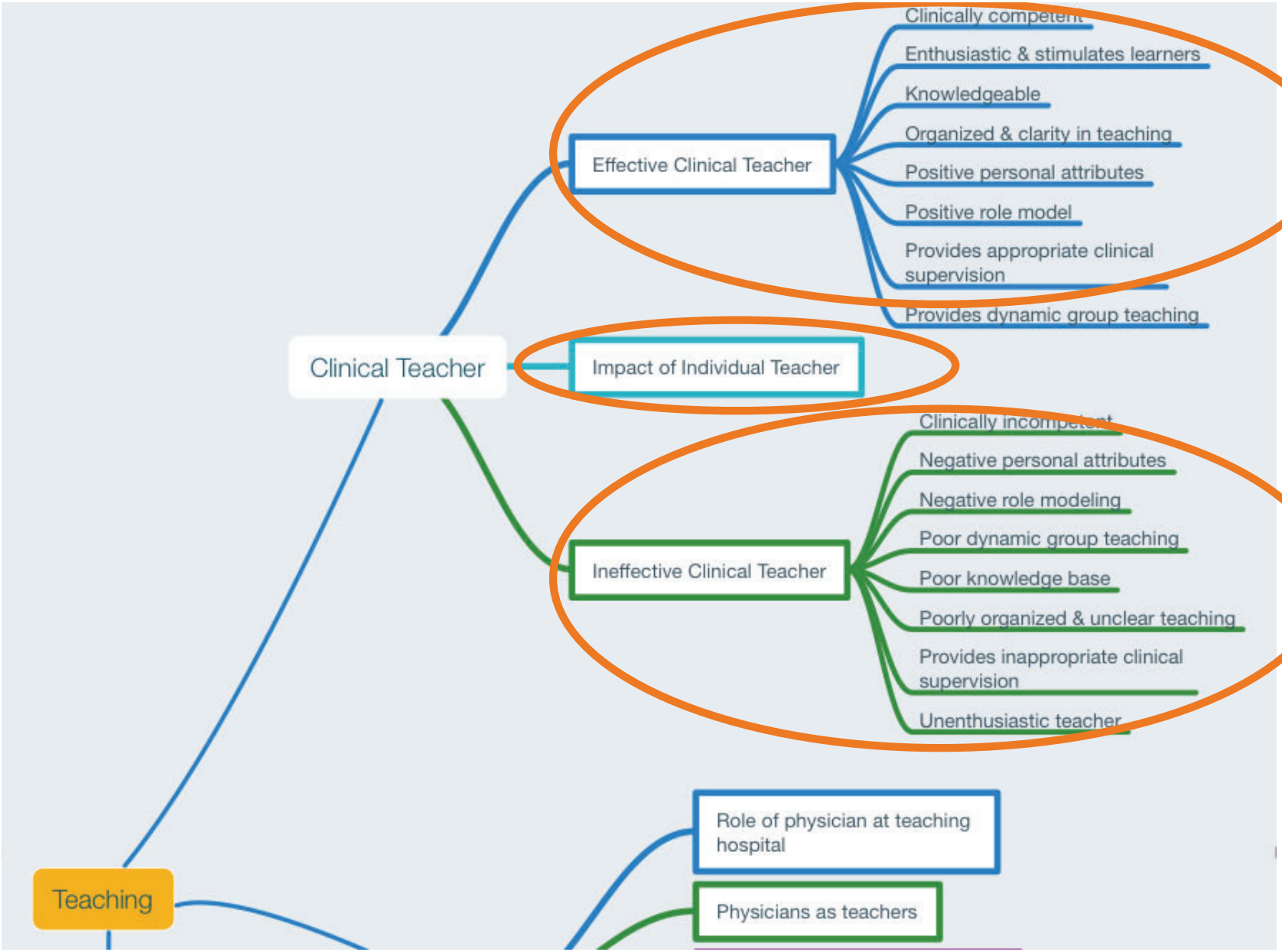
- We continued this process by now considering our third primary driver:

  #3) Promote effective clinical teaching

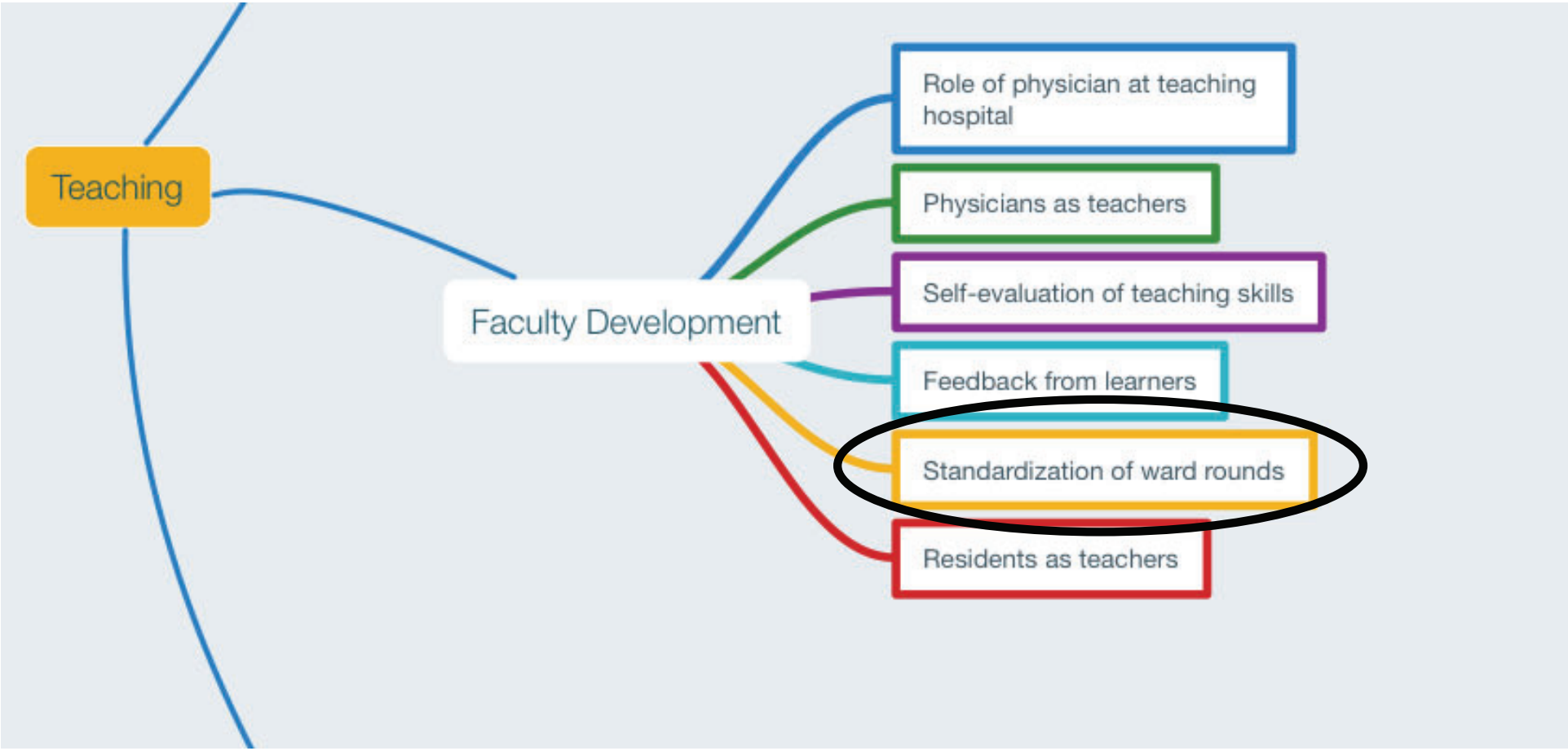
Primary Driver #3
Promote effective clinical teaching



Phase 1 Results



Phase 1 Results



Measuring Primary Driver #3
Promote effective clinical teaching

- The main themes identified in Phase 1 related to Primary Driver #3 were the description of an effective verses ineffective clinical teacher, the impact of the individual teacher, and the need for a standardization of ward round teaching.
- As described in Phase 1 results, an effective clinical teacher was described as someone who is clinically competent, enthusiastic, stimulates learners, knowledgeable, organized and clear in his/her teaching, has positive personal attributes, is a positive role model, provides appropriate clinical supervision, and provides dynamic group teaching.
- In addition, other notable items identified included: ‘what is the role of a physician at a teaching hospital?’, ‘how are teaching skills transferred?’, ‘residents need modeling and instruction to be future clinical teachers’, and that there was no current feedback mechanism for evaluating clinical teaching skills.

Measuring Primary Driver #3
Promote effective clinical teaching

- After reviewing the Phase 1 results, we sought out ways to measure the effectiveness and variation of clinical teaching within the department.
- From our literature we were introduced to the benefit of evaluating the effectiveness of clinical teaching skills from a complementary three-sided perspective:
  - 1) the teachers' self-evaluation,
  - 2) peer evaluation, and
  - 3) the trainees' perspectives.

Measuring Primary Driver #3
Promote effective clinical teaching

- To this end, we found three separate clinical teaching tools in the literature – one for each: self, peer and trainee evaluation:

  1) (Self): Self-assessment instrument. Stalmeijer, Renée E., et al. "Combined student ratings and self-assessment provide useful feedback for clinical teachers."[181]

  2) (Peer): Observation and learning tool for clinical teachers. Sommer, Johanna, et al. "A teaching skills assessment tool inspired by the Calgary–Cambridge model and the patient-centered approach."[100]

  3) (Trainee): Instrument for Evaluating Clinical Teachers. Stalmeijer, Renée E., et al. "The development of an instrument for evaluating clinical teachers: involving stakeholders to determine content validity."[182]

Measuring Primary Driver #3
Promote effective clinical teaching

- When we reviewed each survey, we found that for the most part, they were quite relevant to our Phase 1 results. But since there was no current formal feedback from trainees to faculty, as a group, we felt the introduction of such could potentially be politically problematic within the department. We therefore decided to avoid a direct trainee to faculty evaluation by having the trainees reflect on the *teaching*, not the *teacher*.
- Instead, we focused on the feedback from the most recent faculty update meetings where we were encouraged to define the goals and expectations of the clinical teacher on rounds at PMH.

Measuring Primary Driver #3
Promote effective clinical teaching

- To this end, and with expert support from my PhD supervisor, we discussed the potential of one of the survey tools to double as a set of faculty 'goals and expectations'.
- Of the three survey tools we had reviewed from the literature, the one that stood out the most was the "Observation and Learning Tool for Clinical Teaching."[100]
- It's capacity to draw on skills already possessed by a practicing physician (patient-centred skills and structure of a clinical encounter) easily applied to a teaching scenario was very appealing.
- We decided that we could actually use the Observation & Learning Tool for the basis of introducing the faculty to 'What does it mean to be a clinical teacher?'.
- *Note*: this was later developed as a core component of the Faculty Teach-the-Teacher workshop series.

Measuring Primary Driver #3
Promote effective clinical teaching

- In addition, we decided that while the tool had been designed to capture *peer* evaluation, it could be easily modified to be a *self-assessment* as well. We chose not to further modify the tool to a *trainee-evaluation* survey based on departmental issues discussed above.
- Therefore, we modified the “Observation and Learning Tool for Clinical Teaching” into two surveys:
  - 1) Self-Assessment Tool (SAT), and
  - 2) Peer Assessment Tool (PAT)
- Of note, we were conscious that the faculty might feel threatened by the term ‘assessment’, so while the purpose of the survey was to assess the self and peer perceptions of an individual faculty member’s clinical teaching skills, we opted to continue to call the survey as the authors had suggested: the Observation and learning tool for clinical teaching.

Primary Driver	Related Phase 1 QUAL Themes	Related Phase 1 QUAN Surveys	Further Literature Review	Notes & Possible data collection ideas
#3) Promote effective clinical teaching (e.g. organized & clarity in teaching; standardization of ward rounds)	- Effective vs Ineffective Clinical teacher - Impact of the individual teacher - Clinically competent - Enthusiastic & stimulates learners - Knowledgeable - Organized & clarity in teaching - Positive personal attributes - Positive role model - Provides appropriate clinical supervision - Provides dynamic group teaching Also from Faculty Development theme: - Senior Residents as Teachers - Feedback: Feedback from faculty to faculty; Feedback from learners; Self-evaluation of teaching skills - Physicians as teachers: teach the teacher; role of physician at teaching hospital; transferring teaching skills - Residents as teachers - Standardization of ward rounds	DREEM: 13. The teachers are good at providing feedback to students (median = 1.6, S) PHEEM: 10. My clinical teachers have good communication skills (median = 2.0, R) 15. My clinical teachers are enthusiastic (median = 2.0, R) 22. I get regular feedback from seniors (median = 2.0, R) 23. My clinical teachers are well organized (median = 2.0, R) 33. Senior staff utilize learning opportunities effectively (median = 2.0, R) 39. The clinical teachers provide me with good feedback on my strengths and weaknesses (median = 2.0, R) EEL: 15. Teaching points are focused with minimal deviations. (median = 3.0, S; 2.0, R) 16. Learners are encouraged to help focus teaching topics. (median = 3.0, S; 2.0, R) 31. I receive frequent positive and constructive feedback after paediatric ward rounds. (median = 3.0, S; 2.0, R) 32. The feedback I receive relates to a specific behavior. (i.e. something I did or didn't do and can adjust). (median = 3.0, S; 2.0, R) 33. I am encouraged to self-assess my own performance. (median = 3.0, S; 2.0, R)	Three validated surveys. 1) (Self): Self-assessment instrument .Stalmeijer, Renée E., et al. "Combined student ratings and self-assessment provide useful feedback for clinical teachers." Advances in health sciences education 15.3 (2010): 315-328. 2) (Peer): Observation and learning tool for clinical teachers. Sommer, Johanna, et al. "A teaching skills assessment tool inspired by the Calgary–Cambridge model and the patient-centered approach." Patient education and counseling 99.4 (2016): 600-609. 3) (Trainee): Instrument for Evaluating Clinical Teachers. Stalmeijer, Renée E., et al. "The development of an instrument for evaluating clinical teachers: involving stakeholders to determine content validity." Medical teacher 30.8 (2008): e272-e277.	Consider measuring the effectiveness of clinical teaching from a three-pronged approach: the faculty self-evaluation, the peer evaluation, and the trainee evaluation. Example: Do you think teaching and learning on rounds "depends on who you're with"? Was there teaching on rounds this week? Was it effective?

Project Measures & DCTs/Surveys

- The following is a description of how the Observation and Learning Tool for Clinical Teaching was modified to measure our third project measure (primary driver #3).

ORIGINAL: Observation and Learning Tool for Clinical Teaching

Teaching Skills Assessment Tool

J. Sommer et al./Patient Education and Counseling 99 (2016) 600-609

Observation and learning tool for clinical supervision

The supervisor	**Level X (low-weak):** makes the learning unpredictable	**Level Y (mean-good):** has good teaching skills to enhance learning	**Level Z (very good):** has excellent teaching skills to enhance learning
Step 1: Organizes the supervision			
1. Welcomes the resident	☹ does not put the resident at ease and concentrates on the clinical problem	☺ welcomes the resident and expresses his availability	☺☺ assures adequate time and space or suggests arrangements to put at ease
2. Drives the supervision according to the resident's needs	☹ listens to the case presentation without asking the resident's own question or needs to drive the supervision	☺ let the resident express the problem that prevents him to solve the case (before or just after the case presentation)	☺☺ clarifies/reflects what prevents the resident to solve the case (learning needs) (before or just after the case presentation) or discusses the case aiming explicitly at the resident's needs
Step 2: helps the resident to learn from the case			

ORIGINAL: Observation and Learning Tool for Clinical Teaching – cont.

3. Discusses the case and explores . . .			
a. the clinical reasoning	☹ a. interrupts the resident so as to get more information following his own medical reasoning or thinks aloud without including the resident	☺ a. asks the resident what hypotheses has driven his reasoning, or speaks aloud involving the resident	☺☺ a. encourages the resident to argue or complete the hypotheses of his medical reasoning
b. the underlying medical knowledge	☹ b. questions/explains theoretical notions without clear link with the case or does not discuss any related knowledge	☺ b. teaches the knowledge related to the missing notions or wrong interpretations of the resident	☺☺ b. stimulates the resident to remember the relevant knowledge, or helps to find relevant missing knowledge (gives tools/references)
c. the relevant psychosocial elements and patient's perspective	☹ c. does not question or underline psychosocial context or patient's perspective relevant to solve the problem	☺ c. questions or underlines the relevant psychosocial or patient's perspective details	☺☺ c. underlines the link between patient's perspective or psychosocial elements and the relevance for this problem solving or values when the resident is taking it into account

ORIGINAL: Observation and Learning Tool for Clinical Teaching – cont.

4. Teaches or corrects . . .			
a. the history taking or clinical exam	☹ a. tells what the resident should do without explanation or modeling; or does not teach the history taking or clinical exam	☺ a. teaches history taking or clinical examination by explanation or modeling	☺☺ a. lets the resident demonstrate a skill or history taking or clinical examination
b. an interpersonal/ communicational skills	☹ b. tells what the resident should do without explanation or modeling or does not teach interpersonal skills	☺ b. teaches relevant interpersonal/ communication skills by explanation or modeling	☺☺ b. lets the resident demonstrate an interpersonal/ communication skill
c. a technical skill (technical procedure, venous puncture, joint puncture, stitching, etc.)	☹ c. tells what the resident should do without explanation nor modeling or does not teach technical skills	☺ c. teachers relevant technical skill by explanation or modeling	☺☺ c. lets the resident demonstrate a technical skills

ORIGINAL: Observation and Learning Tool for Clinical Teaching – cont.

5. Discusses the plan . . .			
a. developing an action plan	☹ a. after a diagnosis or definition of the problem, tells the resident what to do	☺ a. asks the resident to express an action plan (investigations, treatment and follow up) or expresses an action plan involving the resident	☺☺ a. asks the resident to argue and discuss own action plan
b. adapting the action plan to the patient's psychosocial context and individual perspective	☹ b. does not take the psychosocial context (nor the patient's perspective) into account when defining the action plan	☺ b. encourages the resident to take into account the patient's psychosocial context and perspective when defining the action plan	☺☺ b. values an action plan that takes into account the patient's psychosocial context or perspective or stresses the importance to take into account so as to improve the treatment
c. verifying the strategies of application	☹ c. does not check the resident's strategies of application, or tells the action plan to the patient without discussing it with the resident	☺ c. asks the resident if he feels confident to apply the action plan, or offers to help for the application of the action plan	☺☺ c. checks how the resident will apply the action plan or makes a role play
6. Addressing own limits of knowledge			
	☹ expresses no doubt about the medical knowledge	☺ expresses the limits of his own knowledge or his doubts	☺☺ expresses the doubts or limits of his own knowledge and defines with the residents a way to find the needed information to overcome the doubts

ORIGINAL: Observation and Learning Tool for Clinical Teaching – cont.

Step 3: Ends the supervision			
7. States . . .			
a. strengths: what is mastered	☹ a. does not value or reflect on resident's strengths that helped him to solve the problem	☺ a. stresses the resident's strengths that helped him to solve the problem and values them	☺☺ a. encourages the resident to reflect on own strengths before valuing them
b. new learning	☹ b. does not speak about what should be remembered	☺ b. tells the resident what he should remember	☺☺ b. asks the resident what he will remember and can add some suggestions (or asks for some transfer to other case) or asks the resident for some general principles/ rules that can be deducted from present case
c. what has to be learned	☹ c. does not speak about what should be learned on behalf of the discussion	☺ c. suggests some ideas to enhance his ongoing learning	☺☺ c. defines with the resident a learning plan (actions, literature, timing, evaluation)
8. Evaluation of supervision process			
	☹ does not speak about the supervision process	☺ checks if supervision has answered his learning needs (content)	☺☺ checks if supervision has answered the learning needs and if supervision process is adequate or asks for suggestions of improvement in supervision process

ORIGINAL→ MODIFIED version 1/FINAL:
11) Peer assessment Tool

- We modified the original version for faculty in the Department of Paediatrics at Princess Marina Hospital. Specifically, we changed ‘resident’ to ‘learner’ and added ‘her/she’; we removed technical skills that weren’t relevant to the ward round and added an open-comment space at end of survey.
- We also crossed out elements relating to the psychosocial aspects of patient care. While those aspects are important for overall patient care and teaching, it was beyond the scope of this project to include at this time.

MODIFIED version 1: Observation and Learning Tool for Clinical Teaching

11) Peer Assessment Tool

OBSERVATION & LEARNING TOOL FOR CLINICAL SUPERVISION

Supervisor's Name:	**Level X (~~low~~-weak):** makes the learning unpredictable	**Level Y (~~mean~~-good):** has good teaching skills to enhance the learning	**Level Z (very good):** has excellent teaching skills to enhance learning
Step 1: Organizes the supervision			
1. Welcomes the learner	☹ does not put the learner at ease and concentrates on the clinical problem	☺ welcomes the learner and expresses his availability	☺☺ assures adequate time and space or suggests arrangements to put at ease
2. Drives the supervision according to the learner's needs	☹ listens to the case presentation without asking the learner's own question or needs to drive the supervision	☺ lets the learner express the problem that prevents him/her to solve the case (before or just after the case presentation)	☺☺ clarifies or reflects what prevents the learner to solve the case (learning needs) (before or just after the case presentation) or discusses the case aiming explicitly at the learner's needs
Step 2: helps the learner to learn from the case			
3. Discusses the case and explores . . .			
a. clinical reasoning	☹ a. interrupts the learner so as to get more information following his/her own medical reasoning or thinks aloud *without* including the learner	☺ a. asks the learner what hypotheses has driven his/her reasoning, or speaks aloud involving the learner	☺☺ a. encourages the learner to argue or complete the hypotheses of his/her medical reasoning

MODIFIED version 1: Observation and Learning Tool for Clinical Teaching
11) Peer Assessment Tool

b. the underlying medical knowledge	☹ b. questions/ explains theoretical notions without clear link with the case or does not discuss any related knowledge	☺ b. teaches the knowledge related to the missing notions or wrong interpretations of the learner	☺☺ b. stimulates the learner to remember the relevant knowledge, or helps to find relevant missing knowledge (gives tools/references)
~~**c. the relevant psychosocial elements and patient's perspective**~~	~~☹ c. does not question or underline psychosocial context or patient's perspective relevant to solve the problem~~	~~☺ c. questions or underlines the relevant psychosocial or patient's perspective details~~	~~☺☺ c. underlines the link between patient's perspective or psychosocial elements and the relevance for this problem solving or values when the learner is taking it into account~~
4. Teaches or corrects . . .			
a. the history taking or clinical exam	☹ a. tells what the learner should do without explanation or modeling; or does not teach the history taking or clinical exam	☺ a. teaches history taking or clinical examination by explanation or modeling	☺☺ a. lets the learner demonstrate a skill or history taking or clinical examination
b. interpersonal/ communicational skills	☹ b. tells what the learner should do without explanation or modeling or does not teach interpersonal skills	☺ b. teaches relevant interpersonal/ communication skills by explanation or modeling	☺☺ b. lets the learner demonstrate an interpersonal/ communication skill

MODIFIED version 1: Observation and Learning Tool for Clinical Teaching
11) Peer Assessment Tool

5. Discusses the plan . . .			
a. developing an action plan	☹ a. after a diagnosis or definition of the problem, tells the learner what to do	☺ a. asks the learner to express an action plan (investigations, treatment and follow up) or expresses an action plan involving the learner	☺☺ a. asks the learner to argue and discuss own action plan
b. adapting the action plan to the patient's psychosocial context and individual perspective	☹ b. does not take the psychosocial context (nor the patient's perspective) into account when defining the action plan	☺ b. encourages the learner to take into account the patient's psychosocial context and perspective when defining the action plan	☺☺ b. values an action plan that takes into account the patient's psychosocial context or perspective or stresses the importance to take into account so as to improve the treatment
c. verifying the strategies of application	☹ c. does not check the learner's strategies of application, or tells the action plan to the patient without discussing it with the learner	☺ c. asks the learner if he/she feels confident to apply the action plan, or offers to help for the application of the action plan	☺☺ c. checks how the learner will apply the action plan
6. Addressing own limits of knowledge			
	☹ expresses no doubt about the medical knowledge	☺ expresses the limits of his/her own knowledge or his/her doubts	☺☺ expresses the doubts or limits of his/her own knowledge and defines with the learner a way to find the needed information to overcome the doubts

MODIFIED version 1: Observation and Learning Tool for Clinical Teaching

11) Peer Assessment Tool

Step 3: Ends the supervision			
7. States . . .			
a. strengths: what is mastered	☹ a. does not value or reflect on learner's strengths that helped him/her to solve the problem	☺ a. stresses the learner's strengths that helped him/her to solve the problem and values them	☺☺ a. encourages the learner to reflect on own strengths before valuing them
b. new learning	☹ b. does not speak about what should be remembered	☺ b. tells the learner what he/she should remember	☺☺ b. asks the learner what he/she will remember and can add some suggestions (or asks for some transfer to other case) or asks the learner for some general principles/ rules that can be deducted from present case
c. what has to be learned	☹ c. does not speak about what should be learned on behalf of the discussion	☺ c. suggests some ideas to enhance his/her ongoing learning	☺☺ c. defines with the learner a learning plan (actions, literature, timing, evaluation)
8. Evaluation of supervision process			
	☹ does not speak about the supervision process	☺ checks if supervision has answered his/her learning needs (content)	☺☺ checks if supervision has answered the learning needs and if supervision process is adequate or asks for suggestions of improvement in supervision process

MODIFIED version 1: Observation and Learning Tool for Clinical Teaching
11) Peer Assessment Tool

Comments: (any comments about this observation tool, about the teaching session, the learner(s), etc.)

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ORIGINAL→ MODIFIED FINAL:
10) Self-assessment Tool

- In addition to the above, for the SAT version, we modified the ‘peer-assessment’ tool to be a ‘self-assessment’ tool. We did this by modifying phrases to be in the first person.
- Finally, we added instructions, and removed the overall rating level for the self-assessment.

MODIFIED version 1: Observation and Learning Tool for Clinical Teaching
10) Self-Assessment Tool

OBSERVATION & LEARNING TOOL FOR CLINICAL SUPERVISION

Chief or Faculty (please circle) Self	**Level X (weak):** I make the learning unpredictable	**Level Y (good):** I have good teaching skills to enhance learning	**Level Z (very good):** I have excellent teaching skills to enhance learning
Step 1: Organizes the supervision			
1. Welcomes the learner	☹ I do not put the learner at ease and concentrate on the clinical problem	☺ I welcome the learner and express my availability	☺☺ I assure adequate time and space or I suggest arrangements to put the learner at ease
2. Drives the supervision according to the learner's needs	☹ I listen to the case presentation without asking the learner's own question or needs to drive the supervision	☺ I let the learner express the problem that prevents him/her to solve the case (before or just after the case presentation)	☺☺ I clarify or reflect what prevents the learner to solve the case (learning needs) (before or just after the case presentation) or I discuss the case aiming explicitly at the learner's needs
Step 2: helps the learner to learn from the case			
3. Discusses the case and explores . . .			
a. clinical reasoning	☹ a. I interrupt the learner so as to get more information following his/her own medical reasoning or I think aloud *without* including the learner	☺ a. I ask the learner what hypotheses has driven his/her reasoning, or I speak aloud involving the learner	☺☺ a. I encourage the learner to argue or I complete the hypotheses of his/her medical reasoning
b. the underlying medical knowledge	☹ b. I question/explain theoretical notions without making a clear link with the case or I do not discuss any related knowledge	☺ b. I teach the knowledge related to the missing notions or wrong interpretations of the learner	☺☺ b. I stimulate the learner to remember the relevant knowledge, or I help to find relevant missing knowledge (give tools/references)

MODIFIED version 1: Observation and Learning Tool for Clinical Teaching
10) Self-Assessment Tool

4. Teaches or corrects . . .			
a. the history taking or clinical exam	☹ a. I tell what the learner should do without explanation or modeling; or I do not teach the history taking or clinical exam	☺ a. I teach history taking or clinical examination by explanation or modeling	☺☺ a. I let the learner demonstrate a skill or history taking or clinical examination
b. interpersonal/ communicational skills	☹ b. I tell what the learner should do without explanation or modeling or I do not teach interpersonal skills	☺ b. I teach relevant interpersonal/ communication skills by explanation or modeling	☺☺ b. I let the learner demonstrate an interpersonal/ communication skill
5. Discusses the plan . . .			
a. developing an action plan	☹ a. after a diagnosis or definition of the problem, I tell the learner what to do	☺ a. I ask the learner to express an action plan (investigations, treatment and follow up) or I express an action plan involving the learner	☺☺ a. I ask the learner to argue and discuss his/her own action plan
b. verifying the strategies of application	☹ c. I do not check the learner's strategies of application, or I tell the action plan to the patient without discussing it with the learner	☺ c. I ask the learner if he/she feels confident to apply the action plan, or I offer to help for the application of the action plan	☺☺ c. I check how the learner will apply the action plan
6. Addressing own limits of knowledge			
	☹ I express no doubt about my medical knowledge	☺ I express the limits of my own knowledge or my doubts	☺☺ I express the doubts or limits of my own knowledge and define with the learner a way to find the needed information to overcome the doubts

MODIFIED version 1: Observation and Learning Tool for Clinical Teaching
10) Self-Assessment Tool

Step 3: Ends the supervision			
7. States . . .			
a. strengths: what is mastered	☹ a. I do not value or reflect on learner's strengths that helped him/her to solve the problem	☺ a. I stress the learner's strengths that helped him/her to solve the problem and value them	☺☺ a. I encourage the learner to reflect on his/her own strengths before valuing them
b. new learning	☹ b. I do not speak about what should be remembered	☺ b. I tell the learner what he/she should remember	☺☺ b. I ask the learner what he/she will remember and add some suggestions (or I ask for some transfer to other case) or I ask the learner for some general principles/ rules that can be deducted from present case
c. what has to be learned	☹ c. I do not speak about what should be learned on behalf of the discussion	☺ c. I suggest some ideas to enhance the learner's ongoing learning	☺☺ c. I define with the learner a learning plan (actions, literature, timing, evaluation)
8. Evaluation of supervision process			
	☹ I do not speak about my supervision process	☺ I check if my supervision has answered learner's learning needs (content)	☺☺ I check if my supervision has answered the learning needs and if my supervision process is adequate or I ask for suggestions of improvement in my supervision process

MODIFIED version 1: Observation and Learning Tool for Clinical Teaching
10) Self-Assessment Tool

Comments: (any comments about this observation tool, about the teaching session, the learner(s), etc.)

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MODIFIED FINAL: Observation and Learning Tool for Clinical Teaching
10) Self-Assessment Tool

SELF - OBSERVATION & LEARNING TOOL FOR CLINICAL SUPERVISION

Please circle one: **Chief Resident or Faculty.** *Please complete the form below by thinking back to your last week on service and indicate which statement most resembles your average encounter with a medical trainee. Only circle* ***one*** *response per line.*			
Step 1: Organizes the supervision			
1. Welcomes the learner	☹ I do not put the learner at ease and concentrate on the clinical problem	☺ I welcome the learner and express my availability	☺☺ I assure adequate time and space or I suggest arrangements to put the learner at ease
2. Drives the supervision according to the learner's needs	☹ I listen to the case presentation without asking the learner's own question or needs to drive the supervision	☺ I let the learner express the problem that prevents him/her to solve the case (before or just after the case presentation)	☺☺ I clarify or reflect what prevents the learner to solve the case (learning needs) (before or just after the case presentation) or I discuss the case aiming explicitly at the learner's needs
Step 2: helps the learner to learn from the case			
3. Discusses the case and explores . . .			
a. clinical reasoning	☹ a. I interrupt the learner so as to get more information following his/her own medical reasoning or I think aloud *without* including the learner	☺ a. I ask the learner what hypotheses has driven his/her reasoning, or I speak aloud involving the learner	☺☺ a. I encourage the learner to argue or I complete the hypotheses of his/her medical reasoning
b. the underlying medical knowledge	☹ b. I question/explain theoretical notions without making a clear link with the case or I do not discuss any related knowledge	☺ b. I teach the knowledge related to the missing notions or wrong interpretations of the learner	☺☺ b. I stimulate the learner to remember the relevant knowledge, or I help to find relevant missing knowledge (give tools/references)

MODIFIED FINAL: Observation and Learning Tool for Clinical Teaching
10) Self-Assessment Tool

4. Teaches or corrects . . .			
a. the history taking or clinical exam	☹ a. I tell what the learner should do without explanation or modeling; or I do not teach the history taking or clinical exam	☺ a. I teach history taking or clinical examination by explanation or modeling	☺☺ a. I let the learner demonstrate a skill or history taking or clinical examination
b. interpersonal/ communicational skills	☹ b. I tell what the learner should do without explanation or modeling or I do not teach interpersonal skills	☺ b. I teach relevant interpersonal/ communication skills by explanation or modeling	☺☺ b. I let the learner demonstrate an interpersonal/ communication skill
5. Discusses the plan . . .			
a. developing an action plan	☹ a. after a diagnosis or definition of the problem, I tell the learner what to do	☺ a. I ask the learner to express an action plan (investigations, treatment and follow up) or I express an action plan involving the learner	☺☺ a. I ask the learner to argue and discuss his/her own action plan
b. verifying the strategies of application	☹ c. I do not check the learner's strategies of application, or I tell the action plan to the patient without discussing it with the learner	☺ c. I ask the learner if he/she feels confident to apply the action plan, or I offer to help for the application of the action plan	☺☺ c. I check how the learner will apply the action plan
6. Addressing own limits of knowledge			
	☹ I express no doubt about my medical knowledge	☺ I express the limits of my own knowledge or my doubts	☺☺ I express the doubts or limits of my own knowledge and define with the learner a way to find the needed information to overcome the doubts

MODIFIED FINAL: Observation and Learning Tool for Clinical Teaching
10) Self-Assessment Tool

Step 3: Ends the supervision			
7. States . . .			
a. strengths: what is mastered	☹ a. I do not value or reflect on learner's strengths that helped him/her to solve the problem	☺ a. I stress the learner's strengths that helped him/her to solve the problem and value them	☺☺ a. I encourage the learner to reflect on his/her own strengths before valuing them
b. new learning	☹ b. I do not speak about what should be remembered	☺ b. I tell the learner what he/she should remember	☺☺ b. I ask the learner what he/she will remember and add some suggestions (or I ask for some transfer to other case) or I ask the learner for some general principles/ rules that can be deducted from present case
c. what has to be learned	☹ c. I do not speak about what should be learned on behalf of the discussion	☺ c. I suggest some ideas to enhance the learner's ongoing learning	☺☺ c. I define with the learner a learning plan (actions, literature, timing, evaluation)
8. Evaluation of supervision process			
	☹ I do not speak about my supervision process	☺ I check if my supervision has answered learner's learning needs (content)	☺☺ I check if my supervision has answered the learning needs and if my supervision process is adequate or I ask for suggestions of improvement in my supervision process

MODIFIED FINAL: Observation and Learning Tool for Clinical Teaching
10) Self-Assessment Tool

Comments:

MODIFIED FINAL: Observation and Learning Tool for Clinical Teaching

11) Peer Assessment Tool

PEER - OBSERVATION & LEARNING TOOL FOR CLINICAL SUPERVISION

Supervisor: Chief or Faculty	**Level X (weak):** makes the learning unpredictable	**Level Y (good):** has good teaching skills to enhance the learning	**Level Z (very good):** has excellent teaching skills to enhance learning
Step 1: Organizes the supervision			
1. Welcomes the learner	☹ does not put the learner at ease and concentrates on the clinical problem	☺ welcomes the learner and expresses his availability	☺☺ assures adequate time and space or suggests arrangements to put at ease
2. Drives the supervision according to the learner's needs	☹ listens to the case presentation without asking the learner's own question or needs to drive the supervision	☺ lets the learner express the problem that prevents him/her to solve the case (before or just after the case presentation)	☺☺ clarifies or reflects what prevents the learner to solve the case (learning needs) (before or just after the case presentation) or discusses the case aiming explicitly at the learner's needs
Step 2: helps the learner to learn from the case			
3. Discusses the case and explores . . .			
a. clinical reasoning	☹ a. interrupts the learner so as to get more information following his/her own medical reasoning or thinks aloud *without* including the learner	☺ a. asks the learner what hypotheses has driven his/her reasoning, or speaks aloud involving the learner	☺☺ a. encourages the learner to argue or complete the hypotheses of his/her medical reasoning
b. the underlying medical knowledge	☹ b. questions/ explains theoretical notions without clear link with the case or does not discuss any related knowledge	☺ b. teaches the knowledge related to the missing notions or wrong interpretations of the learner	☺☺ b. stimulates the learner to remember the relevant knowledge, or helps to find relevant missing knowledge (gives tools/references)

MODIFIED FINAL: Observation and Learning Tool for Clinical Teaching
11) Peer Assessment Tool

4. Teaches or corrects . . .			
a. the history taking or clinical exam	☹ a. tells what the learner should do without explanation or modeling; or does not teach the history taking or clinical exam	☺ a. teaches history taking or clinical examination by explanation or modeling	☺☺ a. lets the learner demonstrate a skill or history taking or clinical examination
b. interpersonal/ communicational skills	☹ b. tells what the learner should do without explanation or modeling or does not teach interpersonal skills	☺ b. teaches relevant interpersonal/ communication skills by explanation or modeling	☺☺ b. lets the learner demonstrate an interpersonal/ communication skill
5. Discusses the plan . . .			
a. developing an action plan	☹ a. after a diagnosis or definition of the problem, tells the learner what to do	☺ a. asks the learner to express an action plan (investigations, treatment and follow up) or expresses an action plan involving the learner	☺☺ a. asks the learner to argue and discuss own action plan
b. verifying the strategies of application	☹ b. does not check the learner's strategies of application, or tells the action plan to the patient without discussing it with the learner	☺ b. asks the learner if he/she feels confident to apply the action plan, or offers to help for the application of the action plan	☺☺ b. checks how the learner will apply the action plan
6. Addressing own limits of knowledge			
	☹ expresses no doubt about the medical knowledge	☺ expresses the limits of his/her own knowledge or his/her doubts	☺☺ expresses the doubts or limits of his/her own knowledge and defines with the learner a way to find the needed information to overcome the doubts

MODIFIED FINAL: Observation and Learning Tool for Clinical Teaching
11) Peer Assessment Tool

Step 3: Ends the supervision			
7. States . . .			
a. strengths: what is mastered	☹ a. does not value or reflect on learner's strengths that helped him/her to solve the problem	☺ a. stresses the learner's strengths that helped him/her to solve the problem and values them	☺☺ a. encourages the learner to reflect on own strengths before valuing them
b. new learning	☹ b. does not speak about what should be remembered	☺ b. tells the learner what he/she should remember	☺☺ b. asks the learner what he/she will remember and can add some suggestions (or asks for some transfer to other case) or asks the learner for some general principles/ rules that can be deducted from present case
c. what has to be learned	☹ c. does not speak about what should be learned on behalf of the discussion	☺ c. suggests some ideas to enhance his/her ongoing learning	☺☺ c. defines with the learner a learning plan (actions, literature, timing, evaluation)
8. Evaluation of supervision process			
	☹ does not speak about the supervision process	☺ checks if supervision has answered his/her learning needs (content)	☺☺ checks if supervision has answered the learning needs and if supervision process is adequate or asks for suggestions of improvement in supervision process

MODIFIED FINAL: Observation and Learning Tool for Clinical Teaching
11) Peer Assessment Tool

Comments: (any comments about this observation tool, about the teaching session, the learner(s), etc.)

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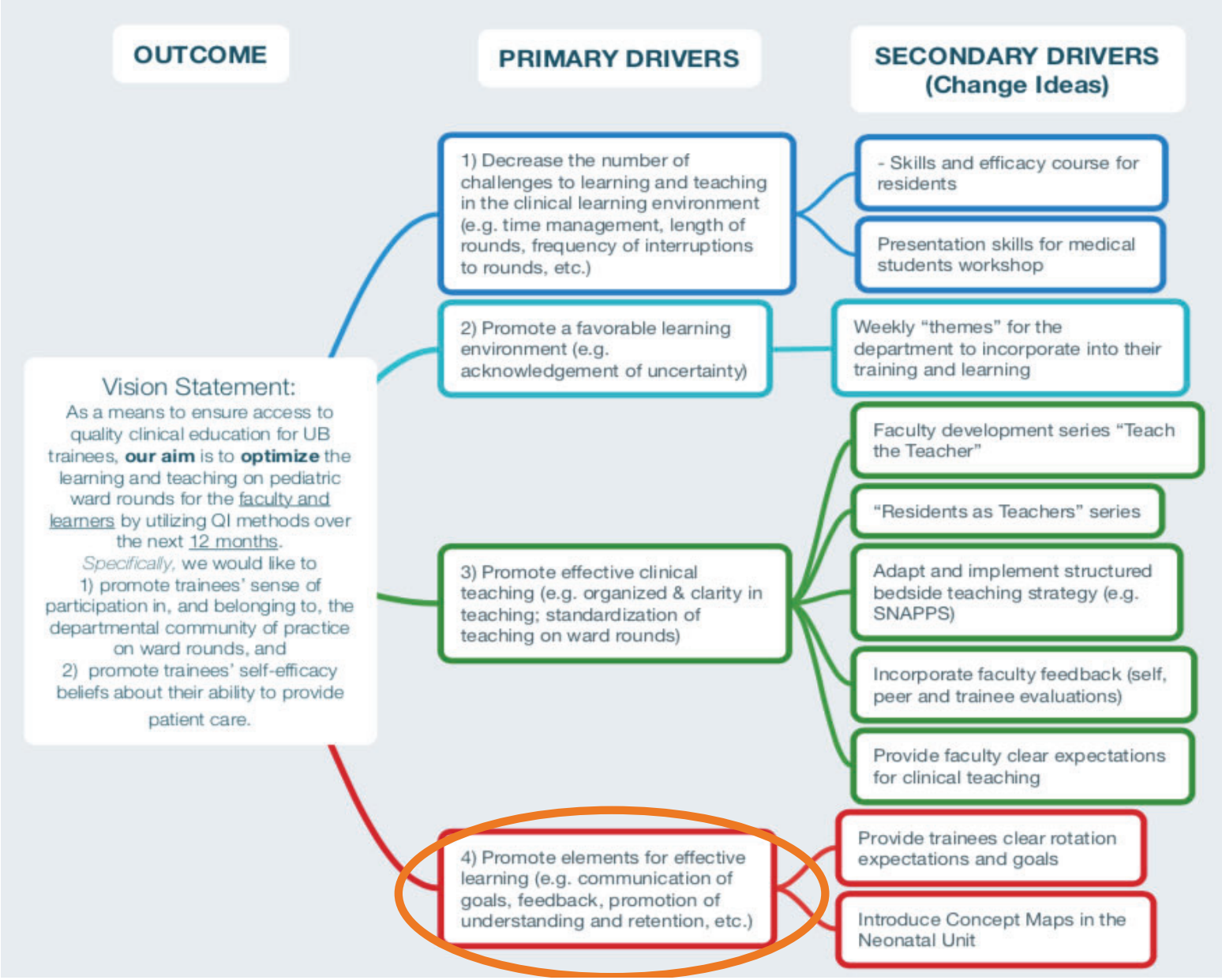
Project Measures & DCTs/surveys

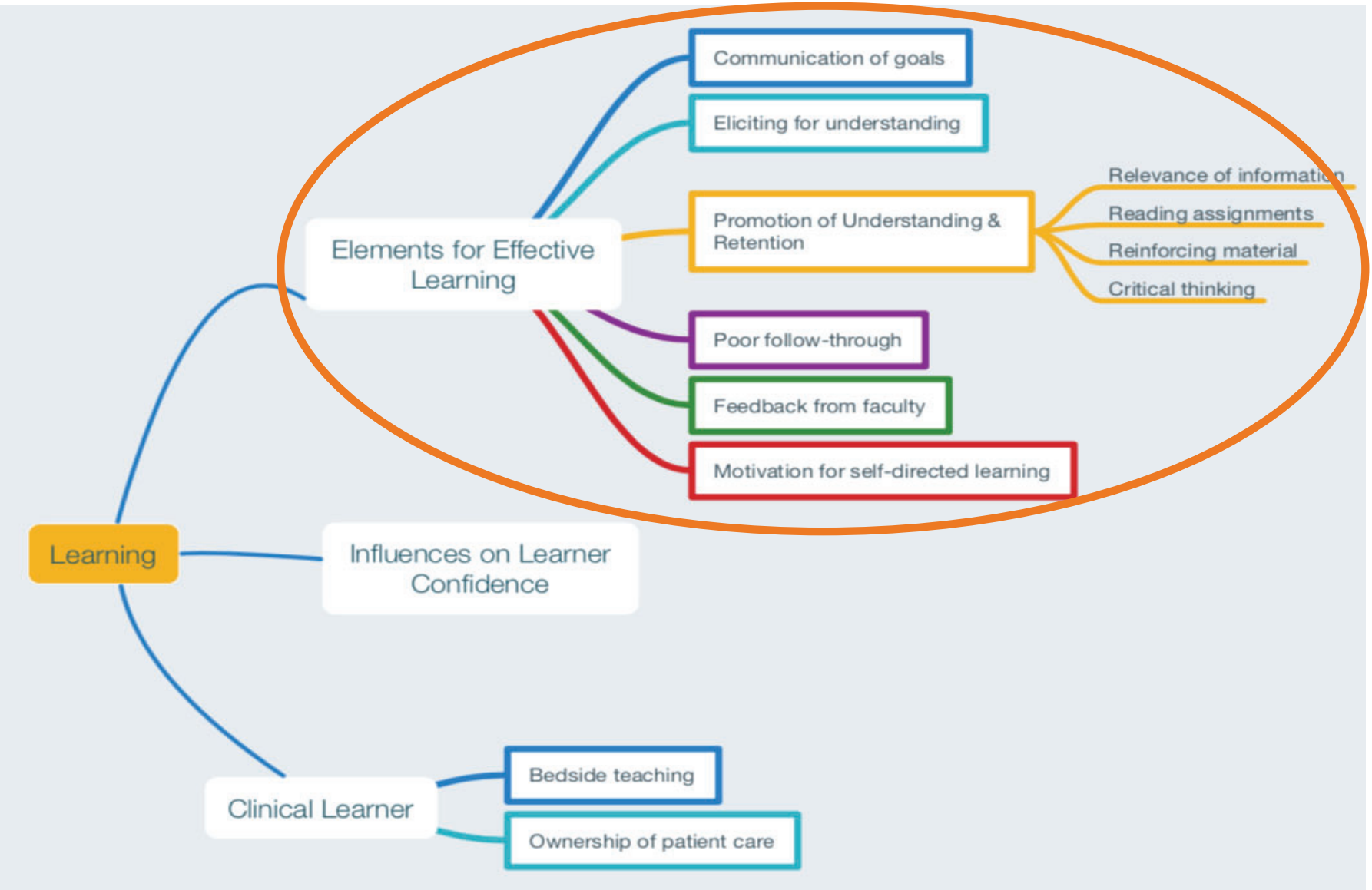
- We continued this process by now considering our fourth primary driver:

  #4) Promote elements for effective clinical learning

Primary Driver #4
Promote elements for effective learning



Phase 1 Results



Measuring Primary Driver #4
Promote elements for effective clinical learning

- To measure the elements for effective learning, we went back to the original Elements for Effective Learning survey developed for Phase 1 of the study.
- The Elements for Effective Learning survey was a newly constructed survey, based on the Stanford Faculty Development Program's (SFDP) seven elements for effective learning, and was used to assess trainees' prevailing perceptions of the clinical learning environment.[96]
- The newly constructed 36-item questionnaire assessed for elements for effective learning using six of the seven SFDP subscales: Establish a positive learning environment (10 items), Control of session (6 items), Communication of goals (6 items), Promotion of understanding and retention (8 items), Feedback (3 items), and Promotion of self-directed learning (3 items).

ORIGINAL: Elements for Effective Learning

Elements for Effective Learning on Ward Rounds Survey

This questionnaire is designed to help us get a better understanding of your perspective of paediatric ward rounds.

Your answers will be kept ***strictly confidential*** and will not be identified by name.

Please circle one:

Are you a 'medical student' or 'paediatric resident'?

Please rate your level of agreement with the statement based on a scale of:

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
0	1	2	3	4	5

Question:	**0**	**1**	**2**	**3**	**4**	**5**
1. Paediatric ward rounds have a learning environment where I feel ***involved*** to perform as the ***presenting*** medical student or resident.						
2. Paediatric ward rounds have a learning environment where I feel ***stimulated*** to perform as the ***presenting*** medical student or resident.						
3. Paediatric ward rounds have a learning environment where I feel ***respected*** to perform as the ***presenting*** medical student or resident.						

ORIGINAL: Elements for Effective Learning – cont.

4. Paediatric ward rounds have a learning environment where I feel ***comfortable*** to perform as the ***presenting*** medical student or resident.						
5. Paediatric ward rounds have a learning environment where I feel ***involved*** to actively participate as a ***member*** of the team.						
6. Paediatric ward rounds have a learning environment where I feel ***stimulated*** to actively participate as a ***member*** of the team.						
7. Paediatric ward rounds have a learning environment where I feel ***respected*** to actively participate as a ***member*** of the team.						
8. Paediatric ward rounds have a learning environment where I feel ***comfortable*** to actively participate as a ***member*** of the team						
9. Paediatric ward rounds promote an atmosphere where uncertainty is respected.						
10. On paediatric ward rounds, teachers and learners are encouraged to acknowledge their limitations. (I.e. When I do *not* know an answer, I am *not* scolded, but instead am encouraged to look-up or discuss the answer.)						

ORIGINAL: Elements for Effective Learning – cont.

11. Paediatric ward rounds are well organized for appropriate learning.						
12. There are minimal interruptions during ward rounds.						
13. Ward rounds are well paced and the time spent rounding on each patient is appropriate.						
14. On paediatric ward rounds, there is a clearly defined agenda of learning topics.						
15. Teaching points are focused with minimal deviations.						
16. Learners are encouraged to help focus teaching topics.						
17. The goals and objectives of ***paediatric ward rounds*** have been clearly explained to me.						
18. I understand the purpose of ***paediatric ward rounds.***						
19. The goals and objectives of my role as a ***presenter*** during paediatric ward rounds have been clearly explained to me.						
20. I understand what is expected of me ***as a presenter*** during paediatric ward rounds.						

ORIGINAL: Elements for Effective Learning – cont.

Question:	0	1	2	3	4	5
21. The goals and objectives of my role as a ***participant*** during paediatric ward rounds have been clearly explained to me.						
22. I understand what is expected of me ***as a participant*** during paediatric ward rounds.						
23. During paediatric ward rounds, specific key learning points are identified in a clear manner.						
24. During paediatric ward rounds, I am encouraged to ask questions.						
25. During paediatric ward rounds, I am stimulated to make comparisons and evaluations about my patients' diagnosis.						
26. During paediatric ward rounds, I am encouraged to discuss my differential diagnoses.						
27. During paediatric ward rounds, I am encouraged to discuss my thought process about my management plan.						
28. During paediatric ward rounds, my role is limited to reporting or summarizing the patient case.						
29. During paediatric ward rounds, if I am asked a question, it is usually asking only about facts, not my thinking process.						
30. After paediatric ward rounds, I am able to retain specific key learning points discussed on rounds.						

ORIGINAL: Elements for Effective Learning – cont.

31. I receive frequent positive and constructive feedback after paediatric ward rounds.						
32. The feedback I receive relates to a specific behavior. (i.e. something I did or didn't do and can adjust).						
33. I am encouraged to self-assess my own performance.						
34. After paediatric ward rounds, I feel motivated or stimulated to read further about cases presented.						
35. I feel confident that I can utilize my available resources to read up on patients and topics after ward rounds.						
36. I feel that those resources are adequate for my learning.						

Measuring Primary Driver #4
Promote elements for effective clinical learning

- We knew from Phase 1 results that the department scored generally low in communication of goals, feedback, and control of session.
- The learning environment, promotion of understanding and retention, and even promotion of self-directed learning was felt to be dependent on the individual faculty member conducting the ward round.

Primary Driver	Related Phase 1 QUAL Themes	Related Phase 1 QUAN Surveys	Further Literature Review	Notes & Possible data collection ideas
#4) Promote elements for effective learning	- Communication of goals - Evaluation - Feedback from faculty - Motivation for self-directed learning - Promotion of understanding and retention - Poor follow-through on teaching points	DREEM: 6. I am clear about the learning objectives on ward rounds (median = 1.7, S) 9. The teaching is student centered (median = 2.0, S) PHEEM: 2. My clinical teachers set clear expectations (median = 2.0, R) 4. I had an informative induction programme (median = 2.0, R) EEL: 14. On paediatric ward rounds, there is a clearly defined agenda of learning topics. (median = 3.0, S; 2.0, R) 17. The goals and objectives of paediatric ward rounds have been clearly explained to me. (median = 2.0, S; 2.0, R) 19. The goals and objectives of my role as a presenter during paediatric ward rounds have been clearly explained to me. (median = 2.0, S; 3.0, R) 20. I understand what is expected of me as a presenter during paediatric ward rounds. (median = 2.0, S; 4.0, R) 21. The goals and objectives of my role as a participant during paediatric ward rounds have been clearly explained to me. (median = 2.0, S; 4.0, R)	Reviewed the following: - SNAPPS – Learner Centered Bedside Teaching model - Observation Learning Tool for Clinical Supervision - Stanford Faculty Development Program	We considered how these aspects of a ward round (communication, feedback, promotion of understanding, etc.) was related to the bedside teaching model SNAPPS and how it was related to the components of effective clinical teaching.

Project Measures & DCTs/Surveys

- The following is a description of how the original Elements for Effective Learning survey was modified to measure our fourth project measure (primary driver #4).

ORIGINAL → Modified version 1: Elements for Effective Learning

- When considering what to continue to measure for Phase 3, we removed several sections of the original EEL survey since they were already being covered by other surveys. I.e.:

  1) Establish Positive Learning Environment was now being measured in the ECI survey;

  2) Control of Session was now being measured under 'Challenges to learning and teaching in the clinical learning environment' DCT; and

  3) Feedback was now being measured under the Communities of Practice survey.

ORIGINAL → Modified version 1: Elements for Effective Learning

- The original EEL survey did not include 5) Evaluation, because at the time it was thought that it would be difficult for a trainee to comment on. But the Phase 1 qualitative results described many important aspects of Evaluation that we now thought we could ask trainees about.
- For our modified version of the EEL survey, we now focused on four of the seven SFDP elements for effective learning:
  - communication of goals,
  - promotion of understanding and retention,
  - self-directed learning, and
  - evaluation.
- This left us with 17 of the original 36 questions to examine for inclusion in subsequent versions of the EEL.

Modified version 1: Elements for Effective Learning

From the Literature	Related questions from original EEL survey
3) Communication of goals: *"The [teacher] describes plans for each day; expectations and learning goals are set for each month. This process encourages trust and reiterates the objective that residents teach each other."* [1,2] Communication of goals: "This includes establishment as well as explicit expression of teachers' and learners' expectations for the learners. Setting goals provides a structure for the teaching process, guides teachers in planning the teaching and provide a basis for assessment." [3]	17) The goals and objectives of ***paediatric ward rounds*** have been clearly explained to me. 18) I understand the purpose of ***paediatric ward rounds.*** 19) The goals and objectives of my role as a ***presenter*** during paediatric ward rounds have been clearly explained to me. 20) I understand what is expected of me ***as a presenter*** during paediatric ward rounds. 21) The goals and objectives of my role as a ***participant*** during paediatric ward rounds have been clearly explained to me. 22) I understand what is expected of me ***as a participant*** during paediatric ward rounds.

References:
1. Skeff KM. Evaluation of a method for improving the teaching performance of attending physicians. *Am J Med*. 1983;75(3):465-470.
2. Skeff KM, Campbell M, Stratos G, Jones HW,3rd, Cooke M. Assessment by attending physicians of a seminar method to improve clinical teaching. *J Med Educ*. 1984;59(12):944-950.
3. Ramani S, Leinster S. AMEE guide no. 34: Teaching in the clinical environment. *Med Teach*. 2008;30(4):347-364.

MODIFIED version 1: Elements for Effective Learning – cont.

From the Literature	Related questions from original EEL survey
4) Promotion of Understanding and Retention: *"It is important for the [teacher] . . . to listen and extract substance from the presentation and condense the important learning points into a daily take-home message."* [1,2] Promoting understanding and retention: "Understanding is the ability to correctly analyse, synthesize and apply whereas retention is the process of remembering facts or concepts. This category deals with approaches teachers can use to explain content being taught and have learner meaningfully interact with the content, enabling them to understand and retain it." [3]	23) During paediatric ward rounds, specific key learning points are identified in a clear manner. 24) During paediatric ward rounds, I am encouraged to ask questions. 25) During paediatric ward rounds, I am stimulated to make comparisons and evaluations about my patients' diagnosis. 26) During paediatric ward rounds, I am encouraged to discuss my differential diagnoses. 27) During paediatric ward rounds, I am encouraged to discuss my thought process about my management plan. 28) During paediatric ward rounds, my role is limited to reporting or summarizing the patient case. 29) During paediatric ward rounds, if I am asked a question, it is usually asking only about facts, not my thinking process. 30) After paediatric ward rounds, I am able to retain specific key learning points discussed on rounds.

References:
1. Skeff KM. Evaluation of a method for improving the teaching performance of attending physicians. *Am J Med*. 1983;75(3):465-470.
2. Skeff KM, Campbell M, Stratos G, Jones HW,3rd, Cooke M. Assessment by attending physicians of a seminar method to improve clinical teaching. *J Med Educ*. 1984;59(12):944-950.
3. Ramani S, Leinster S. AMEE guide no. 34: Teaching in the clinical environment. *Med Teach*. 2008;30(4):347-364.

MODIFIED version 1: Elements for Effective Learning – cont.

From the Literature	Related questions from original EEL survey
6) Self-directed Learning: *"[R]esidents who present cases with pertinent literature will be stimulated into regular reading that is sustained by the excitement of discovering information that enables better patient care."* [1,2] Promoting self-directed learning: "Teachers achieve this by facilitating learning initiated by learner's needs, goals and interests. It stresses the importance of acquiring skills to equip the learner to continue learning beyond the time of formal education." [3] **References:** 1. Skeff KM. Evaluation of a method for improving the teaching performance of attending physicians. *Am J Med*. 1983;75(3):465-470. 2. Skeff KM, Campbell M, Stratos G, Jones HW,3rd, Cooke M. Assessment by attending physicians of a seminar method to improve clinical teaching. *J Med Educ*. 1984;59(12):944-950. 3. Ramani S, Leinster S. AMEE guide no. 34: Teaching in the clinical environment. *Med Teach*. 2008;30(4):347-364.	34) After paediatric ward rounds, I feel motivated or stimulated to read further about cases presented. 35) I feel confident that I can utilize my available resources to read up on patients and topics after ward rounds. 36) I feel that those resources are adequate for my learning.

MODIFIED version 1: Elements for Effective Learning – cont.

From the Literature	Related questions from original EEL survey
5) Evaluation "Evaluation: It is the process by which the teacher assesses the learner's knowledge, skills and attitudes, based on educational goals previously established. It allows the teacher to know where the learner is and helps them plan future teaching as well as assess effectiveness of teaching. Evaluation can be formative to assess ongoing learner's progress towards educa- tional goals or summative for final assessment to judge learner's achievement of goals." **References:** 3. Ramani S, Leinster S. AMEE guide no. 34: Teaching in the clinical environment. *Med Teach*. 2008;30(4):347-364.	

Modified version 1 → version 2: Elements for Effective Learning

- We then reviewed the related themes identified in Phase 1 qualitative results and compared them with the literature to determine which questions should be kept, which should be discarded, and to help generate further questions.
- We also restructured the content order and numbering for ease moving forward.

Modified version 2: Elements for Effective Learning

Literature Review	Phase 1 Qualitative Results	Related Question
Communication of goals: *"The [teacher] describes plans for each day; expectations and learning goals are set for each month. This process encourages trust and reiterates the objective that residents teach each other."* Communication of goals: This includes establishment as well as explicit expression of teachers' and learners' expectations for the learners. Setting goals provides a structure for the teaching process, guides teachers in planning the teaching and provide a basis for assessment.	**Communication of Goals:** - knew what was expected - laying out expectations - exactly expected - outline expectations - no orientation, lost, confused about what to do/know - clear expectations - actual job isn't clear - explain & be consistent - defined roles - a lot of grey leaves you getting in trouble and you don't even know why - what does it mean 'go read'? - what does it mean 'go teach'? - help students understand their responsibility - need to provide structure/expectations - communicate upfront - communicate clearly	1) During ward rounds today, were the learning goals and expectations for you laid out clearly? 2) During ward rounds today, did you know what was expected of you to say or do as the presenter? 3) During ward rounds today, did you know what was expected of you to say or do as a participant? 4) Did you feel confused about what you were supposed to do or say on ward rounds today? 5) Did you understand your responsibilities on ward rounds today?

Modified version 2: Elements for Effective Learning – cont.

Literature Review	Phase 1 Qualitative Results	Related Question
Promotion of Understanding and Retention: *"It is important for the [teacher] . . . to listen and extract substance from the presentation and condense the important learning points into a daily take-home message."* "Promoting understanding and retention: Understanding is the ability to correctly analyse, synthesize and apply whereas retention is the process of remembering facts or concepts. This category deals with approaches teachers can use to explain content being taught and have learner meaningfully interact with the content, enabling them to understand and retain it."	**Promotion of Understanding & Retention – Critical Thinking** - not being told, but encouraged to approach problem critically - trying to solve puzzles, 'how does this fit into our patient' - allowed to have my own train of thought motivated me - given a chance to express your thoughts, not just told the plan - not just drilled questions, but asked 'what did you think about the topic' - give a chance to think for yourself, instead of just dictated to - not a drill session, but a discussion - role limited to secretary - allow students draw things out for themselves, not just giving them the answer: 'lets think through that' or 'tell me what you think about that' - learn the thought process of faculty - show them the thought process	6) During ward rounds today, were you given the chance to express your thoughts, not just told the plan? 7) During ward rounds today, did rounds feel more like a discussion rather than a Q&A 'drill session'? 8) During ward rounds today, did you feel like you were able to understand the thought process of the consultant? 9) During ward rounds today, did the consultant encourage you to come up with your own answers?

Modified version 2: Elements for Effective Learning – cont.

Literature Review	Phase 1 Qualitative Results	Related Question
"**Evaluation:** It is the process by which the teacher assesses the learner's knowledge, skills and attitudes, based on educational goals previously established. It allows the teacher to know where the learner is and helps them plan future teaching as well as assess effectiveness of teaching. Evaluation can be formative to assess ongoing learner's progress towards educational goals or summative for final assessment to judge learner's achievement of goals."	**Evaluation:** - consultant just assumes you know stuff - assumes knowledge we don't know - makes sure we understand before going on - guided me through - not assessing for understanding after making a point, just kept going - just kept asking questions without seeing if we follow - not seeking feedback if we've understood - need to be able to identify needs of the learners - try to make them acknowledge their gaps - quotes about poor follow thru: didn't answer my question, just "go read"; gave me an assignment but no feedback the next day	10) During ward rounds today, did you feel like the consultant just assumed you knew stuff you didn't know? 11) During ward rounds today, did the consultant take the time to assess for your understanding? 12) During ward rounds today, did the consultant expect you to answer questions you didn't know the answers to? 13) During ward rounds today, did you feel the consultant guided you through the learning point so that you could understand? 14) During ward rounds today, did you feel the consultant helped you identify your knowledge gaps? 15) During ward rounds today, when you asked a question, did you feel that the consultant adequately answered it?

Modified version 2: Elements for Effective Learning – cont.

Literature Review	Phase 1 Qualitative Results	Related Question
Self-directed Learning: *"[R]esidents who present cases with pertinent literature will be stimulated into regular reading that is sustained by the excitement of discovering information that enables better patient care."* "Promoting self-directed learning: Teachers achieve this by facilitating learning initiated by learner's needs, goals and interests. It stresses the importance of acquiring skills to equip the learner to continue learning beyond the time of formal education."	**Motivation for Self-Directed Learning** - increased responsibility/ownership 'pushed me to read more because I didn't have anyone to tell me' - if there isn't teaching on rounds, then there's not incentive to read, but if you're in a team where you know there's going to be teaching, then there's a greater focus on wanting to understand more about your patient - if you're not stimulated on rounds, you don't think about reading up on the patient - we read more for exams than for rounds - we don't really get stimulation to study for ward rounds - when you have regular reading assignments it gets you in the habit of reading everyday - questions and assignments actually make me stimulated to study - when you're tired, the only thing that can motivate you[to read] is your specialist and your team **Reading Assignments:** - quotes that describe the amount of material/teaching at the bedside to be either overwhelming or "precise, short and not too much" - lots of quotes about how having reading assignments is helpful for rounds because then you're discussing the cases having been prepared, rather than just Q&A and not knowing, etc. But can't be "just go read" for every patient/question	16) During ward rounds today, did you feel stimulated by the consultant to read about the case(s) you presented?

Modified version 2 → version 3: Elements for Effective Learning

- We then took these 16 remaining questions and compared them to the content and structure of the Observation and Learning Tool for Clinical Supervision.
- We wanted to make sure that there was a connection between our Effective Clinical Teaching and Elements for Effective Learning surveys.
- This would also indirectly provide trainees a way to evaluate the teaching they received since we could not evaluate individual teachers.
- This allowed us to remove and add questions and to consider in which ways these surveys were similar and in which ways they differed.

Modified version 3: Elements for Effective Learning

Observation & Learning Tool for Clinical Supervisor	Generated questions from above: Elements for Effective Learning
Step 1: Organizes the supervision *1. Welcomes the learner (asked under PSE and ECI surveys)*	N/A
*Added here about setting G&Os	1. During ward rounds today, were the learning goals and expectations for you laid out clearly? ~~2. During ward rounds today, did you know what was expected of you to say or do as the *presenter*?~~ ~~3. During ward rounds today, did you know what was expected of you to say or do as a *participant*?~~ 4. Did you feel confused about what you were supposed to do or say on ward rounds today? 5. Did you understand your responsibilities on ward rounds today?

Modified version 3: Elements for Effective Learning – cont.

2. Drives the supervision according to the learner's needs	11. During ward rounds today, did the consultant take the time to assess for your understanding? 10. During ward rounds today, did you feel like the consultant just assumed you knew stuff you didn't know? 12. During ward rounds today, did the consultant expect you to answer questions you didn't know the answers to?
Step 2: helps the learner learn from the case 3. Discusses the case and explores . . . (a) clinical reasoning	6. During ward rounds today, were you given the chance to express your thoughts, not just told the plan? 8. During ward rounds today, did you feel like you were able to understand the thought process of the consultant when he/she discussed the case or management plan?
(b) underlying medical knowledge	14. During ward rounds today, did you feel the consultant helped you identify your knowledge gaps? 15. During ward rounds today, when you asked a question, did you feel that the consultant adequately answered it? 13. During ward rounds today, did you feel the consultant guided you through the learning point so that you could understand? 7. During ward rounds today, when discussing a case, did it feel more like a discussion rather than a Q&A 'drill session'?

Modified version 3: Elements for Effective Learning – cont.

4. Teaches or corrects . . . (a) the history taking or clinical exam	**Were you given an opportunity on rounds today to demonstrate your history taking or clinical examination skills?
(b) interpersonal/communication skills	**Were you given an opportunity on rounds today to demonstrate your patient/family communication skills?
5. Discusses the plan . . . (a) developing an action plan	9. During ward rounds today, did the consultant encourage you to come up with your own patient plan?
(b) verifying the strategies of application ***I think this will be answered under Challenges L&T in the Clinical Learning Environment*	*N/A*
6. Addressing own limits of knowledge	**During ward rounds today, did the consultant expressed his/her uncertainty about the case?
8. Evaluation of the supervision process	**After ward rounds, did the consultant ask you for feedback for how he/she can improve the teaching on rounds?
**Added here stimulated for SDL	16. During ward rounds today, did you feel stimulated by the consultant to read about the case(s) you presented?

Modified version 3 → version 4/FINAL: Elements for Effective Learning

- Once the questions had be determined, I then generated the answer-response scale, structured the survey formatting, and created final versions for students and residents.

FINAL:

12) Elements for Effective Learning - Students

Elements for Effective Learning – Department of Paediatrics – Students

***Circle One:* Which rotation are you on this week?** **NNU** **PMW** **PHO**

*Please answer the following questions in relation to your experience on ward rounds today. Your answers will be kept **strictly confidential** and will **not** be identified by name.*

1) During ward rounds today, were the learning goals and expectations for you laid out clearly?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

2) Did you feel confused about what you were supposed to do or say on ward rounds today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

3) Did you understand your responsibilities on ward rounds today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

4) During ward rounds today, did the consultant take the time to assess for your understanding?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

5) During ward rounds today, did you feel like the consultant just assumed you knew stuff you didn't know?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

FINAL: 12) Elements for Effective Learning - Students

6) During ward rounds today, did the consultant expect you to answer questions you didn't know the answers to?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

7) During ward rounds today, were you mainly just told what to do?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

8) During ward rounds today, did you feel like you were able to understand the thought process of the consultant when he/she discussed the case or management plan?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

9) During ward rounds today, did you feel the consultant helped you identify your knowledge gaps?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

10) During ward rounds today, when you asked a question, did you feel that the consultant adequately answered it?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

11) During ward rounds today, did you feel the consultant guided you through the learning point so that you could understand?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

12) During ward rounds today, when discussing a case, did the discussion feel like a 'drill session'?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

FINAL:

12) Elements for Effective Learning - Students

13) Were you given an opportunity on rounds today to demonstrate your history taking or clinical examination skills?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

14) Were you given an opportunity on rounds today to demonstrate your patient/family communication skills?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

15) During ward rounds today, did the consultant encourage you to come up with your own patient plan?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

16) During ward rounds today, did the consultant express his/her uncertainty about the case?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

17) After ward rounds, did the consultant ask you for feedback for how he/she can improve the teaching on rounds?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

18) During ward rounds today, did you feel stimulated by the consultant to read about the case(s) you presented?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

FINAL:

13) Elements for Effective Learning - Residents

Elements for Effective Learning – Department of Paediatrics – Resident

***Circle One:* Which rotation are you on this week? NNU PMW PHO**

*Please answer the following questions in relation to your experience on ward rounds today. Your answers will be kept **strictly confidential** and will **not** be identified by name.*

1) During ward rounds today, were the learning goals and expectations for you laid out clearly?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

2) Did you feel confused about what you were supposed to do or say on ward rounds today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

3) Did you understand your responsibilities on ward rounds today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

4) During ward rounds today, did the consultant take the time to assess for your understanding?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

5) During ward rounds today, did you feel like the consultant just assumed you knew stuff you didn't know?

Not at all	A little bit	Somewhat	Quite a bit	A great amount

FINAL: 13) Elements for Effective Learning - Residents

6) During ward rounds today, did the consultant expect you to answer questions you didn't know the answers to?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

7) During ward rounds today, were you mainly just told what to do?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

8) During ward rounds today, did you feel like you were able to understand the thought process of the consultant when he/she discussed the case or management plan?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

9) During ward rounds today, did you feel the consultant helped you identify your knowledge gaps?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

10) During ward rounds today, when you asked a question, did you feel that the consultant adequately answered it?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

11) During ward rounds today, did you feel the consultant guided you through the learning point so that you could understand?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

12) During ward rounds today, when discussing a case, did the discussion feel like a 'drill session'?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

FINAL:
13) Elements for Effective Learning - Residents

13) Were you given an opportunity on rounds today to demonstrate your history taking or clinical examination skills?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

14) Were you given an opportunity on rounds today to demonstrate your patient/family communication skills?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

15) During ward rounds today, did the consultant encourage you to come up with your own patient plan?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

16) During ward rounds today, did the consultant express his/her uncertainty about the case?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

17) After ward rounds, did the consultant ask you for feedback for how he/she can improve the teaching on rounds?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

18) During ward rounds today, did you feel stimulated by the consultant to read about the case(s) you presented?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

Driver Diagram (drafts 7-9)
(March – May 2018)

Updating the Driver Diagram

- By March 2018, we had developed the first several drafts of the driver diagram and corresponding project measures and the first versions of the updated surveys.
- Also around this time my PhD supervisor workshop was held, which was very influential on the overall driver diagram and primary drivers and subsequently the project measures and surveys.

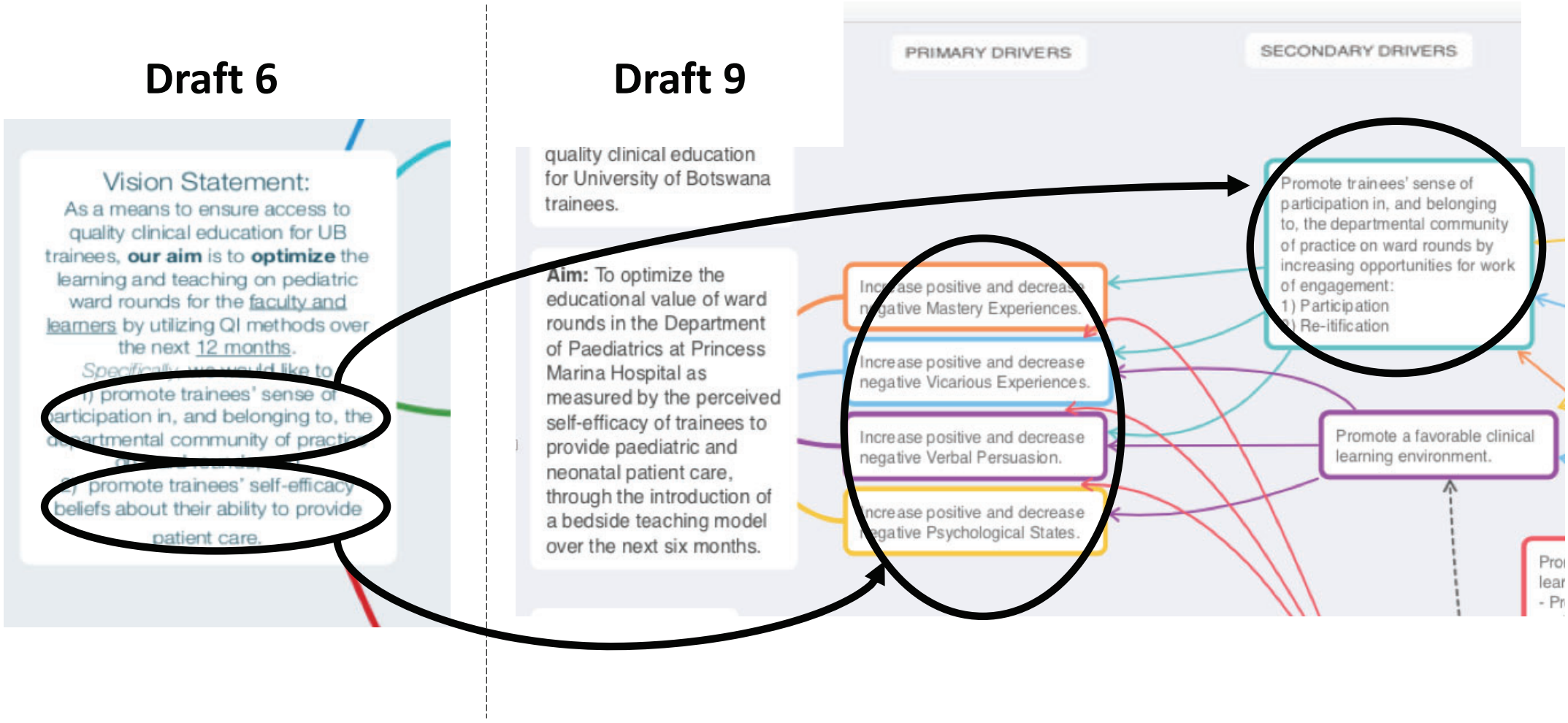
Updating the Driver Diagram

- The main update in the later versions of the driver diagram was pulling out from the aim statement the elements of trainees' perceived self-efficacy and sense of belonging to a clinical community of practice. These were restructured now to be primary and secondary drivers, respectively.
- In turn, we now had two new drivers which needed corresponding project measures and surveys:

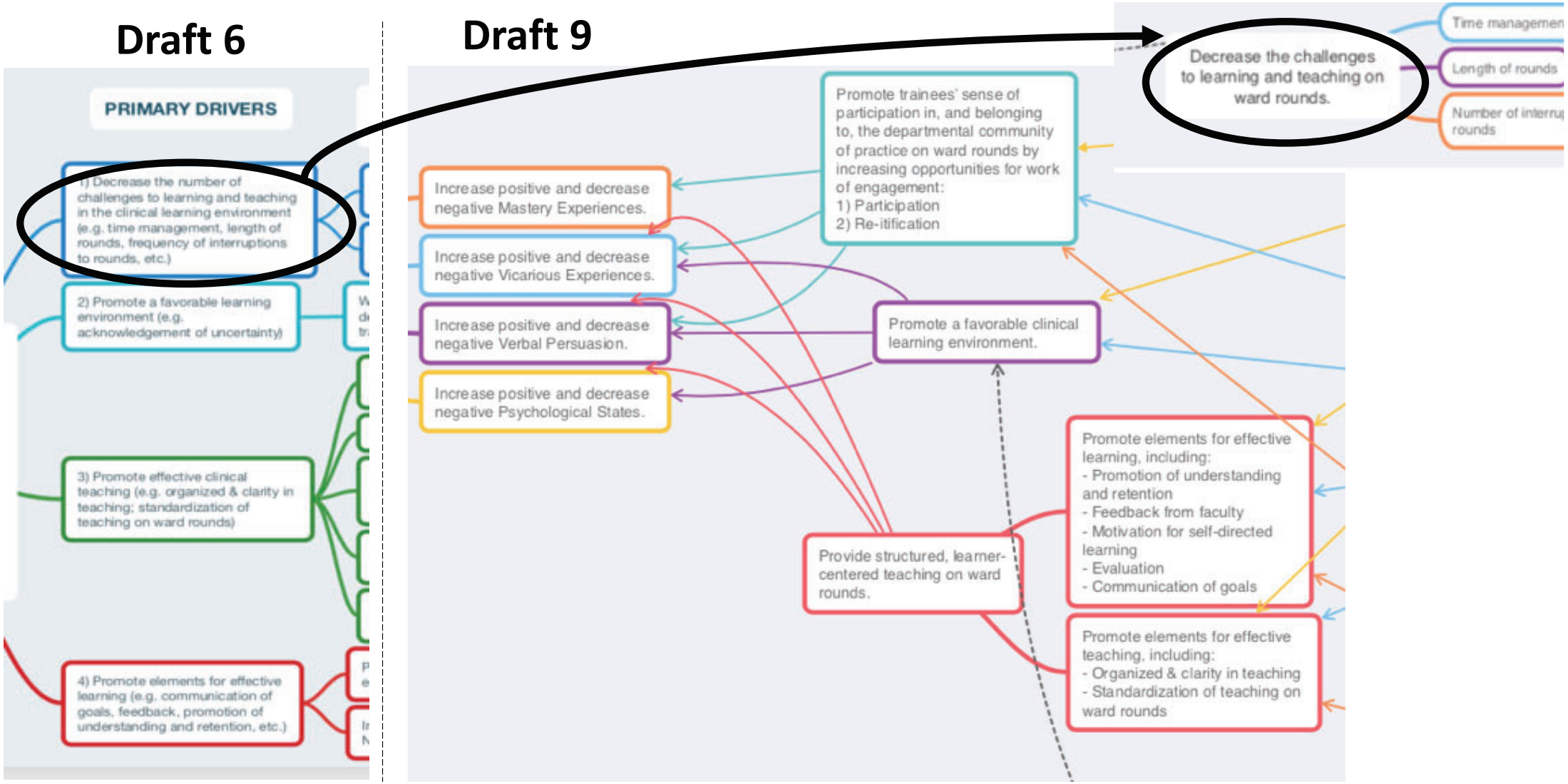
  5) Promote trainees' self-efficacy beliefs about their ability to provide paediatric patient care

  6) Promote trainees' sense of participation in, and belonging to, the departmental community of practice on ward rounds
- But it is important to note that our four previously defined primary drivers remained an integral part within the updated driver diagram, but were moved to secondary drivers to allow us to keep the perceived self-efficacy of trainees at the forefront of the project.

Updating the Driver Diagram created two new drivers . . .

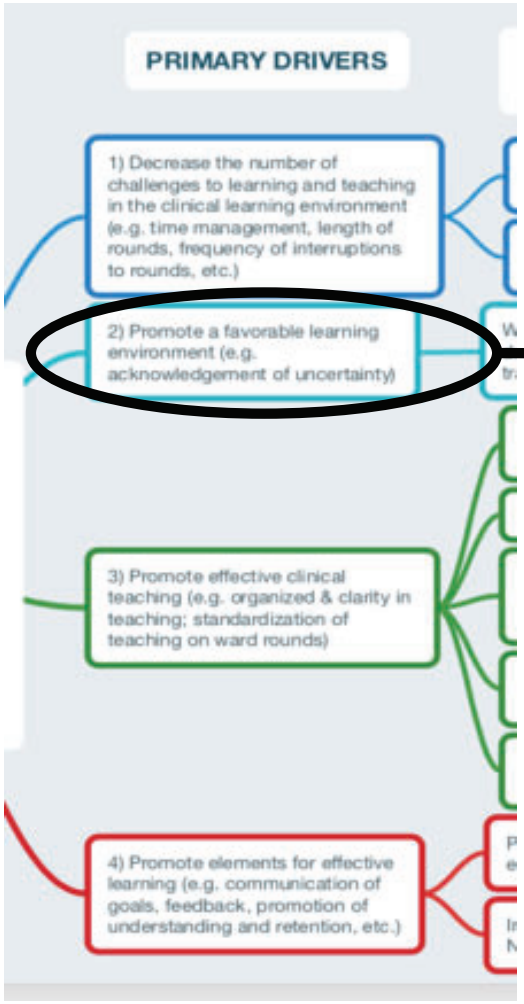


Updating the DD created two new drivers, but maintained the original four.

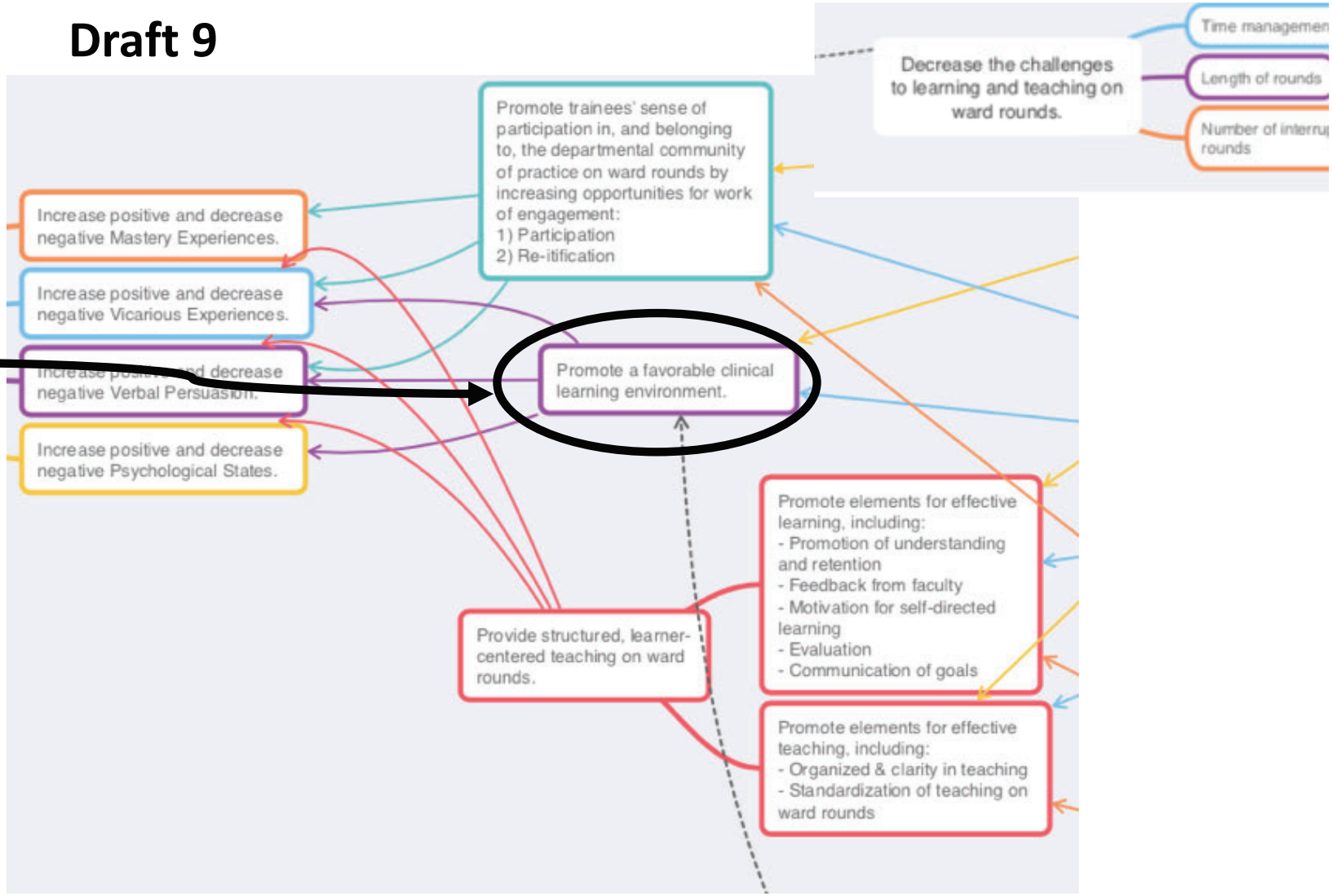


Updating the DD created two new drivers, but maintained the original four.

Draft 6

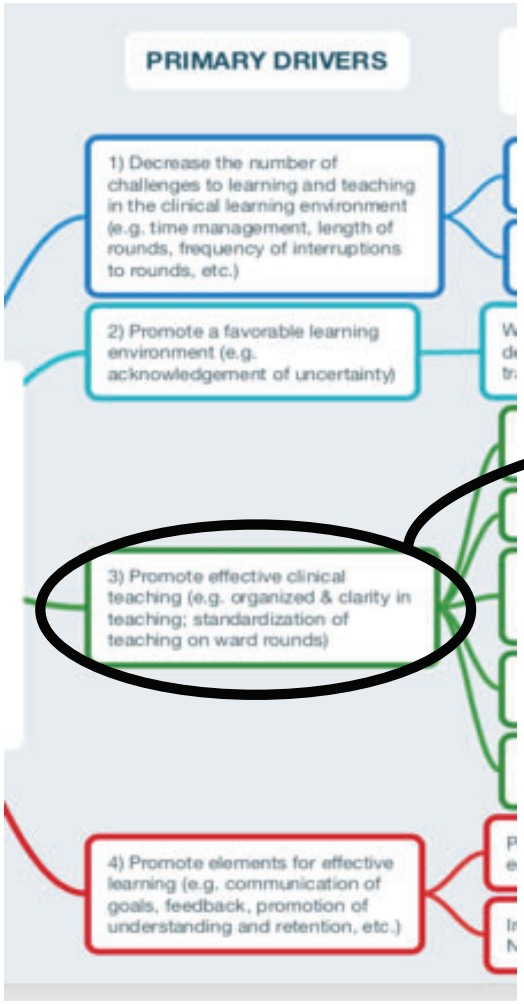


Draft 9



Updating the DD created two new drivers, but maintained the original four.

Draft 6



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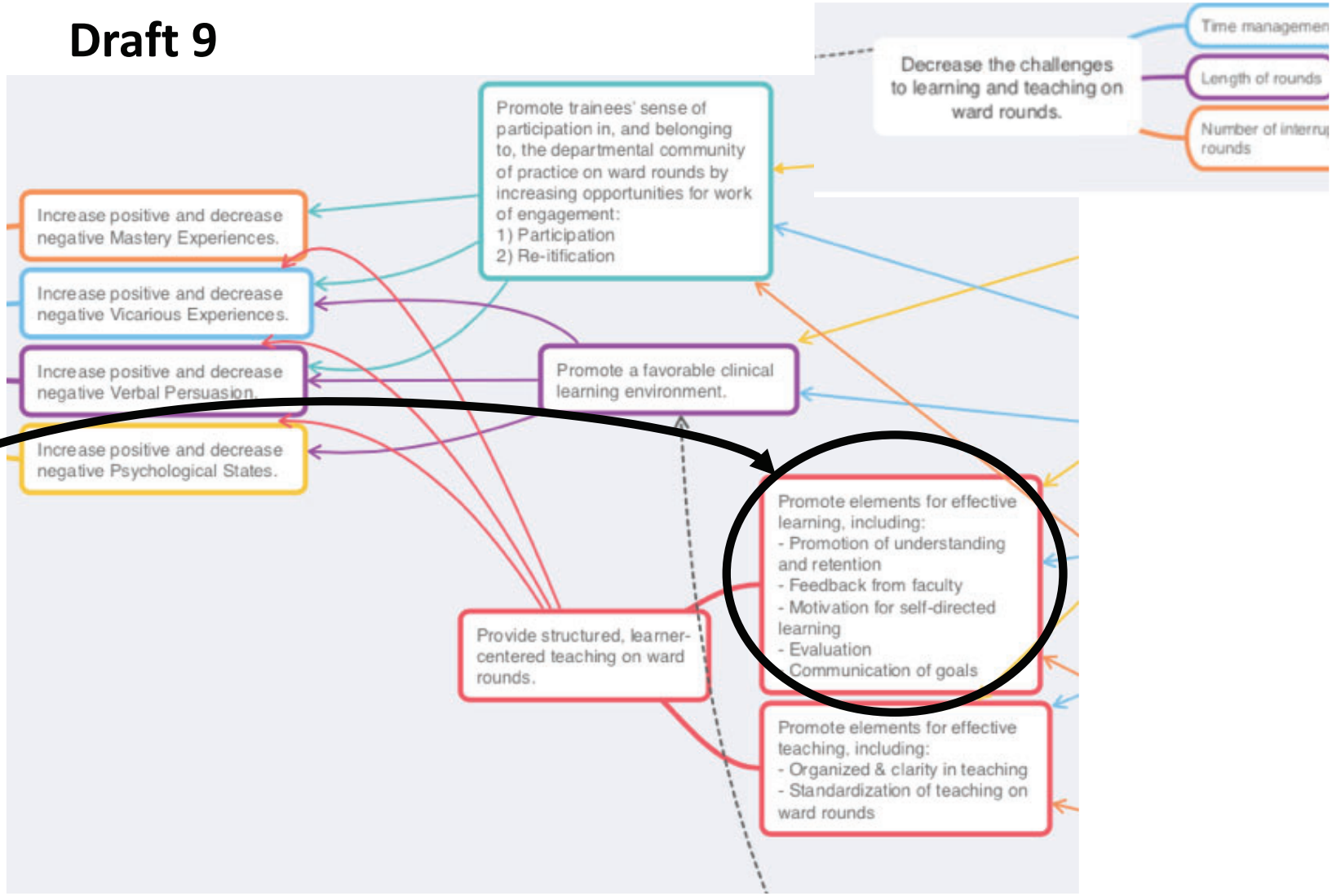
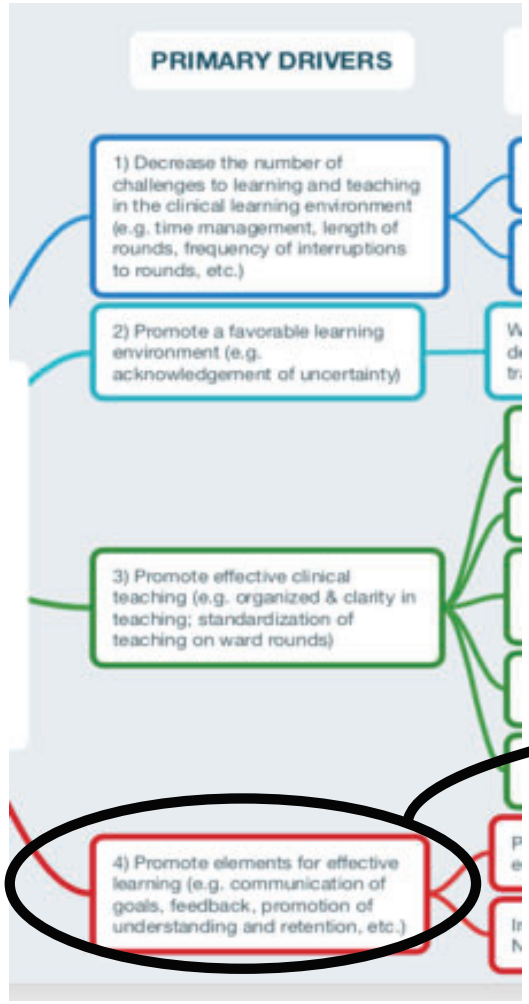
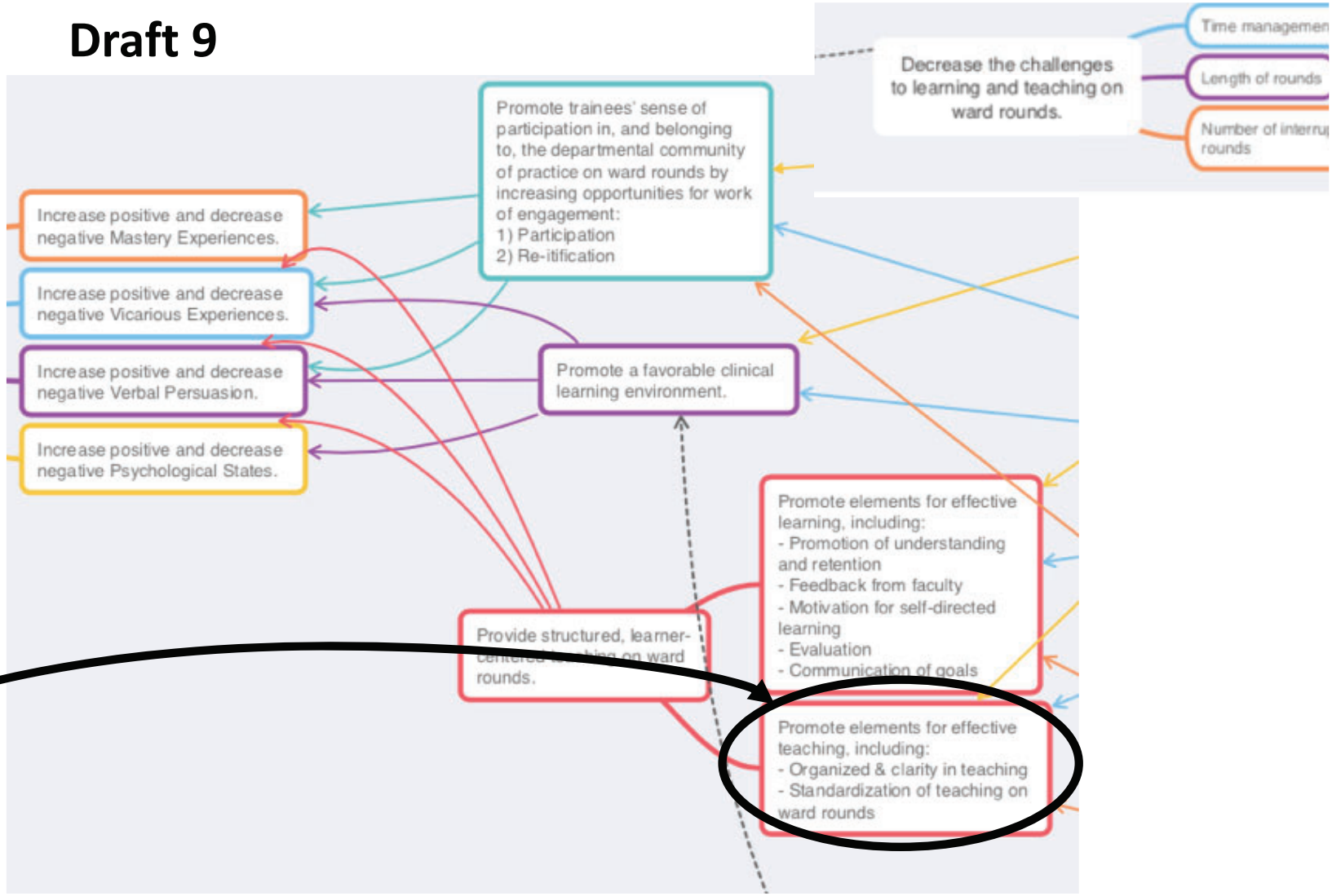


Updating the DD created two new drivers, but maintained the original four.

Draft 6



Draft 9



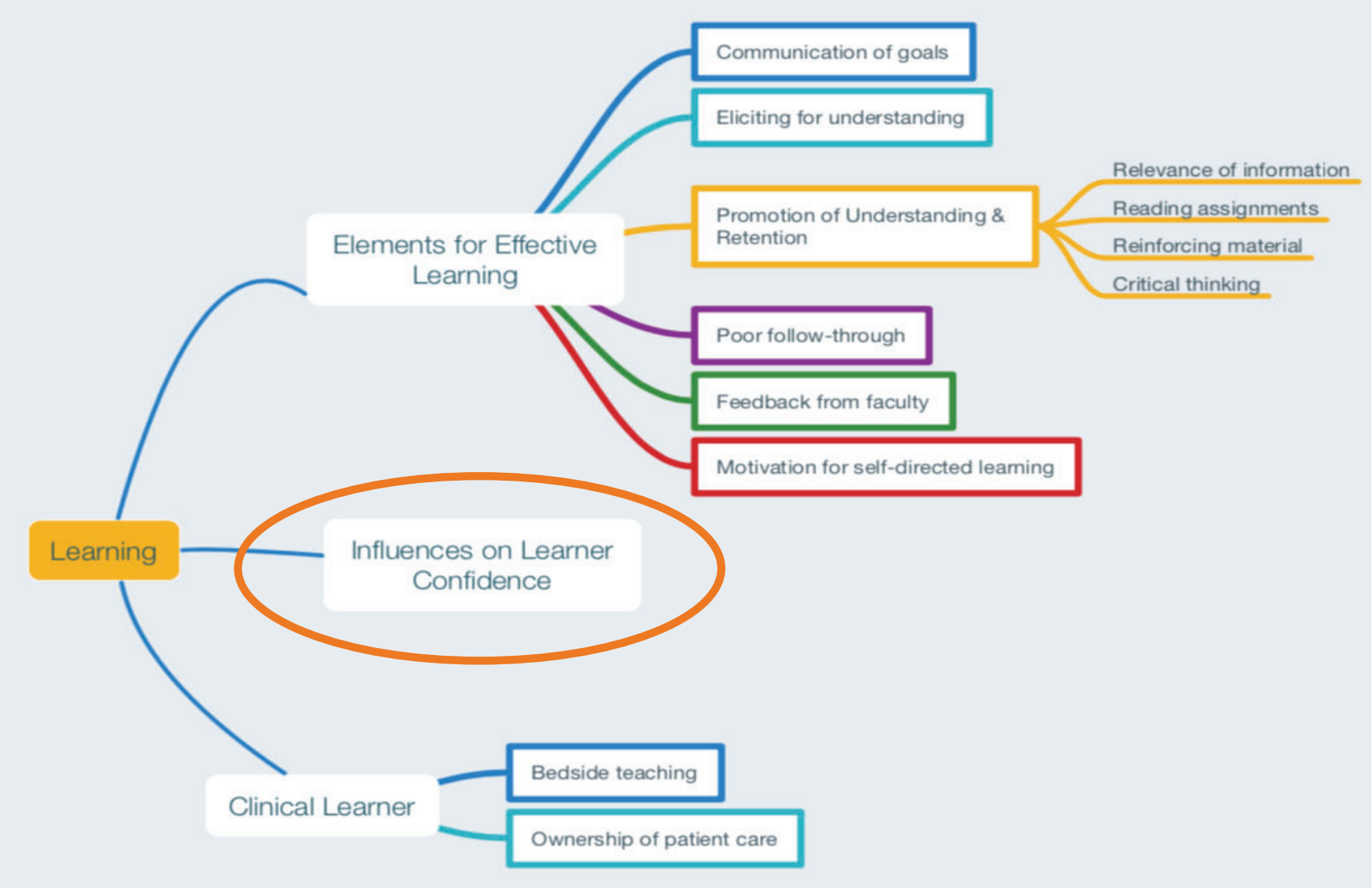
Project Measures & DCTs/surveys

- Once the driver diagram was updated, we continued our process of determining *what* to measure (project measure) and *how* (surveys), now by considering our fifth primary driver:

  #5 Promote trainees' self-efficacy beliefs about their ability to provide paediatric patient care

Primary Driver #5 – Promote trainees' self-efficacy beliefs about their ability to provide paediatric patient care

Phase 1 Results



Measuring Primary Driver #5

Promote trainees' self-efficacy beliefs about their ability to provide paediatric patient care

- To measure the trainees' Perceived Self-Efficacy (PSE) we went back to the original PSE survey developed for Phase 1 of the study.
- The PSE survey was a newly constructed survey, used to evaluate medical students' and residents' perceived self-efficacy with regards to their ability to provide paediatric patient care.
- The 21-item questionnaire was designed according to the principles of self-efficacy scale development as described by Bandura, where participants were asked to rate their level of certainty to perform a specific task by recording their confidence level from 0 to 100. The specific tasks participants were asked to rate were based on a combination of activities described in the CanMEDS framework and the SNAPPS bedside teaching model.

ORIGINAL: Perceived Self-Efficacy survey

Perceived Self-Efficacy Survey

This questionnaire is designed to help us get a better understanding of the kinds of things that are difficult for learners in relation to patient care.

Your answers will be kept ***strictly confidential*** and will not be identified by name.

Please rate how certain you are that you can do each of the things described below by writing the appropriate number.

Rate your degree of confidence by recording a number 0 to 100 using the scale given below:

0	10	20	30	40	50	60	70	80	90	100
Cannot do at all can do				Moderately can do					Highly certain	

Please circle one:

Are you a 'medical student' or 'paediatric resident'?

Question	Confidence
1. Elicit accurate, organized and appropriate focused histories for Paediatric patients.	
2. Elicit accurate, organized and appropriate focused histories for Neonatal patients.	
3. Conduct accurate, sensitive and organized physical examinations for Paediatric patients.	
4. Conduct accurate, sensitive and organized physical examinations for Neonatal patients.	
5. Accurately assess the developmental age of a child based on history and physical exam.	

ORIGINAL: Perceived Self-Efficacy survey – cont.

6. Accurately assess the growth of a child given weight, height, and head circumference.	
7. Summarize and present the pertinent information obtained from the patient's history on ward rounds in an accurate, organized and thoughtful manner.	
8. Summarize and present the pertinent information obtained from the patient's physical exam on ward rounds in an accurate, organized and thoughtful manner.	
9. Critically analyze information and interpret test results relevant to Paediatric patients.	
10. Critically analyze information and interpret test results relevant to Neonatal patients.	
11. Generate a meaningful differential diagnosis.	
12. Narrow differential diagnosis in regards to current patient.	
13. Analyze differential (discuss what is more or less likely).	

ORIGINAL: Perceived Self-Efficacy survey – cont.

14. Integrate prior knowledge with new information.	
15. Competently devise a management plan for my patient (that does not require much addendum from consulting physician).	
16. Provide clear and thorough explanations to patients/families.	
17. Ask questions or guidance from the consulting physician.	
18. Seek help when necessary.	
19. Choose a case-related topic for further learning.	
20. Utilize available resources to find information about a case-related topic.	
21. Perform self-directed learning, including curiosity and motivation to learn.	

Measuring Primary Driver #5

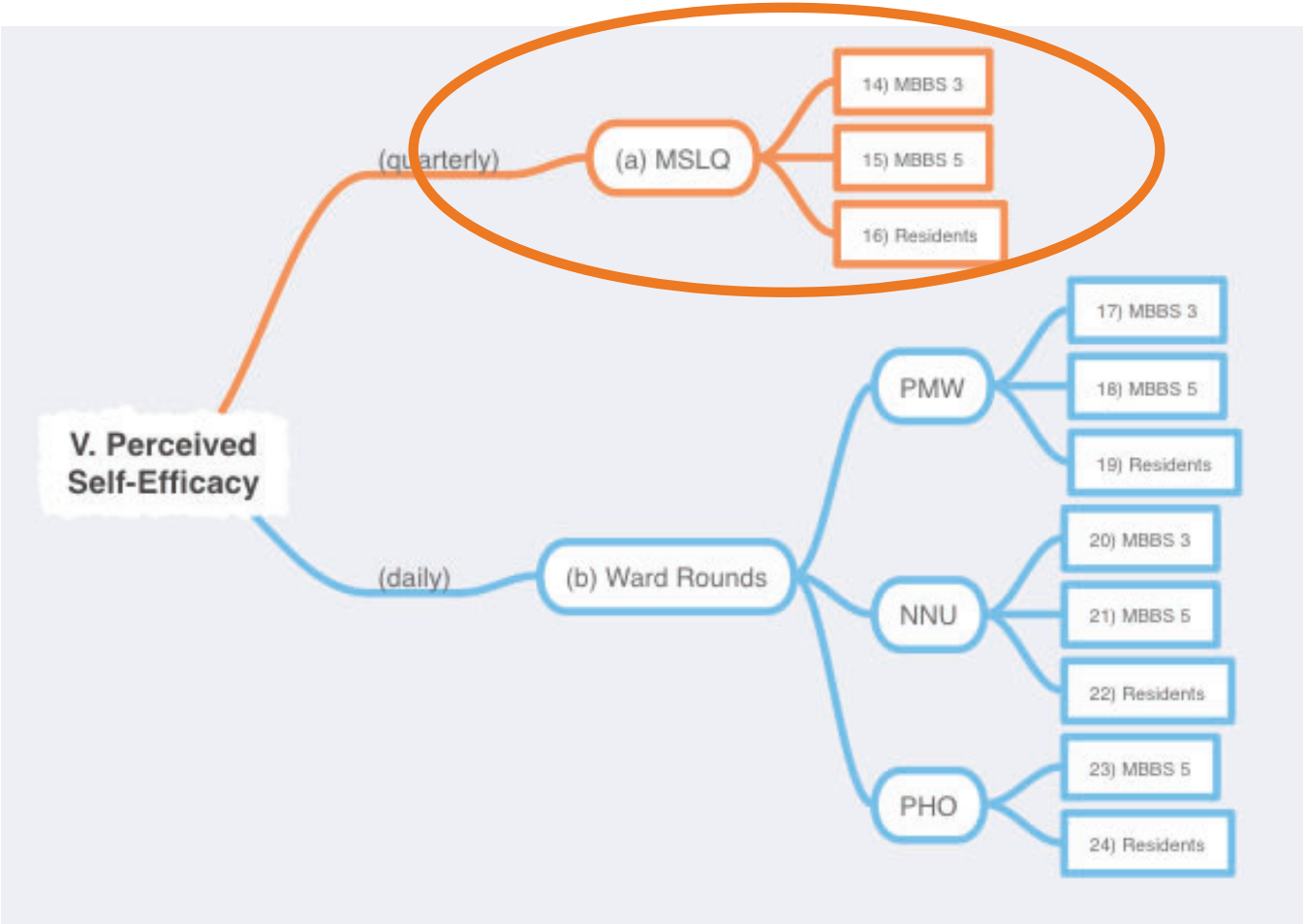
Promote trainees' self-efficacy beliefs about their ability to provide paediatric patient care

- In regards to trainees' self-efficacy beliefs, our Phase 1 results were somewhat divergent from the qualitative and quantitative data. In general, for the quantitative data (PSE survey), trainees rated themselves quite high in CanMEDS and SNAPPS related activities. But the overall qualitative data suggested that the clinical learning environment was not conducive to promote trainees' PSE and often resulted in eroded self-confidence of the learners.
- While we believed there was face validity to the PSE survey, we did not think that it was fully accurate or reflective of trainees' true PSE as described in the qualitative data.
- We therefore went back to the literature look for alternative ways to measure trainees' PSE on ward rounds.

Primary Driver	Related Phase 1 QUAL Themes	Related Phase 1 QUAN Surveys	Further Literature Review	Notes & Possible data collection ideas
#5) Promote trainees' self-efficacy beliefs about their ability to provide paediatric patient care by increasing positive and decreasing negative (i) mastery experiences, (ii) vicarious experiences, (iii) verbal persuasion, and (iv) psychological states.	Learner self-confidence	PSE survey – all questions	- The effect of the Advanced Paediatric Life Support course on perceived self-efficacy and use of resuscitation skills Nigel McBeth Turner, Miranda P. Dierselhuis, Jos M.Th. Draaisma, Olle Th. J. ten Cate - Development of an Instrument to Assess Perceived Self-Efficacy in the Parents of Infants Rudi Crncec, Bryanne Barnett, Stephen Matthey - Changes in medical students' motivation and self-regulated learning: a preliminary study Kyong-Jee Kim, Hye W. Jang - Motivational and Self-Regulated Learning Components of Classroom Academic Performance Paul R. Pintrich and Elisabeth V. De Groot School of Education University of Michigan Ann Arbor, Michigan - The influence of academic self-efficacy on academic performance: A systematic review. Toni Honicke, Jaclyn Broadbent. School of Psychology, Deakin University, Australia	Phase 1 results were somewhat divergent from the qualitative and quantitative data. In general, for the quantitative data (PSE survey), trainees rated themselves quite high in CanMEDS and SNAPPS related activities. But the overall qualitative data suggested that the clinical learning environment was not conducive to promote trainees' PSE and often resulted in eroded self-confidence of the learners. While we believed there was face validity to the PSE survey, we did not think that it was fully accurate or reflective of trainees' true PSE as described in the qualitative data.

Project Measures & DCTs/Surveys

- The following is a description of how the Motivational Strategies for Learning Questionnaire (MSLQ) was modified to measure our fifth project measure.



Measuring Primary Driver #5

Promote trainees' self-efficacy beliefs about their ability to provide paediatric patient care

- In the literature, we found the Motivated Strategies for Learning Questionnaire (MSLQ) to be widely used for evaluating PSE of trainees.[131]

ORIGINAL: Motivated Strategies for Learning Questionnaire (MSLQ)

Motivated Strategies for Learning Questionnaire*

Please rate the following items based on your behavior in this class. Your rating should be on a 7-point scale where **1= not at all true of me** to **7=very true of me** .

1. I prefer class work that is challenging so I can learn new things.
2. Compared with other students in this class I expect to do well
3. I am so nervous during a test that I cannot remember facts I have learned
4. It is important for me to learn what is being taught in this class
5. I like what I am learning in this class
6. I'm certain I can understand the ideas taught in this course
7. I think I will be able to use what I learn in this class in other classes
8. I expect to do very well in this class
9. Compared with others in this class, I think I'm a good student
10. I often choose paper topics I will learn something from even if they require more work

ORIGINAL: Motivated Strategies for Learning Questionnaire (MSLQ) – cont.

11. I am sure I can do an excellent job on the problems and tasks assigned for this class
12. I have an uneasy, upset feeling when I take a test
13. I think I will receive a good grade in this class
14. Even when I do poorly on a test I try to learn from my mistakes
15. I think that what I am learning in this class is useful for me to know
16. My study skills are excellent compared with others in this class
17. I think that what we are learning in this class is interesting
18. Compared with other students in this class I think I know a great deal about the subject
19. I know that I will be able to learn the material for this class
20. I worry a great deal about tests

ORIGINAL: Motivated Strategies for Learning Questionnaire (MSLQ) – cont.

21. Understanding this subject is important to me
22. When I take a test I think about how poorly I am doing
23. When I study for a test, I try to put together the information from class and from the book
24. When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly
25. I ask myself questions to make sure I know the material I have been studying
26. It is hard for me to decide what the main ideas are in what I read
27. When work is hard I either give up or study only the easy parts
28. When I study I put important ideas into my own words
29. I always try to understand what the teacher is saying even if it doesn't make sense.
30. When I study for a test I try to remember as many facts as I can

ORIGINAL: Motivated Strategies for Learning Questionnaire (MSLQ) – cont.

31. When studying, I copy my notes over to help me remember material
32. I work on practice exercises and answer end of chapter questions even when I don't have to
33. Even when study materials are dull and uninteresting, I keep working until I finish
34. When I study for a test I practice saying the important facts over and over to myself

ORIGINAL: Motivated Strategies for Learning Questionnaire (MSLQ) – cont.

35. Before I begin studying I think about the things I will need to do to learn
36. I use what I have learned from old homework assignments and the textbook to do new assignments
37. I often find that I have been reading for class but don't know what it is all about.
38. I find that when the teacher is talking I think of other things and don't really listen to what is being said
39. When I am studying a topic, I try to make everything fit together
40. When I'm reading I stop once in a while and go over what I have read
41. When I read materials for this class, I say the words over and over to myself to help me remember
42. I outline the chapters in my book to help me study
43. I work hard to get a good grade even when I don't like a class
44. When reading I try to connect the things I am reading about with what I already know.

*Pintrich, R. R., & DeGroot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance, *Journal of Educational Psychology, 82*, 33-40.

ORIGINAL → MODIFIED version 1:
14, 15 & 16) MSLQ

- The original MSLQ was modified for the University of Botswana trainees in several ways.
- First, the questions were modified to reflect participation on a paediatric ward round.
- Second, I created description values to the scale from 2-6, which were otherwise not previously defined, creating a seven-point, binary response scale.
- I also removed nine questions that were unrelated to ward rounds.

MODIFIED version 1: Motivational Strategies for Learning Questionnaire 14, 15, & 16) MSLQ

Motivated Strategies for Learning Questionnaire
Department of Paediatrics
Students (MBBS 3 & 5)

Please rate the following items based on your behavior on this rotation.
Your rating should be on a 7-point scale, where **1 = not at all true of me** to **7 = very true of me.**
1 = not like me at all; never
2 = mostly not like me; almost never
3 = somewhat not like me; once in a while
4 = neither like me or not like me; sometimes
5 = somewhat like me; often
6 = mostly like me; almost always
7 = very much like me; all the time

Question	Rating (1-7)
1. I prefer paediatric cases that are challenging so I can learn new things.	
2. Compared with other students on ward rounds, I expect to do well.	
3. I am so nervous during ward rounds that I cannot remember facts I have learned.	
4. It is important for me to learn what is being taught on ward rounds.	
5. I like what I am learning on ward rounds.	
6. I'm certain I can understand the ideas taught on ward rounds.	
7. On ward rounds, I think I will be able to use what I learn from one patient to other patients.	

MODIFIED version 1: Motivational Strategies for Learning Questionnaire – cont. 14, 15, & 16) MSLQ

8. I expect to do very well on ward rounds.	
9. Compared with others on ward rounds, I think I'm a good student.	
10. I often chose patients I will learn something from even if they require more work.	
11. I am sure I can do an excellent job of presenting my patient when on ward rounds.	
12. I am sure I can do an excellent job of generating an assessment and plan for my patient when on ward rounds.	
13. I have an uneasy, upset feeling when I am on ward rounds.	
14. Even when I do poorly on ward rounds, I try to learn from my mistakes.	
15. I think what I am learning on ward rounds is useful for me to know.	
16. I think that what we are learning on ward rounds is interesting.	
17. Compared with other students on ward rounds I think I know a great deal about paediatrics.	
18. Compared with other students on ward rounds I think I know a great deal about neonatology.	

MODIFIED version 1: Motivational Strategies for Learning Questionnaire – cont. 14, 15, & 16) MSLQ

19. I worry a great deal about presenting on ward rounds.	
20. Understanding my patient's condition and management is important to me.	
21. When I present on ward rounds, I think about how poorly I am doing.	
22. When I prepare to present a patient on ward rounds, I try to put together information I have learned from previous patients and my text books.	
23. When I prepare for ward rounds, I try to remember what the consultant said on rounds so I can answer his/her questions correctly.	
24. It is hard for me to decide what the main ideas being taught are when I am on ward rounds.	
25. When the patient case is hard, I either give up or study only the easy parts.	
26. When I prepare for ward rounds, I put important ideas into my own words.	
27. I always try to understand what the consultant is saying on ward rounds even if it doesn't make sense.	
28. When I prepare for ward rounds, I try to remember as many facts as I can.	
29. I continue to read up on patients and their conditions even when I don't have to.	

MODIFIED version 1: Motivational Strategies for Learning Questionnaire – cont.
14, 15, & 16) MSLQ

30. Even when the patient cases are dull and uninteresting, I keep working until I understand.	
31. I use what I have learned from previous patients and the textbook to care for new patients.	
32. I often find that I have been on ward rounds but don't know what has been discussed.	
33. I find that when the consultant is talking on ward rounds I think of other things and don't really listen to what is being said.	
34. When I am taking care of a patient, I try to make everything fit together.	
35. When I'm reading about a patient I stop once in a while and go over what I have read.	
36. When taking care of a patient I try to connect the things I am seeing with what I already know.	

MODIFIED version 1: Motivational Strategies for Learning Questionnaire – cont. 14, 15, & 16) MSLQ

~~13. I think I will receive a good score for this rotation.~~	~~SE~~
~~16. My study skills are excellent compared with others on this rotation.~~	~~SE~~
~~19. I know that I will be able to learn the material from this rotation.~~	~~SE~~
~~25. I ask myself questions to make sure I know the material I have been studying.~~	~~SR~~
~~31. When preparing for ward rounds, I take notes to help me remember important information.~~	~~CS~~
~~35. Before I begin , I think about the things I will need to do to learn.~~	~~SR~~
~~41. When I read materials for this class, I say the words over and over to myself to help me remember.~~	~~CS~~
~~42. I outline the chapters in my book to help me study~~	~~CS~~
~~43. I work hard to get a good grade even when I don't like a class.~~	~~SR~~

MODIFIED version 1 → version 2/FINAL:
14, 15 & 16) MSLQ

- In this final draft, I decided not to give a description of the 2-6 scale after all, but to keep in more similar to how the survey was originally published.[131]
- Modified versions were stratified for MBBS 3, MBBS 5 and residents; Note: the MBBS 3 and 5 surveys were identical.

MODIFIED version 2/FINAL: Motivational Strategies for Learning Questionnaire 14 & 15) MSLQ – MBBS 3 & 5

Motivated Strategies for Learning Questionnaire
Department of Paediatrics – Student – MBBS 3

Please rate the following items based on your behavior on this rotation. Your rating should be on a 7-point scale, where **1 = not at all true of me** to **7 = very true of me.**

Question	Rating (1-7)
1. I prefer paediatric cases that are challenging so I can learn new things.	
2. Compared with other students on ward rounds, I expect to do well.	
3. I am so nervous during ward rounds that I cannot remember facts I have learned.	
4. It is important for me to learn what is being taught on ward rounds.	
5. I like what I am learning on ward rounds.	
6. I'm certain I can understand the ideas taught on ward rounds.	
7. On ward rounds, I think I will be able to use what I learn from one patient to other patients.	
8. I expect to do very well on ward rounds.	
9. Compared with others on ward rounds, I think I'm a good student.	
10. I often chose patients I will learn something from even if they require more work.	
11. I am sure I can do an excellent job of presenting my patient when on ward rounds.	
12. I am sure I can do an excellent job of generating an assessment and plan for my patient when on ward rounds.	
13. I have an uneasy, upset feeling when I am on ward rounds.	
14. Even when I do poorly on ward rounds, I try to learn from my mistakes.	

MODIFIED version 2/FINAL: Motivational Strategies for Learning Questionnaire
14 & 15) MSLQ – MBBS 3 & 5 cont.

15. I think what I am learning on ward rounds is useful for me to know.	
16. I think that what we are learning on ward rounds is interesting.	
17. Compared with other students on ward rounds I think I know a great deal about paediatrics.	
18. Compared with other students on ward rounds I think I know a great deal about neonatology.	
19. I worry a great deal about presenting on ward rounds.	
20. Understanding my patient's condition and management is important to me.	
21. When I present on ward rounds, I think about how poorly I am doing.	
22. When I prepare to present a patient on ward rounds, I try to put together information I have learned from previous patients and my text books.	
23. When I prepare for ward rounds, I try to remember what the consultant said on rounds so I can answer his/her questions correctly.	
24. It is hard for me to decide what the main ideas being taught are when I am on ward rounds.	

MODIFIED version 2/FINAL: Motivational Strategies for Learning Questionnaire
14 &15) MSLQ – MBBS 3 & 5 cont.

25. When the patient case is hard, I either give up or study only the easy parts.	
26. When I prepare for ward rounds, I put important ideas into my own words.	
27. I always try to understand what the consultant is saying on ward rounds even if it doesn't make sense.	
28. When I prepare for ward rounds, I try to remember as many facts as I can.	
29. I continue to read up on patients and their conditions even when I don't have to.	
30. Even when the patient cases are dull and uninteresting, I keep working until I understand.	
31. I use what I have learned from previous patients and the textbook to care for new patients.	
32. I often find that I have been on ward rounds but don't know what has been discussed.	
33. I find that when the consultant is talking on ward rounds I think of other things and don't really listen to what is being said.	
34. When I am taking care of a patient, I try to make everything fit together.	
35. When I'm reading about a patient I stop once in a while and go over what I have read.	
36. When taking care of a patient I try to connect the things I am seeing with what I already know.	

MODIFIED version 2/FINAL: Motivational Strategies for Learning Questionnaire
16) MSLQ - Residents

Motivated Strategies for Learning Questionnaire
Department of Paediatrics - Resident

Please rate the following items based on your behavior during your paediatric residency training. Your rating should be on a 7-point scale, where **1 = not at all true of me** to **7 = very true of me.**

Question	Rating (1-7)
1. I prefer paediatric cases that are challenging so I can learn new things.	
2. Compared with other residents on ward rounds, I expect to do well.	
3. I am so nervous during ward rounds that I cannot remember facts I have learned.	
4. It is important for me to learn what is being taught on ward rounds.	
5. I like what I am learning on ward rounds.	
6. I'm certain I can understand the ideas taught on ward rounds.	
7. On ward rounds, I think I will be able to use what I learn from one patient to other patients.	
8. I expect to do very well on ward rounds.	
9. Compared with others on ward rounds, I think I'm a good resident.	
10. I often chose patients I will learn something from even if they require more work.	

MODIFIED version 2/FINAL: Motivational Strategies for Learning Questionnaire
16) MSLQ – Residents – cont.

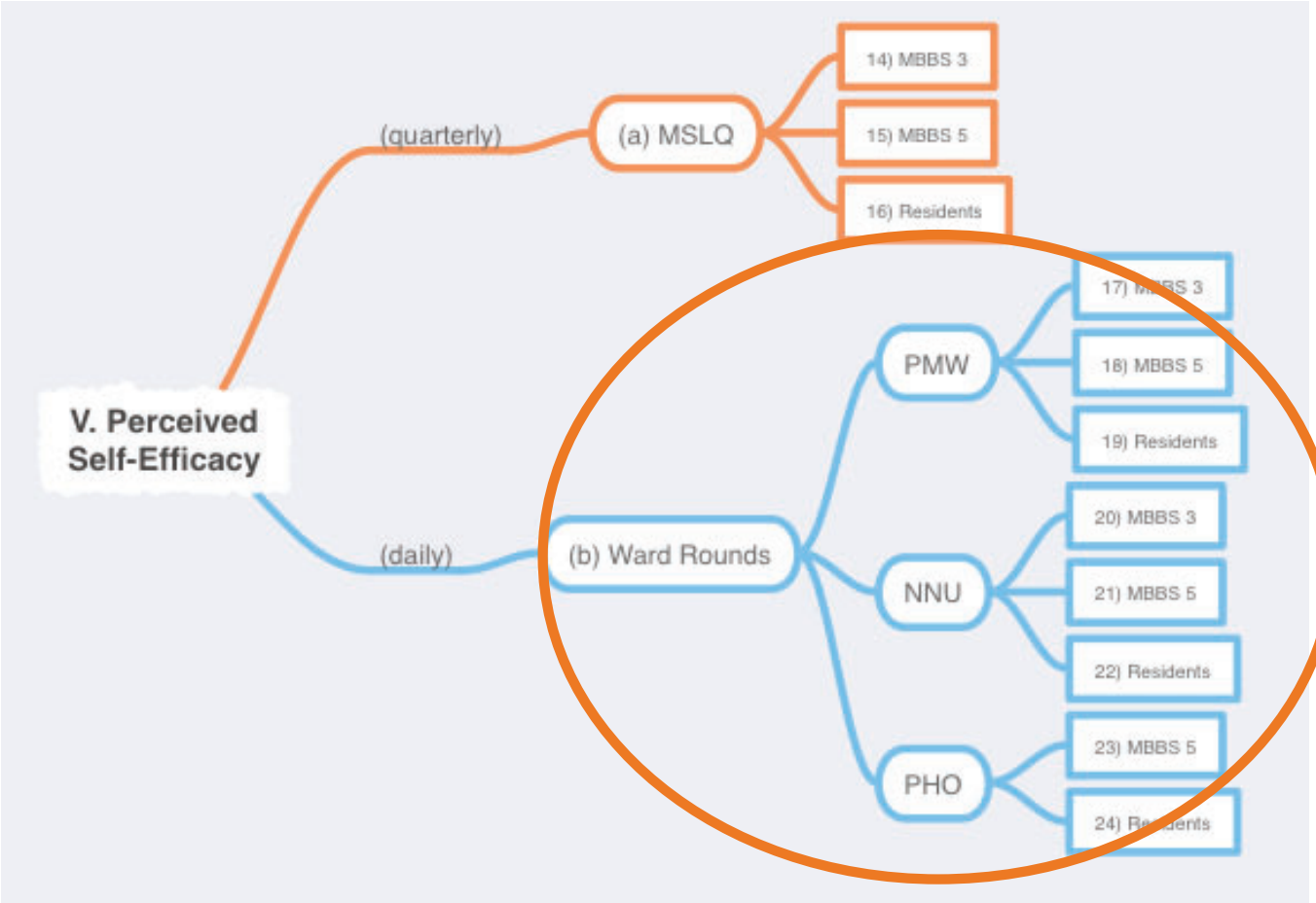
11. I am sure I can do an excellent job of presenting my patient when on ward rounds.	
12. I am sure I can do an excellent job of generating an assessment and plan for my patient when on ward rounds.	
13. I have an uneasy, upset feeling when I am on ward rounds.	
14. Even when I do poorly on ward rounds, I try to learn from my mistakes.	
15. I think what I am learning on ward rounds is useful for me to know.	
16. I think that what we are learning on ward rounds is interesting.	
17. Compared with other residents on ward rounds I think I know a great deal about paediatrics.	
18. Compared with other residents on ward rounds I think I know a great deal about neonatology.	
19. I worry a great deal about presenting on ward rounds.	
20. Understanding my patient's condition and management is important to me.	
21. When I present on ward rounds, I think about how poorly I am doing.	
22. When I prepare to present a patient on ward rounds, I try to put together information I've learned from previous patients and my text books.	
23. When I prepare for ward rounds, I try to remember what the consultant said on rounds so I can answer his/her questions correctly.	

MODIFIED version 2/FINAL: Motivational Strategies for Learning Questionnaire
16) MSLQ – Residents – cont.

24. It is hard for me to decide what the main ideas being taught are when I am on ward rounds.	
25. When the patient case is hard, I either give up or study only the easy parts.	
26. When I prepare for ward rounds, I put important ideas into my own words.	
27. I always try to understand what the consultant is saying on ward rounds even if it doesn't make sense.	
28. When I prepare for ward rounds, I try to remember as many facts as I can.	
29. I continue to read up on patients and their conditions even when I don't have to.	
30. Even when the patient cases are dull and uninteresting, I keep working until I understand.	
31. I use what I have learned from previous patients and the textbook to care for new patients.	
32. I often find that I have been on ward rounds but don't know what has been discussed.	
33. I find that when the consultant is talking on ward rounds I think of other things and don't really listen to what is being said.	
34. When I am taking care of a patient, I try to make everything fit together.	
35. When I'm reading about a patient I stop once in a while and go over what I have read.	
36. When taking care of a patient I try to connect the things I am seeing with what I already know.	

Project Measures & DCTs/Surveys

- The following is a how the original PSE survey was modified to measure our fifth project measure.



Measuring Primary Driver #5

Promote trainees' self-efficacy beliefs about their ability to provide paediatric patient care

- While we felt confident that the MSLQ would work well to capture the PSE of the trainees, it was too long of a survey to use frequently. We decided that at most, the MSLQ could be collected quarterly from the residents and at the end of each student rotation.
- But in order for us to practically track and flexibly react to 'real time' feedback of our Phase 3 interventions, we needed to create a short survey to measure trainees' PSE.

Measuring Primary Driver #5

Promote trainees' self-efficacy beliefs about their ability to provide paediatric patient care

- To create this short or 'daily' PSE survey, I first went back to the original PSE survey used in Phase 1. Since this survey was found not to be completely reflective of our qualitative findings, I went back to the literature to review other styles and methods of measuring PSE.
- Interestingly, I found that many of the recommended elements for 'how to make a good survey' as described in the AMEE Guide 87 didn't match what I'd found in the PSE literature. For example, the AMEE Guide 87 recommended to phrase questions conversationally, i.e. Ask "How confident are you?" verses "I am confident" statement. But for measuring PSE, I found the "I am" statements to be more popular (e.g. MSLQ).

Measuring Primary Driver #5

Promote trainees' self-efficacy beliefs about their ability to provide paediatric patient care

- Based on this discrepancy, I continued to review the literature in other PSE articles to observe the question type, style, formatting and measuring scale used.[128, 183-186]
- In general, the more personal, first-person statements seemed to be the most popular. Other noted items was the importance of phrasing questions in the future or present tense since PSE is about what a person thinks he/she *will do*, as opposed to an assessment of how he/she *did*.
- In addition, the more specific the event, the more accurate you could measure the related PSE.[20, 183]

Measuring Primary Driver #5

Promote trainees' self-efficacy beliefs about their ability to provide paediatric patient care

- Based on this literature review, I chose to measure trainee PSE at the micro level – i.e. of the trainees' perception of their presentation on ward rounds, not rounds in general. The hope was that trainees would fill in one to two surveys per day based on their first two patient encounters for the day.
- Of the different types of measurements, I chose a rating scale variation to make the answers more reflective of the statements. I considered using the modified version of the MSLQ with a seven-point, unipolar response scale, but thought it would not be useful for the recommended conversational-type questions.

Measuring Primary Driver #5

Promote trainees' self-efficacy beliefs about their ability to provide paediatric patient care

- I then put this all together under Bandura's four elements of PSE:
  - mastery experiences,
  - vicarious experiences,
  - verbal persuasion and
  - psychological state.
- I also tried to make sure questions correlated with SNAPPS.

Measuring Primary Driver #5

Promote trainees' self-efficacy beliefs about their ability to provide paediatric patient care

SNAPPS	PSE
S **Take Hx** **Do Exam** **Present Hx** **Present Exam**	I'm able to take Hx I'm able to do exam I'm able to present hx I'm able to present exam
N **Generate DDx** **Narrow DDx**	I'm able to generate a differential diagnosis I'm able to narrow my differential diagnosis
A **Analyzed test** **Integrates prior knowledge**	
P **Probe preceptor**	
P **Make plan**	
S **Select topic**	

Measuring Primary Driver #5

Promote trainees' self-efficacy beliefs about their ability to provide paediatric patient care

- When choosing which questions to include, it occurred to me that the types of things we expect trainees to do on a ward round depends on their level of training – i.e. MBBS 3 are encouraged to practice their history and physical exam skills, whereas an MBBS 5 should be gaining skills in developing an assessment and plan, assuming that an MBBS 5 already has mastered the skills of presenting a history and physical exam. Therefore, I decided to stratify the questions by level of training.

ORIGINAL PSE → MODIFIED version 1:
17 - 24) ‘Daily’ PSE

- From the original PSE survey used in Phase 1, these questions were modified. Some questions from the MSLQ were included to capture more frequently than once at the end of the rotation.
- The final survey was stratified by MBBS 3, MBBS 5, residents and by rotation: PMW, NNU and PHO; creating a total of eight variations of the survey.
- Each survey consists of questions related to mastery experiences, vicarious experiences and psychological state, but not verbal persuasion which was captured under the Communities of Practice survey.

MODIFIED version 1: Perceived Self-efficacy (PSE) survey
17-24) Daily PSE

1) PSE – PMW

Summarize:

1. Elicit accurate, organized and appropriate focused histories for Paediatric patients.
3. Conduct accurate, sensitive and organized physical examinations for Paediatric patients.
7. Summarize and present the pertinent information obtained from the patient's history on ward rounds in an accurate, organized and thoughtful manner.
8. Summarize and present the pertinent information obtained from the patient's physical exam on ward rounds in an accurate, organized and thoughtful manner.

New Q: After presenting my patient on ward rounds today, **my self-confidence** to **elicit** an accurate and organized focused **history** for my paediatric patient is:

much worse worse unchanged better much better

New Q: After presenting my patient on ward rounds today, **my self-confidence** to **conduct** an accurate and organized **physical exam** for my paediatric patient is:

much worse worse unchanged better much better

MODIFIED version 1: Perceived Self-efficacy (PSE) survey
17-24) Daily PSE – cont.

New Q: After presenting my patient on ward rounds today, **my self-confidence** to **summarize** the pertinent information obtained from the patient's **history** on ward rounds in an accurate and organized manner is:
much worse worse unchanged better much better

New Q: After presenting my patient on ward rounds today, **my self-confidence** to **summarize** the pertinent information obtained from the patient's **physical exam** on ward rounds in an accurate and organized manner is:
much worse worse unchanged better much better

Narrow:
11. Generate a meaningful differential diagnosis.
12. Narrow differential diagnosis in regards to current patient.
13. Analyze differential (discuss what is more or less likely).

New Q: After presenting my patient on ward rounds today, **my self-confidence** to generate and narrow a meaningful **differential diagnosis** in regards to my paediatric patient is:
much worse worse unchanged better much better

MODIFIED version 1: Perceived Self-efficacy (PSE) survey
17-24) Daily PSE – cont.

Analyze:

9. Critically analyze information and interpret test results relevant to Paediatric patients.

~~14. Integrate prior knowledge with new information.~~ **will ask this elsewhere in the Data Collection Tool & will likely pull from MSLQ*

New Q: After presenting my patient on ward rounds today, **my self-confidence** to critically **analyze information** and **interpret test results** relevant to my paediatric patient is:

much worse worse unchanged better much better

Probe: **will ask this elsewhere in another Data Collection Tool*

~~17. Ask questions or guidance from the consulting physician.~~

Plan:

15. Competently devise a management plan for my patient (that does not require much addendum from consulting physician).

New Q: After presenting my patient on ward rounds today, **my self-confidence** to competently devise a **management plan** for my paediatric patient (that does not require much addendum from consulting physician) is:

much worse worse unchanged better much better

MODIFIED version 1: Perceived Self-efficacy (PSE) survey
17-24) Daily PSE – cont.

Self-Directed Learning: **will ask this elsewhere in another survey*

~~19. Choose a case-related topic for further learning.~~

~~21. Perform self-directed learning, including curiosity and motivation to learn.~~

From MSLQ:

Please rate the following items based on your behavior ~~on this rotation~~ on **paediatric ward rounds** *today*. Your rating should be on a 7-point scale, where **1 = not at all true of me** to **7 = very true of me.**

Mastery: *(from Motivation: Self-Efficacy Questions from MSLQ)*

~~6. I'm certain I can understand the ideas taught on ward rounds.~~

~~8. I expect to do very well on ward rounds.~~

~~11. I am sure I can do an excellent job of presenting my patient when on ward rounds.~~

~~12. I am sure I can do an excellent job of generating an assessment and plan for my patient when on ward rounds.~~

**Will not use these questions for mastery experience because are too broad and not specific enough for SNAPPS; will still be useful for global assessment of PSE at the end of the rotation, but not for day-to-day rounding*

MODIFIED version 1: Perceived Self-efficacy (PSE) survey
17-24) Daily PSE – cont.

Vicarious: *(from Motivation: Self-Efficacy Questions from MSLQ)*

~~2. Compared with other students on ward rounds, I expect to do well.~~

~~9. Compared with others on ward rounds, I think I'm a good student.~~

17. Compared with other students on ward rounds I think I know a great deal about paediatrics.

Feelings: *(from Motivation: Test Anxiety Questions from MSLQ)*

3. I am so nervous during ward rounds that I cannot remember facts I have learned.

13. I have an uneasy, upset feeling when I am on ward rounds.

~~18. I worry a great deal about presenting on ward rounds.~~

~~20. When I present on ward rounds, I think about how poorly I am doing.~~

Verbal: *(not part of MSLQ); will ask under CoP survey*

MODIFIED version 1: Perceived Self-efficacy (PSE) survey
17-24) Daily PSE – cont.

2) PSE – NNU

2. Elicit accurate, organized and appropriate focused histories for Neonatal patients.
4. Conduct accurate, sensitive and organized physical examinations for Neonatal patients.
10. Critically analyze information and interpret test results relevant to Neonatal patients.

3) PSE – PHO

2. Elicit accurate, organized and appropriate focused histories for haematology-oncology patients.
4. Conduct accurate, sensitive and organized physical examinations for haematology-oncology patients.
10. Critically analyze information and interpret test results relevant to haemoatology-oncology patients.

MODIFIED version 1 → version 2/FINAL

17 - 24) ‘Daily’ PSE

- For this draft, minor phrases were changed. In addition, the MSLQ questions scale was changed to be more consistent with the rest of the survey for ease of use and flow.
- Finally, overall formatting; as well as rephrasing of the response scale from “much better” to “much more confident”.

FINAL/version 2: Perceived Self-efficacy (PSE) survey
17) Daily PSE – PMW – MBBS 3

Daily Rounds: Perceived Self-Efficacy – PMW – MBBS 3

*After presenting your patient on **paediatric ward rounds today . . .***

1) How **self-confident** are you about obtaining an accurate and organized **history** for a paediatric patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

2) How **self-confident** are you about obtaining an accurate and organized **physical exam** for a paediatric patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

3) How **self-confident** are you to summarize the pertinent information from a paediatric patient's **history** on ward rounds in an accurate and organized manner?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

4) How **self-confident** are you to summarize the pertinent information from a paediatric patient's **physical exam** on ward rounds in an accurate and organized manner?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

FINAL/version 2: Perceived Self-efficacy (PSE) survey
17) Daily PSE – PMW – MBBS 3 – cont.

*Please rate the following items based on your behavior on **paediatric** ward rounds **today.***

5) Compared with other students on ward rounds I think I know a great deal about paediatrics.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

6) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
o	o	o	o	o

7) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

FINAL/version 2: Perceived Self-efficacy (PSE) survey
18) Daily PSE – PMW – MBBS 5

Daily Rounds: Perceived Self-Efficacy – PMW – MBBS 5

*After presenting your patient on **paediatric ward rounds today . . .***

1) How **self-confident** are you to generate and narrow a meaningful differential diagnosis for a paediatric patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

2) How **self-confident** are you to critically analyze information and interpret test results for a paediatric patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

3) How **self-confident** are you to competently devise a management plan for a paediatric patient that does not require much addendum from the consulting physician?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

FINAL/version 2: Perceived Self-efficacy (PSE) survey
18) Daily PSE – PMW – MBBS 5 – cont.

*Please rate the following items based on your behavior on **paediatric** ward rounds **today.***

4) Compared with other students on ward rounds I think I know a great deal about paediatrics.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

5) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
o	o	o	o	o

6) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

FINAL/version 2: Perceived Self-efficacy (PSE) survey
19) Daily PSE – PMW – Residents

Daily Rounds: Perceived Self-Efficacy – PMW – Residents

*After presenting your patient on **paediatric ward rounds today . . .***

1) How **self-confident** are you to generate and narrow a meaningful differential diagnosis for a paediatric patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

2) How **self-confident** are you to critically analyze information and interpret test results for a paediatric patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

3) How **self-confident** are you to competently devise a management plan for a paediatric patient that does not require much addendum from the consulting physician?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

FINAL/version 2: Perceived Self-efficacy (PSE) survey
19) Daily PSE – PMW – Residents – cont.

*Please rate the following items based on your behavior on **paediatric** ward rounds **today.***

4) Compared with other residents on ward rounds I think I know a great deal about paediatrics.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

5) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
o	o	o	o	o

6) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

FINAL/version 2: Perceived Self-efficacy (PSE) survey
20) Daily PSE – NNU – MBBS 3

Daily Rounds: Perceived Self-Efficacy – NNU – MBBS 3

*After presenting your patient on **neonatal ward rounds today . . .***

1) How **self-confident** are you about obtaining an accurate and organized **history** for a neonatal patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

2) How **self-confident** are you about obtaining an accurate and organized **physical exam** for a neonatal patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

3) How **self-confident** are you to summarize the pertinent information from a neonatal patient's **history** on ward rounds in an accurate and organized manner?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

4) How **self-confident** are you to summarize the pertinent information from a neonatal patient's **physical exam** on ward rounds in an accurate and organized manner?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

FINAL/version 2: Perceived Self-efficacy (PSE) survey
20) Daily PSE – NNU – MBBS 3 – cont.

*Please rate the following items based on your behavior on **neonatal** ward rounds **today.***

5) Compared with other students on ward rounds I think I know a great deal about neonatology.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

6) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
o	o	o	o	o

7) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

FINAL/version 2: Perceived Self-efficacy (PSE) survey
21) Daily PSE – NNU – MBBS 5

Daily Rounds: Perceived Self-Efficacy – NNU – MBBS 5

*After presenting your patient on **neonatal ward rounds today . . .***

1) How **self-confident** are you to generate and narrow a meaningful differential diagnosis for a neonatal patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

2) How **self-confident** are you to critically analyze information and interpret test results for a neonatal patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

3) How **self-confident** are you to competently devise a management plan for a neonatal patient that does not require much addendum from the consulting physician?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

FINAL/version 2: Perceived Self-efficacy (PSE) survey
21) Daily PSE – NNU – MBBS 5 – cont.

*Please rate the following items based on your behavior on **neonatal** ward rounds **today.***

4) Compared with other students on ward rounds I think I know a great deal about neonatology.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

5) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
o	o	o	o	o

6) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

FINAL/version 2: Perceived Self-efficacy (PSE) survey
22) Daily PSE – NNU – Residents

Daily Rounds: Perceived Self-Efficacy – NNU – Residents

*After presenting your patient on **neonatal ward rounds today . . .***

1) How **self-confident** are you to generate and narrow a meaningful differential diagnosis for a neonatal patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

2) How **self-confident** are you to critically analyze information and interpret test results for a neonatal patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

3) How **self-confident** are you to competently devise a management plan for a neonatal patient that does not require much addendum from the consulting physician?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

FINAL/version 2: Perceived Self-efficacy (PSE) survey
22) Daily PSE – NNU – Residents – cont.

*Please rate the following items based on your behavior on **neonatal** ward rounds **today.***

4) Compared with other residents on ward rounds I think I know a great deal about neonatology.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

5) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
o	o	o	o	o

6) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

FINAL/version 2: Perceived Self-efficacy (PSE) survey
23) Daily PSE – PHO – MBBS 5

Daily Rounds: Perceived Self-Efficacy – PHO – MBBS 5

*After presenting your patient on **paediatric haematology-oncology ward rounds today . . .***

1) How **self-confident** are you to generate and narrow a meaningful differential diagnosis for a paediatric haematology-oncology patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

2) How **self-confident** are you to critically analyze information and interpret test results for a paediatric haematology-oncology patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

3) How **self-confident** are you to competently devise a management plan for a paediatric haematology-oncology patient that does not require much addendum from the consulting physician?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

FINAL/version 2: Perceived Self-efficacy (PSE) survey
23) Daily PSE – PHO – MBBS 5 – cont.

*Please rate the following items based on your behavior on **paediatric haematology-oncology** ward rounds **today.***

4) Compared with other students on ward rounds I think I know a great deal about paediatric haematology-oncology.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

5) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
o	o	o	o	o

6) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

FINAL/version 2: Perceived Self-efficacy (PSE) survey
24) Daily PSE – PHO – Residents

Daily Rounds: Perceived Self-Efficacy – PHO – Residents

*After presenting your patient on **paediatric haematology-oncology ward rounds today . . .***

1) How **self-confident** are you to generate and narrow a meaningful differential diagnosis for a paediatric haematology-oncology patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

2) How **self-confident** are you to critically analyze information and interpret test results for a paediatric haematology-oncology patient?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

3) How **self-confident** are you to competently devise a management plan for a paediatric haematology-oncology patient that does not require much addendum from the consulting physician?

Much less confident	Slightly less confident	Confidence unchanged	Slightly more confident	Much more confident
o	o	o	o	o

FINAL/version 2: Perceived Self-efficacy (PSE) survey
24) Daily PSE – PHO – Residents – cont.

*Please rate the following items based on your behavior on **paediatric haematology-oncology** ward rounds **today.***

4) Compared with other residents on ward rounds I think I know a great deal about paediatric haematology-oncology.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

5) I am so nervous during ward rounds that I cannot remember facts I have learned.

Never	Once in a while	Sometimes	Often	All the time
o	o	o	o	o

6) I have an uneasy, upset feeling when I am on ward rounds.

Not like me at all	Mostly not like me	Somewhat like me	Mostly like me	Very much like me
o	o	o	o	o

Final Version Daily PSE by sub-category

Level of Training	Mastery Experience	Vicarious Experience	Psychological Experience
MBBS 3 Daily PSE	Q. 1, 2, 3 & 4	Q. 5	Q. 6 & 7
MBBS 5 & Residents Daily PSE	Q. 1, 2 & 3	Q. 4	Q. 5 & 6

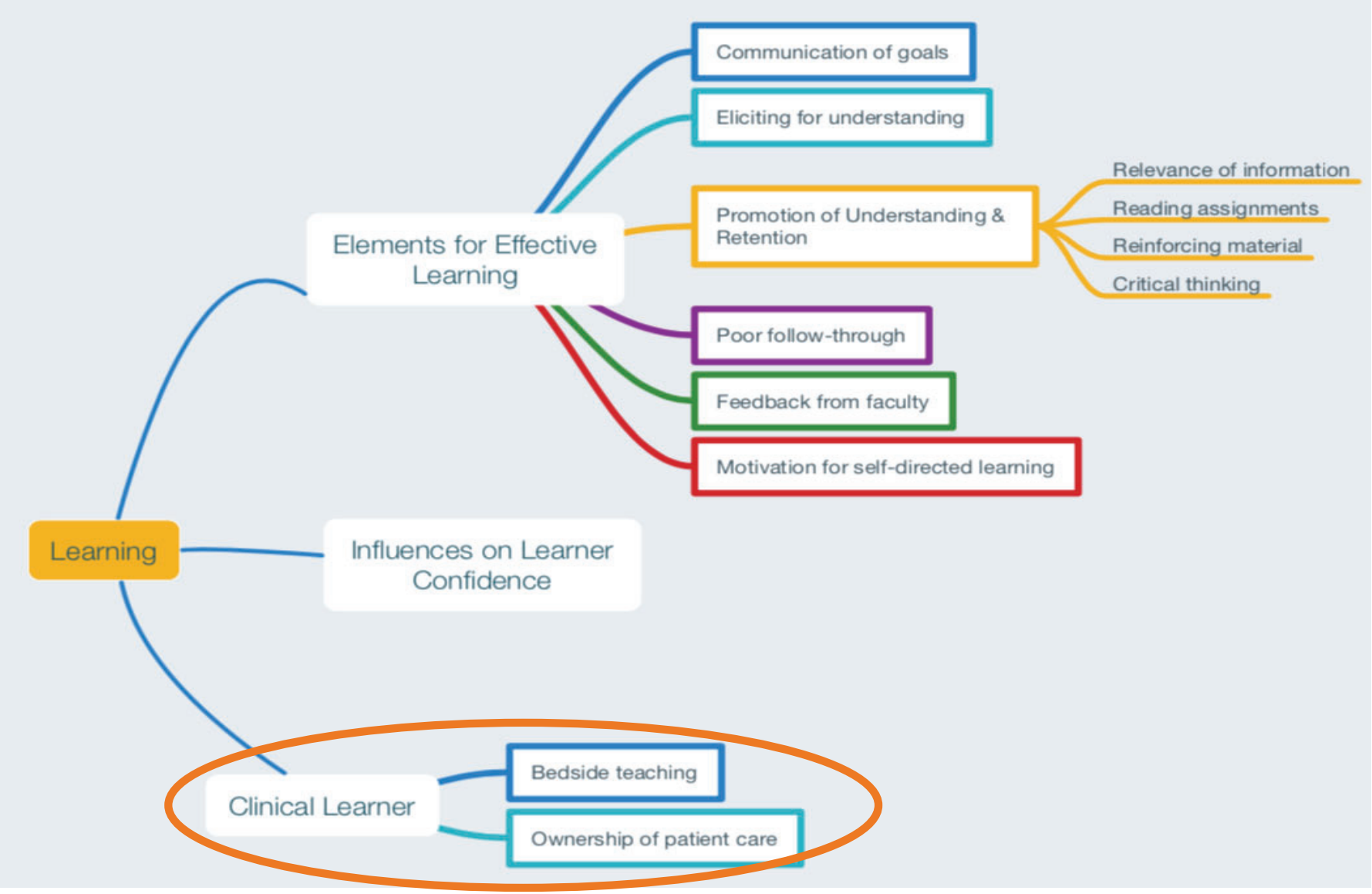
Project Measures & DCTs/surveys

- We continued our process by considering our sixth primary driver:

  #6 Promote trainees' sense of participation in, and belonging to, the departmental community of practice on ward rounds

Primary Driver #6 – Promote trainees' sense of participation in, and belonging to, the departmental community of practice on ward rounds

Phase 1 Results



Primary Driver	Related Phase 1 QUAL Themes	Related Phase 1 QUAN Surveys	Further Literature Review	Notes & Possible data collection ideas
#6) Promote trainees' sense of participation in, and belonging to, the departmental community of practice on ward rounds by increasing opportunities for work of engagement: (i) participation and (ii) re-itification	Clinical learner Bedside teaching Ownership of patient care Participants described the feeling of growth and confidence that comes from direct clinical care and patient responsibility. "On ward rounds . . . it's like you own the patient. And then made you feel like you are the real doctor, not a student as we are."	Of the 22 questions related to the trainees' participation and reification as part of the work of engagement, the students mean score was 64%. Specifically, their mean score for participation was 63%; and for reification the mean score was 64%. Five of these questions scored a 2.5 or below. The residents' mean score was 66%. Specifically, their mean score for participation was 67%; and for reification the mean score was 58%. Four of these questions scored a 2.5 or below.	1) Feb 2018 "Medicine as a Community of Practice: Implications for Medical Education" which under 'Chart Progress Toward Full Membership' 2) Amending Miller's Pyramid to Include Professional Identity Formation, Feb 2016.	In general, there was a poor sense of trainees participation and belonging to the COP of the dept. There were several aspects which contributed to this, including the imposed hierarchy within the department, poor communication of goals and an overall paucity of feedback for trainees. Despite this, when trainees were engaged in the pre-round and providing direct patient care during bedside teaching, then they expressed several qualities related to their 'growth' and 'becoming' a physician.

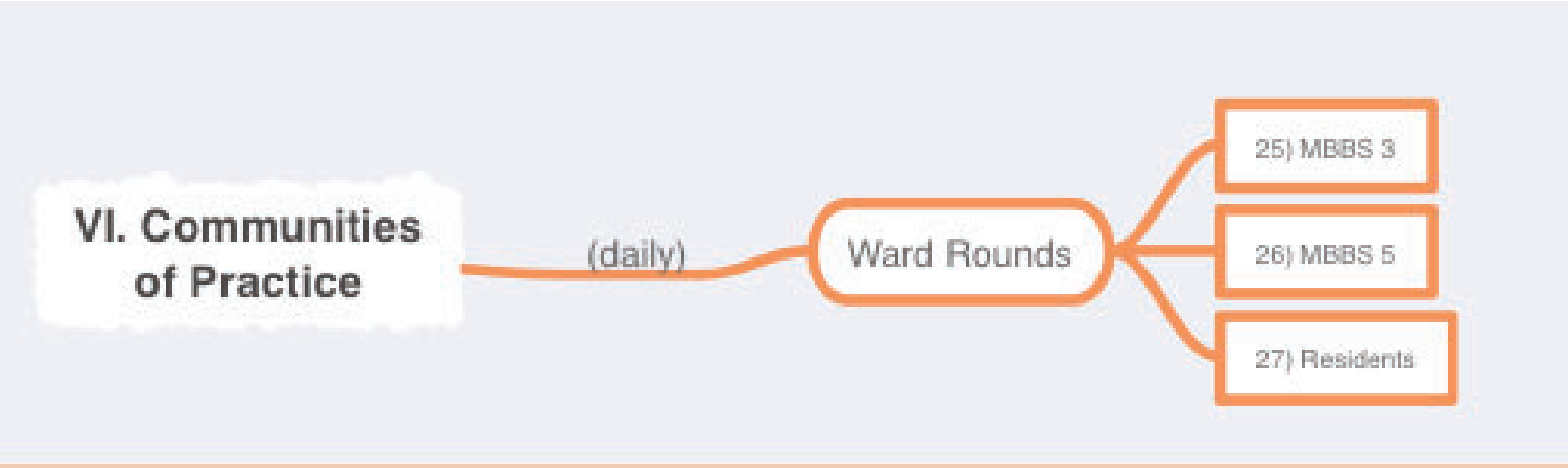
Measuring Primary Driver #6

Promote trainees' sense of participation in, and belonging to, the departmental community of practice on ward rounds (COP)

- To measure the trainees' COP, we went back to the original Elements for Effective Learning (EEL) survey, which had embedded COP questions, developed for Phase 1 of the study.
- Specifically, questions 1-8, 17-22, 24-29, 31-32, and 35-36 all related to COP 'participation' and 'reificaiton' as part of the work of engagement. To create a modified COP survey, we used only the EEL questions related to COP.
- While we felt that Phase 1 data collection was sufficient in regards to COP, we chose to modify the original COP survey to be more aligned with the findings from the Phase 1 results and further literature review. We also wanted to create a shorter survey to prevent survey fatigue and remove any redundant questions that might be covered elsewhere.

Project Measures & DCTs/Surveys

- The following is a how the original COP survey was modified to measure our sixth project measure.



ORIGINAL: Community of Practice survey (from EEL survey)

Elements for Effective Learning on Ward Rounds Survey
Community of Practice Sub-theme

This questionnaire is designed to help us get a better understanding of your perspective of paediatric ward rounds.

Your answers will be kept ***strictly confidential*** and will not be identified by name.

Please circle one:

Are you a 'medical student' or 'paediatric resident'?

Please rate your level of agreement with the statement based on a scale of:

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
0	1	2	3	4	5

Question:	**0**	**1**	**2**	**3**	**4**	**5**
1. Paediatric ward rounds have a learning environment where I feel ***involved*** to perform as the ***presenting*** medical student or resident.						
2. Paediatric ward rounds have a learning environment where I feel ***stimulated*** to perform as the ***presenting*** medical student or resident.						
3. Paediatric ward rounds have a learning environment where I feel ***respected*** to perform as the ***presenting*** medical student or resident.						

ORIGINAL: Community of Practice survey (from EEL survey) – cont.

4. Paediatric ward rounds have a learning environment where I feel ***comfortable*** to perform as the ***presenting*** medical student or resident.						
5. Paediatric ward rounds have a learning environment where I feel ***involved*** to actively participate as a ***member*** of the team.						
6. Paediatric ward rounds have a learning environment where I feel ***stimulated*** to actively participate as a ***member*** of the team.						
7. Paediatric ward rounds have a learning environment where I feel ***respected*** to actively participate as a ***member*** of the team.						
8. Paediatric ward rounds have a learning environment where I feel ***comfortable*** to actively participate as a ***member*** of the team						
17. The goals and objectives of ***paediatric ward rounds*** have been clearly explained to me.						

ORIGINAL: Community of Practice survey (from EEL survey) – cont.

18. I understand the purpose of ***paediatric ward rounds.***						
19. The goals and objectives of my role as a ***presenter*** during paediatric ward rounds have been clearly explained to me.						
20. I understand what is expected of me ***as a presenter*** during paediatric ward rounds.						
21. The goals and objectives of my role as a ***participant*** during paediatric ward rounds have been clearly explained to me.						
22. I understand what is expected of me ***as a participant*** during paediatric ward rounds.						
24. During paediatric ward rounds, I am encouraged to ask questions.						
25. During paediatric ward rounds, I am stimulated to make comparisons and evaluations about my patients' diagnosis.						
26. During paediatric ward rounds, I am encouraged to discuss my differential diagnoses.						
27. During paediatric ward rounds, I am encouraged to discuss my thought process about my management plan.						
28. During paediatric ward rounds, my role is limited to reporting or summarizing the patient case.						

ORIGINAL: Community of Practice survey (from EEL survey) – cont.

29. During paediatric ward rounds, if I am asked a question, it is usually asking only about facts, not my thinking process.						
31. I receive frequent positive and constructive feedback after paediatric ward rounds.						
32. The feedback I receive relates to a specific behavior. (i.e. something I did or didn't do and can adjust).						
35. I feel confident that I can utilize my available resources to read up on patients and topics after ward rounds.						
36. I feel that those resources are adequate for my learning.						

ORIGINAL → MODIFIED version 1
25, 26 & 27) COP survey

- While the goal of the survey had not changed (we still wanted to gain insight into trainees' sense of participation in, and belonging to, the departmental community of practice on ward rounds) we wanted to approach this by answering a few targeted questions:

    1) Was there engagement?,

    2) Was the trainee allowed to contribute?

    3) Did the faculty provide feedback to "refine practice"? and

    4) Was the engagement/feedback helpful?

ORIGINAL → MODIFIED version 1

25, 26 & 27) COP survey

- But we wanted these questions to be answered in the same context of the ward rounds. So we reframed the COP questions to align with SNAPPS during a ward round as a means to measure trainees' COP.

Measuring Primary Driver #6

Promote trainees' sense of participation in, and belonging to, the departmental community of practice on ward rounds (COP)

SNAPPS	Observation & Learning Tool for Clinical Supervision	CoP (Participation & Reitification/Feedback)
S **Take Hx** **Do Exam** **Present Hx** **Present Exam**		Present findings (feedback)
N **Generate DDx** **Narrow DDx**		Discussed w/ consultant (feedback)
A **Analyzed ?** **Analyzed test** **Integrates prior knowledge**		Discussed w/ consultant (feedback)
P **Probe preceptor**		Ask questions form consultant Seek help with necessary
P **Make plan**		Discussed w/ consultant *Make plan happen *Ward work
S **Select topic**		Self-directed learning
+ Feedback	Want to align the feedback description from this survey.	

MODIFIED version 1: Community of Practice survey

Daily - COP

Summarize:
Present findings, (feedback)

Narrow:
Discussed w/ consultant (feedback)
26. During paediatric ward rounds, I was encouraged to discuss my differential diagnoses.

Analyzed:
Discussed w/ consultant (feedback)
25. During paediatric ward rounds, I was stimulated to make comparisons and evaluations about my patients' diagnosis.
27. During paediatric ward rounds, I was encouraged to discuss my thought process about my management plan.
29. During paediatric ward rounds, if I am asked a question, it is usually asking only about facts, not my thinking process.

Probe:
Ask questions form consultant
Seek help with necessary
24. During paediatric ward rounds, I was encouraged to ask questions.

MODIFIED version 1: Community of Practice survey– cont.

Plan:
Discussed w/ consultant (feedback)
*Make plan happen
*Ward work
28. During paediatric ward rounds, my role was limited to reporting or summarizing the patient case.

Select topic:
Self-directed learning

Feedback:
31. I receive frequent positive and constructive feedback after paediatric ward rounds.
32. The feedback I receive relates to a specific behavior. (i.e. something I did or didn't do and can adjust).

MODIFIED version 1 → version 2

25, 26 & 27) COP survey

- I then went back to the literature to look for commonly used ways to measure trainees' sense of COP. Interesting, after reviewing the literature, while an important topic, I found no successful and universally validated tool to measure COP for trainees.
- *Note:* I later found Manchester Clinical Placement Index (MCPI), but only after the project data collection had ended.[127]

MODIFIED version 1 → version 2

25, 26 & 27) COP survey

- Since I had not found a validated tool to measure COP for trainees, I went back to our Phase 1 qualitative data to deductively evaluate further for themes and quotes related to communities of practice.
- I found quotes and vocabulary that were used to describe by trainees a shift in their "Is Level"[167] . . . "real doctor, not just student" and sense of increased responsibility, confidence, and engagement. I also found several quotes that perpetuated trainees sense as 'outsiders' to the COP: "not even there", "just a secretary". I then used these descriptions to generate rough draft questions for the DCT.

Measuring Primary Driver #6

Promote trainees' sense of participation in, and belonging to, the departmental community of practice on ward rounds (COP)

List of Indicators of COP	
COP Literature Review	COP from FGD/I (Legitimate Participation)
- participation **- re-itification** **- "engage and contribute"** **- "refine practice and ensure new members."** **- verbalises his/her thinking, a space for participation is created** **- Because joining medicine's community of practice is indivisibly linked to the acquisition of a professional identity, progress toward membership in the community can be gauged by measuring progress toward "thinking, acting, and feeling like a doctor."1** **- individuals move from peripheral to full participation in the community at different rates.** **- development of a professional identity, engendering a feeling of confidence and a sense of belonging** **- "think, act, and feel like a physician."** **- scale: "first-day student toward qualified doctor"**	+/- listed from FGD/I Bedside Teaching: Involved Practical Experience Apply knowledge Applicable Textbook to patient Hands-on Learner Involvement: Ignored Involved Engaged, not engaged Asked questions, discussed Didn't ask questions, didn't discuss Discuss amongst themselves Interactive One-way traffic, not interactive Just makes the addendum w/o discussing

Measuring Primary Driver #6

Promote trainees' sense of participation in, and belonging to, the departmental community of practice on ward rounds (COP)

List of Indicators of COP	
COP Literature Review	COP from FGD/I (Legitimate Participation)
**** There's a lot more literature on feedback – giving & receiving, and we'll need to create sessions just for this, but for the purposes of this, I want to know did they get any and if yes, was it helpful, and how did it make them feel: empowered vs demoralized?** **From Peer Assessment Tool (PAT) – this is all related to feedback** **Step 3: Ends the supervision** **7. States . . .** **(a) strengths: what is mastered** **(b) new learning** **(c) what has to be learned**	Ownership of Patient Care Responsibility Support Manage team Confidence Just a secretary Own decisions Real doctor, not just student Ownership The pre-round is good for ownership Feedback from Faculty - need feedback to gage where you are as a learner - positive feedback reinforces learning - positive feedback encourages you - constructive criticism can give you an edge to improve - negative feedback needs to be constructive, not demoralizing - when feedback feels like an embarrassment, you don't learn - criticize you in a way that you'll be able to learn tomorrow - criticize you without correcting you, just leave you in the air - continuous feedback during the rotation would be better than just at the end - constructive feedback helped me improve for other rotations & identify where I can improve

MODIFIED version 2: Community of Practice survey

Daily – COP

SNAPPS	Question *During ward rounds today, when you presented your patient . . .*	Scale
Summarize		Disagree - Agree
Narrow differential	26) . . . were you encouraged to discuss your differential diagnoses? **Might need to change this for NNU and PHO where the differential isn't the main thing	
Analyze differential	25. ~~During paediatric ward rounds,~~ were you stimulated to make comparisons about your patients' differential diagnosis? 29. ~~During paediatric ward rounds,~~ were you asked any questions? If yes, did these questions ask about facts? Or did they ask about your thinking process?	
Probe preceptor	24. During paediatric ward rounds, were you encouraged to ask questions?	
Plan	27. ~~During paediatric ward rounds,~~ were you encouraged to discuss your thought process about your management plan? NQ: When the consultant created the addendum, were you involved in the new plan? NQ: Did you feel ignored on ward rounds today? ~~28. During paediatric ward rounds,~~ was your role limited to reporting or summarizing the patient case?	

MODIFIED version 2: Community of Practice survey – cont.

Self-directed learning		
+Feedback	31. I receive frequent positive and constructive feedback after paediatric ward rounds. 32. The feedback I receive relates to a specific behavior. (i.e. something I did or didn't do and can adjust). *During ward rounds today, when you presented your patient . . . did you receive constructive feedback?* *If yes, did the feedback you received relate to a specific behavior that you can change? (i.e. something you did or didn't do and can adjust)?* *Was the feedback helpful?* (c) Did the feedback you received make you feel embarrassed or demoralized? (d) Did the feedback you received make you feel encouraged to improve? **were you encouraged to reflect on your own strengths/limitations before being given feedback?	

MODIFIED version 2: Community of Practice survey – cont.

Ownership of Patient Care Responsibility Support Manage team Confidence Just a secretary Own decisions Real doctor, not just student Ownership The pre-round is good for ownership	in a way that made them feel confident and toward 'thinking, acting, and feeling like a physician/paediatrician'. On ward rounds today when presenting your patient, ~~do you feel confident that you . . .?~~ did you get to *think* like a physician? Did you get to *act* like a physician? Did you get to *feel* like a physician? "first-day student and qualified doctor" --- On ward rounds today when presenting your patient, mark on the line below where did you get the opportunity to *think* like a paediatrician? Did you get the ~~opportunity~~ to *act* like a paediatrician? Did you get to *feel* like a paediatrician? "first-day resident and qualified paediatrician" ---	

MODIFIED version 2 → version 3

25, 26 & 27) COP survey

- For the following draft, based on the above, I flushed out several specific questions and added a response scale. I chose a 5-point, unipolar scale for ease and to allow for a 'neutral' response.
- The DCT was stratified between medical students and junior residents, but not for wards.

MODIFIED version 3: Community of Practice survey

Daily Rounds: Communities of Practice – Students

*Turn into statements so that they can either agree/disagree; turn into first person and get feedback from the students and residents for if they prefer first or second person.

1) During ward rounds today, when you presented your patient, ~~were~~ you were asked ~~encouraged~~ to discuss your differential diagnoses~~?~~. → Yes/No; **how much were you encouraged to discuss your differential diagnosis?**

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
Not at all	A little bit	Somewhat	Quite a bit	A great amount

2) During ward rounds today, when you presented your patient, were you asked ~~stimulated~~ to make comparisons about your patients' differential diagnosis? → Yes/No; **how much were you stimulated to make comparisons about your patient's differential?**

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
Not at all	A little bit	Somewhat	Quite a bit	A great amount

3) During ward rounds today, when you presented your patient, were you asked any questions? how many questions were you asked?

No	Yes

Nothing/none	A few	Some	Quite a few	A great amount

**If 'No', skip to Question 4*

MODIFIED version 3: Community of Practice survey – cont.

(a) Did these questions ask only about facts? How many of these questions were only about facts?

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
~~Never~~	~~Almost never~~	~~Sometimes~~	~~Almost always~~	~~Always~~
~~None~~	~~Almost none~~	~~Some~~	~~Almost all~~	~~All~~
Nothing/none	A few	Some	Quite a few	A great amount

(b) Did these questions ask about your thinking process?

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
~~Never~~	~~Almost never~~	~~Sometimes~~	~~Almost always~~	~~Always~~
Not at all	A little bit	Somewhat	Quite a bit	A great amount

4) During ward rounds today, when you presented your patient, how much were you encouraged to ask the consultant questions?

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
Not at all	A little bit	Somewhat	Quite a bit	A great amount

MODIFIED version 3: Community of Practice survey - cont.

5) During ward rounds today, when you presented your patient, how much/ did the consultant ~~were you~~ encouraged you to discuss your thought process about your management plan. *quantify the frequency of something; quantity/volume of encouragement

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree

6) During ward rounds today, when you presented your patient, ~~was your role limited to reporting or summarizing the patient case?~~ how much was your role was limited to reporting or summarizing the patient case.

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree

7) During ward rounds today, when the consultant created the addendum, ~~were you involved in the new plan?~~ how much you were involved in the new plan.

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree

8) Did you feel ignored on ward rounds today? How often did you feel ignored on the ward round today?

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
Not at all	A little bit	Somewhat	Quite a bit	A great amount

MODIFIED version 3: Community of Practice survey – cont.

9) During ward rounds today, when you presented your patient, how much feedback did you receive from the consultant?

~~No~~	~~Yes~~

~~Not at all~~	~~A little bit~~	~~Somewhat~~	~~Quite a bit~~	~~A great amount~~
None	A little bit	Some	Quite a bit	A great amount

If 'No', skip to question 10.

(a) How much were you encouraged to reflect on your own strengths/limitations before being given feedback?

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
Not at all	A little bit	Somewhat	Quite a bit	A great amount

(b) How helpful did you find the feedback?

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
Not at all	A little bit	Somewhat	Quite a bit	A great amount

*If there is a "yes" response, it helps us quantify 'how much'

MODIFIED version 3: Community of Practice survey – cont.

(c) How much of the feedback you received relate to a specific behavior that you can change? (i.e. something you did or didn't do that you can adjust?)

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
None	A little bit	Some	Quite a bit	A great amount

(d) How much of the feedback you received made you feel embarrassed or demoralized?

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
None	A little bit	Some	Quite a bit	A great amount

(e) How much of the feedback you received made you feel encouraged to improve?

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
None	A little bit	Some	Quite a bit	A great amount

MODIFIED version 3: Community of Practice survey – cont.

10) During ward rounds today, when you presented your patient, how much did you get to *think* like a doctor?

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
Not at all	A little bit	Somewhat	Quite a bit	A great amount

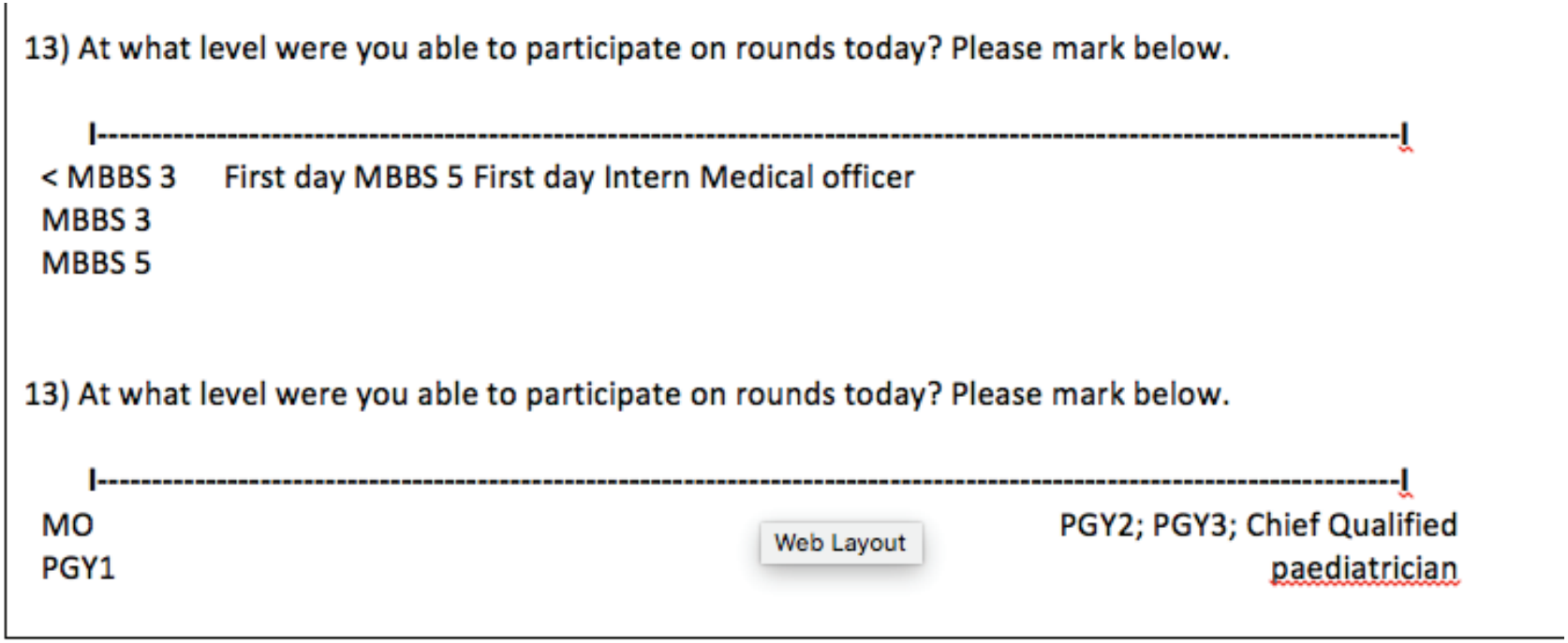
11) During ward rounds today, when you presented your patient, how much did you get to *act* like a doctor?

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
Not at all	A little bit	Somewhat	Quite a bit	A great amount

12) During ward rounds today, when you presented your patient, how much did you get to *feel* like a doctor?

Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
Not at all	A little bit	Somewhat	Quite a bit	A great amount

MODIFIED version 3: Community of Practice survey – cont.



MODIFIED version 3 → version 4/FINAL
25, 26 & 27) COP survey

- For the final draft, minor modifications to the format were made.

FINAL/version 3: Community of Practice survey
25 & 26) COP survey – MBBS 3 & MBBS 5

Daily Rounds: Communities of Practice – Students

1) During ward rounds today, when you presented your patient, how much were you encouraged to discuss your differential diagnosis?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

2) During ward rounds today, when you presented your patient, how much were you stimulated to make comparisons about your patient's differential?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

3) During ward rounds today, when you presented your patient, how many questions were you asked?

None	A few	Some	Quite a few	A great amount
o	o	o	o	o

**If 'None', skip to Question 4*

(a) How many of these questions were only about facts?

None	A few	Some	Quite a few	A great amount
o	o	o	o	o

(b) How many of these questions asked about your thinking process?

None	A few	Some	Quite a few	A great amount
o	o	o	o	o

FINAL/version 3: Community of Practice survey
25 & 26) COP survey – MBBS 3 & MBBS 5 – cont.

4) During ward rounds today, when you presented your patient, how much were you encouraged to ask the consultant questions?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

5) During ward rounds today, when you presented your patient, how much did the consultant encourage you to discuss your thought process about your management plan?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

6) During ward rounds today, when you presented your patient, how much was your role limited to reporting the patient case.

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

7) During ward rounds today, when the consultant created the addendum, how much you were involved in the new plan.

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

8) How often did you feel ignored on the ward round today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

FINAL/version 3: Community of Practice survey
25 & 26) COP survey – MBBS 3 & MBBS 5 – cont.

9) During ward rounds today, when you presented your patient, how much feedback did you receive from the consultant?

None	A few	Some	Quite a few	A great amount
o	o	o	o	o

If 'None', skip to question 10.

(a) How much were you encouraged to reflect on your own strengths and/or limitations before being given feedback?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

(b) How helpful did you find the feedback?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

(c) How much of the feedback you received relate to a specific behavior that you can change? (i.e. something you did or didn't do that you can adjust?)

None	A few	Some	Quite a few	A great amount
o	o	o	o	o

(d) Did the feedback you received make you feel embarrassed or demoralized?

None	A few	Some	Quite a few	A great amount
o	o	o	o	o

(e) Did the feedback you received make you feel encouraged to improve?

None	A few	Some	Quite a few	A great amount
o	o	o	o	o

FINAL/version 3: Community of Practice survey
25 & 26) COP survey – MBBS 3 & MBBS 5 – cont.

10) During ward rounds today, when you presented your patient, how much did you get to *think* like a doctor?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

11) During ward rounds today, when you presented your patient, how much did you get to *act* like a doctor?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

12) During ward rounds today, when you presented your patient, how much did you get to *feel* like a doctor?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

13) At what level were you able to participate on rounds today? Please mark below.

I----------I

MBBS 3 **MBBS 5** **Intern**

FINAL/version 3: Community of Practice survey
27) COP survey – Residents

Daily Rounds: Communities of Practice – Residents

1) During ward rounds today, when you presented your patient, how much were you encouraged to discuss your differential diagnosis?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

2) During ward rounds today, when you presented your patient, how much were you stimulated to make comparisons about your patient's differential?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

3) During ward rounds today, when you presented your patient, how many questions were you asked?

None	A few	Some	Quite a few	A great amount
o	o	o	o	o

**If 'None', skip to Question 4*

(a) How many of these questions were only about facts?

None	A few	Some	Quite a few	A great amount
o	o	o	o	o

(b) How many of these questions asked about your thinking process?

None	A few	Some	Quite a few	A great amount
o	o	o	o	o

FINAL/version 3: Community of Practice survey
27) COP survey – Residents – cont.

4) During ward rounds today, when you presented your patient, how much were you encouraged to ask the consultant questions?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

5) During ward rounds today, when you presented your patient, how much did the consultant encourage you to discuss your thought process about your management plan?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

6) During ward rounds today, when you presented your patient, how much was your role limited to reporting the patient case.

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

7) During ward rounds today, when the consultant created the addendum, how much you were involved in the new plan.

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

8) How often did you feel ignored on the ward round today?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

FINAL/version 3: Community of Practice survey
27) COP survey – Residents – cont.

9) During ward rounds today, when you presented your patient, how much feedback did you receive from the consultant?

None	A few	Some	Quite a few	A great amount
o	o	o	o	o

If 'None', skip to question 10.

(a) How much were you encouraged to reflect on your own strengths and/or limitations before being given feedback?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

(b) How helpful did you find the feedback?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

(c) How much of the feedback you received relate to a specific behavior that you can change? (i.e. something you did or didn't do that you can adjust?)

None	A few	Some	Quite a few	A great amount
o	o	o	o	o

(d) Did the feedback you received make you feel embarrassed or demoralized?

None	A few	Some	Quite a few	A great amount
o	o	o	o	o

(e) Did the feedback you received make you feel encouraged to improve?

None	A few	Some	Quite a few	A great amount
o	o	o	o	o

FINAL/version 3: Community of Practice survey
27) COP survey – Residents – cont.

10) During ward rounds today, when you presented your patient, how much did you get to *think* like a paediatrician?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

11) During ward rounds today, when you presented your patient, how much did you get to *act* like a paediatrician?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

12) During ward rounds today, when you presented your patient, how much did you get to *feel* like a paediatrcian?

Not at all	A little bit	Somewhat	Quite a bit	A great amount
o	o	o	o	o

13) At what level were you able to participate on rounds today? Please mark below.

I----------I

Junior Resident **Senior Resident** **Paediatrician**

Conclusion

- This concludes the process of developing the Phase 2 and 3 data collection tools and surveys.

F.3. Evolution of Phase 2 change ideas

Appendix F.3
Evolution & Development of ‘Change Ideas’

September 2017 – June 2018

Definition of Change Ideas

- ‘Change ideas’ are ideas generated by the project team, and are considered the ‘best guess’ hypothesis we think could lead to an improvement based on what is already known about the system in question.
- Change ideas are then tested using iterative PDSA cycles to see if in fact these ideas lead to improvement or not, which simultaneously builds more information about the system and allows for better hypothesis of which change ideas will lead to improvement.
- Change ideas are similar to ‘interventions’ but instead of pre-post testing, they are measured over time. Change ideas are not intended to be implemented right away, but must be tested first prior to implementation.[154,178]

Definition of Change Ideas

- During Phase 2, we generated several change ideas to be tested in Phase 3, but we did not run specific PDSA cycles as such, instead we continued to adhere to the cyclical action research process of Plan-Act-Observe-Reflect as a means to test our change ideas, recognizing that the "statistical control" used in QI methods may not adequately capture the complexity of our health professional education project.[127]

Approach to the evolution & development of our ‘change ideas’

- The following is a detailed description of our ten-month process to determine and develop our Phase 3 interventions (‘change ideas’). Guided by our collectively created driver diagram and influenced by Phase 1 results and ongoing literature review, we set out to determine and develop a set of activities that would have the most impact to optimize the learning and teaching on paediatric ward rounds during Phase 3 of our project.

Approach to the evolution & development of our ‘change ideas’

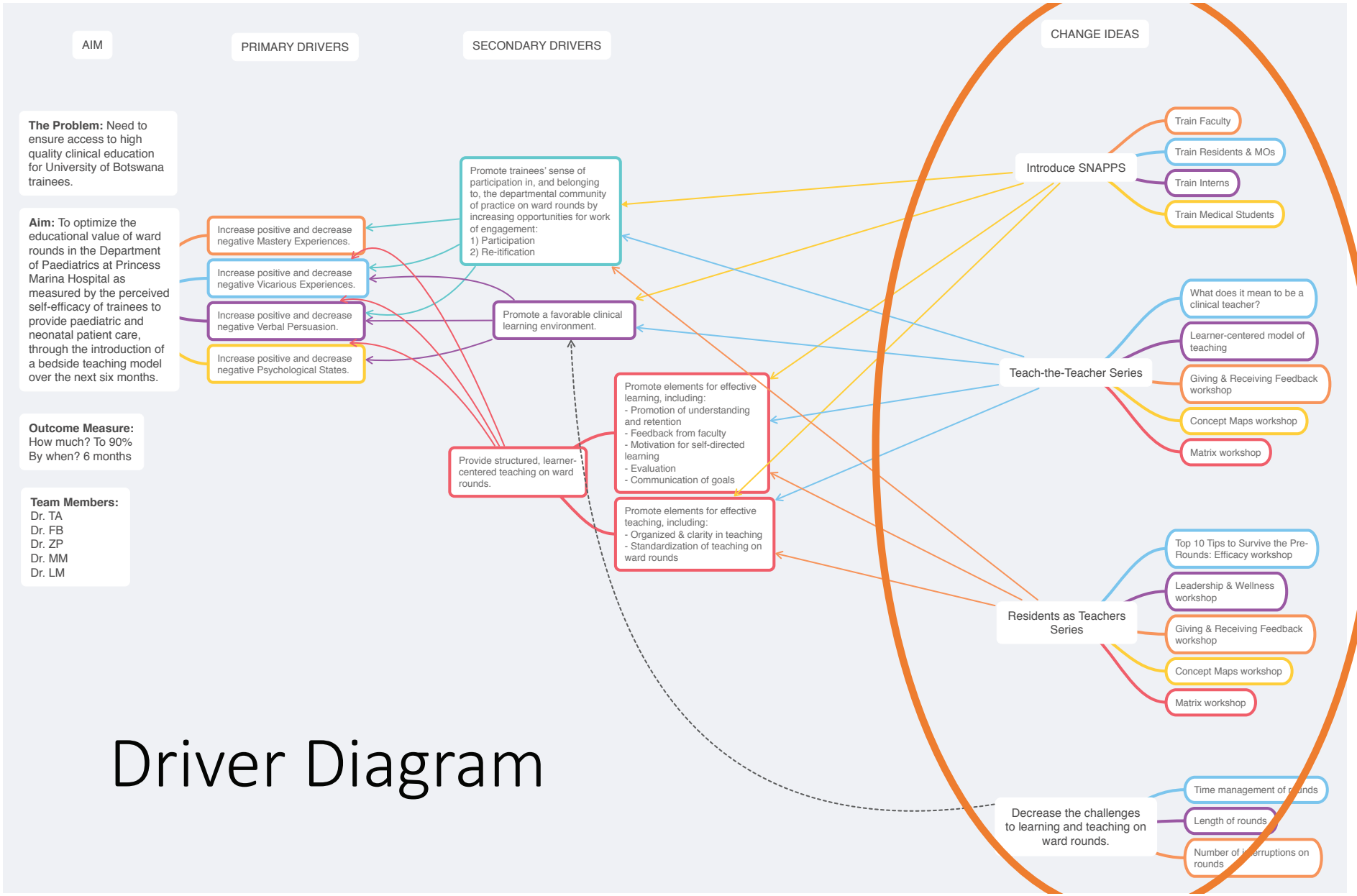
- Guided by our driver diagram, the change ideas generated are reflective of our primary and secondary drivers and the potential to influence them in a positive way so as to achieve our project aim.
- By the end of this process, we had three main change ideas that we felt confident would directly impact our primary and secondary drivers.

  1) Create and conduct a Teach-the-Teacher series

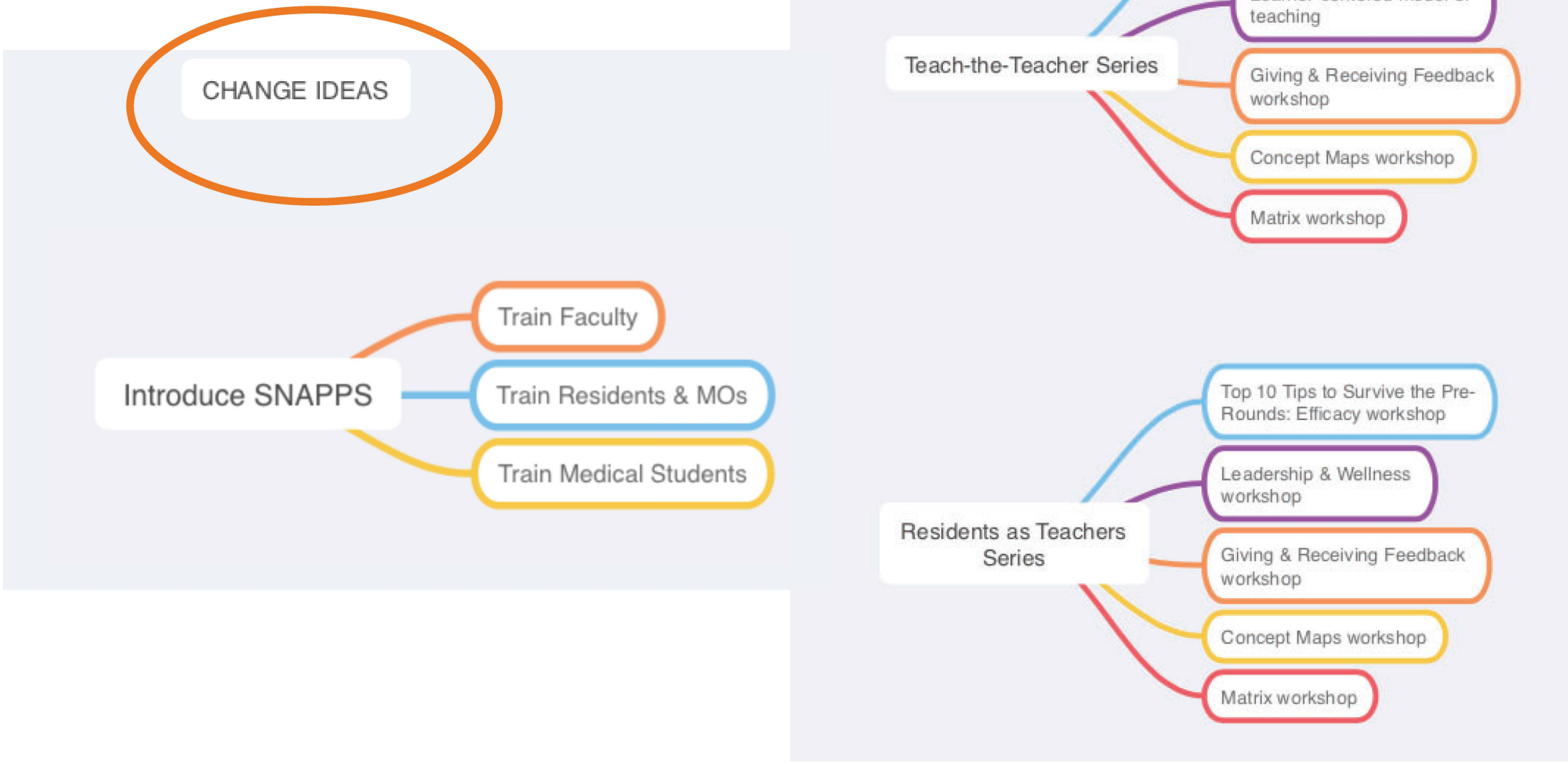
  2) Create and conduct a Resident-as-Teachers series

  3) Introduce a learner-centred bedside teaching model (SNAPPS)

- Of note, we thought of introducing several activities that might decrease some of the challenges to learning and teaching on ward rounds, such as changing start time of rounds, look at ways to decrease the frequency and number of interruptions on ward rounds, etc. but this was beyond the capacity of the project group at the time.



Driver Diagram


CHANGE IDEAS
Introduce SNAPPS
Train Faculty
Train Residents & MOs
Train Medical Students
Teach-the-Teacher Series
What does it mean to be a clinical teacher?
Learner-centered model of teaching
Giving & Receiving Feedback workshop
Concept Maps workshop
Matrix workshop
Residents as Teachers Series
Top 10 Tips to Survive the Pre-Rounds: Efficacy workshop
Leadership & Wellness workshop
Giving & Receiving Feedback workshop
Concept Maps workshop
Matrix workshop

Influences of Phase 1 Results on the development of Change ideas:

- After reviewing the results from Phase 1, several items were identified as potential areas for change:
  - promote effective clinical teaching
  - standardize clinical teachers within the department
  - improve faculty feedback
  - provide clear expectations to faculty, residents and students about the goals and objectives of ward rounds
  - provide more structure during rounds
  - improve resident efficiency

Influences of Phase 1 Results on the development of Change ideas:

- From these, we considered in which ways we could create educational sessions or provide material that might achieve improvement in those identified areas.
- For example:
  - Feedback was noted to be an issue, so we wanted to do a feedback workshop for faculty and residents.
  - Lack of resident preparedness for rounds gave us the idea to do a skills & efficiency workshop for the residents.
  - The ‘impact of the individual teacher’ theme indicated to us the high variation of our paediatricians’ teaching, so we wanted to do a “Teach-the-Teacher” series to create a clinical teaching standard within the department.

Influences of Phase 1 Results on the development of Change ideas:

- The project group's change ideas were supplemented by the literature and a ongoing reflection of the Phase 1 results. The literature helped to provide ideas and context for our initiatives. And by re-reading the Phase 1 direct quotes related to each primary driver, the intent was to be more participatory of the entire department, as well as to help generate other potential change ideas while remaining focused on the issues identified in Phase 1.

Influences of department feedback on the development of Change ideas:

- As we developed change ideas for our driver diagram, we continued to meet with the larger department for their input on our possible Phase 3 interventions. Their feedback helped to provide focus for several of our change ideas.
- Specifically, they encouraged us to develop interventions that would:

  1) ensure that bedside teaching was clinically related,

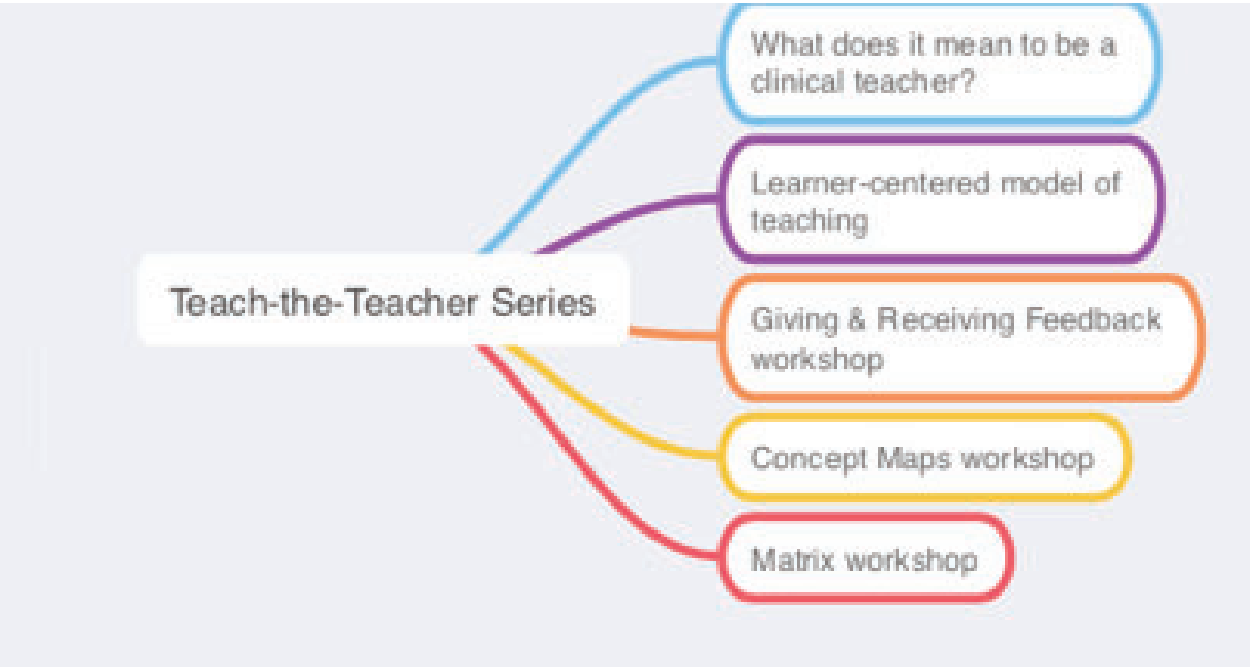
  2) promote a shift from ’worker-centred’ to ‘learner-centred’ rounds,

  3) provide additional training for juniors to better equip them to be prepared for the ward rounds, and

  4) most importantly, create a unified teaching model with embedded goals and objectives to create a general ‘standard’ on ward rounds for faculty and trainees

Influences of department feedback on the development of Change ideas:

- This feedback encouraged us to develop a ‘standard’ for clinical teaching within the department. This gave support for the creation of a faculty development course, which we called the **‘Teach-the-Teacher’** series. At the forefront of this series was answering the question: *“What does it mean to be a clinical teacher?”*



Influences of department feedback on the development of Change ideas:

- Similarly, this feedback encouraged us to develop a **'Residents-as-Teachers'** series which would support the ongoing training of residents, particularly in relationship to leadership and teaching skills.

Development of the educational series

- Based on the department feedback, their main concern was a need to create a department-wide defined goals and expectations for providing clinical teaching on the ward rounds. To this end, we reviewed Sommer et al.'s *Observation and Learning Tool for Clinical Supervision* (OLTCS).[100] There were several advantages to using the OLTCS to generate a clear model of goals and expectations for the faculty.

Development of the educational series

- First, unlike other descriptions of a ‘good clinical teacher’, as part of the OLTCS, it not only defines what characteristics and skills a clinical teacher ought to *possess*, but also *how* to do this. As such, within the OLTCS are clear descriptions of how an excellent clinical teacher provides bedside teaching, and simultaneously provides descriptions of what less than ideal clinical teaching scenario looks like. This allows the clinical teacher to directly compare him/herself with the description and evaluate their clinical teaching skills based on the description provided.

Development of the educational series

- Second, the OLTCS recognizes the limited time a practicing clinical physician has to learn new skills, therefore, they created their tool based on skills a practicing clinician is likely to already possess. Specifically, by using the Calgary-Cambridge Model and the patient-centered approach, they directly compare patient-centred skills and structure of a clinical encounter to learner-centred teaching and structure of an educational encounter, respectively.

Development of the educational series

- By doing this, they draw on strengths of the clinician rather than highlighting the teaching deficits – this has the potential to increase the interest and confidence of the clinical teacher.

  "Previous research has demonstrated that skills are best retained when they are translated from one area to another. In that respect, we hypothesized that emphasizing the similarities between these processes would be enlightening and could facilitate the transfer of competencies from a role that clinicians are very familiar with to another, thereby also promoting a sense of mastery of their teaching tasks."[100]

- The OLTCS's capacity to draw on skills already possessed by a practicing physician and then to transfer those skills to a teaching scenario was very appealing.

Development of the educational series

- Third, because the OLTCS was developed as a formative observational tool, rather than summative tool, integral to its design are "descriptor[s] [which] define the concrete expected teaching behaviour for each level of competence: it helps bridge the gap between theory and practice . . . and emphasizes teaching methods."[100]
- The advantage of these descriptions is that they specifically answer the question our faculty asked in Phase 1: *"It's nice to say 'go and teach' . . . but what does that mean? . . . What are my expectations?"* Therefore we concluded that the OLTCS could be used not only as an assessment tool, **but could double as a 'gold standard' within our department of what a clinical teacher ought to do** – essentially, providing the goals and objectives the faculty were requesting.

Development of the educational series

- Fourth, as a formative observation tool, the OLTCS would allow us to provide ongoing evaluation of our faculty during Phase 3 of our project. And the completing of the evaluation itself would continue to familiarize faculty with the description of being a good clinical teacher.
- And finally, because the OLTCS was developed based on the value of learner-centred teaching, essentially the steps of SNAPPS were already embedded within the framework of the OLTCS.
- Based on these important elements of the OLTCS, we used it as the foundation of our Teach-the-Teacher faculty development series.

Areas where SNAPPS is embedded within the OLTCS

OBSERVATION & LEARNING TOOL FOR CLINICAL SUPERVISION

(SNAPPS+Feedback: a learner-centered Model for Case Presentations to Preceptors)

Blue highlights = what areas SNAPPS does not cover and what will need to be additionally introduced to the faculty

***Note: I have crossed out the elements relating to the psychosocial aspects of patient care for the ease of using this tool in the beginning*

Supervisor's Name:	**Level X (weak):** makes the learning unpredictable	**Level Y (good):** has good teaching skills to enhance the learning	**Level Z (very good):** has excellent teaching skills to enhance learning
Step 1: Organizes the supervision			
1. Welcomes the learner	☹ does not put the learner at ease and concentrates on the clinical problem	☺ welcomes the learner and expresses his availability	☺☺ assures adequate time and space or suggests arrangements to put at ease
2. Drives the supervision according to the learner's needs	☹ listens to the case presentation without asking the learner's own question or needs to drive the supervision	☺ lets the learner express the problem that prevents him/her to solve the case (before or just after the case presentation)	☺☺ clarifies or reflects what prevents the learner to solve the case (learning needs) (before or just after the case presentation) or discusses the case aiming explicitly at the learner's needs *(**S**ummarize briefly the history and findings)*

Areas where SNAPPS is embedded within the OLTCS

Step 2: helps the learner to learn from the case			
3. Discusses the case and explores . . .			
a. clinical reasoning	☹ a. interrupts the learner so as to get more information following his/her own medical reasoning or thinks aloud *without* including the learner	☺ a. asks the learner what hypotheses has driven his/her reasoning, or speaks aloud involving the learner	☺☺ a. encourages the learner to argue or complete the hypotheses of his/her medical reasoning ***(N**arrow the differential to two or three relevant possibilities)*
b. the underlying medical knowledge	☹ b. questions/ explains theoretical notions without clear link with the case or does not discuss any related knowledge	☺ b. teaches the knowledge related to the missing notions or wrong interpretations of the learner	☺☺ c. stimulates the learner to remember the relevant knowledge, or helps to find relevant missing knowledge (gives tools/references) ***(A**nalyze the differential by comparing and contrasting the possibilities)*
~~**c. the relevant psychosocial elements and patient's perspective**~~	~~☹ c. does not question or underline psychosocial context or patient's perspective relevant to solve the problem~~	~~☺ c. questions or underlines the relevant psychosocial or patient's perspective details~~	~~☺☺ c. underlines the link between patient's perspective or psychosocial elements and the relevance for this problem solving or values when the learner is taking it into account~~

Areas where SNAPPS is embedded within the OLTCS

4. Teaches or corrects . . .			
a. the history taking or clinical exam	☹ a. tells what the learner should do without explanation or modeling; or does not teach the history taking or clinical exam	☺ a. teaches history taking or clinical examination by explanation or modeling	☺☺ a. lets the learner demonstrate a skill or history taking or clinical examination *(Probe the preceptor by asking questions about uncertainties, difficulties, or alternative approaches)*
b. interpersonal/ communicational skills	☹ b. tells what the learner should do without explanation or modeling or does not teach interpersonal skills	☺ b. teaches relevant interpersonal/ communication skills by explanation or modeling	☺☺ b. lets the learner demonstrate an interpersonal/ communication skill *(Probe the preceptor by asking questions about uncertainties, difficulties, or alternative approaches)*

Areas where SNAPPS is embedded within the OLTCS

5. Discusses the plan . . .			
a. developing an action plan	☹ a. after a diagnosis or definition of the problem, tells the learner what to do	☺ a. asks the learner to express an action plan (investigations, treatment and follow up) or expresses an action plan involving the learner	☺☺ a. asks the learner to argue and discuss own action plan *(Plan management for the patient's medical issues)*
~~**b. adapting the action plan to the patient's psychosocial context and individual perspective**~~	~~☹ b. does not take the psychosocial context (nor the patient's perspective) into account when defining the action plan~~	~~☺ b. encourages the learner to take into account the patient's psychosocial context and perspective when defining the action plan~~	~~☺☺ b. values an action plan that takes into account the patient's psychosocial context or perspective or stresses the importance to take into account so as to improve the treatment~~
c. verifying the strategies of application	☹ c. does not check the learner's strategies of application, or tells the action plan to the patient without discussing it with the learner	☺ c. asks the learner if he/she feels confident to apply the action plan, or offers to help for the application of the action plan	☺☺ c. checks how the learner will apply the action plan *(Plan management for the patient's medical issues)*

Areas where SNAPPS is embedded within the OLTCS

6. Addressing own limits of knowledge			
	☹ expresses no doubt about the medical knowledge	☺ expresses the limits of his/her own knowledge or his/her doubts	☺☺ expresses the doubts or limits of his/her own knowledge and defines with the learner a way to find the needed information to overcome the doubts
Step 3: Ends the supervision			
7. States . . .			
a. strengths: what is mastered	☹ a. does not value or reflect on learner's strengths that helped him/her to solve the problem	☺ a. stresses the learner's strengths that helped him/her to solve the problem and values them	☺☺ a. encourages the learner to reflect on own strengths before valuing them ***(Feedback)***
b. new learning	☹ b. does not speak about what should be remembered	☺ b. tells the learner what he/she should remember	☺☺ b. asks the learner what he/she will remember and can add some suggestions (or asks for some transfer to other case) or asks the learner for some general principles/ rules that can be deducted from present case ***(Select a case-related issue for self-directed learning)***
c. what has to be learned	☹ c. does not speak about what should be learned on behalf of the discussion	☺ c. suggests some ideas to enhance his/her ongoing learning	☺☺ c. defines with the learner a learning plan (actions, literature, timing, evaluation) ***(Select a case-related issue for self-directed learning)***

Areas where SNAPPS is embedded within the OLTCS

8. Evaluation of supervision process			
	☹ does not speak about the supervision process	☺ checks if supervision has answered his/her learning needs (content)	☺☺ checks if supervision has answered the learning needs and if supervision process is adequate or asks for suggestions of improvement in supervision process

Comments: (any comments about this observation tool, about the teaching session, the learner(s), etc.)

_____

_____

Development of the educational series

- In addition to providing an answer of *“What does it mean to be a clinical teacher?”,* based on department feedback, Phase 1 results, and ongoing conversation with the project group, we incorporated several other topics that we thought would be important for our faculty and resident development series:

  1) Learner-centred model of teaching

  2) Giving and receiving feedback

  3) Concept maps

  4) Matrix workshop

  5) Resident leadership and efficiency skills

1) Learner-centred model of teaching

- As described in Chapter 2, learner-centered teaching is teaching in a way that puts the learner at the forefront. The teacher teaches in a way that considers the learner's needs, engages in teaching with mutual respect and integrity; favors the learner's autonomy for independent learning; takes into account the learner's emotions when teaching; checks for the learner's understanding of clinical reasoning; checks their retention of this new information; and aids the learner in creating self-learning goals.[100]

1) Learner-centred model of teaching

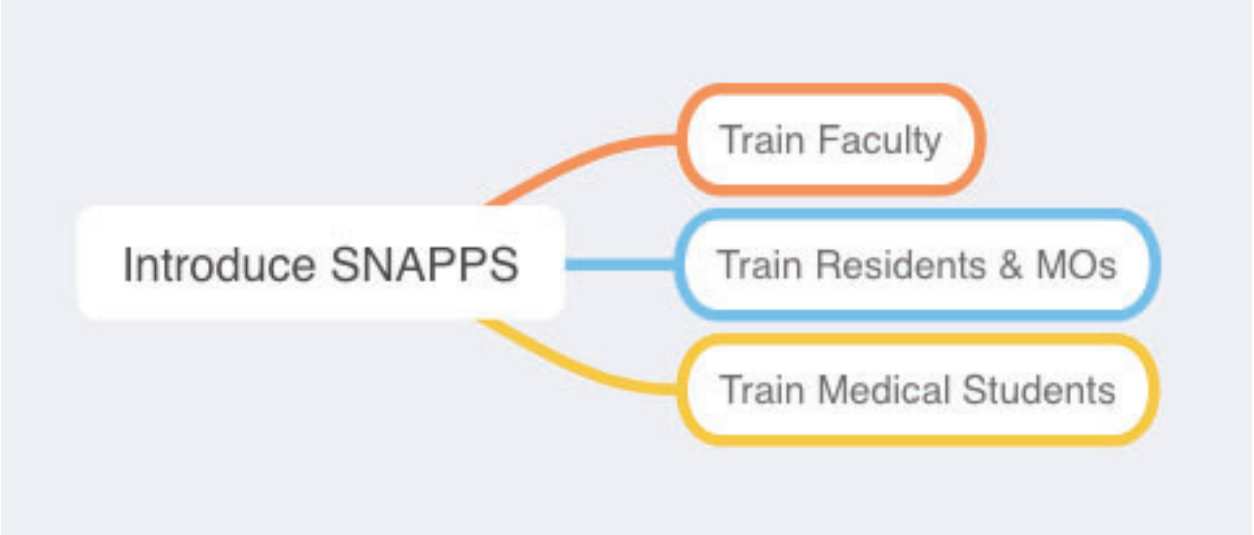
- This is important because, traditionally, when we consider the role of the trainee in medical education, studies have found that the medical students' role is limited to passive learning, only receiving "low-level", factual information. Even in settings where medical students did a large portion of the talking, they tended only to report factual content; questions were seldom asked of students, and when they were asked questions, these questions generally were about facts, and rarely were the students required to verbalized their problem-solving efforts.[43]

1) Learner-centred model of teaching

- Therefore, we needed to put the learner at the forefront - and that's where SNAPPS comes in. SNAPPS provides a structured bedside teaching model for trainees and faculty to move away from the constraining, fact-based presentation/probing teaching style toward encouraging analytical thinking. It puts the learner at the center of the teaching encounter and creates a shared responsibility between the teacher and learner – where the learner is "active and directive in the educational encounter" and the "instructor's role is no longer to deliver but to guide."[14]

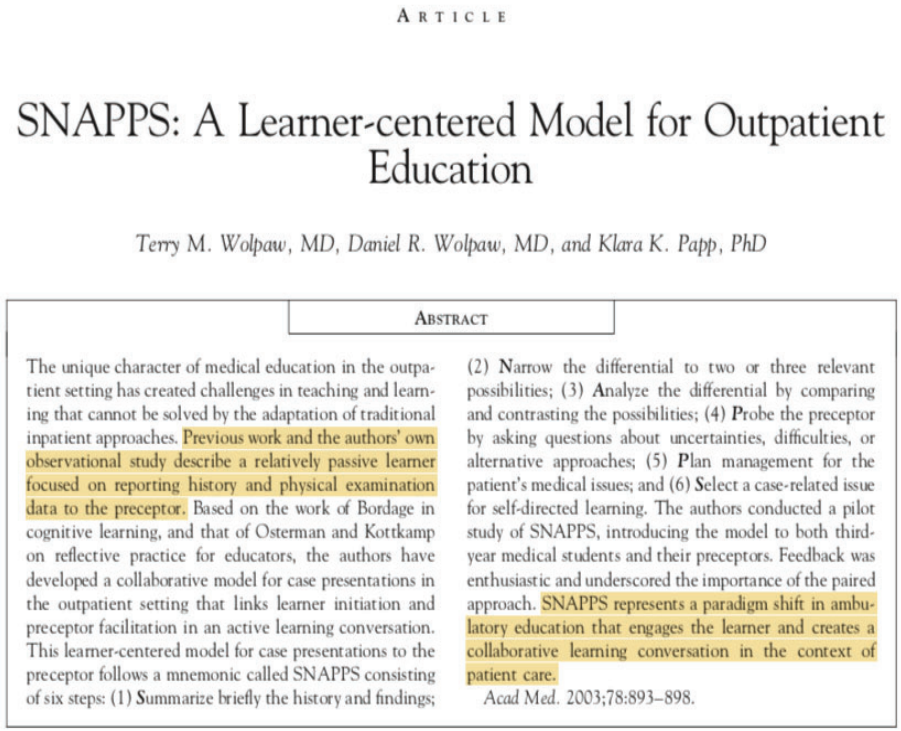
1) Learner-centred model of teaching

- Therefore, a central component of the educational series was the introduction of SNAPPS to the department. This would include faculty, residents, and medical students.
- The hope was that SNAPPS could provide a practical, simple, and clinically applicable model to promote learner-centred teaching.



1) Learner-centred model of teaching

- The idea of introducing SNAPPS to the department was generated from my initial literature review at the very beginning of the project.
- While I had been introduced to SNAPPS prior to the Phase 1 results, after reviewing them in regards to plausible solutions, SNAPPS seemed to potentially address many of the issues we identified during Phase 1.



ARTICLE

SNAPPS: A Learner-centered Model for Outpatient Education

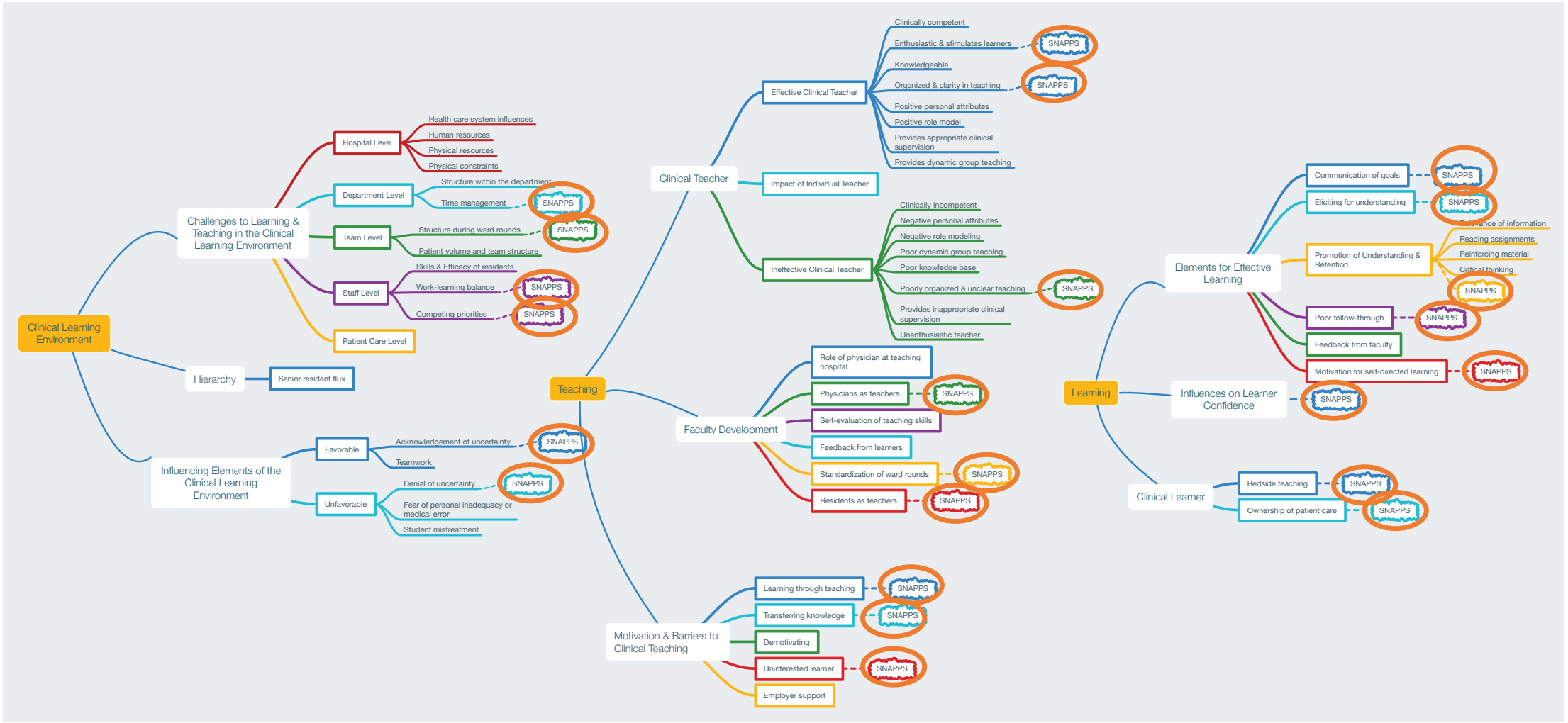
Terry M. Wolpaw, MD, Daniel R. Wolpaw, MD, and Klara K. Papp, PhD

ABSTRACT

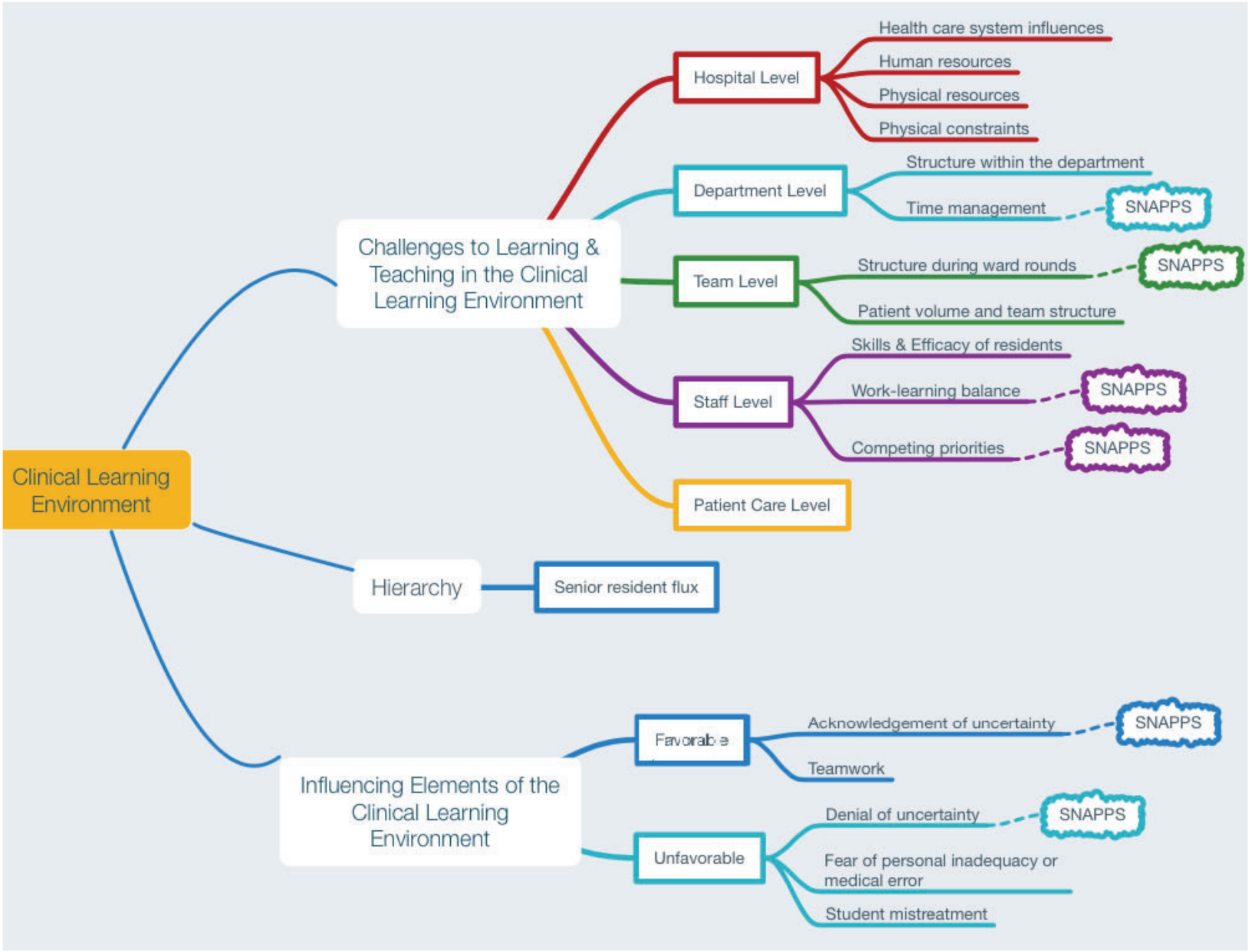
The unique character of medical education in the outpatient setting has created challenges in teaching and learning that cannot be solved by the adaptation of traditional inpatient approaches. Previous work and the authors' own observational study describe a relatively passive learner focused on reporting history and physical examination data to the preceptor. Based on the work of Bordage in cognitive learning, and that of Osterman and Kottkamp on reflective practice for educators, the authors have developed a collaborative model for case presentations in the outpatient setting that links learner initiation and preceptor facilitation in an active learning conversation. This learner-centered model for case presentations to the preceptor follows a mnemonic called SNAPPS consisting of six steps: (1) **S**ummarize briefly the history and findings; (2) **N**arrow the differential to two or three relevant possibilities; (3) **A**nalyze the differential by comparing and contrasting the possibilities; (4) **P**robe the preceptor by asking questions about uncertainties, difficulties, or alternative approaches; (5) **P**lan management for the patient's medical issues; and (6) **S**elect a case-related issue for self-directed learning. The authors conducted a pilot study of SNAPPS, introducing the model to both third-year medical students and their preceptors. Feedback was enthusiastic and underscored the importance of the paired approach. SNAPPS represents a paradigm shift in ambulatory education that engages the learner and creates a collaborative learning conversation in the context of patient care.

Acad Med. 2003;78:893–898.

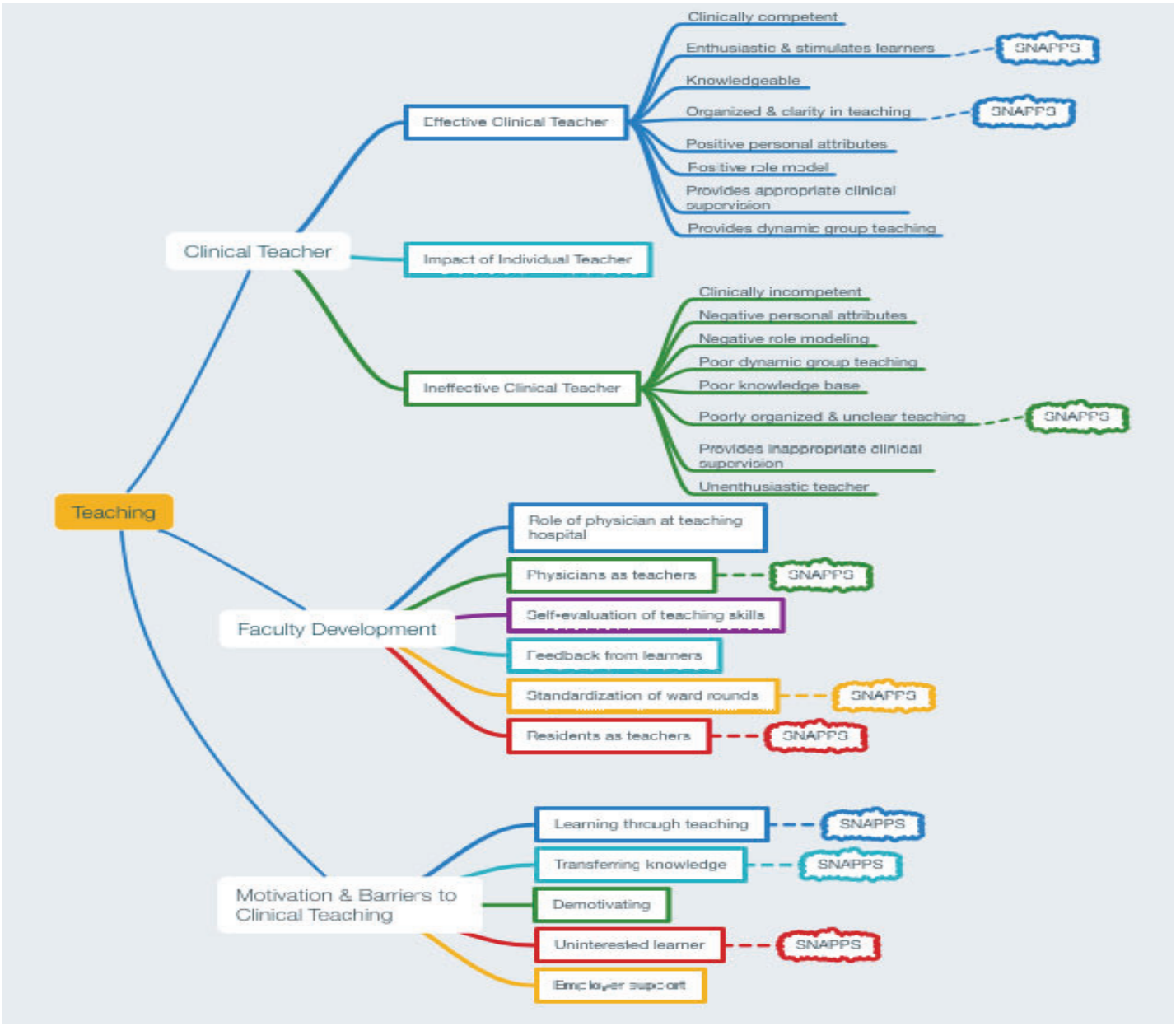
SNAPPS potential areas of influence



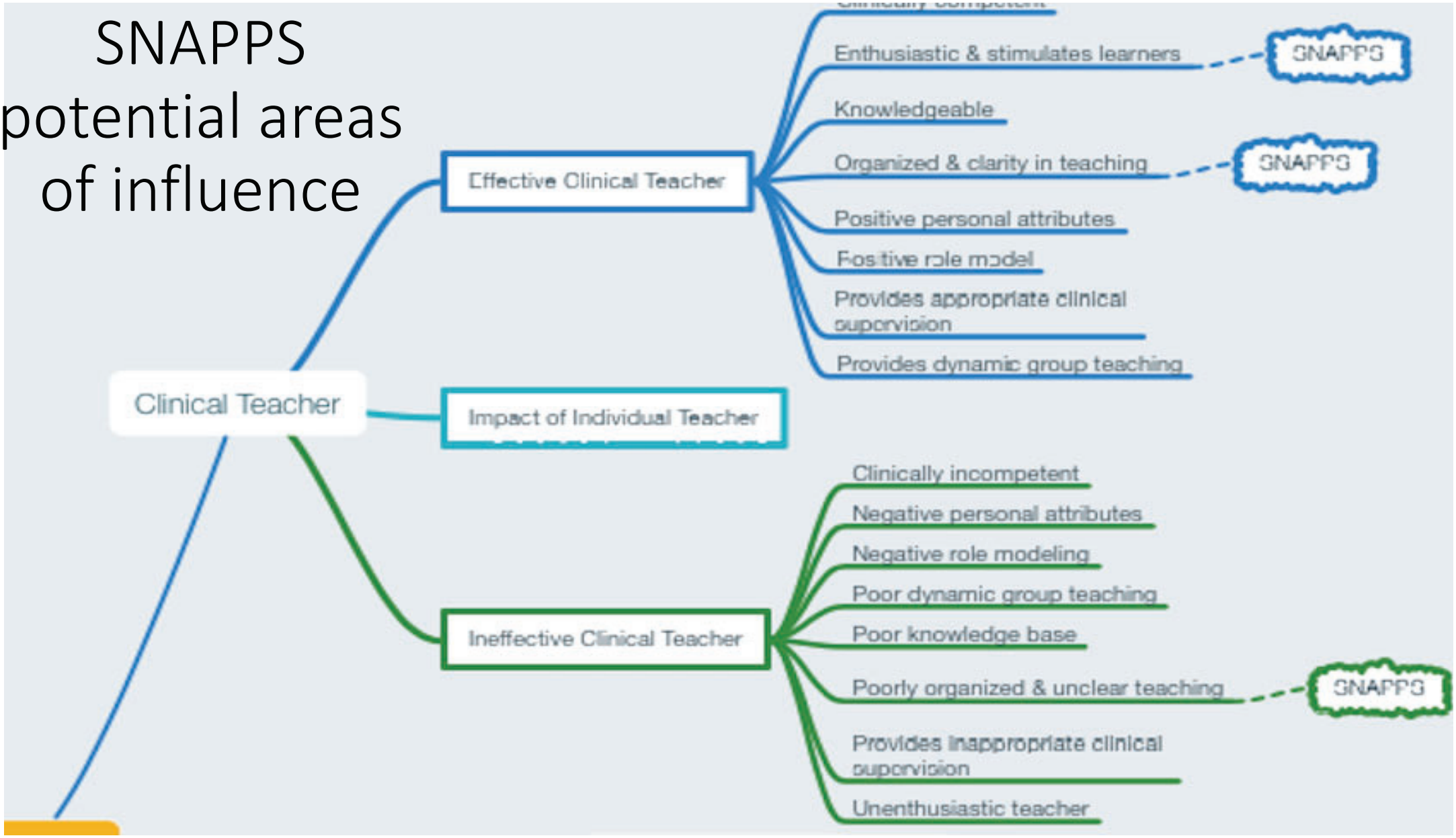
SNAPPS potential areas of influence



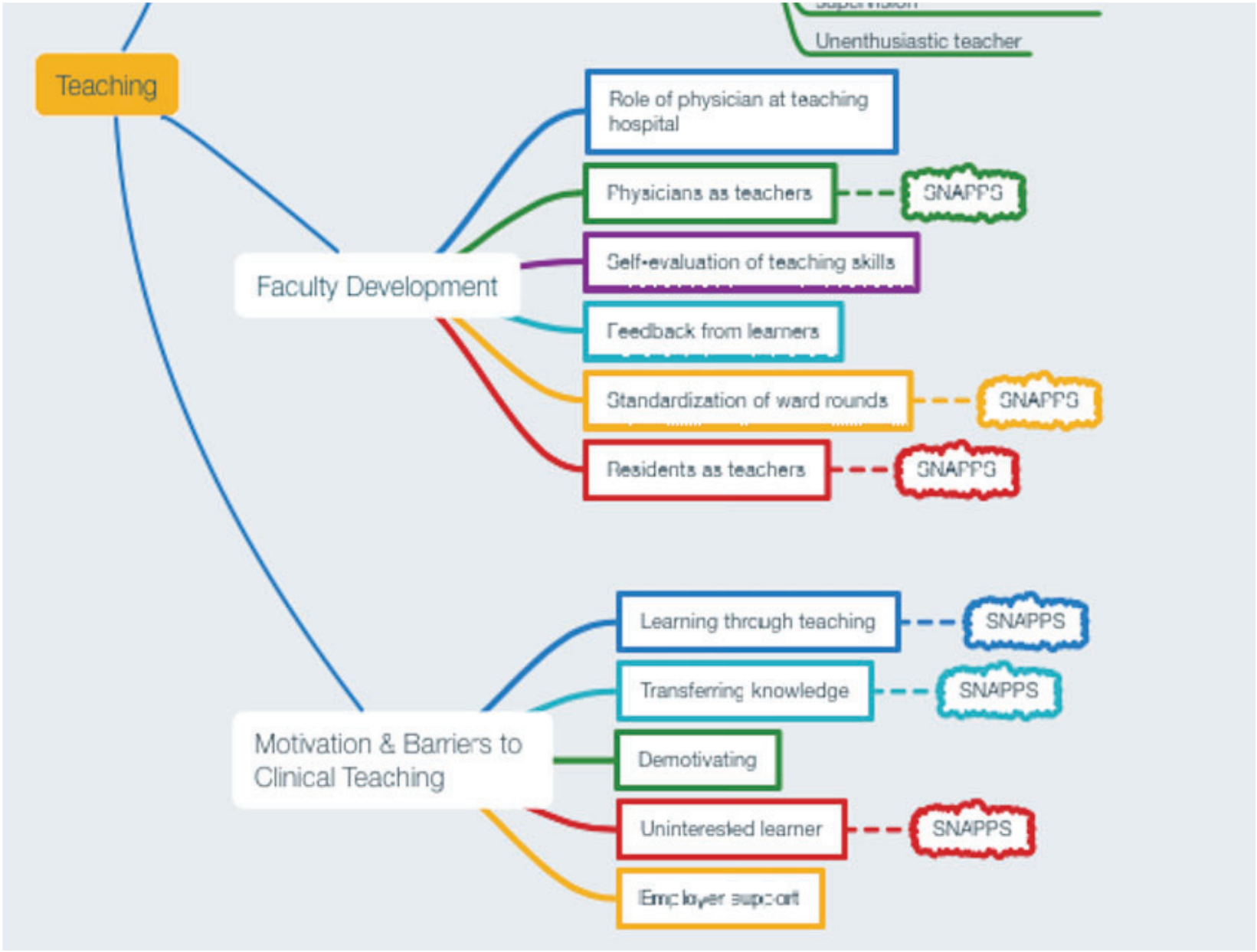
SNAPPS potential areas of influence



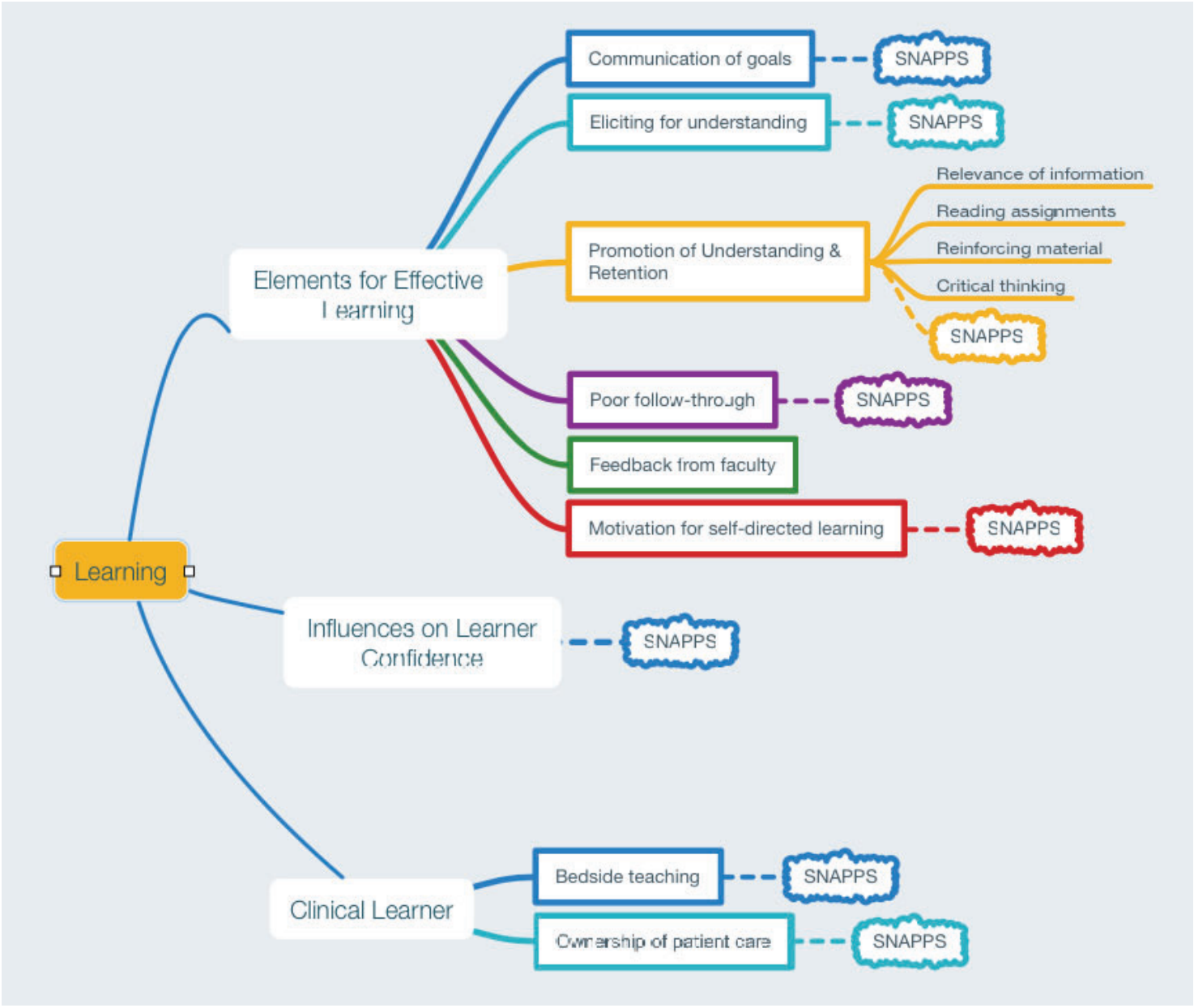
SNAPPS potential areas of influence



SNAPPS potential areas of influence



SNAPPS potential areas of influence



1) Learner-centred model of teaching

- We thought the best way to introduce SNAPPS to the department would be by incorporating ’SNAPPS Training’ into larger Teacher-the-Teacher and Resident-as-Teachers series, where an important component of each would be the emphasis of learner-centred teaching.

2) Giving & Receiving Feedback

- While an extensive account of feedback in HPE is beyond the scope of this project, feedback remains a central component of clinical education. Based on the Phase 1 results, feedback was seen as an effective element for trainee learning, but that the delivery, timing and frequency of the feedback was important as to whether the feedback would be constructive or destructive for the trainee. In general, the department described that there was an overall paucity of feedback of any sort, in either direction.
- Based on these results, we wanted to integrate feedback into our educational series. To achieve this, a member of the UB Faculty of Health Sciences with extensive experience in educational feedback was invited to present her lecture “Giving & Receiving Feedback” during our educational series – both for the faculty and for the residents.

3) Introduction to Concept Maps

- One of the project group's concerns with using the SNAPPS model was how it would translate for patients with chronic issues, not necessarily a new diagnosis to narrow. Specifically, we were concerned that it would not translate well into the Neonatal unit, particularly for the premature babies where they don't have a "narrowed differential" per se, but have an extensive array of related risk factors based on their prematurity.
- Therefore, to add to our clinical faculty's "tool box", we wanted to introduce concept mapping. Concept maps are a learning tool that "involves [the] integration of knowledge and creation of meaning by relating concepts."[188]

3) Introduction to Concept Maps

- We chose concept maps as opposed to other forms of bedside teaching tools based on a recent UB DME journal club that favored the use of concept maps. Also, from my own personal experience and success of using concept maps in the NNU, we thought we could share this tool as part of our educational series for alternative ways for faculty and trainees to ‘narrow’ their learning focus for their patients.
- The plan was for project member MM to create a concept maps workshop as part of the educational series, since he was a part of the UB DME and was most familiar with the topic of concept maps.

4) Introduction to Healthcare Matrix

- From our Phase 1 results, we found that a major influence on the learning and teaching on ward rounds related directly to the external influences of the health care system, with several examples describing health care system breakdowns, which negatively affected both the patient care and the ability to focus on learning and teaching during ward rounds.
- We were concerned that since the SNAPPS model was developed in a high-resource setting, it made basic assumptions about healthcare systems that don't necessarily take into consideration a resource-limited or disorganized healthcare system.
- Therefore, we wanted to introduce faculty and trainees to another clinical tool: a healthcare matrix.

4) Introduction to Healthcare Matrix

- A healthcare matrix is “a common framework for evaluating and improving patient care,” with the “ability to reflect on outcomes for a patient . . . in terms of the gap between the care provided and the care that could be provided.” It simultaneously “encourages reflection on how this knowledge can be used to improve care” and promotes a learning environment that “acknowledges the resident as part of a system of care, in which he or she learns in and about the system of care.”[189]
- Our hope was that the adjunct of the healthcare matrix with SNAPPS would allow faculty and trainees to consider not just how to ‘come up with the plan’ but ‘how will the plan be carried out?’ and look at realistic scenarios – ideal vs real and have that as part of the daily rounding discussion.
- The plan was for us to create a healthcare matrix workshop as part of the educational series.

5) Resident leadership & efficiency skills

- From the Phase 1 results, we learned that lack of team leadership skills and efficiency of residents to run the ward rounds effectively was noted as major obstruction to learning and teaching on rounds.
- We were able to extrapolate that the main issues related to residents' skills and efficiency to prepare for rounds were related to lack of: leadership, team management, organization, professionalism, efficiency, and basic presenting skills.
- Therefore, as part of our change ideas was to build in leadership and efficiency skills for residents as part of their ongoing educational series.

5) Resident leadership & efficiency skills

- Based on this, we incorporated two additional sessions to the Residents-as-Teachers series:
- 1) An efficiency skills workshop – to be developed and facilitated by ZP, one of our project group members, whom he himself had just graduated from the UB paediatric residency program and was well placed to provide junior trainees practical tips for pre-rounding at PMH
- 2) Resident Leadership workshop – to be facilitated by a visiting paeditrician with a long-standing partnership with the department in conducting leadership training for senior residents, but had not been previously offered to junior trainees

Development of the educational series

- By the end of Phase 2, our faculty development **'Teach-the-Teacher'** curriculum included the following sessions:

Session 1- What does it mean to be a clinical teacher?

Session 2 – Introduction to SNAPPS & Learner-centred approach to teaching

Session 3 – 'Summarize' of SNAPPS

Session 4 – 'Narrow' of SNAPPS

Session 5 – 'Analyze' of SNAPPS

Session 6 – 'Probe' of SNAPPS

Session 7 – 'Plan' of SNAPPS

Session 8 – 'Select' of SNAPPS

Session 9 – Matrix – Getting the 'Plan' accomplished

Session 10 – Intro to Concept maps (specifically for NNU)

Session 11 – Giving & Receiving feedback

Session 12 – Open/Ending supervision & the Clinical Learning Environment

Development of the educational series

- And our resident development **‘Residents-as-Teachers’** curriculum included the following sessions:

Session 1 – Top 10 Tips to Surviving the Pre-round! An efficiency skills workshop

Session 2 – Introduction to Learner-centred teaching & SNAPPS

Session 3 – Resident Leadership workshop

Session 4 – Intro to a ‘Matrix’ – Getting the ‘Plan’ accomplished

Session 5 – Intro to Concept maps (specifically for NNU)

Session 6 – Giving & Receiving feedback

Session 7 – What does it mean to be a clinical teacher?

Development of the educational series

- Of the twelve Teach-the-Teacher and eight Residents-as-Teachers planned sessions, I was responsible for the creation of ten of the Teach-the-Teacher and three of the Residents-as-Teachers presentations.
- For the other seven sessions, we drew on local and partner resources to deliver the other content areas. By engaging with local and partner resources, we achieved additional goals, including:

1) by drawing on local experts, this widened the 'expert' scope of the project, and helped to defuse my 'expert' role in the project;

2) the multiple efforts by others involved with this project re-emphasized to the department that this wasn't merely *my* project, but it was ongoing efforts *for* the department, *by* the department; and

3) our hope was that through active engagement with others, this would create more intra and inter-department buy-in of our ongoing activities.

Development of the educational series

- For my presentations – I created the PowerPoint presentations, including written presentation notes, wrote the example scenarios, video scripts, and directed and filmed the videos with volunteers from the department.
- For the other sessions, while I scheduled, organized, and attended these workshop sessions, the content was solely of those presenting, but had been discussed prior to ensure that the content was in line with our overall project goals.

Development of the educational series

- For my educational sessions, I created them using the “First Principles of Learning” as described by Merril:[177]

1) Learning is promoted when learners are engaged in solving real-world problems.

2) Learning is promoted when existing knowledge is activated as a foundation for new knowledge.

3) Learning is promoted when new knowledge is demonstrated to the learner.

4) Learning is promoted when new knowledge is applied by the learner.

5) Learning is promoted when new knowledge is integrated into the learner’s world.

Development of the educational series

- Example using the “First Principles of Learning” Merril:[177]

Teach-the-Teacher – Session 1
“What does it mean to be a clinical teacher?” – Part 1

Goal of Session: To present the goals and objectives of clinical teaching using “A teaching skills assessment tool inspired by the Calgary-Cambridge Model and the patient-centered approach” (Sommer) to the faculty and senior residents (chiefs) in the department. And to ‘kick-off’ the series of faculty development workshops.

Development of the educational series

- Example using the "First Principles of Learning" Merril:[177]

→ **Introduction (5 minutes):**

Display quotes from the Phase 1 qualitative results to remind people why they are here.

→ **Learning is promoted when learners are engaged in solving real-world problems.**

Show Video 1: "what not to do". (AGE)

→ **Learning is promoted when existing knowledge is activated as a foundation for new knowledge.**

What are your thoughts? Good? Bad? Ugly?

3) Learning is promoted when new knowledge is demonstrated to the learner.

Show Video 2: "gold standard"

What are your thoughts? Good? Bad? Ugly?

INTRODUCE THE GOALS & OBJECTIVES

Development of the educational series

- Example using the “First Principles of Learning” Merril:[177]

4) Learning is promoted when new knowledge is applied by the learner.

Practice scenario in pairs. Feedback (good-improve-good).

Debrief – how did it fee?

5) Learning is promoted when new knowledge is integrated into the learner’s world.
Practice this week!

Development of the educational series

- Each session was structured to be interactive with a variety of teaching mediums (e.g. videos, example scenarios, role playing, etc.) as a means to enhance and facilitate adult learning during each session.
- In addition, all sessions were locally contextualized for the Department of Paediatrics at Princess Marina Hospital. For all example scenarios, I used my own experience of working in the department for three years, drew input from conversations with colleagues over time, and used direct quotes from Phase 1 data to help infuse a local and culturally appropriate tone. The teaching videos were filmed in the Department of Paediatrics with volunteer members of the department to provide further visual contextualization.

Development of educational series

- See *Appendix: Phase 3 Educational Series* to view all related materials to the educational series

APPENDIX G – PHASE 3 EDUCATIONAL SERIES (BACK, CH.6) (BACK, CH.7) (BACK, CH.9)

G.1 EDUCATIONAL SERIES CALENDAR, CYCLE 1

Appendix G.1

Educational Series Calendar

Phase 3, Cycle 1

Date, Time Location, & Food	Educational Session	Presenter	Content covered	Audience
20 June, 2018 1:30-3pm; MR room; lunch provided	Residents as Teachers – #1 "Top 10 Tips to Survive the Pre-Round: an Efficiency Skills Workshop"	ZP	An interactive didactic session specifically tailored for junior residents training at PMH. Content included the goals and objectives of pre-rounds, and description of juniors' responsibilities. This was followed by a series of interactive 'real-life' scenarios of common challenges encountered and worked through as a group.	Junior residents and MOs
6 July, 2018 8-8:30am; MR room; tea/coffee provided	Teach-the-Teacher - #1 "What does it mean to be a clinical teacher?" – Part 1	SM	To present the goals and objectives of clinical teaching using "A teaching skills assessment tool inspired by the Calgary-Cambridge Model and the patient-centered approach" (Sommer, et al.) to the faculty and senior residents in the department. Will include videos with ideal vs less than ideal scenarios – to be viewed for feedback and generate conversation. And to 'kick-off' the Teach-the-Teacher series.	Faculty & senior residents
13 July, 2018 8-8:30am; MR room; tea/coffee provided	Teach-the-Teacher - #2 "What does it mean to be a clinical teacher?" – Part 2	SM	Brief review from Session One, then we will go through the modified *Observation and Learning Tool for Clinical Supervision* in detail. Will give opportunities to practice each step of the tool with a pre-created scenario. Will provide video example of Step Three: End of Supervision. Goal is to familiarize faculty with the tool and to continue to introduce learning-centered clinical teaching. The power point will be sprinkled with quotes from Phase I qualitative data to contextualize the material.	Faculty & senior residents
25 July, 2018 1:30-3pm; Baylor COE conference room; lunch provided	Residents as Teachers – #2 "Introduction to SNAPPS – A Learner-Centred Bedside Teaching Model"	SM	Session designed to introduce the concept and value of learner-centred teaching, followed by a step-by-step introduction to the bedside teaching model SNAPPS showing how it achieves the learner-centred goals. Infused with culturally and locally relevant videos, followed by a 'real-life' clinical scenario to practice.	Junior residents and MOs
27 July, 2018 8-8:30am; MR room; tea/coffee provided	Teach-the-Teacher – #3 "Why learner-centered teaching and how?"	SM	Session designed to introduce the concept and value of learner-centred teaching, followed by a brief introduction to the bedside teaching model SNAPPS showing how it achieves the learner-centred goals.	Faculty & senior residents
3 Aug, 2018 8-8:30am;	Teach-the-Teacher – #4	SM	Session designed to reinforce the importance of learner-centred teaching by reviewing our clinical teaching 'gold standard' followed by a step-by-step	Faculty & senior residents

MR room; tea/coffee provided	"Introduction to SNAPPS – A Learner-Centred Bedside Teaching Model"		introduction to the bedside teaching model SNAPPS. Infused with culturally and locally relevant videos, followed by a 'real-life' clinical scenario to practice.	
8 Aug, 2018 1:30-3pm; Baylor COE classroom; lunch provided	Medical Student Session "Introduction to SNAPPS – A Learner-Centred Bedside Teaching Model"	SM	Session designed to introduce the concept and value of learner-centred teaching, followed by a step-by-step introduction to the bedside teaching model SNAPPS showing how it achieves the learner-centred goals. Infused with culturally and locally relevant videos, followed by a 'real-life' clinical scenario to practice.	MBBS 3 & 5
29 Aug, 2018 1:30-3pm; Baylor COE classroom; lunch provided	Residents as Teachers – #4 "Residents Leadership Workshop"	AB	Session focused a lot of the importance of emotional intelligence to be a good leader, with special focus on the importance of self-care and wellness in medicine and in general to be an effective leader.	Junior residents and MOs
30 Aug, 2018 1:30-3pm; Baylor COE classroom; lunch provided	Teach-the-Teacher – Re-cap Combination of previous Sessions #1-4	SM	Combination of previous sessions #1-4, focusing on: 1) What does it mean to be a good clinical teacher?, 2) Importance of learner-centred teaching, and 3) Introduction to the learner-centred bedside teaching model, SNAPPS.	Faculty & senior residents
11 Sept, 2018 1:30-3pm; Baylor COE classroom; lunch provided	Medical Intern Session "Introduction to SNAPPS – A Learner-Centred Bedside Teaching Model"	SM	Session designed to introduce the concept and value of learner-centred teaching, followed by a step-by-step introduction to the bedside teaching model SNAPPS showing how it achieves the learner-centred goals. Infused with culturally and locally relevant videos, followed by a 'real-life' clinical scenario to practice.	Interns
12 Sept, 2018 1:30-3pm; Baylor COE classroom; lunch provided	Residents as Teachers – #5 "Giving & Receiving Feedback"	LB	Interactive didactic session designed to define feedback and its importance in medical education. Followed by several strategies to how to give and receive feedback. Dispersed group discussion and practice scenarios.	Junior residents and MOs
14 Sept, 2018 8-8:30am; MR room; tea/coffee provided	Teach-the-Teacher – #11 "Giving & Receiving Feedback"	LB	Interactive didactic session designed to define feedback and its importance in medical education. Followed by several strategies to how to give and receive feedback. Dispersed with group discussion and practice scenarios.	Faculty & senior residents

G.2 TEACH-THE-TEACHER: "WHAT DOES IT MEAN TO BE A CLINICAL TEACHER, PART 1"

Appendix G.2

Teach-the-Teacher

“What does it mean to be a clinical teacher, Part 1”

Teach-the-Teacher – Session 1
"What does it mean to be a clinical teacher?" – Part 1

Goal of Session: To present the goals and objectives of clinical teaching using "A teaching skills assessment tool inspired by the Calgary-Cambridge Model and the patient-centered approach" (Sommer) to the faculty and senior residents (chiefs) in the department. And to 'kick-off' the series of faculty development workshops.

Use literature and qualitative data to create the workshop, using a format based on the "First Principles of Instruction" (Merril), below.

Workshop will be based on the First Principles of Learning:
1) Learning is promoted when learners are engaged in solving real-world problems.
2) Learning is promoted when existing knowledge is activated as a foundation for new knowledge.
3) Learning is promoted when new knowledge is demonstrated to the learner.
4) Learning is promoted when new knowledge is applied by the learner.
5) Learning is promoted when new knowledge is integrated into the learner's world.

→ Introduction (5 minutes):

Display quotes from the interviews/FGDs to remind people why they are here.

→ Learning is promoted when learners are engaged in solving real-world problems.

Show Video 1: "what not to do". (AGE)

→ Learning is promoted when existing knowledge is activated as a foundation for new knowledge.

What are your thoughts? Good? Bad? Ugly?

3) Learning is promoted when new knowledge is demonstrated to the learner.

Show Video 2: "gold standard"

What are your thoughts? Good? Bad? Ugly?

INTRODUCE THE GOALS & OBJECTIVES

4) Learning is promoted when new knowledge is applied by the learner.

Practice scenario in pairs. Feedback (good-improve-good).

Debrief – how did it fee?

5) Learning is promoted when new knowledge is integrated into the learner's world.

Teach-the-Teacher: Session One

Welcome to our first session for optimizing our learning & teaching on ward rounds! I want to start out by saying that everything we hope to cover over the next several weeks is based on the premise that you each bring your unique styles and experiences to clinical teaching. So our goal here isn't to train you how to "be different" or "do it right" but how to take the skills you already possess and optimize them, share different perspectives of clinical teaching, and even maybe add a few more tricks to your toolbox. For today, we'll be looking at the question: "What does it mean to be a clinical teacher?"

The reason we picked this topic for our first session was from our previous trainee FGDs and faculty interviews, where this was identified as an area for us that we needed to work on. This direct quote sums it up: "what does it mean to 'go & teach'?" When we last met, it was decided that one of our first priorities ought to be to create a standardization among us in the department and to identify our clinical teaching goals and objectives. So today, we hope to present a 'gold standard' that we can all strive for.

For those of you who might be new to the concept of medical education or health professional education – I just wanted to give you context. Medical education, or the more encompassing current term "health professional education" describes the teaching and learning that occurs in medicine. There is a rich historical past to medical education, but everything we will be discussing during these sessions comes from the most up to date, evidence based research in HPE, which is grounded in larger frameworks of education theory. And for us, all of that literature that we bring into these sessions will need to be contextualized for our setting – there are a lot of inherent assumptions in the education models and frameworks that are in the literature, and we have to determine whether those assumptions hold true in our context.

As busy clinicians in a teaching hospital, our concern today is – "what does it mean to be a clinical teacher?" There is ton in the medical education literature that describes the role of a clinical teacher – but in short, it's the dual task of caring for patients while simultaneously teaching medical students and residents.

But more importantly for us, what does it mean to be a *good* clinical teacher? And again, there is a ton in the medical education literature that describes the qualities of a good clinical teacher. Of note, it is widely acknowledged that a *good clinician* is not necessarily a *good clinical teacher*.

From our perspective, from the trainee FGDs and your faculty interviews, these were the qualities identified as an Effective Clinical Teacher . . .

And the opposite was described for an Ineffective Clinical Teacher. These themes are not unique to us, but are very aligned with the definitions within the general medical education literature. But before we get too hung up on descriptions of the 'good' or 'bad' clinical teacher, let's look at a few scenarios to help make this relevant.

Video 1 - You can't hear Kaang too well, so I have the script here so you can read along. The medicine and the case isn't the important part, it's the interaction between the trainee and the consultant, and learning and teaching occurring.

Thoughts?

Video 2

Thoughts?

So, as a way to standardize the clinical teaching in our department, we need to agree to a 'gold standard'. Obviously, we want to each have the qualities described as an "Effective Clinical Teacher" we spoke about early – but those are really more adjectives and doesn't help us know exactly "what to do" – and since we're trying to answer that question "what does it mean 'go teach'?" – we needed to find a resource that provides a concrete description of what the interaction between the consultant and the trainee looks like. We needed something that won't just tell us ***what*** needs to be improved, but also ***how*** to do it. And, lucky for us, we've found one such tool!

A very recently published article, "A teaching skills assessment tool inspired by the Calgary-Cambridge model and the patient-centered approach" describes the creation of an observation & learning tool for clinical teachers to help provide them explanations of what is expected to provide excellent clinical teaching. "This tool contains the criteria for evaluation, the three levels of competence for each criterion, and for each level of competence, a descriptor defining the expected observable behavior." We'll go through this tool in detail - and I'll send an email with the soft copy of the article.

But what's really nice about this model is how it was developed. When the authors were designing it, they thought of the current busy clinician and asked "what do these clinicians *already* do well?" and the answers were: 1) Provide patient-centered care, and 2) Engage in daily clinical encounters.

For the first, every day, we provide patient-centered care. Think of any example: a new diagnosis of cancer, congenital heart disease, a preterm baby, a new onset DM, an uncontrolled asthmatic, or a seizure patient – any scenario - when we see this patient (Read aloud; use example of asthmatic patient). We agree that this is what we all strive for in our patient encounters?

So now, I want you to highlight in your mind everywhere it says "patient" here and replace it with the word "learner" . . .

Read aloud: we meet the learner where he/she is at - not where we want them to be, but where they are so we can guide them to where they need to be; we are establishing a positive learning climate – these are still relationships, consultant – trainee is still a relationship that is best developed with mutual integrity and respect; is the resident post-call and/or too burnt out to hear teaching right now, should I wait for a better time to provide feedback?

What this shows us is that if we're already providing patient-centered care, then as clinical teachers, we can easily adapt our teaching to provide learner-centered teaching, because the same teaching skills required for providing patient-centered care are the same skills required for providing learner-centered teaching.

For the second, as clinicians, we have a daily momentum whereby we control our clinical encounters: initiating the session with the patient, gathering information, doing our physical exam, explain and plan with the patient & families, and close the session by making the next follow up, etc.) . . . Again, here, we can see how this same structure that we already excel at to provide patient care can be applied to create structure in the learning session.

Now that we know how this clinical teacher observation and learning tool was developed, as we go through "the criteria for evaluation, the levels of competence for each criterion, and the descriptors defining the expected observable behavior," we'll be better prepared to translate our patient-centered skills and our patient encounter skills into the context of clinical teaching.

For a sneak-peek into next week's session – here is the outline of the clinical teacher learning tool that we will be going through in much, much detail!

Thoughts? Questions?

See you next Friday!

Teach-the-Teacher Series
Session 1

Video 1: Example of 'weak' teaching: makes learning unpredictable (50 seconds)

Scenario: 13mo F, HIV neg, with AGE and moderate dehydration

Resident at bedside. Consultant enters.

Consultant: "So, what do you have for me?"

Resident: "This is Thembi, a 1y-1mo, HIV negative, female who came in last night with two days of vomiting and diarrhea. The mom reports it was associated with fever. She says the vomiting was nonbilious, nonbloody, occurring about 4 times per day. The diarrhea was also nonbloody, approximately 8 times per day. Mom reports that the older sister. . .

Consultant goes to the child and begins examining – interrupts the resident, "Urine output?"

Resident: "Yes, mom can't really quantify because there's been so many diarrhea diapers she can't assess for urine diapers."

Consultant continues to examine child. "Yeah, it's important to know the urine output, right?"

Resident continues: "Yeah . . . so, on physical exam when she came in was a little tachycardic with dry mucous membranes, but alert and drinking well. We assessed as acute gastroenteritis with dehydration, but since she was tolerating ORS, we decided not to get labs or start fluids."

Consultant: "Ok, so acute gastroenteritis. So let's keep up with the ORS and recheck this afternoon. Who's next?"

Video 2: Example of 'excellent' teaching: skills to enhance learning (2 min, 20 sec)

Resident at bedside. Consultant enters.

Consultant: "Good morning, team. Looks like it was a busy night, so we'll need to get through these new admissions, but please be sure to ask any questions that you might have from admitting last night. Sound good? Let's get started."

Resident: "This is Thembi, a 1y-1mo, HIV negative, female who came in last night with two days of vomiting and diarrhea. The mom reports it was associated with fever. She says the vomiting was nonbilious, nonbloody, occurring about 4 times per day. The diarrhea was also nonbloody, approximately 8 times per day. Mom reports that the older sister had similar symptoms last week, but is better now. She's had poor appetite, but despite vomiting, is still tolerating ORS and drinking well. Mom is unsure of the urine output since the stool has been mixed with the urine, but she is still crying with tears.

On physical exam last night, she came in a little tachycardic, with dry mucous membranes, skin tugor was normal. Her other vitals and the rest of her physical exam were unremarkable.

So we assessed as acute gastroenteritis with dehydration. Since she was still tolerating ORS, we decided to not start IVF and just follow clinically."

Consultant: "Ok, great. Your history and physical exam were good, but let's talk a little about your assessment, you said 'AGE w/ dehydration' – but you didn't quantify the dehydration. Can you maybe try describe her level of dehydration?"

Resident: "Oh, yes, sorry – I thought she was moderately dehydrated because she was mildly tachycardic HR 170s with normal pulses, but eager to drink and dry mucous membranes, but her mental status was fine and she had tears and good skin tugor, warm extremities."

Consultant: "Ok, great. I agree, she fits in the moderate dehydration. Now, you said you didn't want to give IVF – why is that?"

Resident: "Well, I think that the recommendation is that if the child isn't severely dehydrated and is tolerating ORS well, and since her vomiting has resolved, then we can replace her losses and her ongoing losses with ORS alone."

Consultant: "Yes, that's right. So your plan is to continue ORS and observe. How will you 'observe'?"

Resident: "Well, I guess I'll come back after rounds and check how she's tolerating?"

Consultant: "Yeah, we'll need to keep a close eye on her so we don't go from moderately to severely dehydrated. Let's set an alarm to make sure you're back here in two hours. Can you please let mom know our plan?"

Resident discusses with mom while consultant examines child.

Consultant: “For the students, AGE is a very common paediatric condition – I want you to read up on AGE and dehydration and the different levels and how we manage them differently. We can discuss tomorrow and see if there’s something new I need to learn about too!”

Video 3: Example of ‘Ending Supervision’ (30 sec)

Consultant: “So for today’s round – how do you think you did?”

Resident: “Well, I think we managed to see all the patients and pre-round pretty well and had all the labs ready, but I need to read up on a few of our admissions.”

Consultant: “Ok, good. I also thought you were prepared for rounds, but yes, we need to fill some knowledge gaps. How about we make a list of topics for the rest of the week and try to get through those?”

Resident: “Sure.”

Consultant: “Ok, suggestions for me to improve my teaching?”

Resident: “Not at the moment, but I’ll let you know if I think of any.”

Teach-the-Teacher

Session 1: ’What does it mean to be a clinical teacher?’

“What does it mean ‘go and teach’? We need expectations laid out.”

What is health professional education?

What does it mean to be a clinical teacher?

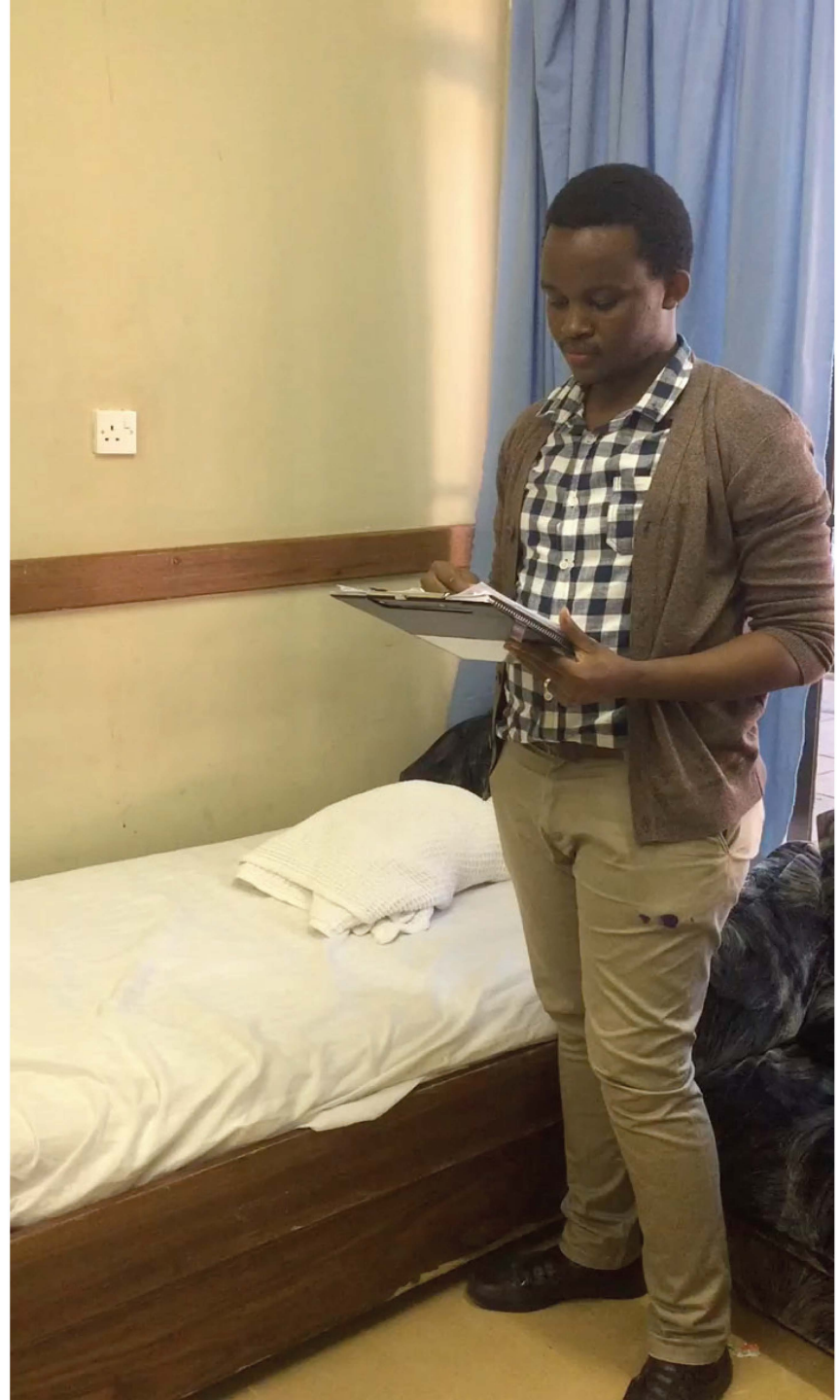
What does it mean to be a *good* clinical teacher?

OUR definition of an Effective Clinical Teacher

- Clinically competent
- Enthusiastic & stimulates learners
- Knowledgeable
- Organized & clarity in teaching
- Positive personal attributes
- Positive role model
- Provides appropriate clinical supervision
- Provides dynamic group teaching

OUR definition of an Ineffective Clinical Teacher

- Clinically incompetent
- Negative personal attributes
- Negative role modeling
- Poor dynamic group teaching
- Poor knowledge base
- Poorly organized & unclear teaching
- Provides inappropriate clinical supervision
- Unenthusiastic teacher



Thoughts?

What should our ‘gold standard’ be?

Observation & Learning Tool

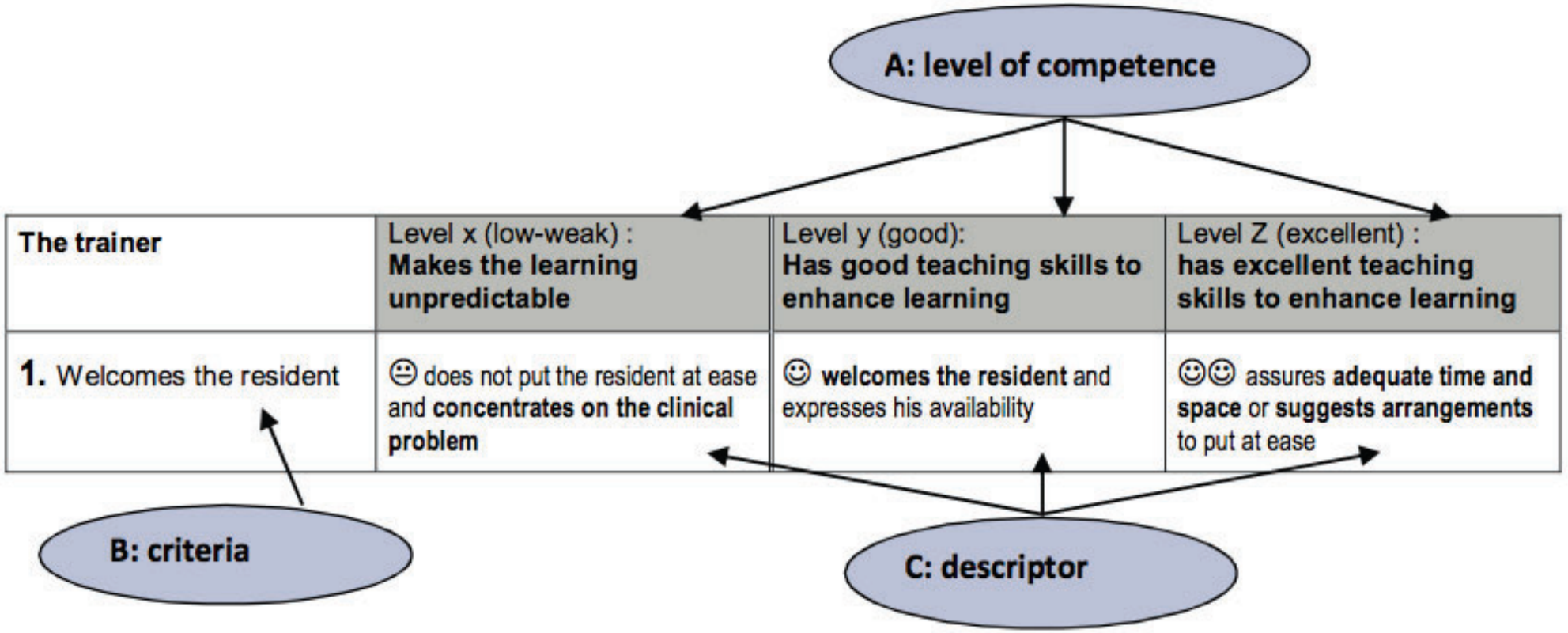


Fig. 4. structure of a formative rubric (extract of the developed instrument).

Design of the clinical teaching learning tool

- Question:
  - “What do these clinicians *already* do well?”
- Answer:
  - Provide patient-centered care
  - Engage in daily clinical encounters

1) We provide patient-centered care

- Defines patient's needs & answers patient's needs
- Establishes a therapeutic relationship using empathy, integrity, respect and patient-centered
- Favor patient's autonomy that enhances management of illness
- Take into account patient's emotions and psychosocial distress
- Checks for patient's understanding of illness, treatment, etc.
- Checks the retention of new information
- Anticipates with the patient the next steps

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- Defines patient's needs & answers patient's needs
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- Take into account patient's emotions and psychosocial distress
- Checks for patient's understanding of illness, treatment, etc.
- Checks patient's retention of new information
- Anticipates with the patient the next steps

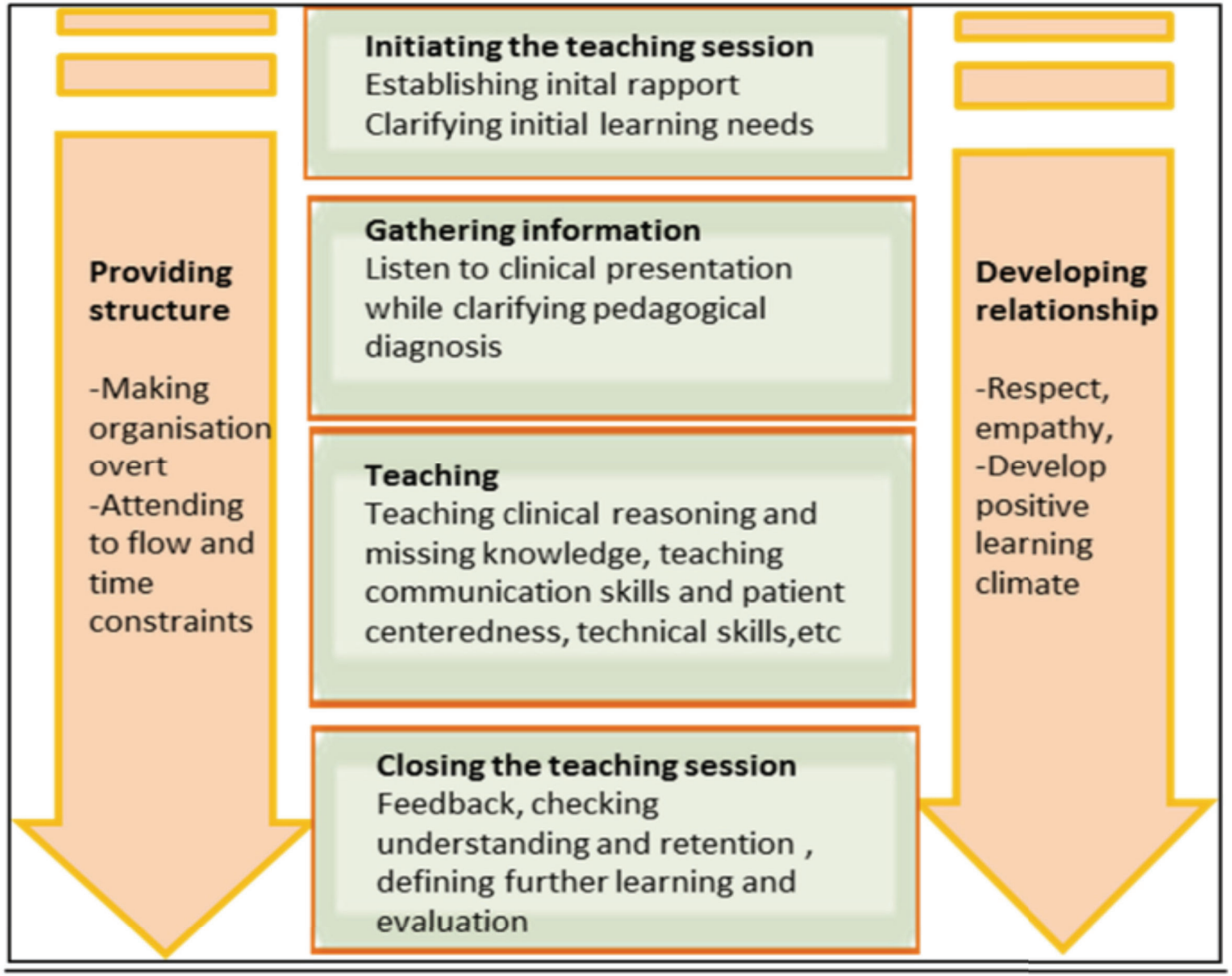
1) We provide learner-centered teaching

- Defines learner's needs & answers learner's needs
- Establishes a positive learning climate using empathy, integrity, respect and learner-centered
- Favor learner's autonomy that enhances independent learning
- Take into account learner's emotions and psychosocial distress
- Checks for learner's understanding of clinical reasoning, plan, etc.
- Checks learner's retention of new information
- Anticipates with the learner the next steps/learning goals

1) We provide patient-centered care

Patient-centered education **The physician as trainer for the patient**
The physician defines the patient's needs and answers the patient's needs (specific treatment needs, fears, lack of knowledge, need of support, etc,)
The physician establishes a therapeutic relationship using empathy, integrity, respect and being patient centered (valuing his needs, expectations, fears, emotions).
The physicians favors patient's autonomy that enhances his own management of illness
The physician takes into account the patient's emotions and psychosocial distress
The physician checks the patient's understanding of the illness, the treatment, the procedures, etc
The physician checks the retention of new information, explanation, etc,
The physician anticipates with the patient the next steps and the way to evaluate the application of new concepts

2) We engage in daily patient encounters



Observation & Learning Tool

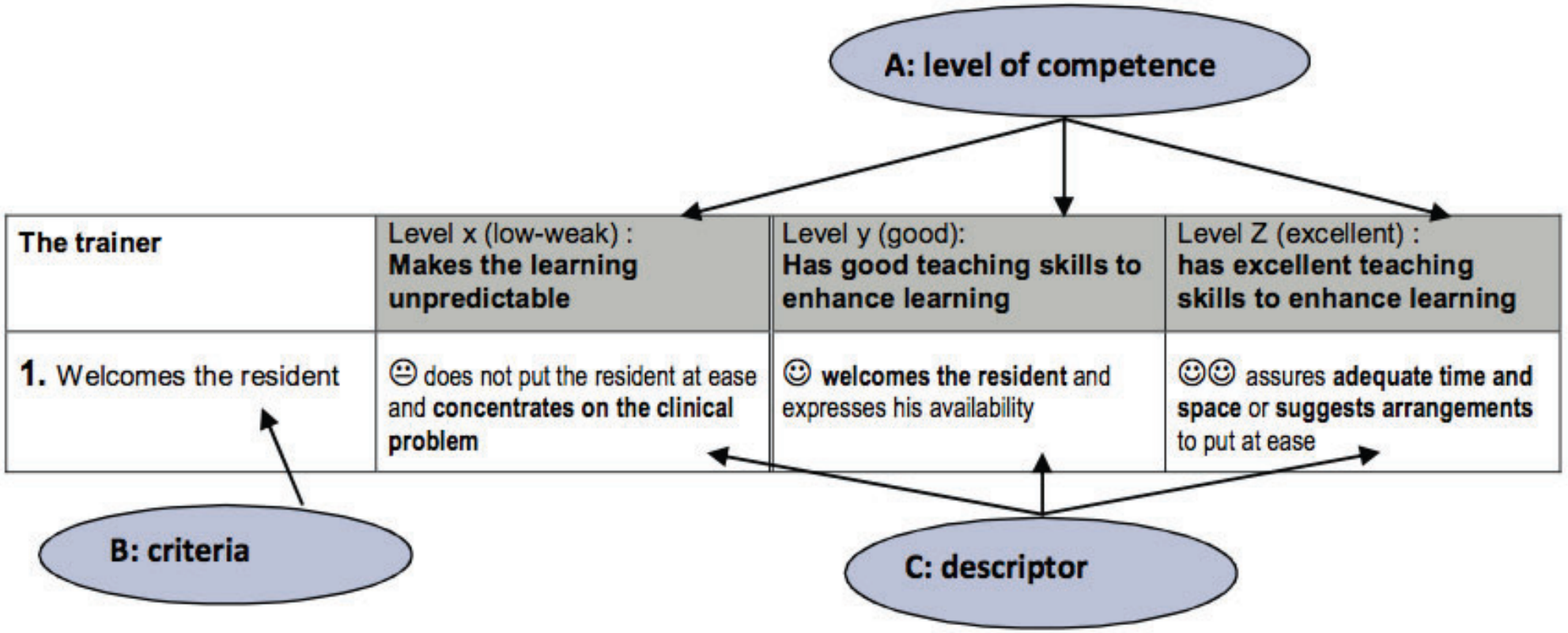


Fig. 4. structure of a formative rubric (extract of the developed instrument).

Step 1: Organizes the supervision	
1. Welcomes the learner	
2. Drives the supervision according to the learner’s needs	

Step 2: helps the learner to learn from the case	
3. Discusses the case and explores . . .	
a. clinical reasoning	
b. the underlying medical knowledge	

4. Teaches or corrects . . .	
a. the history taking or clinical exam	
b. interpersonal/ communicational skills	

5. Discusses the plan . . .
a. developing an action plan
b. verifying the strategies of application

6. Addressing own limits of knowledge

Step 3: Ends the supervision

7. States . . .

a. strengths: what is mastered	
b. new learning	

8. Evaluation of supervision process

Questions? Thoughts?

Teach-the-Teacher: Session Two

Friday, 13 July at 8:00-8:30am

G.3 TEACH-THE-TEACHER: "WHAT DOES IT MEAN TO BE A CLINICAL TEACHER, PART 2"

Appendix G.3

Teach-the-Teacher

“What does it mean to be a clinical teacher, Part 2”

Teach-the-Teacher – Session 2
"What does it mean to be a clinical teacher?" – Part 2

Goal of Session: Brief review from Session One, then we will go through the modified Observation & Learning Tool in detail. Will give opportunities to practice each step of the Observation and Learning Tool with a pre-created scenario. Will provide video example of Step Three: End of Supervision. Goal is to familiarize faculty with the tool and to continue to introduce learning-centered clinical teaching. The power point will be sprinkled with quotes from Phase I qualitative data to contextualize the material.

Use literature and qualitative data to create the workshop, using a format based on the "First Principles of Instruction" (Merril), below. Added quotes from qualitative data within the session to continue to contextualize the information.

1) Learning is promoted when learners are engaged in solving real-world problems.

Given example scenario of 4mo baby with bronchiolitis.

2) Learning is promoted when existing knowledge is activated as a foundation for new knowledge.

Reminded group that the Observation & Learning tool was created based on skills practicing clinicians already possess: patient-centered practice and structure of patient encounters.

3) Learning is promoted when new knowledge is demonstrated to the learner.

We will walk through the description of the Observation & Learning tool as a group.

4) Learning is promoted when new knowledge is applied by the learner.

In pairs practice each step of the Observation & Learning tool.

5) Learning is promoted when new knowledge is integrated into the learner's world.

Practice this week!

Teach-the-Teacher: Session Two

Good morning, and thank you for joining us again in Session 2 of our Teach-the-Teacher series!

Last week, we attempted to begin to answer the question from our qualitative findings "What does it mean 'go and teach?'

And from our qualitative data where we identified a need to create standardization of our teaching among us, we've set out to define what our "gold standard" ought to be. To this end, we introduced an "Observation and Learning Tool" as a means to define and teach how to provide excellent learner-centered clinical teaching.

Last week, we discussed how the model was developed, with special emphasis that the model was developed drawing on skills clinicians *already* possess - 'patient-centered' model and 'patient-encounter' structure.

This highlighted for us that becoming a learning-centered clinical teacher is a skill set that we likely already possess, but just need to apply to our clinical teaching.

This week, we'd like to go through the Observation and Learning Tool in detail and give you the opportunity to familiarize yourself with the tool. (Handout tool)

This is an overview of the steps – now we'll consider each one in detail.

1) Welcomes the learner - This helps establish a positive learning environment. So prior to any discussion of a clinical case, the consultant will 'welcome the learner' as a way to set the tone that rounds are a safe learning environment where uncertainty is respected. From our qualitative data, our trainees described a favorable clinical learning environment in these terms: "non-threatening" "interactive" "engaged" "encouraged" "feel safe" - establishing this at the beginning will go a long way in setting the tone for the rest of your rounds.

2) Drives the supervision according to the learner's needs. This is huge – and may be a large shift for some of us – the focus during the round shouldn't be on us and what we know, or even our agenda, but should be about the learner – i.e. what are the learner needs for this particular case? We'll spend a lot of time on this concept of learning-centered teaching during our next session, but for today, just think about this as 'meeting the learner where he/she is at' – again, from our qualitative data "People just assume that you know something while in fact you may not."

→ Today we will engage in a little bit of role playing! I will hand out a clinical scenario and you can use it as a springboard for your learning & teaching interaction. Whoever is playing the "trainee" can decide what the assessment and plan will be – this will mix up the "learner needs" for the person playing the "consultant". Use the Scenario provided to practice Step One (#1 and 2) of the Observation & Learning Tool.
May I have a pair please volunteer to show the group their interaction?

Rather than just tell the learner what the issue is, this step encourages the learner to 'think aloud'; so we're 'hearing' what they are thinking. Notice here – this isn't about "lecturing" to the trainee. We have dedicated time for lectures – what this is about is "hearing" the trainee ***think***. Rounds shouldn't be mini-lectures at the bedside, but about engaging the trainee so that we stimulate/facilitate their clinical thought processes.

By drawing on the underlying knowledge, this helps the learner make connections. There's a lot of education literature about the importance of linking information to other known information as a way to organize material – this is much more effective than memorizing discrete facts. But again, this is not a mini-lecture, but a chance for the learner to remember, or if he/she doesn't know, then it allows the teacher to know where the learner is at, and probe accordingly.

This step 4 will depend on the case, but it might be a good opportunity to allow the trainee to demonstrate a skill – either history, physical exam, or communication with the families. Too often on rounds, we don't take advantage of watching the trainee demonstrate a skill, and so it's only during the mock exams or the miniCx that we are shocked to find out the trainee doesn't possess that skill. Whether we incorporate this into our daily rounds or our bedside teaching – observing trainees is critical to their education and training.

An area that is very important is to not only listen to the trainee's plan, but especially if we wish to create an addendum, instead of just dictating our addendum to the trainee, we need involve him/her in the plan.

And at PMH, we know that we might write the best, most up-to-date, evidence based plan in the world – but how do we ensure that actually happens for our patients? This is something we'll need to spend time with our trainees on – verifying the strategies of application of the plan.

This step is really important to help create an environment where uncertainty is respected. This is crucial in an academic environment, especially in medicine, where we must always keep reading and growing over time. If we role model life-long learning, then trainees will learn how to engage in it themselves. It also helps us move away from the negative, false and unrealistic traditions that the physician is "all knowing" toward a more positive and sustainable practice of life-long learning and engagement with new discoveries.

→ Now use the same Scenario to practice Step Two (#3-6) of the Observation & Learning Tool.

Ending the supervision is as important as the initial welcome, because it allows for feedback of the learner, self-directed learning, and for feedback for the teacher.

We'll dedicate a whole session to 'giving & receiving' feedback, but for now, start by allowing the resident to reflect on his/her own strengths before we value them, again placing the learner at the forefront.

And finally, step 8 – evaluation of the supervision processes. This allows us to get better and to elicit feedback so we can improve.

Here's an example of how you might end the supervision. This video is from last week's scenario of the baby with AGE and moderate dehydration. It doesn't have to happen after every patient, but maybe at the end of rounds – up to you.

→ Now use the same Scenario to practice Step Three (#7 and 8) of the Observation & Learning Tool.

Now, putting it all together – you've practiced the three large steps and broken them down into 8 smaller steps.

You might be thinking, but what about time? Over the next several weeks, we'll look at how we can actually make our rounds shorter and more effective teaching. But just from these examples, the teaching at the 'gold standard' was only 2 minutes longer, and the debrief only took 1 min.

Today we spent a lot of time going into the description of what it looks like to be an excellent clinical teacher. Next time we will provide you practical strategies of *how* to practice learner-centered teaching. We will not meet next week, since that is the BPA conference. Thank you.

Teach-the-Teacher Series
Session 2

Scenario:

A 4-month-old, HIV unexposed, male presents with a three-day history of rhinorrhea and nasal congestion, followed by acute onset of increased work of breathing for one day. He had subjective fever at home. He is tolerating PO and has adequate UOP. The older sister to the baby also has URTI symptoms. Review of systems is otherwise negative. Past medical history is unremarkable – born at term, HIV unexposed, no previous hospitalizations, feeding breastmilk elusively, vaccines up to date, with normal growth and development. There is no personal or family history of asthma, allergies, or eczema.

On physical exam, vitals show T 38.1, HR 140, RR 60, O2 sat 96%. He is alert, consolable, in mild respiratory distress. He has increased work of breathing with tachypnea 62bpm, and subcostal retractions, but no grunting, stridor, suprasternal retractions, or nasal flaring. On auscultation, there is diffuse expiratory wheeze, but with good air entry throughout, no crackles or creps. He is pink, well perfused, with moist mucus membranes and crying with tears. Rest of exam is unremarkable.

Teach-the-Teacher Series
Session 2

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Teach-the-Teacher

Session 2: ’What does it mean to be a clinical teacher?’

“What does it mean ‘go and teach’?
We need expectations laid out.”

Observation & Learning Tool

A: level of competence

	Level x (low-weak) : **Makes the learning unpredictable**	Level y (good): **Has good teaching skills to enhance learning**	Level Z (excellent) : **has excellent teaching skills to enhance learning**
1. Welcomes the resident	😐 does not put the resident at ease and **concentrates on the clinical problem**	☺ **welcomes the resident** and expresses his availability	☺☺ assures **adequate time and space** or **suggests arrangements** to put at ease

B: criteria

C: descriptor

Fig. 4. structure of a formative rubric (extract of the developed instrument).

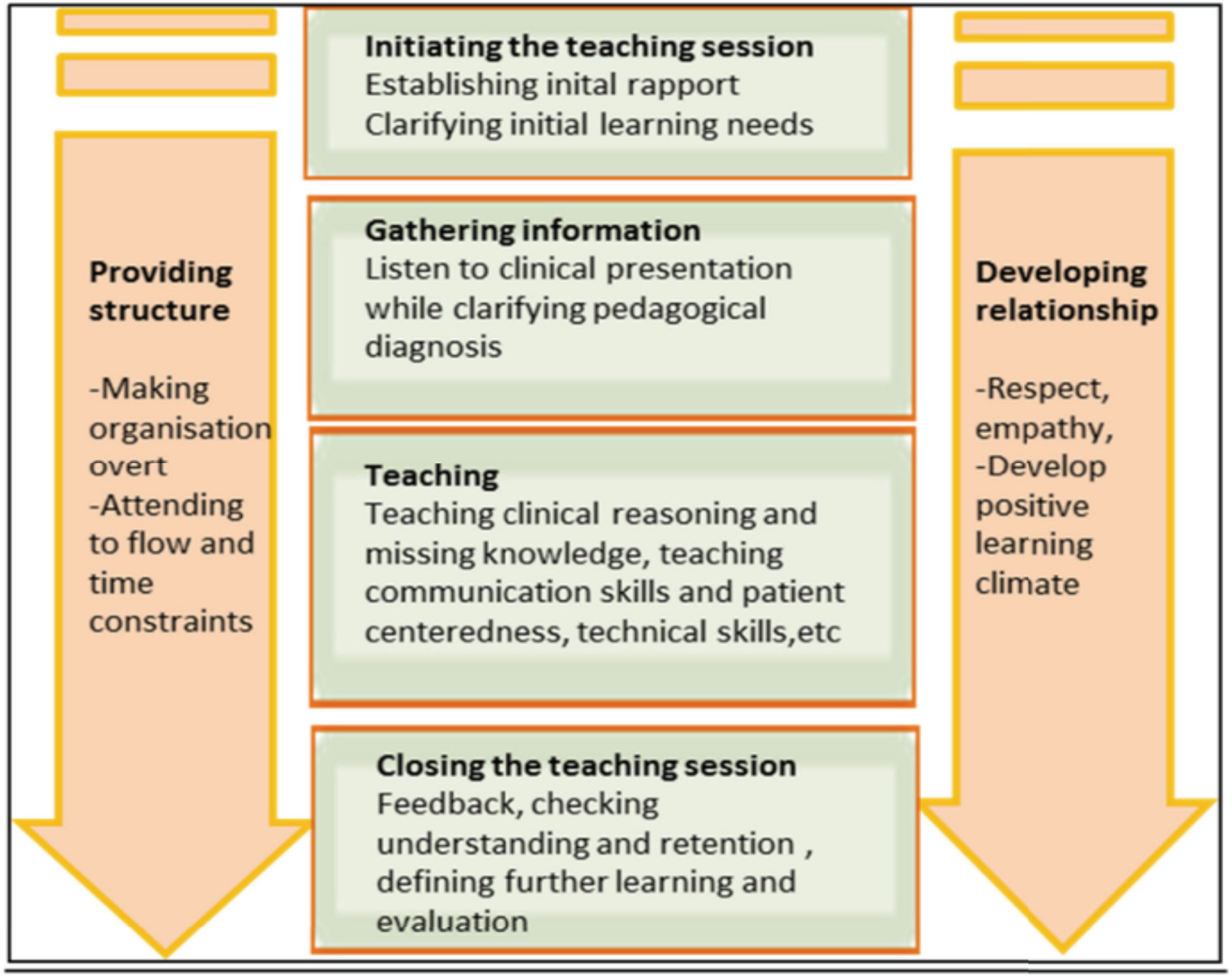
1) We provide patient-centered care

- Defines patient's needs & answers patient's needs
- Establishes a therapeutic relationship using empathy, integrity, respect and patient-centered
- Favor patient's autonomy that enhances management of illness
- Take into account patient's emotions and psychosocial distress
- Checks for patient's understanding of illness, treatment, etc.
- Checks patient's retention of new information
- Anticipates with the patient the next steps

1) We provide learner-centered teaching

- Defines learner's needs & answers learner's needs
- Establishes a positive learning climate using empathy, integrity, respect and learner-centered
- Favor learner's autonomy that enhances independent learning
- Take into account learner's emotions and psychosocial distress
- Checks for learner's understanding of clinical reasoning, plan, etc.
- Checks learner's retention of new information
- Anticipates with the learner the next steps/learning goals

2) We engage in daily patient encounters



Observation & Learning Tool

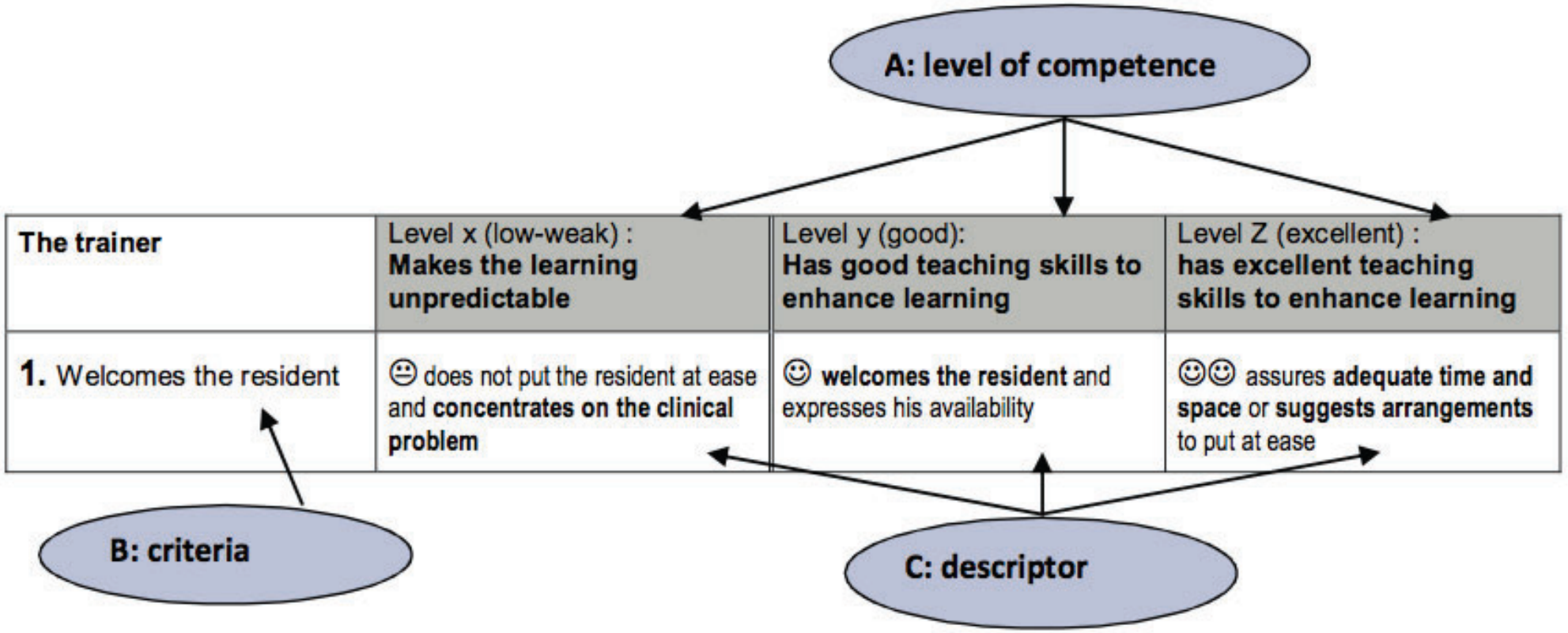
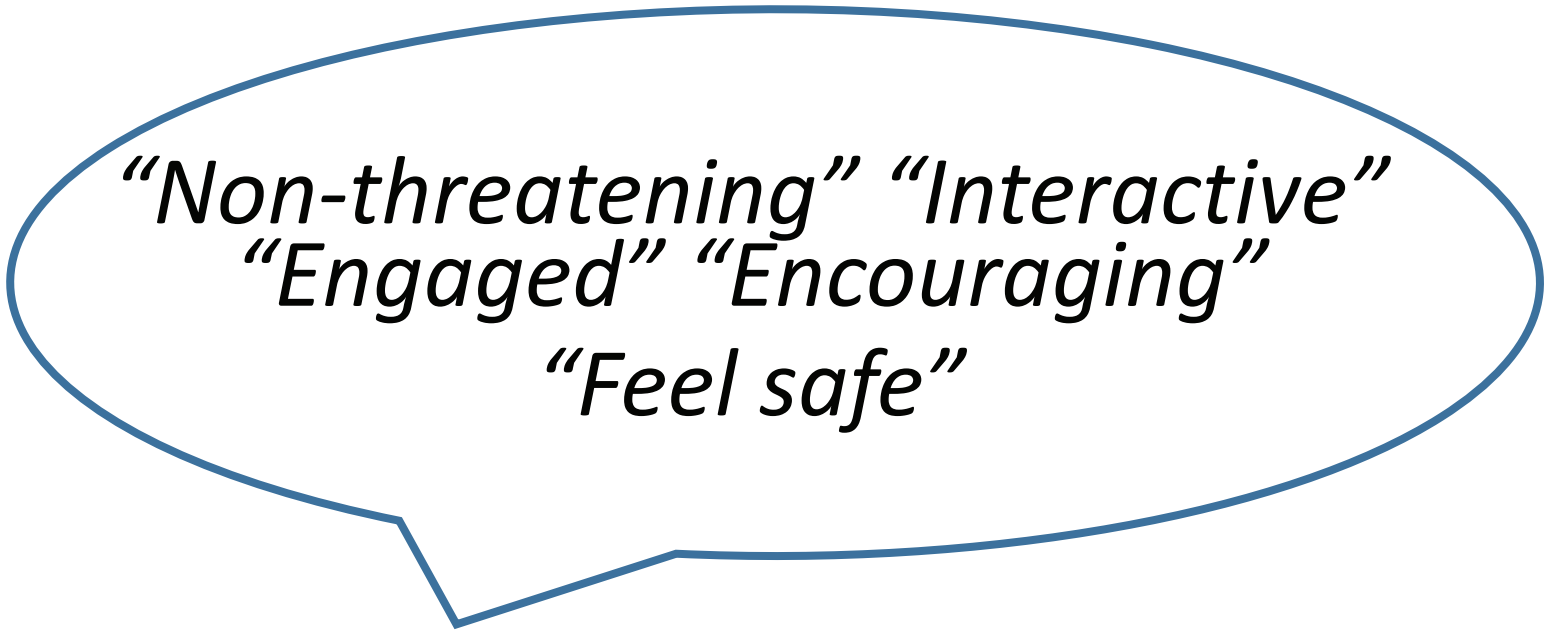


Fig. 4. structure of a formative rubric (extract of the developed instrument).

- **Step One: Organizes the supervision**
  1. Welcomes the learner
  2. Drives the supervision according to the learner's needs
- **Step Two: Helps the learner to learn from the case**
  3. Discusses the case and explores
     a. Clinical reasoning
     b. Underlying medical knowledge
  4. Teaches or corrects
     a. History taking or clinical exam
     b. Communication skills
  5. Discusses the plan
     a. Developing an action plan
     b. Verifying the strategies of the application
  6. Addresses own limits of knowledge
- **Step Three: Ends to Supervision**
  7. States
     a. Strengths
     b. New learning
     c. What has to be learned
  8. Evaluation of supervision process

Step One: Organizes the supervision

Step One: Organizes the supervision			
1. Welcomes the learner	☹ does not put the learner at ease and concentrates on the clinical problem	☺ welcomes the learner and expresses his availability	☺☺ assures adequate time and space or suggests arrangements to put at ease



Step One: Organizes the supervision

“People just assume that you know something while in fact you may not”

2. Drives the supervision according to the learner’s needs	☹ listens to the case presentation without asking the learner’s own question or needs to drive the supervision	☺ lets the learner express the problem that prevents him/her to solve the case (before or just after the case presentation)	☺☺ clarifies or reflects what prevents the learner to solve the case (learning needs) (before or just after the case presentation) or discusses the case aiming explicitly at the learner’s needs

Practice!

- Get into pairs
- Each person in the pair takes turns being the ‘consultant’ and the ‘trainee’
- Give each other feedback on the interaction
- Use the Scenario provided to practice Step One (#1 and 2) of the Observation & Learning Tool.

Step Two: helps the learner to learn from the case

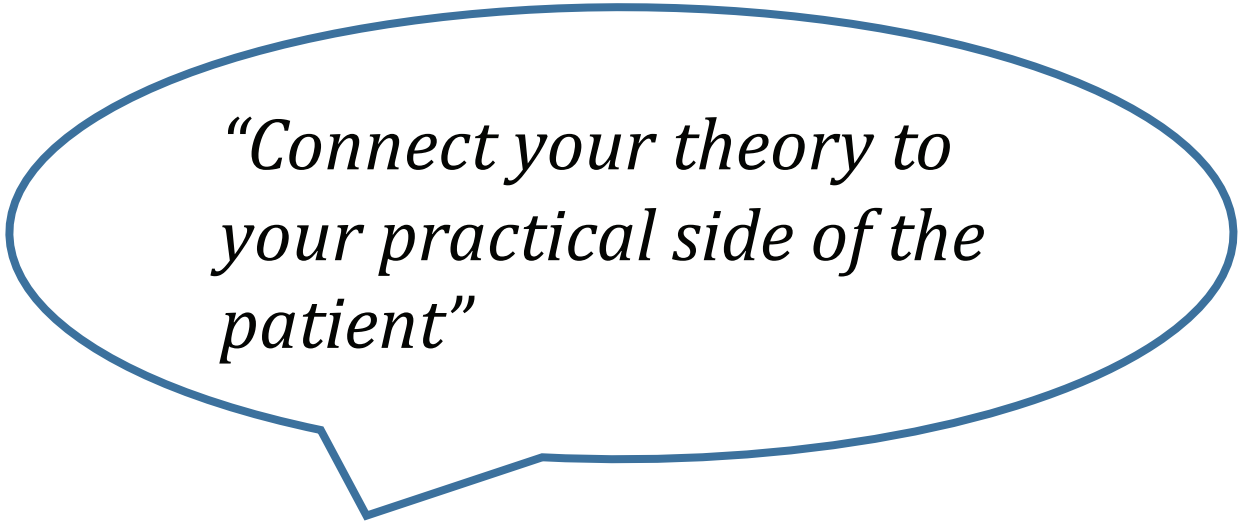
Step Two: helps the learner to learn from the case	
3. Discusses the case and explores . . .	
a. clinical reasoning	
b. the underlying medical knowledge	

Step 2: helps the learner to learn from the case			
3. Discusses the case and explores . . .			
a. clinical reasoning	☹ a. interrupts the learner so as to get more information following his/her own medical reasoning or thinks aloud without including the learner	☺ a. asks the learner what hypotheses has driven his/her reasoning, or speaks aloud involving the learner	☺☺ a. encourages the learner to argue or complete the hypotheses of his/her medical reasoning

"Guided question" . . .
"Helped me to arrive at conclusion."

Step 2: helps the learner to learn from the case

3. Discusses the case and explores . . .



b. the underlying medical knowledge	☹ b. questions/ explains theoretical notions without clear link with the case or does not discuss any related knowledge	☺ b. teaches the knowledge related to the missing notions or wrong interpretations of the learner	☺☺ b. stimulates the learner to remember the relevant knowledge, or helps to find relevant missing knowledge (gives tools/references)

Step Two: helps the learner to learn from the case

4. Teaches or corrects . . .

Step Two: helps the learner to learn from the case			
4. Teaches or corrects . . .			
a. the history taking or clinical exam	☹ a. tells what the learner should do without explanation or modeling; or does not teach the history taking or clinical exam	☺ a. teaches history taking or clinical examination by explanation or modeling	☺☺ a. lets the learner demonstrate a skill or history taking or clinical examination

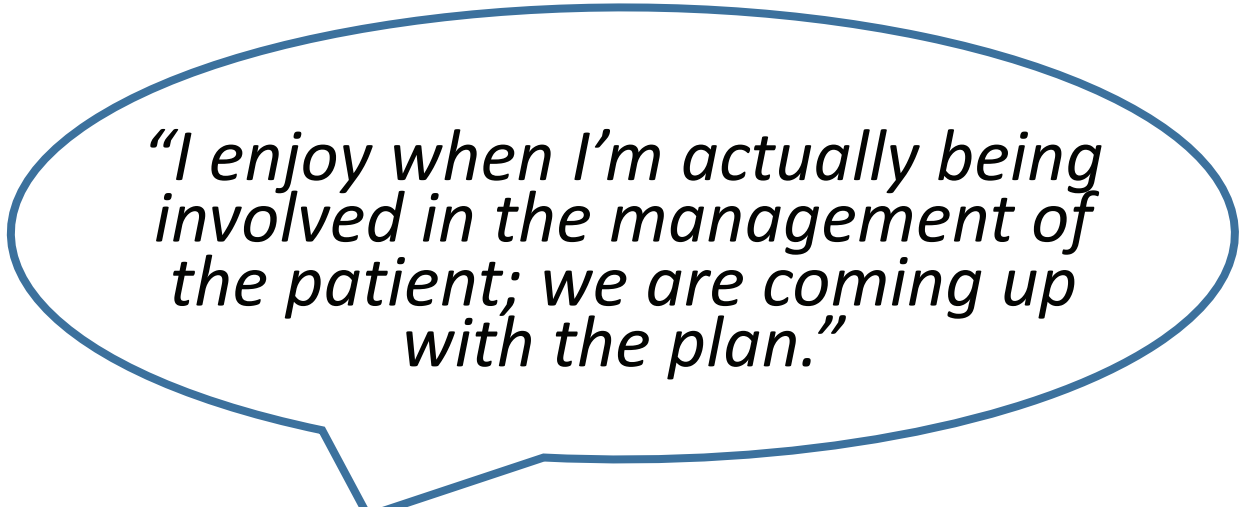
"Practical hands on teaching with supervisor there showing you."

Step Two: helps the learner to learn from the case			
4. Teaches or corrects . . .			
b. interpersonal/ communicational skills	☹ b. tells what the learner should do without explanation or modeling or does not teach interpersonal skills	☺ b. teaches relevant interpersonal/ communication skills by explanation or modeling	☺☺ b. lets the learner demonstrate an interpersonal/ communication skill

Step Two: helps the learner to learn from the case

5. Discusses the plan . . .

Step Two: helps the learner to learn from the case			
5. Discusses the plan . . .			
a. developing an action plan	☹ a. after a diagnosis or definition of the problem, tells the learner what to do	☺ a. asks the learner to express an action plan (investigations, treatment and follow up) or expresses an action plan involving the learner	☺☺ a. asks the learner to argue and discuss own action plan



Step Two: helps the learner to learn from the case			
5. Discusses the plan . . .			
b. verifying the strategies of application	☹ c. does not check the learner's strategies of application, or tells the action plan to the patient without discussing it with the	☺ c. asks the learner if he/she feels confident to apply the action plan, or offers to help for the application of the action plan	☺☺ c. checks how the learner will apply the action plan

Step Two: helps the learner to learn from the case			
6. Addressing own limits of knowledge			
	☹ expresses no doubt about the medical knowledge	☺ expresses the limits of his/her own knowledge or his/her doubts	☺☺ expresses the doubts or limits of his/her own knowledge and defines with the learner a way to find the needed information to overcome the doubts

"Faculty admitting when they don't know something."

Practice!

- Get into pairs
- Each person in the pair takes turns being the ‘consultant’ and the ‘trainee’
- Give each other feedback on the interaction
- Use the scenario to practice Step Two (#3-6) of the Observation & Learning Tool.

Step Three: Ends the supervision

Step Three: Ends the supervision

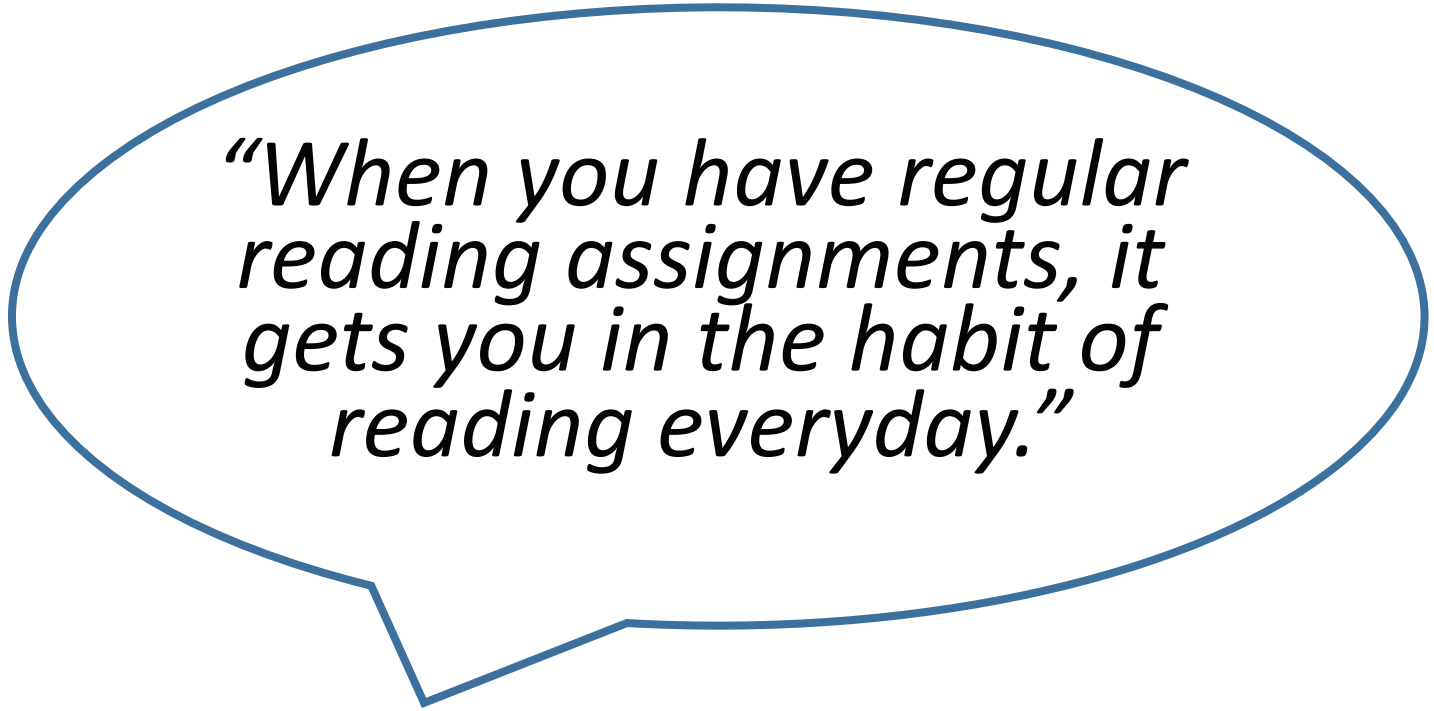
7. States . . .			
a. strengths: what is mastered	☹ a. does not value or reflect on learner's strengths that helped him/her to solve the problem	☺ a. stresses the learner's strengths that helped him/her to solve the problem and values them	☺☺ a. encourages the learner to reflect on own strengths before valuing them

"Positive feedback encourages you; constructive criticism can give you edge to improve."

Step Three: Ends the supervision			
7. States . . .			
b. new learning	☹ b. does not speak about what should be remembered	☺ b. tells the learner what he/she should remember	☺☺ b. asks the learner what he/she will remember and can add some suggestions (or asks for some transfer to other case) or asks the learner for some general principles/ rules that can be deducted from present case

Step Three: Ends the supervision

7. States . . .

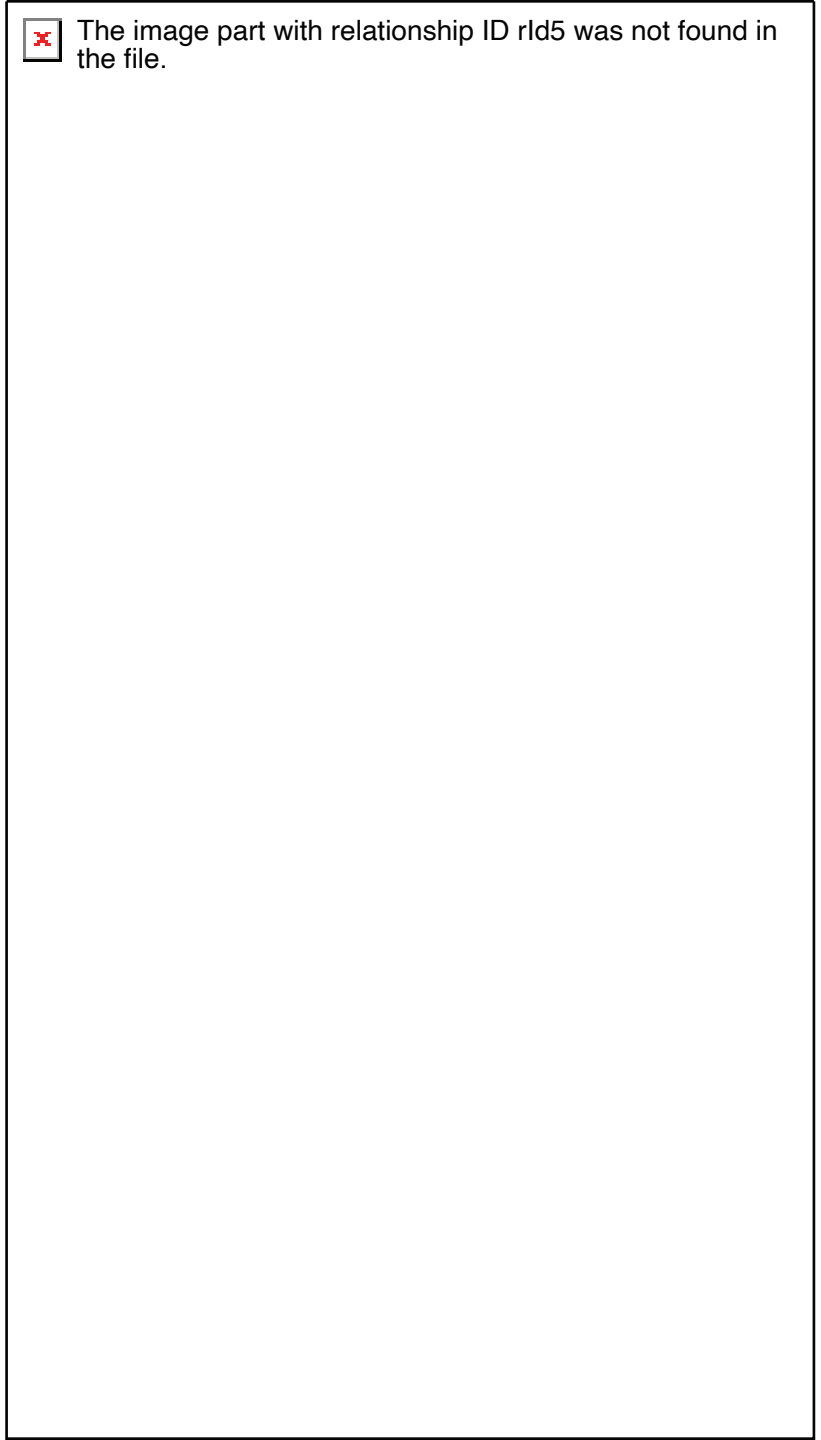


c. what has to be learned	☹ c. does not speak about what should be learned on behalf of the discussion	☺ c. suggests some ideas to enhance his/her ongoing learning	☺☺ c. defines with the learner a learning plan (actions, literature, timing, evaluation)

Step Three: Ends the supervision

8. Evaluation of supervision process			
	☹ does not speak about the supervision process	☺ checks if supervision has answered his/her learning needs (content)	☺☺ checks if supervision has answered the learning needs and if supervision process is adequate or asks for suggestions of improvement in supervision process

"Never get an opportunity to tell a specialist how they could have helped you with a patient."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Practice!

- Get into pairs
- Each person in the pair takes turns being the ‘consultant’ and the ‘trainee’
- Give each other feedback on the interaction
- Use the scenario to practice Step Three (#7 and 8) of the Observation & Learning Tool.

- Step One: Organizes the supervision
  1. Welcomes the learner
  2. Drives the supervision according to the learner's needs
- Step Two: Helps the learner to learn from the case
  3. Discusses the case and explores
     a. Clinical reasoning
     b. Underlying medical knowledge
  4. Teaches or corrects
     a. History taking or clinical exam
     b. Communication skills
  5. Discusses the plan
     a. Developing an action plan
     b. Verifying the strategies of the application
  6. Addresses own limits of knowledge
- Step Three
  7. States
     a. Strengths
     b. New learning
     c. What has to be learned
  8. Evaluation of supervision process

But what about time?

Questions? Thoughts?

Teach-the-Teacher: Session Three

Friday, 27 July at 8:00-8:30am

(*20 July – BPA)

G.4 TEACH-THE-TEACHER: "WHY LEARNER-CENTRED TEACHING, AND HOW"

Appendix G.4

Teach-the-Teacher

“Why learner-centered teaching & how”

Teach-the-Teacher: Session Three

Thank you for joining us again for Session 3 of our Teach-the-Teacher series!

So, as you may recall, last time we met, we went into great detail looking at the Observation and Learning Tool. We hope that this tool will provide us guidance as a department to provide excellent, learner-centered clinical teaching – our department "gold standard" for teaching if you will.

We said in our first session that learner-centered teaching considers the learner's needs "meet him/her where he/she is at"; that we engage in teaching with mutual respect and integrity; that we favor the learner's autonomy for independent learning; that we take into account the learner's emotions when teaching; that we check for the learner's understanding of clinical reasoning; we check their retention of this new information; and we aid the learner in creating self-learning goals.

But what we haven't talked about is ***why*** it's so important to provide learner-centered teaching.

Traditionally, when we consider the role of the trainee in medical education, studies have found that the medical students' role is limited to passive learning, only receiving "low-level", factual information. Even in settings where medical students did a large portion of the talking, they tended only to report factual content; questions were seldom asked of students, and when they were asked questions, these questions generally were about facts, and rarely were the students required to verbalized their problem-solving efforts. Unfortunately, little has changed in medical education for several decades and this continues to be a norm in many academic settings.

Foley et al described in their work "low level" vs "high level" aspects of clinical teaching. Low-level clinical teaching includes aspects pertaining to reporting, reading, summarizing, giving or asking directions, and/or asking about facts. Whereas high-level clinical teaching provides or asks students information regarding: comparing, contrasting, evaluating, synthesizing, predicting, and hypothesizing. Foley et al. argue that, "Medical students will become better problem-solvers when provided with opportunities to engage actively in problem-solving, whereby the student rather than the teacher solves the problem."

More worrisome, if the content of the discussion during ward rounds is consistently probing for low-level knowledge, this biased emphasis could be misconstrued by the learner to believe that what is important about *being* or *becoming* a doctor is 'knowing facts,' not analytical thinking and decision making. And as Foley wrote, "Infrequently asking students questions which challenge them to interpret, synthesize, or assess data may encourage the creation of good medical dictionaries rather than skilled practitioners." (Foley)

And from our own trainees, they do sometimes feel this way – not like physicians or paediatricians in training, but like secretaries. And from our own faculty, we recognize the importance of engaging in the critical thinking process with our juniors.

Therefore, the content of the discourse between the teacher and learner on ward rounds ought to be high-level, which requires a learner centered approach. But ***how*** do we do this?

Well, we've already seen from our last session, one way to provide learner-centered teaching is to follow the rubric from the Observation & Learning Tool. But what is missing from here is that the focus is still on ***us*** as the teachers, and not as the learners – this tells ***us*** what do to, but we need to know what the ***learner*** ought to be doing during the encounter and provide him/her with that information.

So we need to put the learner at the forefront. And that's where SNAPPS comes in! SNAPPS is a pneumonic for a bedside teaching model. SNAPPS provides a structured bedside teaching model for trainees and faculty to move away from the constraining, fact-based presentation/probing teaching style toward encouraging analytical thinking. It puts the learner at the center of the teaching encounter and creates a shared responsibility between the teacher and learner.

This is key – the learner is "active and directive in the educational encounter" and the "instructor's role is no longer to deliver but to guide." This is a shift from the consultant having to direct the educational component of rounds, but instead, the LEARNER is responsible to initiate and direct the educational encounter.

The same way we've provided ourselves with a structure, our trainees will be provided with a structured model to follow to present their case on rounds in a way that will facilitate the learner-centered encounter without drawing away from the patient-centered care. So what I'd like to do now is to introduce you to the SNAPPS model and then show you how it relates and can be easily integrated into our clinical teacher's observation and learning tool.

SNAPPS is a helpful pneumonic to describe the six steps of the bedside teaching model: Summarize, Narrow, Analyze, Probe, Plan and Select.

But why SNAPPS? We've chose SNAPPS as our model to introduce to the department for a couple of reasons. Firstly, the literature shows that SNAPPS students who are trained in SNAPPS outperformed their peers who were not trained in SNAPPS, specifically, they expressed twice as many differential diagnoses, justified their reasoning 5 times more often than their peers, and expressed twice as often more questions and uncertainties than their peers. The ability to generate a broader differential, justify reasoning for the differential, and to be able to ask questions and express uncertainties when taking care of patients are all critical to the trainee development to become a doctor. Of note, students who used SNAPPS on rounds did not take longer than the standard rounds.

The first step in SNAPPS is for the trainee to summarize briefly the history and physical exam.

The key word here is BRIEFLY.

Like we talked about last week, currently, when we round, especially with students, they provide a very lengthy, time consuming history and physical exam. What they are currently presenting is for the **medical record**, ***not*** for the teaching interaction that should occur on rounds.

They need to understand the difference in the purpose between the medical record and presenting on rounds. The purpose of charting and creating the medical record is to create documentation of the hospitalization – this is generally for the future physician who is not currently seeing the patient, but if he/she is seen in the future, the next physician can easily read and understand the patient's presentation and hospital course. The medical record is also for nurses to read the plan and to carry out orders as written. This is very different than the purpose of presenting on rounds, which is to provide relevant clinical information and to teach and learn.

Therefore, what is presented needs to be very different than what has been charted in the medical records. Instead of capturing all aspects of the medical record, they need to provide a brief summary of the history and physical exam to include the pertinent information: pertinent positives and negatives.

So what happens now, is that they provide this very hyperinflated history and physical exam (often which is missing essential pertinent negatives and positives); does not indicate if they can really ***do*** the physical exam that they have read out loud, sometimes they are just reading aloud someone else's history and physical exam from night before, but most worrisome - their assessment and plan are atrophied in comparison to the history and physical.

Therefore, what SNAPPS helps the leaner do is minimize the regurgitation piece and maximize the cognitive piece.

In this way, we're not wasting time on rounds listening to a lengthy history and physical exam, but instead free up time to hear the actual clinical thought process of our trainees. We know they can read, write and regurgitate, but if we force them to summarize (from that meter long HPI! what are the pertinent negatives and pertinent positives!) then we can spend more time on hearing their critical thinking.

A few good rules of thumb: while the actual summary may vary in length depending on the complexity of the case,

1) the summary should not occupy more than 50% of the learning encounter and should generally not be longer than three minutes.
2) Remember, because you are at the bedside with the trainee, if he/she omits something from their summary, you can easily ask (and then provide explanation for its relevance).
3) We should also use this time to teach our trainees how to present using medical terminology: "yesterday" → "acute" and "third time" → "recurrent", because successful diagnosticians use these qualifiers early in their presentations.

Step 2 in SNAPPS is for the learner to "Narrow" the differential diagnosis to two to three relevant possibilities.

After the learner has presented the history, physical exam and any labs, but before going on to the Plan, the learner needs to verbalize what he/she thinks is going on in the case. This is an opportunity to help the learner develop his/her Assessment. He/she should focus on what is most likely. So for the new patient, the learner can present 2-3 most likely diagnosis, and for the known/follow-up patient, the learner can choose which problem they would like to focus on for today – e.g. "known seizure patient with break-thru seizure" – why back again? Or "known Wilms tumor patient" - can chose to focus on the therapeutic interventions, etc. **We will be discussing other relevant teaching strategies for this because the "narrow the differential" doesn't always work especially in NNU and PHO where we often already know the differential diagnosis but there is still a lot to discuss and learn about. So for today we are just focusing on the patient where the differential isn't known.

"This step requires a **commitment** on the part of the learner . . . [and] the learner must present an initial differential to the consultant before engaging the consultant to expand or revise the differential."

Example . . .

This commitment to possible differential diagnosis sets the learner up for the third step: Analyze. At this step, the learner must compare and contrast the two to three previously stated possibilities

Example . . .

*"*This discussion allows the learner to verbalize his or her thinking process and can stimulate an interactive discussion with the preceptor. Learners will vary in their fund of knowledge and level of diagnostic sophistication, but all are expected to utilize the strategy of comparing and contrasting to discuss the differential." Another way to think of this – is that these combined steps set up the learner to make his/her assessment of the patient. And we'll have heard how the learner came up with the assessment that he/she did.

Step 4, "Probe" is now the first step that the consultant comes in. During this step, the learner is "expected to reveal areas of confusion and knowledge deficits and is rewarded for doing so."

"This step is the most unique aspect of the learner-driven model because the **learner** initiates an educational discussion by probing the consultant with questions rather than waiting for the **consultant** to initiate the probing of the learner. The learner is taught to utilize the consultant as a knowledge resource that can readily be accessed. The learner may access the consultant's knowledge base with questions or statements ranging from general to specific." This also helps to establish in our learning climate that uncertainty is respected and asking questions is not only a natural process of learning medicine, but also part of the dedication to life-long learning that physicians must possess.

Example . . .

Step 5: Making the plan.

“The learner initiates a discussion of patient management with the consultant and must attempt either a brief management plan or suggest specific interventions. This step asks for a commitment from the learner, but encourages him or her to access the consultant readily as a rich resource of knowledge and experience.” What’s important here is that if we amend the plan that we involve the learner in this process.

Step 6: Select a case-related issue for self-directed learning.

“This final step encourages the learner to read about **focused, patient-based** questions. The learner may identify a learning issue at the end of the patient presentation or after seeing the patient with the consultant. The learner should check with the consultant to focus the reading and frame relevant questions. The learner should devote time to reading as soon after the office encounter as possible. We encourage learners to read nightly in a regular, disciplined, and patient-based manner rather than in long, unfocused bursts. For example, a learner would be encouraged to read to answer a question such as, ‘What is the rationale for the use of ace inhibitors in congestive heart failure?’ rather than reading an entire chapter in a review text on heart failure.”

Putting it all together . . .

Teach-the-Teacher Series
Session 3

Scenario - PMW:

1. Welcomes the learner - welcomes the learner and expresses his availability

2. Drives the supervision according to the learner's needs - clarifies or reflects what prevents the learner to solve the case (learning needs) (before or just after the case presentation) or discusses the case aiming explicitly at the learner's needs

Summarize

Summarize Briefly the History and Physical Findings

The learner obtains a history, performs an appropriate examination of a patient, and presents a concise summary to the preceptor. Though the length may vary, depending on the complexity of the case, the summary should not occupy more than 50% of the learning encounter and, generally, should be no longer than three minutes. The summary should be condensed to relevant information because the preceptor can readily elicit further details from the learner. In this step, the learner should be encouraged to present the case at a higher level of abstraction (i.e., to use semantic qualifiers: yesterday becomes acute, third time becomes recurrent) because successful diagnosticians use these qualifiers early in their presentations.

3 yo 4mo, HIV negative, previously well female presented last night with seizure. The mother witnessed the seizure and she described the child as jerking all of her limbs, with eyes open and rolled back, without loss of bladder or bowel function. This lasted approximately three minutes and spontaneously resolved. This was a single episode of seizure. After the seizure, the mother report the child was sleepy, but noted no focal deficits. She has never had a seizure episode before. Of note, the child has had cough and fever for one day prior to the seizure, and child was reported to have subjective fever during the seizure. Review of systems otherwise negative. She has not received any antibiotics recently. No TB or sick contacts in the home, but child attends daycare. The older sister has a history of febrile seizures.

There is no significant past medical history – she was born term without complications, has been growing and developing well, and is up to date on all vaccines. There is no family history of epilepsy or neurodevelopmental delays.

On physical exam, vital signs are T 37.9, HR 118, RR 22, 100% O2 sat on room air, BP 102/65. The child is awake, alert, playful and appropriate for age. CNS exam shows pupils are equal, round and reactive to light. Other cranial nerves are intact, with symmetric facies, tongue midline and no focal deficits. She has normal tone and strength. Sensation is intact. DTR are intact at +2. She has normal gait and coordination for age. Kernig's and Brudzinski's signs are negative. She has no photophobia. The rest of her physical exam is unremarkable with

the exception of nasal congestion and rhinorrhea; tympanic membranes are clear, non-bulging, without opacities bilaterally. Her chest is clear with no increased work of breathing.

3. Discusses the case & explores

(a) clinical reasoning - encourages the learner to argue or complete the hypotheses of his/her medical reasoning

Narrow

Narrow the Differential to Two or Three Relevant Possibilities

The learner verbalizes what he or she thinks is going on in the case, focusing on the most likely possibilities rather than on "zebras." For a new patient encounter, the learner may present two or three reasonable diagnostic possibilities. For follow-up or sick visits, the differential may focus on why the patient's disease is active, what therapeutic interventions might be considered, or relevant preventive health strategies. This step requires a commitment on the part of the learner, . . . [and] may initially represent early steps in the problem-solving process such as a hunch or best guess. In the SNAPPS method, the learner must present an initial differential to the preceptor before engaging the preceptor to expand or revise the differential.

My differentials at this time are: simple febrile seizure, meningitis, or new onset epilepsy.

(b) underlying medical knowledge - stimulates the learner to remember the relevant knowledge, or helps to find relevant missing knowledge (gives tools/references)

Analyze

Analyze the Differential by Comparing and Contrasting the Possibilities

The learner initiates a case-focused discussion of the differential by comparing and contrasting the relevant diagnostic possibilities and discriminating findings. A learner's discus- sion of the cause of a patient's chest pain might proceed as follows: "I think that angina is a concern because the pain is in his anterior chest. At the same time I think that a pulmonary cause is more likely because the pain is worse with inspiration, and I heard crackles when I examined the lungs." Often the learner may combine this step with the previous step of identifying the diagnostic possibilities, comparing and contrasting each in turn. This discussion allows the learner to verbalize his or her thinking process and can stimulate an interactive discussion with the preceptor. Learners will vary in their fund of knowledge and level of diagnostic sophistication, but all are expected to utilize the strategy of comparing and contrasting to discuss the differential.

Simple febrile seizure seems to fit the best, based on the clinical presentation, age of the child, and family history, but it's important to make sure this isn't a CNS infection. I think CNS infection or meningitis to be less likely because her CNS exam is normal, she doesn't have any meningeal signs, she hasn't been partially treated with antibiotics, there are no TB contacts, and she is well appearing on physical exam. This could be new onset epilepsy, but she only had one seizure, so we can't really say that this is epilepsy yet.

So my assessment is: 3yo4mo, HIV negative female status-post simple, febrile seizure and upper respiratory tract infection of viral origin.

4. Teaches or corrects

(a) history taking or clinical exam – lets the learner demonstrate a skill or history taking or clinical examination

(b) communication skills - lets the learner demonstrate an interpersonal/ communication skill

Probe

Probe the Preceptor by Asking Questions about

Uncertainties, Difficulties, or Alternative Approaches

During this step, the learner is expected to reveal areas of confusion and knowledge deficits and is rewarded for doing so. This step is the most unique aspect of the learner-driven model because the learner initiates an educational discussion by probing the preceptor with questions rather than waiting for the preceptor to initiate the probing of the learner. The learner is taught to utilize the preceptor as a knowledge resource that can readily be accessed. The learner may access the preceptor's knowledge base with questions or statements ranging from general to specific. Examples include, "What else should I include in the differential?," or "I'm not sure how to examine for a knee effusion," or "We could taper his corticosteroids since his Crohn's flare is nearly resolved, but what protocols can be used to avoid problems with steroid withdrawal?" The preceptor can learn a great deal about the learner's thought process and knowledge base by such inter- actions.[13] In the first two interactions, the learner recognizes a need for help with knowledge or skill deficits. In the third, the learner demonstrates a more sophisticated level of knowledge. The preceptor may discuss steroid withdrawal protocols and introduce new learning issues such as the patient's risk for steroid osteoporosis.

My question is if you think this is a simple febrile seizure, when do you need to do an LP to rule out CNS infection? Or is it ok to follow clinically? And I don't know when you would consider putting a child on anti-epileptics if they've had a febrile seizure.

5) Discusses the plan

(a) developing an action plan - asks the learner to argue and discuss own action plan
Plan

Plan Management for the Patient's Medical Issues

The learner initiates a discussion of patient management with the preceptor and must attempt either a brief management plan or suggest specific interventions. This step asks for a commitment from the learner, but encourages him or her to access the preceptor readily as a rich resource of knowledge and experience.

Since she's currently clinically stable and neurologically intact, I thought she could be discharged home. Since I'm thinking this was a simple, febrile seizure most likely caused by fever associated with an upper respiratory tract infection of viral origin, she doesn't necessarily need imaging or bloods or medication, but the family would need counseling for when to return and reassurance about the event.

(b) verifying the strategies of the application of the plan - checks how the learner will apply the action plan

6) Addresses own limits of knowledge - expresses the doubts or limits of his/her own knowledge and defines with the learner a way to find the needed information to overcome the doubts

7) Ends Supervision –
(a) Strengths mastered - encourages the learner to reflect on own strengths before valuing them
(b) New learning - asks the learner what he/she will remember and can add some suggestions (or asks for some transfer to other case) or asks the learner for some general principles/ rules that can be deducted from present case
(c) What has to be learned - defines with the learner a learning plan (actions, literature, timing, evaluation)

Select learning

Select a Case-related Issue for Self-directed Learning

This final step encourages the learner to read about focused, patient-based questions. The learner may identify a learning issue at the end of the patient presentation or after seeing the patient with the preceptor. The learner should check with the preceptor to focus the reading and frame relevant ques- tions. The learner should devote time to reading as soon after the office encounter as possible. We encourage learners to read nightly in a regular, disciplined, and patient-based manner rather than in long, unfocused bursts. For example, a learner would be encouraged to read to answer a

question such as, “What is the rationale for the use of ace inhibitors in congestive heart failure?” rather than reading an entire chap- ter in a review text on heart failure. Learners should have an index card or personal digital assistant with them in the office to note learning issues. At the next office visit, the learner can utilize the preceptor as a resource as he or she refers to the list and further probes the preceptor with questions based on the readings.

I’d like to read up on when an LP is needed in febrile seizures and how you treat long term.

8) Evaluation of the supervision process - checks if supervision has answered the learning needs and if supervision process is adequate or asks for suggestions of improvement in supervision process

SNAPPS – NNU Scenario

Summarize

2-day-old, HIV unexposed, male was admitted from 4G to Fully last night after a seizure episode. The mom reports that the baby had stiffening of the right arm associated with the head turning and the eyes deviated to the left; the baby did not arouse with touch and the posturing of the limb persisted for approximately 2 minutes, which then spontaneously resolved. And random blood glucose taken at time of seizure event showed 2.2mmol/L and baby received an IV dose of D10 and a loading dose of phenobarbital. The baby has not had any further seizure activity, and has been tolerating PO feeds without issue.

The baby was born to a P2G1 mom, HIV negative, non-reactive, blood group A+, via C-section due to failure to progress during labor. The baby was born at 39 weeks and 5 days. Other than the need for an urgent C-section, there were no other complications at birth, mother was afebrile without signs of infection. The baby did not require resuscitation and was deemed to be clinically fit to be with mom in 4G. He passed meconium and urine on day 1 of life. Of note, since mom has been in a lot of pain secondary to her C-section, she reports that she has not been feeding the baby regularly, and prior to the seizure episode, the baby had not been fed for over six hours. But mom has milk supply and baby feeds well when given the breast. Review of systems otherwise negative – the baby has not been hypo or hyperthermic. There is no family history of seizures, and mom's first child is a healthy child without issue.

On physical exam, currently the vital signs are stable and the RBG is 4.5mmol/L. The baby is active, alert, pink, no jaundice or cyanosis, no signs of distress or dysmporphic features, with a strong cry. CNS exam - the baby responds appropriately; with pupils round, equal and reactive to light. Facies are symmetric, tongue midline. Normal tone and strength. DTRs intact. Suck, rooting, grasp, plantar, Galant, and Moro reflexes are intact. There are no focal deficits. The rest of the physical exam is unremarkable: The head is normocephalic, anterior fontanel is open and flat, the eyes have red reflex bilaterally, without discharge or scleral icterus, nares are patent, and mouth has moist mucus membranes. Normal heart sounds without murmur; chest clear without increased work of breathing; abdomen soft, nontender, nondistended, with healing umbilical cord without evidence of infection; normal male genitalia with testicles palpable bilaterally; extremities normal with negative Barlow and Ortolani, anus patent, normal back; skin normal without rash or other lesions.

Narrow:

My differential in a neonate with seizure includes: hypoglycemia, hypocalcemia, hypomagnesemia, and hyponatremia. Other differentials include sepsis, inborn error of metabolism, withdrawal of sedative or opioid exposure, possible stroke or hemorrhage, and hypoxia secondary to perinatal asphyxia.

Analyze:

Based on the fact that the baby hadn't eaten for six hours and presented with a low glucose at the time of the seizure, I think most likely the seizure is secondary to hypoglycemia. While the baby didn't have any distress at birth, since there were issues with the failure to progress requiring an emergent C-section, it's possible that the seizure is from hypoxic ischemic encephalopathy, but the baby's neuro exam is normal, so this makes this a little less likely. And while the baby didn't have any fever or hypothermia, it's still important to rule out infection.

So my assessment is 2-day-old male, HIV unexposed, with neonatal seizure – most likely secondary to hypoglycemia, but with risk factors for HIE and need to rule-out sepsis.

Probe:

What I wasn't sure about was if the baby only has one seizure, does he need more antiepileptics, or was the loading dose enough?

Plan by systems:

CNS – Monitor for seizure activity. Again, I wasn't sure if we should continue on maintenance phenobarbital, but I put in my plan that we should start it if the baby continues to have seizures. Obtain head ultrasound if more seizure activity. Get C/M/P
CV/Resp: Currently hemodynamically stable on room air – monitor vitals.
FEN/GI: Mom is to feed baby every 3 hours with expressed breast milk. But if baby has more seizures, then make NPO and start IVF and consider TPN. Check RBS every three hours before feeds.
HEM/ID: Obtain FBC, BCx, CSF and CSF Cx. Start first line antibiotics
Social: Update mother of the plan

Select:

I'll read up on the treatment of neonatal seizures.

Intro to SNAPPS
Script One - Bronchiolitis

Trainee at bedside. Consultant finishes examining patient.

Consultant: "Ok, are you ready to present our next patient?"

Summarize

Trainee: "Yes, this is a new admission. A 4-month-old, HIV unexposed, male presented last night with a three-day history of rhinorrhea and nasal congestion, followed by acute onset of cough and increased work of breathing for one day. He had subjective fever at home. He is tolerating PO and has adequate UOP. The older sister to the baby also has URTI symptoms. Review of systems is otherwise negative.

Past medical history is unremarkable – born at term, HIV unexposed, no previous hospitalizations, feeding breastmilk elusively, vaccines up to date, with normal growth and development. There is no personal or family history of asthma, allergies, or eczema.

On physical exam, vitals show T 38.1, HR 140, RR 60, O2 sat 97%. He is alert, consolable, in mild respiratory distress. He has increased work of breathing with tachypnea 62bpm, and subcostal retractions, but no grunting, stridor, suprasternal retractions, or nasal flaring. On auscultation, there is diffuse expiratory wheeze, but with good air entry throughout, no crackles or creps. He is pink, well perfused, with moist mucus membranes and crying with tears. Rest of exam is unremarkable."

Narrow

Trainee continues: "My differentials at this time are bronchiolitis, pneumonia, and asthma."

Analyze

Trainee continues: "Bronchiolitis seems to fit the best based on the patient's age and clinical symptoms of URTI followed by increased work of breathing and wheeze. It could be pneumonia, but on physical exam, there weren't any areas of decreased breath sounds or crackles, and really sounded like diffuse wheeze. Asthma can also present with wheeze, but I think 4-months-old might be too young to diagnose asthma."

Trainee continues: "So my assessment is of a 4-month-old, HIV unexposed, male with bronchiolitis with moderate respiratory distress and clinically well hydrated."

Probe

Trainee continues: "So, I think this is bronchiolitis, but I wasn't sure at what age you can diagnose asthma. I'm also not sure how we should treat bronchiolitis – do we use salbutamol and steroids like in asthma?"

Consultant: “Ok, great summary and I agree with your analysis of your differential, but it sounds like you might be a little confused about bronchiolitis verse asthma. Can you recall what is similar and what is different about them?”

Trainee: “Well, I know they both involve the small airways, there’s an inflammation of them, so that’s why we hear the expiratory wheeze. I know bronchiolitis is caused by a virus whereas asthma can have many triggers, including viruses. But I always get confused why you don’t treat them the same?”

Consultant: “Ok, yeah, that’s a good start. Bronchiolitis, usually caused by an RSV infection which causes inflammation and mucus plugging starting in the upper respiratory tract down to the small airways. Asthma also involves inflammation of the small airway, as well as bronchoconstriction. As far as treatment goes, you said you know they are treated differently, can you explain more?”

Trainee: “Well, I know with asthma we give B-agonists and corticosteroids, but I’m not sure if we give those when treating bronchiolitis.”

Consultant: “Ok, yes, those are the mainstay treatments of asthma, but for bronchiolitis, we treat with supportive care only, which includes frequent nasal suctioning, oxygen as needed, and monitoring hydration status. There have been lots of studies demonstrating that despite hearing the wheeze and wanting to treat with bronchodilators, they do not provide consistent benefit and should not be used to treat bronchiolitis. A brief trial with objective evaluation of the response may be warranted in some patients, but should be discontinued if not improvement occurs because of the significant adverse effects.”

Trainee: “Ok, what about steroids?”

Consultant: “Neither systemic nor inhaled corticosteroids have consistent benefit in the treatment of acute RSV disease, and again, based on the safety concern of corticosteroids, they are also not recommended for the routine use in the treatment of bronchiolitis.”

Trainee: “Oh, ok.”

Consultant: “So, for this patient, stepping back from treatment, and thinking about our diagnosis, what is the main thing that makes you think this is bronchiolitis and not asthma?”

Trainee: “Well, there isn’t a family history of asthma or allergies or eczema, but I guess the main thing would be that the patient is only 4-months-old.”

Consultant: “Exactly, age is a huge part of the differential is paediatrics. We don’t diagnose asthma really until 3 years of age, and under 1 year, we would really be thinking bronchiolitis over any other cause of wheeze. But I might just also add to your differential diagnosis, an infant with dilated cardiomyopathy or congesting heart failure can sometimes present with wheezing that can mimic an acute respiratory infection, so just keep that in mind, too.”

Trainee: “Oh, ok.”

Plan

Trainee continues: “Well, my plan was to give salbutamol nebs and give steroids, *(laughs a little)* but since we’ve talked, I think I’ll change it to: monitor vitals, give oxygen as needed to keep saturations about 95%, provide Q3H nasal suctioning, and monitor hydration status.”

Consultant: “Great, sounds good. I’d just add, if becomes severely tachypnea, respiratory rate greater than 70bpm, then should make NPO and start on IVF to avoid the risk for aspiration. We should also monitor for any signs of apnea, which can be a common complication of bronchiolitis. Oh, and since the baby is breastfeeding, it’s also important to get an HIV rapid on mom during this admission.”

Select

Trainee: “Ok, sure. And for tonight I’ll to read up on the management of bronchiolitis just to make sure I’ve got it.”

Consultant: “Sounds like a plan. I have a good article I can send to the group and we can discuss it tomorrow at the start of rounds.”

Teach-the-Teacher

Session 3: ’Why learner-centered teaching and how?’

Observation & Learning Tool

A: level of competence

	Level x (low-weak) : **Makes the learning unpredictable**	Level y (good): **Has good teaching skills to enhance learning**	Level Z (excellent) : **has excellent teaching skills to enhance learning**
1. Welcomes the resident	😐 does not put the resident at ease and **concentrates on the clinical problem**	☺ **welcomes the resident** and expresses his availability	☺☺ assures **adequate time and space** or **suggests arrangements** to put at ease

B: criteria

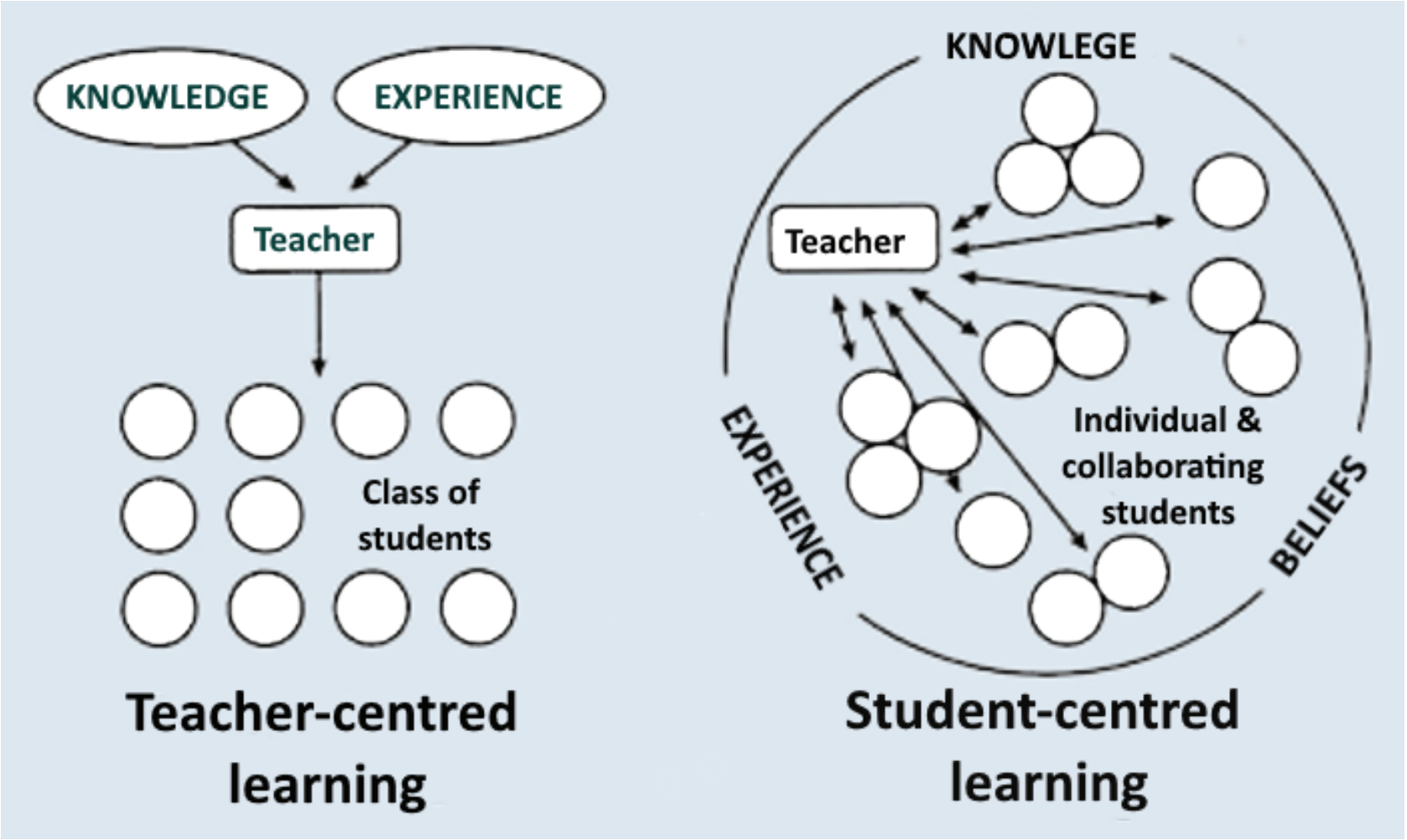
C: descriptor

Fig. 4. structure of a formative rubric (extract of the developed instrument).

We provide learner-centered teaching

- Defines learner's needs & answers learner's needs
- Establishes a positive learning climate using empathy, integrity, respect and learner-centered
- Favor learner's autonomy that enhances independent learning
- Take into account learner's emotions and psychosocial distress
- Checks for learner's understanding of clinical reasoning, plan, etc.
- Checks learner's retention of new information
- Anticipates with the learner the next steps/learning goals

Why should we promote ’learner-centered’ teaching?



What is the role of the learner in medical education?

“Low-level” vs “High-level” Clinical Teaching

- Low-level
  - Reporting
  - Reading
  - Summarizing
  - Giving directions
  - Asking directions
  - Asking about facts
- High-level
  - Comparing
  - Contrasting
  - Evaluating
  - Synthesizing
  - Predicting
  - Hypothesizing

“Medical students will become better problem-solvers when provided with opportunities to engage actively in problem-solving, whereby the student rather than the teacher solves the problem.”

(Foley)

Training the next generation . . .

"Infrequently asking students questions which challenge them to interpret, synthesize, or assess data may encourage the creation of good medical dictionaries rather than skilled practitioners." (Foley)

"I expect you all to be independent, innovative, critical thinkers who will do exactly as I say!"

Training the next generation . . .

"Sometimes . . .

I just recite my plan and feel like a secretary."

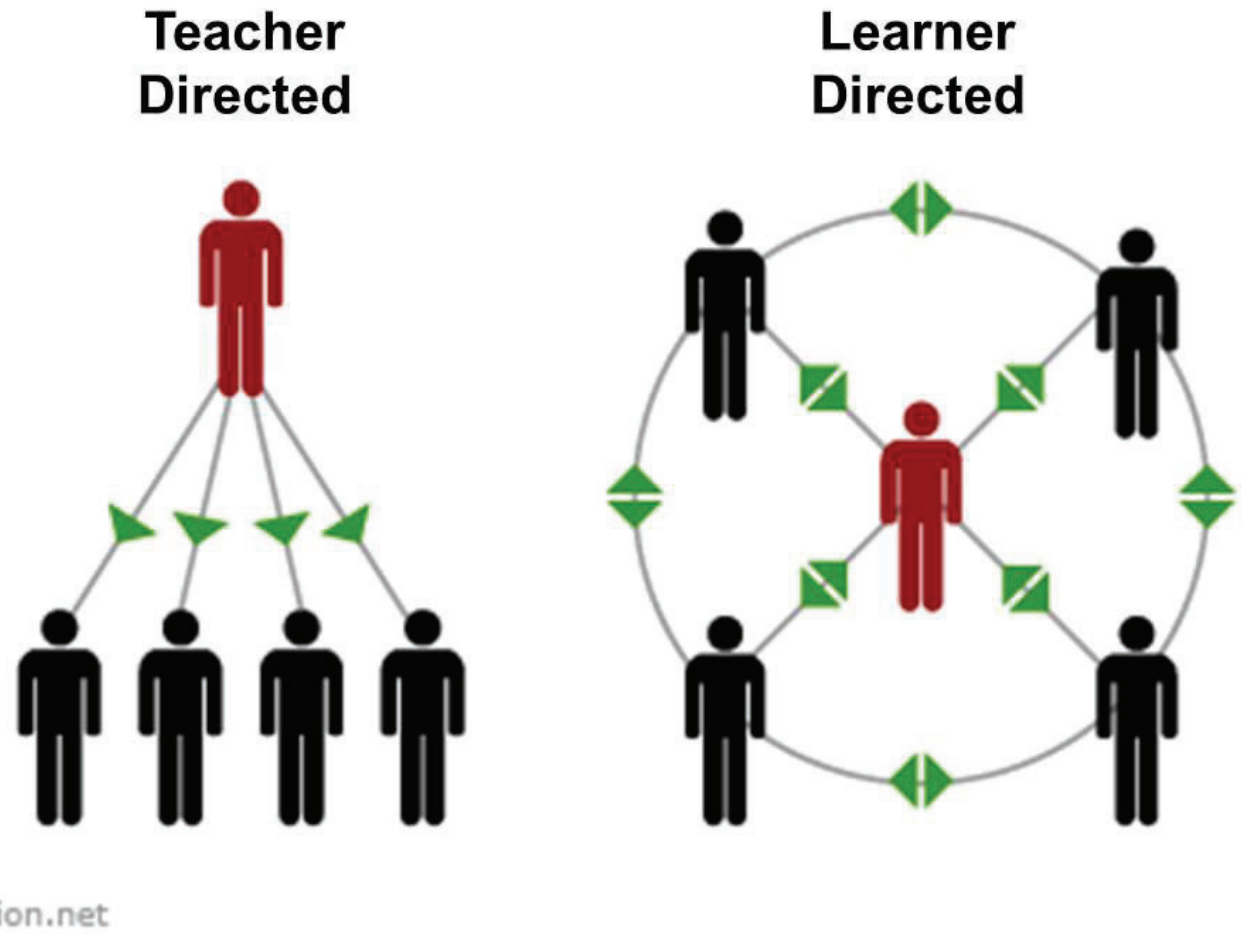
"Allowing the student to draw things our for themselves, not just giving them the answer."

"I expect you all to be independent, innovative, critical thinkers who will do exactly as I say!"

Learner-centered teaching

- **Step One: Organizes the supervision**
  1. Welcomes the learner
  2. Drives the supervision according to the learner's needs
- **Step Two: Helps the learner to learn from the case**
  3. Discusses the case and explores
     a. Clinical reasoning
     b. Underlying medical knowledge
  4. Teaches or corrects
     a. History taking or clinical exam
     b. Communication skills
  5. Discusses the plan
     a. Developing an action plan
     b. Verifying the strategies of the application
  6. Addresses own limits of knowledge
- **Step Three: Ends to Supervision**
  7. States
     a. Strengths
     b. New learning
     c. What has to be learned
  8. Evaluation of supervision process

SNAPPS! A structured bedside teaching model



SNAPPS! A structured bedside teaching model

→ The learner is “active and directive in the educational encounter”

→ the “instructor’s role is no longer to deliver but to guide.”

SNAPPS learner-centered bedside teaching model

- Summarize
- Narrow
- Analyze
- Probe
- Plan
- Select

Why SNAPPS?

- A randomized comparison group trial found that SNAPPS-trained students outperformed:
  - expressed more than twice as many differential diagnoses
  - justified their reasoning more than five times as often
  - expressed more questions and uncertainties.
- The SNAPPS students' presentations were no longer than in the usual and customary group

- **Step One: Organizes the supervision**
  1. Welcomes the learner
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- **SNAPPS**
  - **Summarize**
  - **Narrow**
  - **Analyze**
  - **Probe**
  - **Plan**
  - **Select**

- **Step One: Organizes the supervision**
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  2. Drives the supervision according to the learner's needs → **Summarize**
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SNAPPS

- 1) Summarize briefly the history & physical exam
- Narrow
- Analyze
- Probe
- Plan
- Select

Summarize

SNAPPS

- 1) Summarize ***briefly*** the history & physical exam
- Narrow
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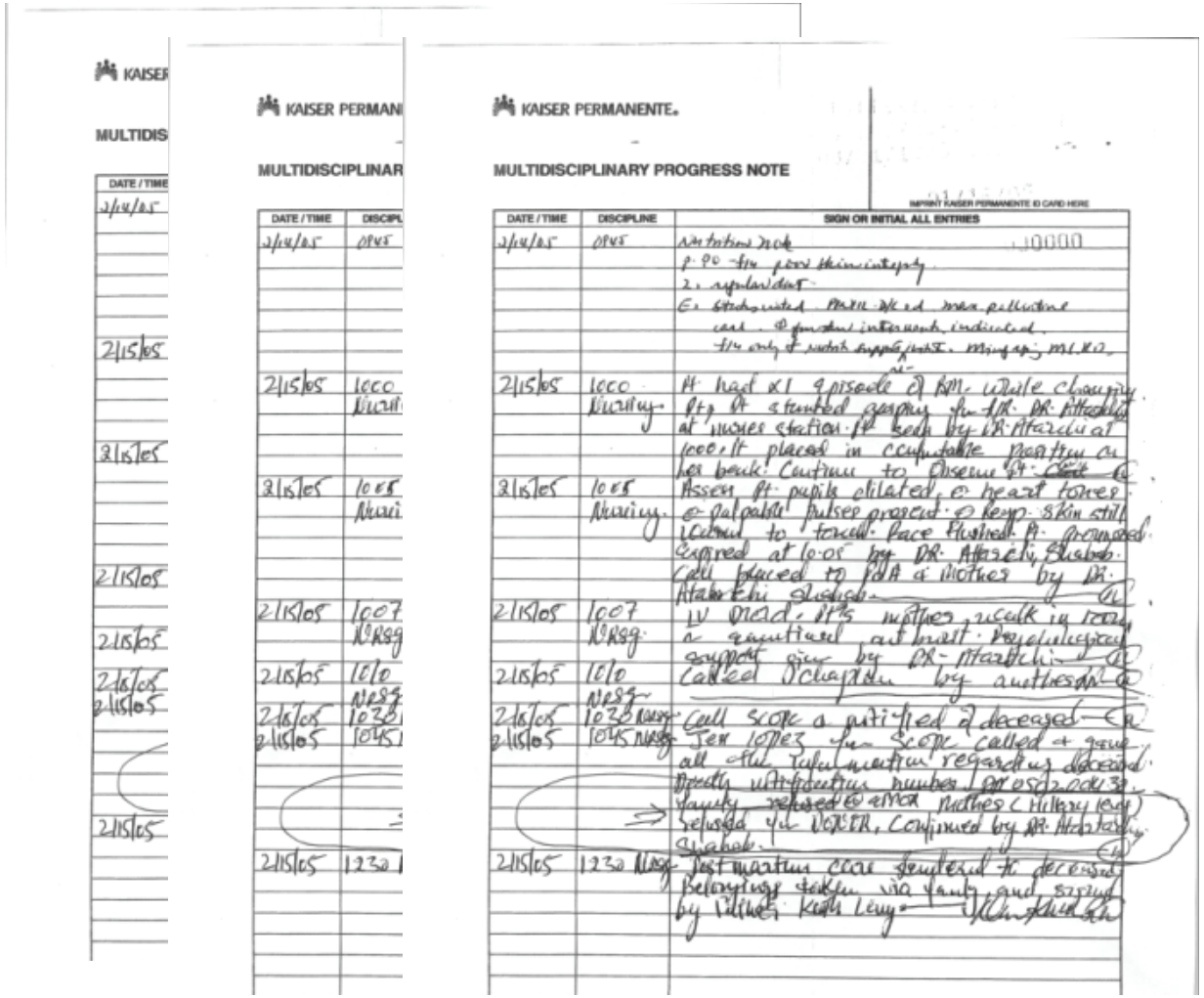
- Select

1) Summarize ***briefly*** the history & physical exam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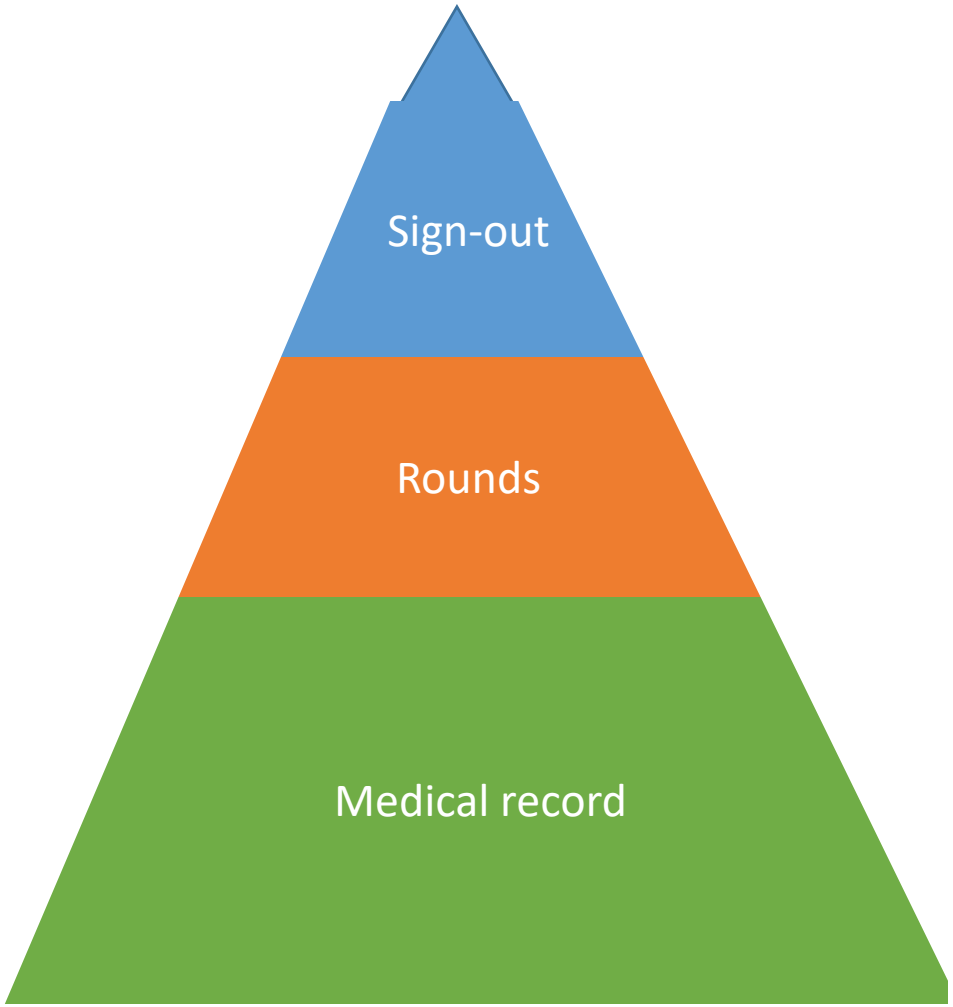
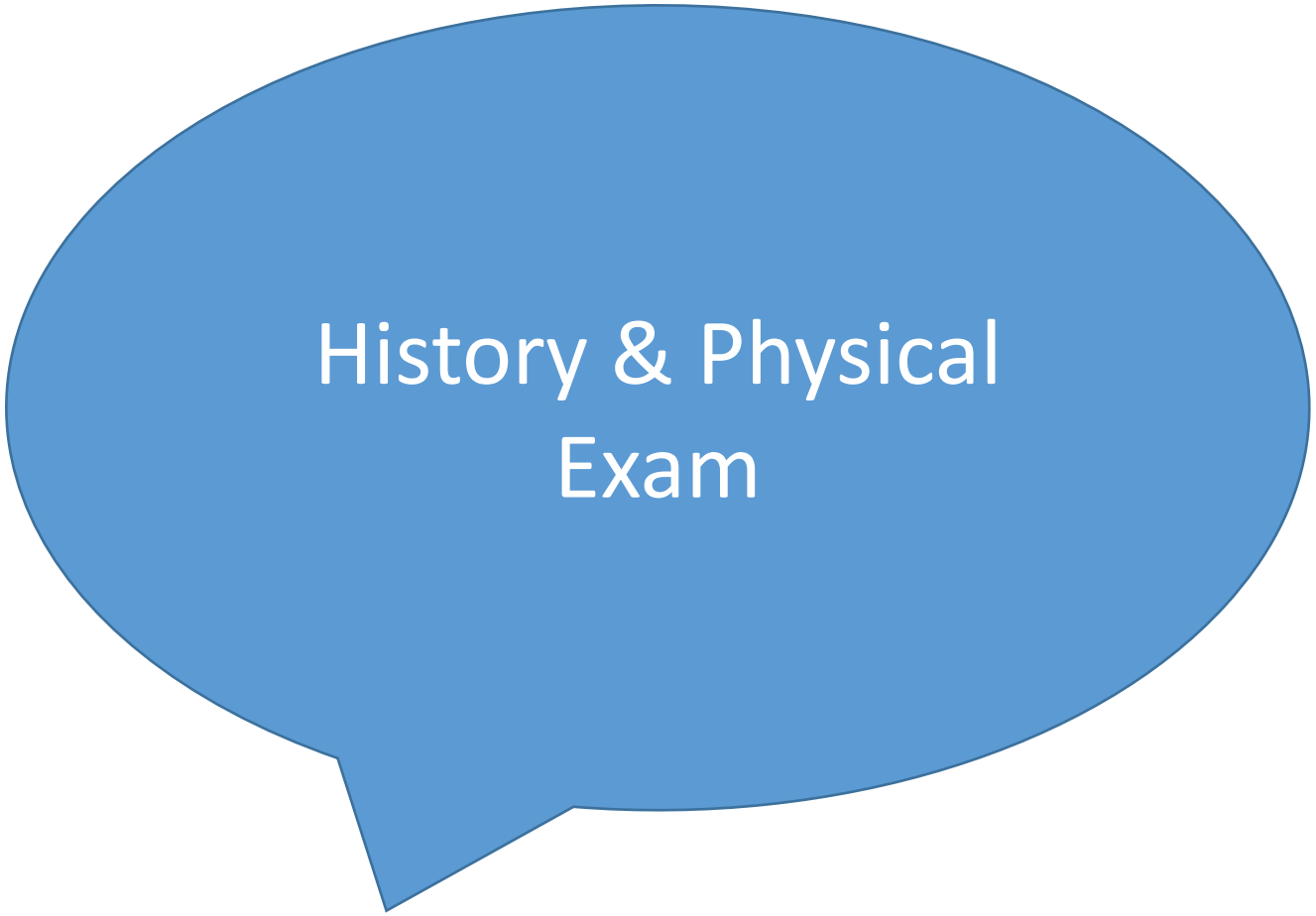
MULTIDISCIPLINARY PROGRESS NOTE

“The Triage Triangle of Information”



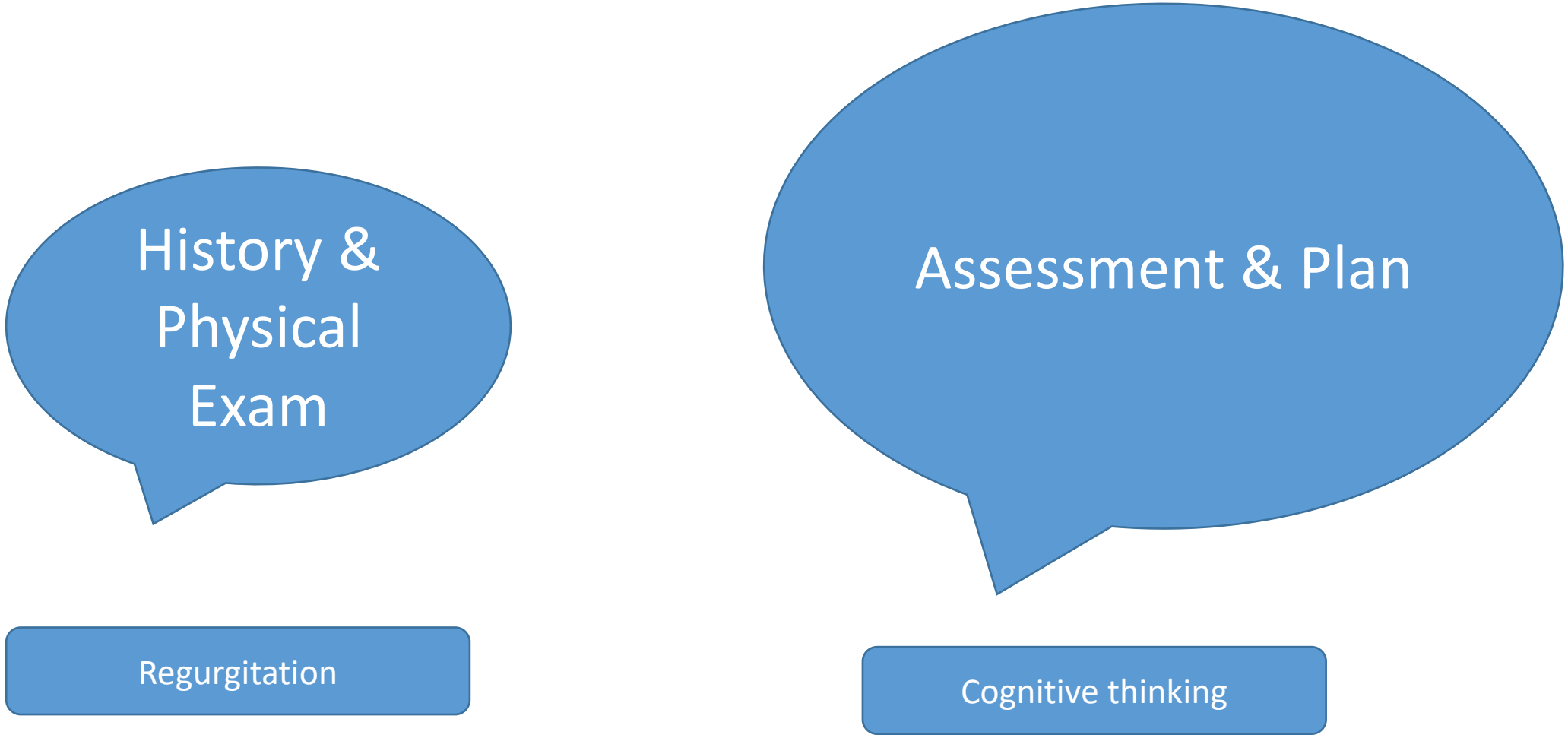
1) Summarize ***briefly*** the history & physical exam



Regurgitation

Cognitive thinking

1) Summarize ***briefly*** the history & physical exam



1) Summarize ***briefly*** the history & physical exam

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- Summary should not be more than 50% of the presentation
- Consultant can easily ask for more information as needed
- Encourage medical terminology
  - e.g. “yesterday”→ “acute”
  - e.g. “third time” → “recurrent”

SNAPPS learner-centered bedside teaching model

- Summarize ***(*Assessment goes here!)***
- Narrow
- Analyze
- Probe
- Plan
- Select

SNAPPS

- Summarize
- 2) Narrow the differential diagnosis to 2-3 possibilities
- Analyze
- Probe
- Plan
- Select

Narrow

2) Narrow the differential diagnosis to 2-3 possibilities

2) Narrow the differential diagnosis to 2-3 possibilities

What if the diagnosis is already known?

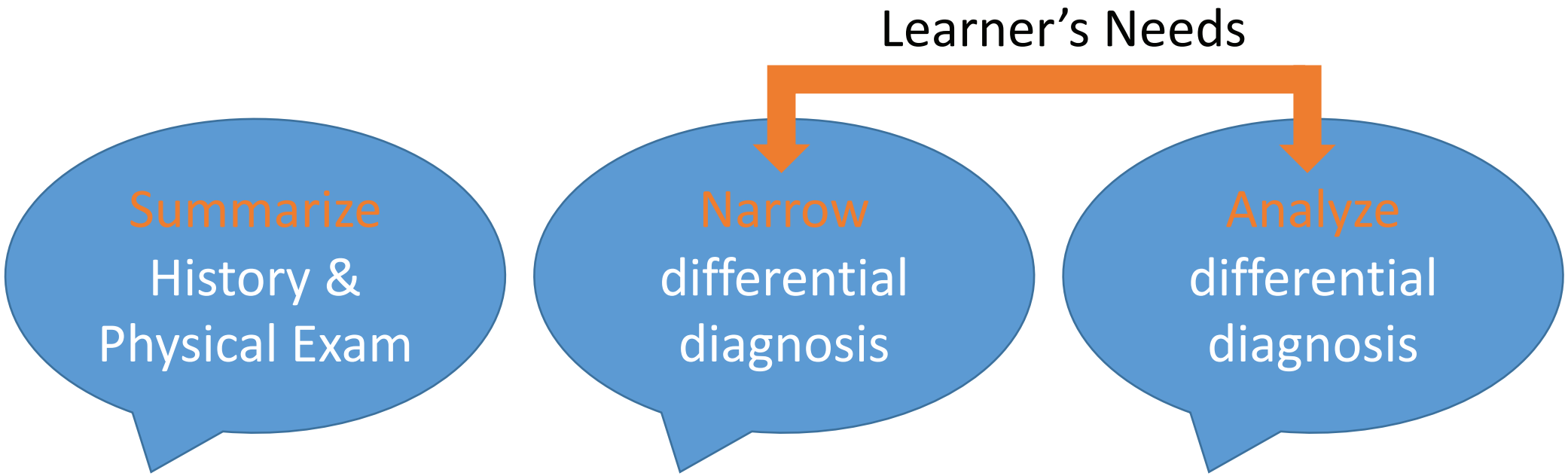
- Use your patient problem list!!

SNAPPS

- Summarize
- Narrow
- 3) Analyze the differential by comparing and contrasting the possibilities
- Probe
- Plan
- Select

Analyze

3) Analyze the differential by comparing and contrasting the possibilities



SNAPPS

- Summarize
- Narrow
- Analyze
- 4) Probe the consultant by asking questions about uncertainties, difficulties or alternative approaches
- Plan
- Select

Probe

4) Probe the consultant

Don’t be afraid to Probe!!

- What were your curiosities about this patient when you pre-rounded?
- There is no “stupid” question
- This is your chance to learn!

SNAPPS

- Summarize
- Narrow
- Analyze
- Probe
- 5) Plan management for the patient
- Select

5) Plan management for the patient

"Not just agree or make changes to plan, but to explain the reason why."

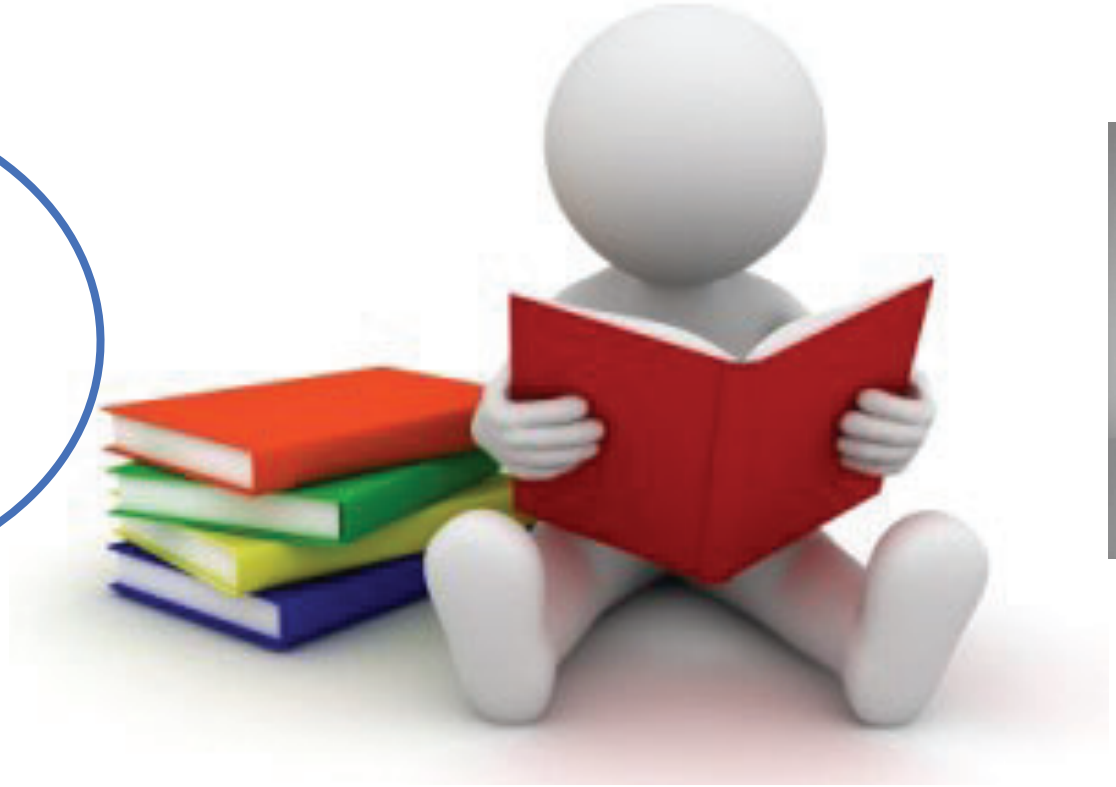
SNAPPS

- Summarize
- Narrow
- Analyze
- Probe
- Plan
- 6) Select a case-related issue for self-directed learning

Select

6) Select a case-related issue for self-directed learning

"Given assignments, but never asked to present back."



Let’s Practice!

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Questions? Thoughts?

Teach-the-Teacher: Session Four

Friday, 3 August at 8:00-8:30am

G.5 Teach-the-teacher: "Intro to SNAPPS: A learner-centred bedside teaching model"

Appendix G.5

Teach-the-Teacher

“Intro to SNAPPS: A learner-centered bedside teaching model”

Teach-the-Teacher

Session 4: Practicing SNAPPS

Observation & Learning Tool

A: level of competence

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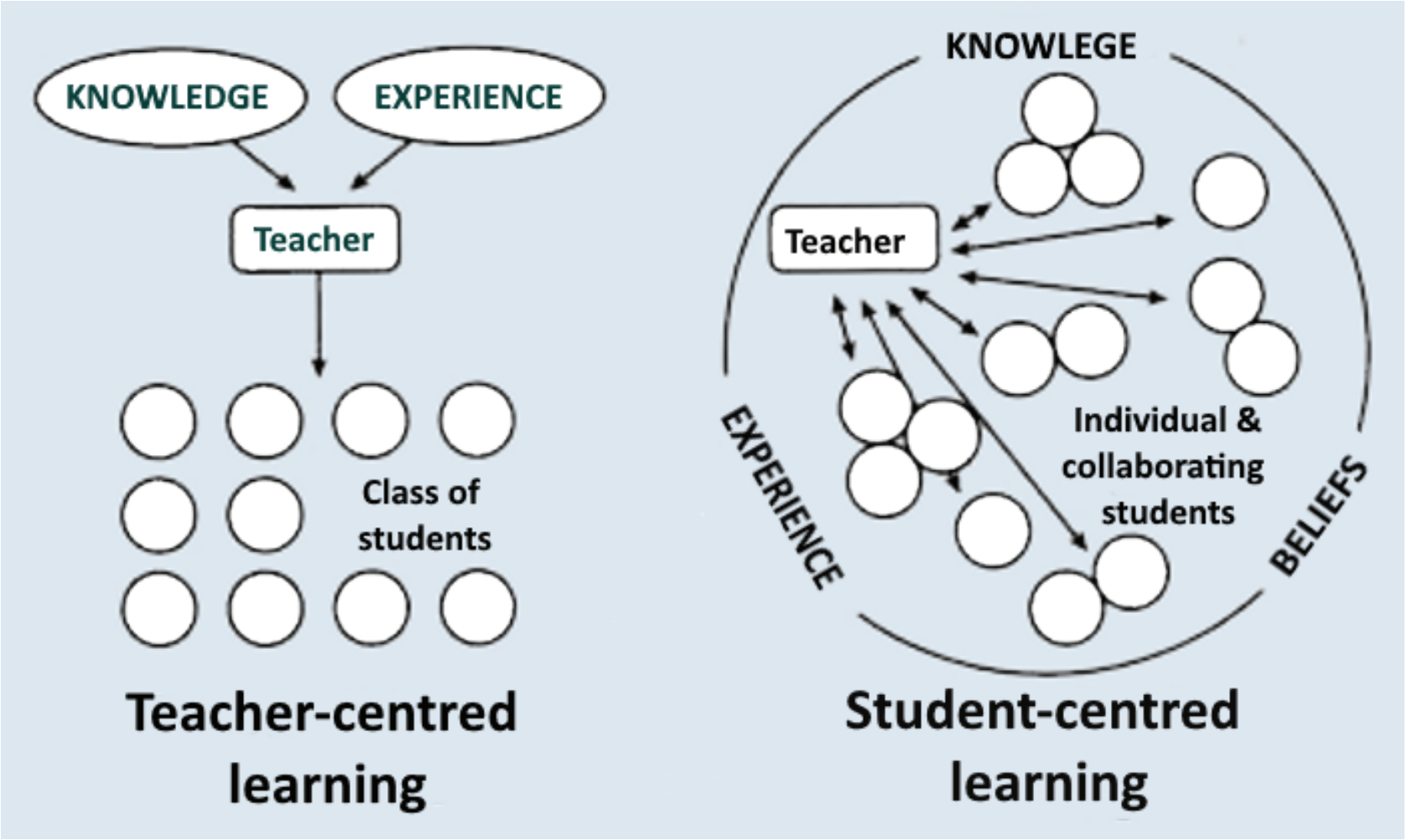

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SNAPPS learner-centered bedside teaching model

- Summarize
- Narrow
- Analyze
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- Plan
- Select

SNAPPS

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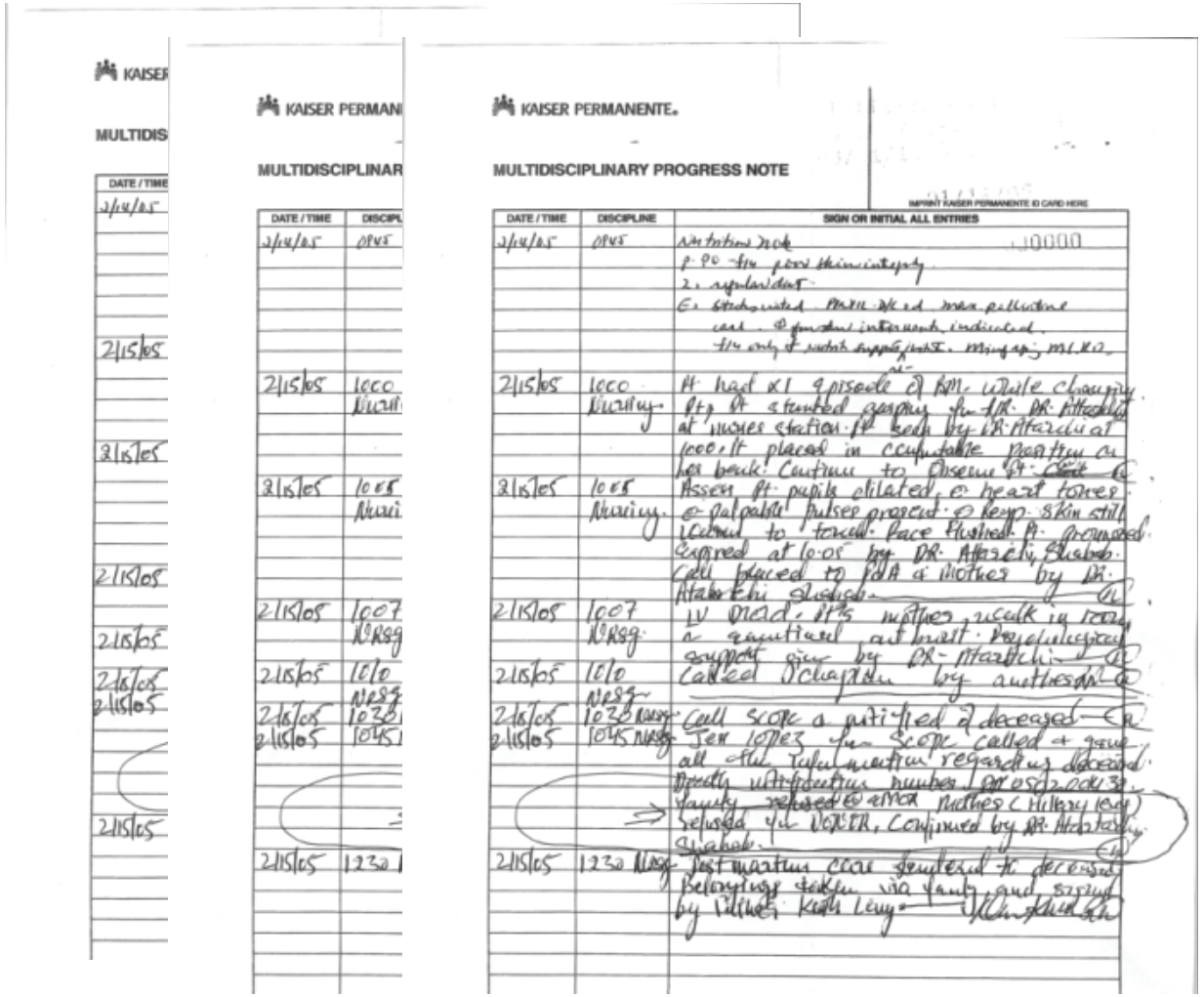
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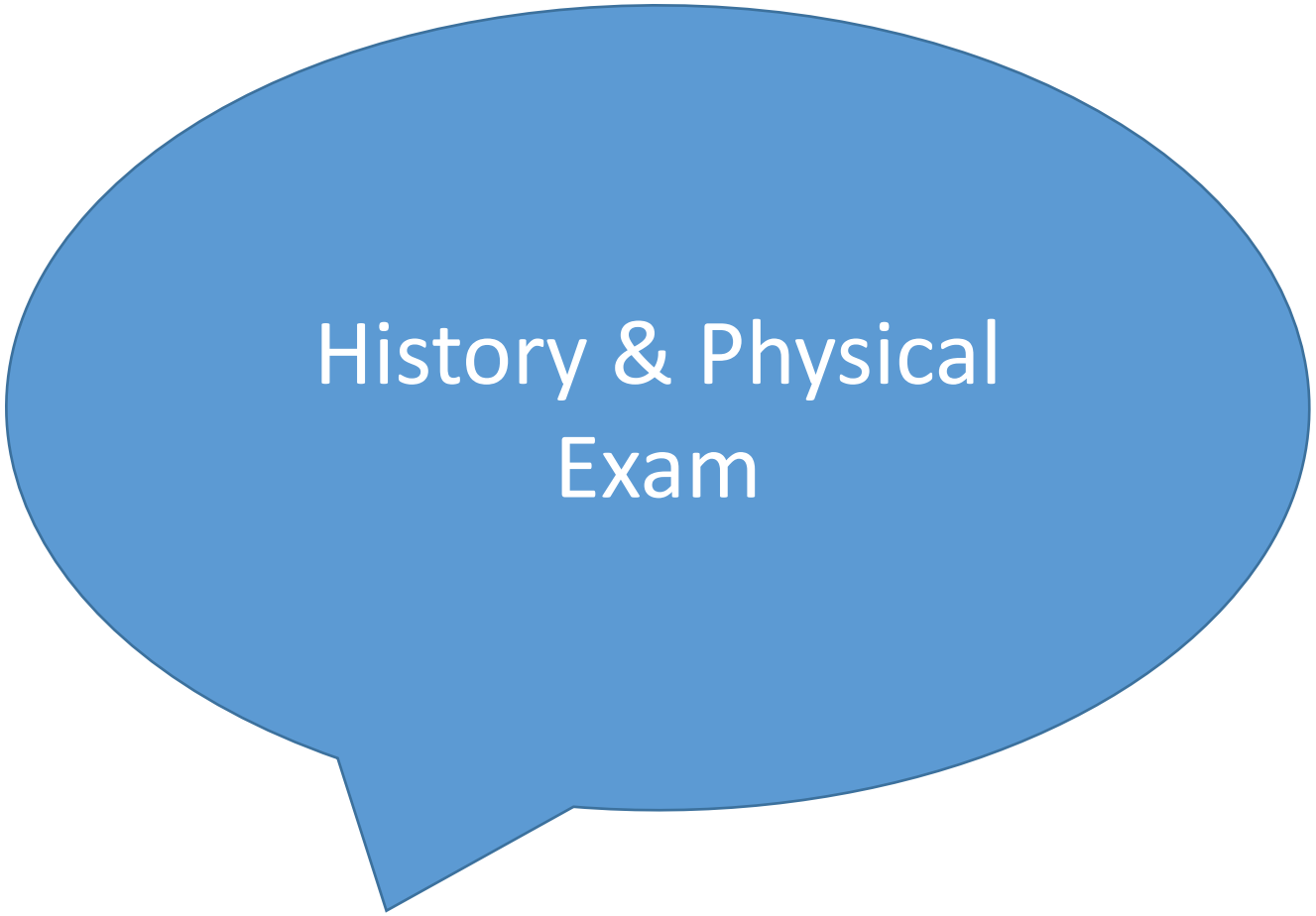

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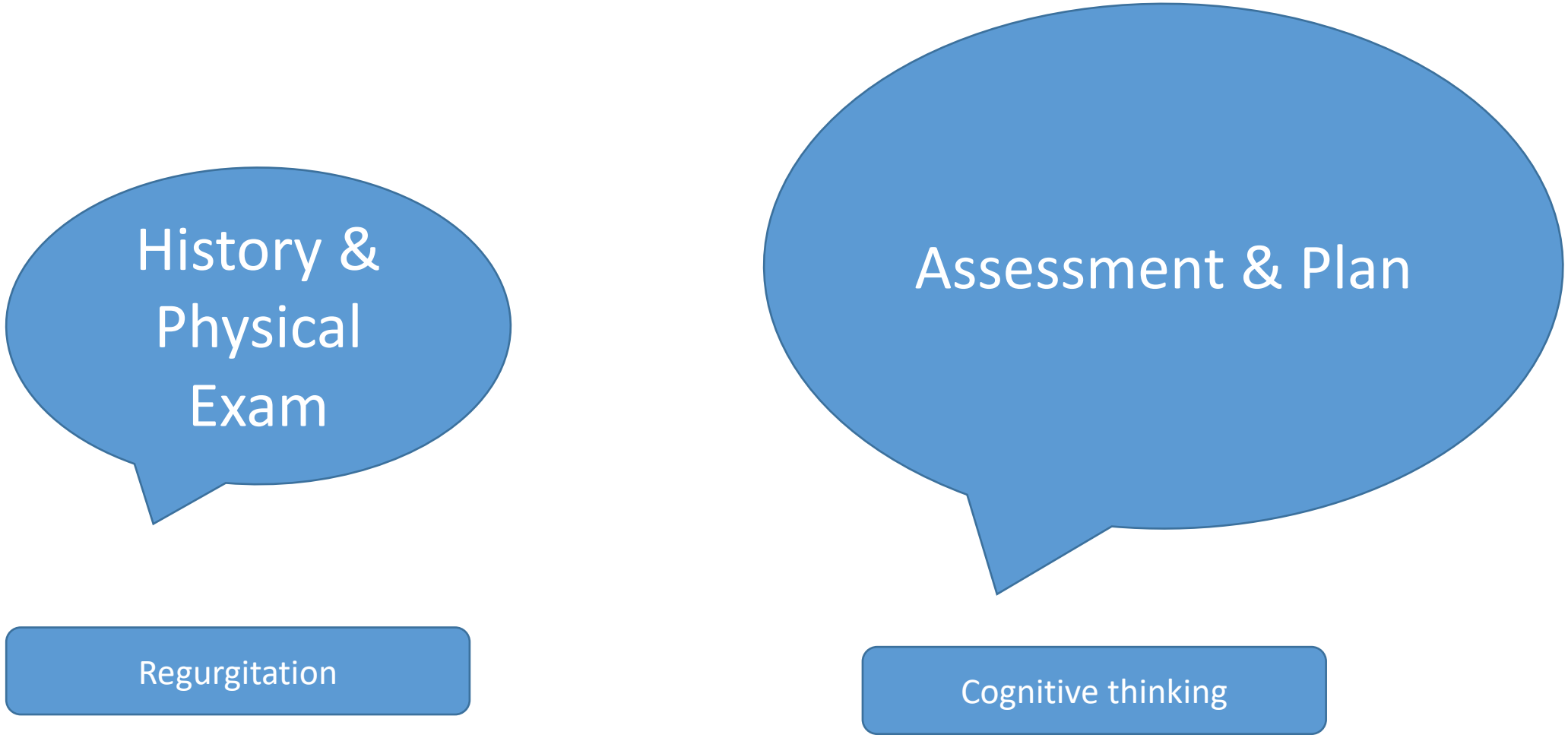

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SNAPPS

- Summarize
- 2) Narrow the differential diagnosis to 2-3 possibilities
- Analyze
- Probe
- Plan
- Select

2) Narrow the differential diagnosis to 2-3 possibilities

SNAPPS

- Summarize
- Narrow
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- Probe
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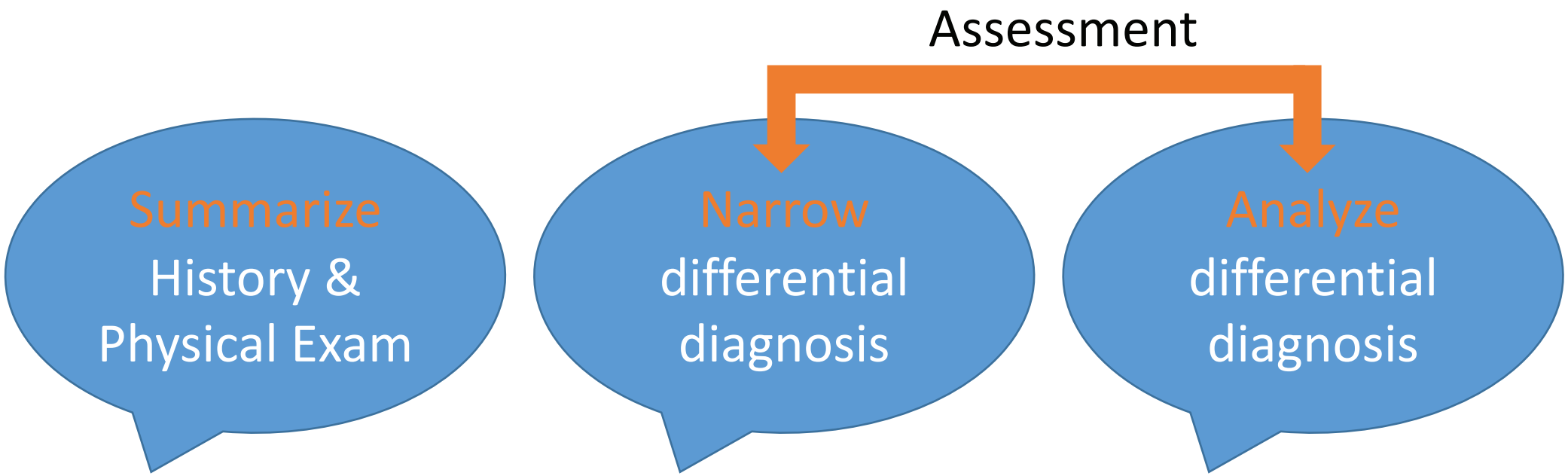
- Select

3) Analyze the differential by comparing and contrasting the possibilities



SNAPPS

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SNAPPS

- Summarize
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"Not just agree or make changes to plan, but to explain the reason why."

SNAPPS

- Summarize
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"Given assignments, but never asked to present back."

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     b. New learning
     c. What has to be learned → **Select**
  8. Evaluation of supervision process

Let’s Practice!

Questions? Thoughts?

Teach-the-Teacher: Session Five

TBA

G.6 Residents-as-teachers: "Top 10 tips to surviving the pre-round"

Appendix G.6

Residents-as-Teachers

“Top 10 Tips to Surviving the Pre-round”

Top 10 Tips to Survive the Pre-Round

Workshop will be based on the First Principles of Learning:
1) Learning is promoted when learners are engaged in solving real-world problems.
2) Learning is promoted when existing knowledge is activated as a foundation for new knowledge.
3) Learning is promoted when new knowledge is demonstrated to the learner.
4) Learning is promoted when new knowledge is applied by the learner.
5) Learning is promoted when new knowledge is integrated into the learner's world.

13:30 - Residents/MOs arrive and get lunch & sign in

13:40 - Welcome residents to the workshop and give brief intro into topic

13:50 - Ask residents/MOs for 'real life' issues when trying to get thru the pre-round efficiently (*careful! we don't want this to become a venting session, but want it to be productive solutions!!)

14:00 - Hand out previously prepared example scenarios of difficult pre-round tasks. Ask residents/MOs to work thru these Example scenarios for how they might deal with the situation.

14:10 - Discuss the Top 10 Tips - go through five of the ten

14:20 - Break into groups and have the Res/MOs practice using the 5 tips based on the Example Scenarios above.

14:30 - Discuss the next 5 of the Top 10 Tips

14:40 - Again, have the Res/MO break into groups and practice using the tips

14:50 - Time for question and answers/ debrief, etc.

Top 10 Tips to Survive the Pre-Round

20 June 2018

Dept. of Paediatrics

Princess Marina Hospital

The Pre-round

- Happens before the main round
- Urgent matters are dealt with immediately
- Make sure all patients are seen
- Results are updated
- Gives students, interns and residents an opportunity to make a management plan

Hierarchy of Power

- Head of Dept. & Professors
- Consultants
- **Senior residents**
- **Junior residents**
- **MOs**
- Interns
- Students

Challenges of the Pre-Round

- Morning report finishing late
- Disruptions – phone calls
- The bench, The Bench, The Bench!!!
- Patients in other wards (PSW, Private ward, ICU)
- Team members working in a disorganized manner

Scenario 1

- You have one computer on the ward, 5 students, but labs need to be looked up for 8 patients

Top 10 Tips

1. Get a file

- Be organized
- More time is wasted looking for items than actually doing the work
- Orientate yourself to your working environment. Know your playing field…know your battle field even better!!

2. Patient List

- Have a patient list at all times
- The list must have all action items. Eg. Cannulas, lab follow ups, procedures, discharges
- This gives you a birds eye view of all your patients & a quick glance of ward work
- Do paper-rounds as well.

3. Make friends everywhere

- Keep a good relationship with your fellow residents & MO's
- But also get to know the people in the different department. Radiology, lab, blood bank, Case management, social worker, dietician

4. Nursing staff

- Make friends with the nursing staff
- Help them & they will help you.
- They can make your life busy or easy….your attitude decides your fate

5. Prioritize

- Know what's important
- Eg. Urgent LP vs reading a mantoux
- Don’t procrastinate
- Time management is important
- Screen the patients in the morning and allocate to the rest of the team

6. Team spirit

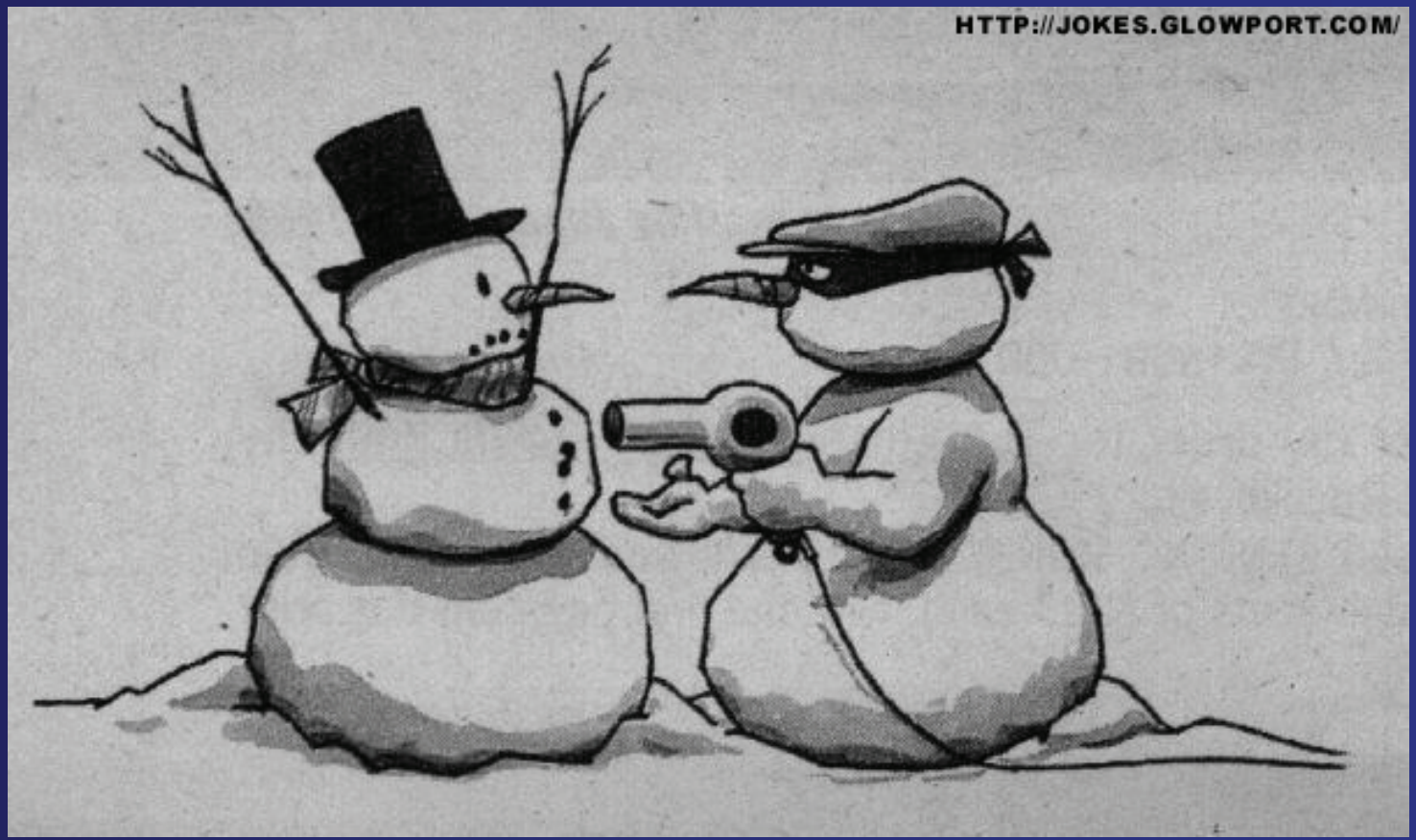
- Remember 2 heads are better than 1
- So learn to work in a team
- Be a Team Leader, Be a team player
- The people around you can make a big difference
- Respect your colleagues
- Help out other teams when you have time, they will return the favour when you need it!!

Team work!!!

7. Students

- Students are invaluable.
- Please don’t abuse your students unless you have to
- Assign students with tasks and show them good clinical cases
- Teach the students, it will keep your knowledge sharp
- Acknowledge their efforts

Student blackmail!!!



8. Work smart

- Simple decisions that have a high impact
- Collective collection of Lab results
- Collecting xrays
- Standardized patient files
- Results sheet

9. Don’t procrastinate

- Don’t leave for tomorrow what can be done today
- If something can be done right away –
- DO IT NOW
  - DELEGATE IT
    - DO IT LATER

Don’t overload yourself

10. Relax

- You must relax & pace yourself.
- Have a 5-10 minute break before the main round starts

Bonus tip: Technology

- Use technology
- Setup a WhatsApp group for the Team.
- Ensures communication with the whole team
- Can use for updates and delegation of tasks
- Sending lab results, Xrays, reports etc

- Organize yourself at work & at home
- Be prepared

Recap

- 1. Get a file
- 2. Patient List
- 3. Make friends
- 4. Nursing staff
- 5. Prioritize
- 6. Team spirit
- 7. Students
- 8. Work smart
- 9. Don’t procrastinate
- 10. Relax
- ***Technology

Case scenario 1

- You have one computer on the ward, 5 students, but labs need to be looked up for 8 patients

Case scenario 2

- Your team is admitting today, its 9am
- You get a call from A&E about a sick child with dehydration.
- There are 4 patients on the bench, 2 for MRI and 2 for CT scan
- You need to follow up bloods for the patients in HD
- Your team has 1 Resident, 2 Interns & 4 students

Case scenario 3

- You have a 1 month old patient with cyanotic congenital heart disease that needs urgent transfer to RSA.
- You have no students in your team. You only have 1 intern and a visiting resident

G.7 Residents-as-teachers: "Intro to SNAPPS: A learner-centred bedside teaching model"

Appendix G.7

Residents-as-Teachers

“Intro to SNAPPS: A learner-centered bedside teaching model”

Resident Intro to SNAPPS

Welcome! Thank you for joining us today. As part of an ongoing project in the department to optimize the learning and teaching on our paediatric ward rounds – for both NNU and PMW, today, we'd like to introduce you to a learner-centered structured bedside teaching model called SNAPPS.

An integral part of any medical school or residency programme is access to high quality clinical teaching within a rich learning environment.

The most historic method of clinical teaching takes place at the bedside. This method provides an opportunity for faculty to "engage in clinical reasoning and problem-solving" with students and residents during authentic patient encounters. Yet, the practice of bedside teaching is declining for a variety of reasons, and conducting bedside teaching is becoming a dying art. As a way to revive and sustain the practice of bedside teaching, several teaching models have been developed. An example is SNAPPS, which strives to improve the quality of teaching at the bedside while addressing common barriers to bedside teaching.

SNAPPS is a helpful pneumonic to describe the six steps of the bedside teaching model: Summarize, Narrow, Analyze, Probe, Plan and Select. To help optimize the learning and teaching on our paediatric ward rounds, we've chosen SNAPPS as a model to introduce department wide. Today, I'm introducing it to all of you (residents, MOs, interns) but we are also introducing this to the faculty, chiefs and will be introducing it to the students as they join our department.

But why SNAPPS? We've chose SNAPPS as our model to introduce to the department for a couple of reasons. Firstly, the literature shows that SNAPPS students who are trained in SNAPPS outperformed their peers who were not trained in SNAPPS, specifically, they expressed twice as many differential diagnoses, justified their reasoning 5 times more often than their peers, and expressed twice as often more questions and uncertainties than their peers. The ability to generate a broader differential, justify reasoning for the differential, and to be able to ask questions and express uncertainties when taking care of patients are all critical to the trainee development to become a doctor. Of note, students who used SNAPPS on rounds did not take longer than the standard rounds.

But the main reason we've chose SNAPPS as our bedside teaching model is that it offers a learner-centered approach to teaching.

Learner-centered teaching is teaching in a way that puts the learner, not the teacher, at the forefront. The teacher teaches in a way that considers the learner's needs "meet him/her where he/she is at"; engages in teaching with mutual respect and integrity; favors the learner's autonomy for independent learning; takes into account the learner's emotions when teaching; checks for the learner's understanding of clinical reasoning; checks their retention of this new information; and aids the learner in creating self-learning goals. These were all things we elicited from our FGDs that you, our trainees wanted . . .

Read aloud quotes from FGD/I

But ***why*** is learner-centered teaching so important? From above, seems like it sounds like a good idea, but what does the literature say? Why should we promote this type of teaching in our department?

Traditionally, when we consider the role of the trainee in medical education, studies have found that the medical students' role is limited to passive learning, only receiving "low-level", factual information. Even in settings where medical students did a large portion of the talking, they tended only to report factual content; questions were seldom asked of students, and when they were asked questions, these questions generally were about facts, and rarely were the students required to verbalized their problem-solving efforts. Unfortunately, little has changed in medical education for several decades and this continues to be a norm in many academic settings.

Foley et al described in their work "low level" vs "high level" aspects of clinical teaching. Low-level clinical teaching includes aspects pertaining to reporting, reading, summarizing, giving or asking directions, and/or asking about facts. Whereas high-level clinical teaching provides or asks students information regarding: comparing, contrasting, evaluating, synthesizing, predicting, and hypothesizing. Foley et al. argue that, "Medical students will become better problem-solvers when provided with opportunities to engage actively in problem-solving, whereby the student rather than the teacher solves the problem."

More worrisome, if the content of the discussion during ward rounds is consistently probing for low-level knowledge, this biased emphasis could be misconstrued by the learner to believe that what is important about *being* or *becoming* a doctor is 'knowing facts,' not analytical thinking and decision making. And as Foley wrote, "Infrequently asking students questions which challenge them to interpret, synthesize, or assess data may encourage the creation of good medical dictionaries rather than skilled practitioners." (Foley)

And again, from our FGDs, we found that you, our trainees, do sometimes feel this way – not like physicians or paediatricians in training, but like secretaries. And from our own faculty, they recognized the importance of engaging in the critical thinking process with their juniors.

Therefore, the content of the discourse between the teacher and learner on ward rounds ought to be high-level, which requires a learner centered approach. But ***how*** do we do this?

We need to put the learner at the forefront. And that's where SNAPPS comes in! SNAPPS provides a structured bedside teaching model for trainees and faculty to move away from the constraining, fact-based presentation/probing teaching style toward encouraging analytical thinking. It puts the learner at the center of the teaching encounter and creates a shared responsibility between the teacher and learner – where the learner is "active and directive in the educational encounter" and the "instructor's role is no longer to deliver but to guide."

This is key – the learner is “active and directive in the educational encounter” and the ”instructor’s role is no longer to deliver but to guide.” This is a shift from you as the trainee passively attending rounds, waiting for the consultant to tell you what to do, what to learn, etc. but now YOU are responsible to direct the educational encounter – you inform the consultant what YOUR needs are in managing this patient, what YOUR questions are, and what learning YOU need. This is teaching where the learner is empowered to direct his/her own learning.

So what does this look like? SNAPPS: Summarize, Narrow, Analyze, Probe, Plan and Select.

I’ll show you a quick video and then we will break it down step-by-step.

The first step in SNAPPS is for the trainee to summarize briefly the history and physical exam.

The key word here is BRIEFLY.

Currently, when we round, especially with students, they provide a very lengthy, time consuming history and physical exam. What they are currently presenting is for the **medical record**, ***not*** for the teaching interaction that should occur on rounds.
You, as learners need to understand the difference in the purpose between the medical record and presenting on rounds. The purpose of charting and creating the medical record is to create documentation of the hospitalization – this is generally for the future physician who is not currently seeing the patient, but if he/she is seen in the future, the next physician can easily read and understand the patient’s presentation and hospital course. The medical record is also for nurses to read the plan and to carry out orders as written. This is very different than the purpose of presenting on rounds, which is to provide relevant clinical information and to teach and learn.
Therefore, what is presented needs to be very different than what has been charted in the medical records. Instead of capturing all aspects of the medical record, you need to provide a brief summary of the history and physical exam to include the pertinent information: pertinent positives and negatives.

So what happens now, is that you, as our learners provide this very hyperinflated history and physical exam; does not indicate if you can really ***do*** the physical exam that you read aloud, and sometimes you are just reading aloud someone else’s history and physical exam from night before, but most worrisome - your assessment and plan are atrophied in comparison to the history and physical.

Therefore, what SNAPPS helps the leaner do is minimize the regurgitation piece and maximize the cognitive piece.

In this way, we’re not wasting time on rounds listening to a lengthy history and physical exam, but instead free up time to hear your actual clinical thought process. We know you can read, write and regurgitate, but if we force you to summarize (from that meter long HPI! what are the pertinent negatives and pertinent positives!) then we can spend more time on hearing your critical thinking.

A few good rules of thumb: while the actual summary may vary in length depending on the complexity of the case,

1) the summary should not occupy more than 50% of the learning encounter and should generally not be longer than three minutes.
2) Remember, because the consultant is at the bedside with the trainee, if you omits something from your summary, the consultant can easily ask (and then provide explanation for its relevance).
3) You should be encouraged to present using medical terminology: "yesterday" → "acute" and "third time" → "recurrent", because successful diagnosticians use these qualifiers early in their presentations.

Here is an example medial chart from the ward. Go through the HPI and see if you can summarize into a short paragraph for what you would actually present on rounds using the SNAPPS model.

Step 2 in SNAPPS is for the learner to "Narrow" the differential diagnosis to two to three relevant possibilities.

After you have presented the history, physical exam and any labs, but before going on to the Plan, you need to verbalize what you think is going on in the case. This is an opportunity to help you develop your Assessment. You should focus on what is most likely. So for the new patient, you can present 2-3 most likely diagnosis, and for the known/follow-up patient, you can chose which problem they would like to focus on for today – e.g. "known seizure patient with break-thru seizure" – why back again? Or "known Wilms tumor patient" - can chose to focus on the therapeutic interventions, etc. **We will be discussing other relevant teaching strategies for this because the "narrow the differential" doesn't always work especially in NNU and PHO where we often already know the differential diagnosis but there is still a lot to discuss and learn about. So for today we are just focusing on the patient where the differential isn't known.

"This step requires a **commitment** . . . [from you and you] must present an initial differential to the consultant before engaging the consultant to expand or revise the differential." Example: "My differential right now is bronchiolitis, pneumonia, and asthma"

This commitment to possible differential diagnosis sets you up for the third step: Analyze. At this step, you must compare and contrast the two to three previously stated possibilities

Example: I think bronchiolitis because of X,Y,Z, think not asthma because of A,B,C
"This discussion allows you to verbalize your thinking process and can stimulate an interactive discussion with the consultant. Learners will vary in their fund of knowledge and level of diagnostic sophistication, but all are expected to utilize the strategy of comparing and contrasting to discuss the differential." Another way to think of this – is that these combined steps set you up to make your assessment of the patient. And we'll have heard how you came up with your assessment.

Step 4, “Probe” is now the first step that the consultant comes in. During this step, you are ”expected to reveal areas of confusion and knowledge deficits and are rewarded for doing so.”

“This step is the most unique aspect of the learner-driven model because the **learner** initiates an educational discussion by probing the consultant with questions rather than waiting for the **consultant** to initiate the probing of the learner. The learner is taught to utilize the consultant as a knowledge resource that can readily be accessed. The learner may access the consultant’s knowledge base with questions or statements ranging from general to specific.” This also helps to establish in our learning climate that uncertainty is respected and asking questions is not only a natural process of learning medicine, but also part of the dedication to life-long learning that physicians must possess.
“I’m not sure about the difference in treatment of bronchiolitis vs asthma?”

Step 5: Making the plan.

“The learner initiates a discussion of patient management with the consultant and must attempt either a brief management plan or suggest specific interventions. This step asks for a commitment from the learner, but encourages him or her to access the consultant readily as a rich resource of knowledge and experience.” What’s important here is that if we as consultants amend the plan that we involve you in this process.

Step 6: Select a case-related issue for self-directed learning.

“This final step encourages the learner to read about **focused, patient-based** questions. The learner may identify a learning issue at the end of the patient presentation or after seeing the patient with the consultant. The learner should check with the consultant to focus the reading and frame relevant questions. The learner should devote time to reading as soon after the office encounter as possible.
We encourage learners to read nightly in a regular, disciplined, and patient-based manner rather than in long, unfocused bursts. For example, a learner would be encouraged to read to answer a question such as, “What is the rationale for the use of ace inhibitors in congestive heart failure?” rather than reading an entire chapter in a review text on heart failure.

Putting it all together.

Example Scenario

SNAPPS	Learner	Consultant/Senior Resident	Practical Tips
1. Summarize	"5yo, HIV negative, female presents with recurrent epistaxis, occurring about once per month for the last year which all spontaneously resolve after 3-5 min. There is no other bleeding, no hematuria or bloody stools. No family history of bleeding disorders. Work-up reveals normal growth & development, normal vital signs, unremarkable physical exam, without pallor, active mucosal bleeding, or petechiae, with normal hemoglobin and platelet levels.	Active listening	Rather than a complete, detailed history and physical, we emphasize tailoring the oral presentation to include only those components relevant to this admission/visit. Then, transition to the SNAPPS presentation with a "summary statement" as presented here.
2. Narrow the differential	"The most likely diagnoses are direct trauma, mucosal dryness, or maybe ITP."	If the diagnosis is already established or the learner prematurely closes the differential, ask "What else could this be?"	Hospitalized patients often have multiple problems. Learners can go through this process of SNAPPS for each problem or only the primary problem.
3. Analyze the differential	"Mucosal dryness or some abnormality in the nasal vascular seem to be most likely because they are pretty infrequent and spontaneously resolve. ITP or other systemic cause is less likely because the platelets are normal and the rest of the history and exam are normal."	"This is a reasonable differential. You did a good job thinking about local verses systemic causes of bleeding. Have you considered your differential based on anterior vs posterior causes of nosebleeds?"	Learners should use the 'key findings' to argue for or against each diagnostic hypothesis. Novice learners often need reminders that vital signs and negative findings (e.g. absence of tachycardia) are often key findings.

4. Probe the consultant	"I know epistaxis is common in paediatrics, but when should we worry about it being something bad?" NOTE: This is a great place for learners to ask questions that might be harder to look up, or to ask about physical findings (e.g. "I thought I heard crackles but was not sure. Could somebody check this with me?")	"You are right that epistaxis is common in children. Generally, it's the recurrent or refractory episodes we worry more about. What do you think refractory bleeding might be caused by?" "Does anyone else on the team have thoughts about this question?"	Guide learners to the correct answer, helping them connect pre-existing knowledge to the question at hand. This is also a good spot to provide real-time feedback. Alternatively, give the resident an opportunity to address the question. This allows the consultant to assess the resident's clinical reasoning and give him/her an opportunity to practice teaching.
5. Plan management	"Since we're thinking this is most likely an anterior nosebleed, maybe we could refer to ENT to see if there are any anatomical reasons for the frequent nose bleeds? Otherwise, just observe?"	"That sounds reasonable. Does anyone else on the team want to add to the management plan?"	If a student is presenting, offer the intern/MO/resident an opportunity to add to the plan.
6. Select a case-related issue for self-directed learning	"I will look up systemic causes of epistaxis to broaden my differential."	"Sounds good. Please share with us tomorrow what you find."	Make sure learner's questions are focused and related to the case, not too broad. Set aside 5-10 minutes before rounds each day for learners to present their findings or at the beginning of rounding on the patient for the day.

Introduction to SNAPPS

Residents, Medical Officers, Interns and Medical Students

Undergrad & Postgrad Medical Education

UNIVERSITY of BOTSWANA

Bedside teaching on the ward round

SNAPPS learner-centered bedside teaching model

- Summarize
- Narrow
- Analyze
- Probe
- Plan
- Select

Why SNAPPS?

- A randomized comparison group trial found that SNAPPS-trained students outperformed:
  - expressed more than twice as many differential diagnoses
  - justified their reasoning more than five times as often
  - expressed more questions and uncertainties.
- The SNAPPS students' presentations were no longer than in the usual and customary group

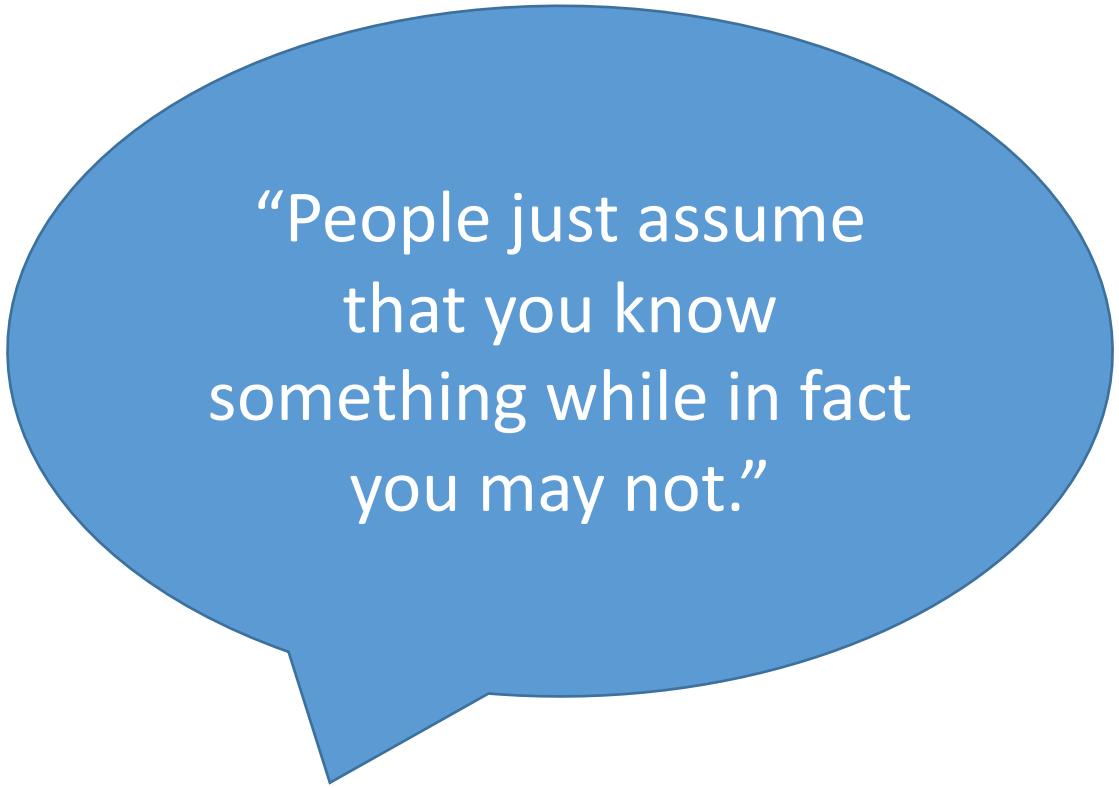
Learner-centered!

We provide learner-centered teaching

- Defines learner's needs & answers learner's needs
- Establishes a positive learning climate using empathy, integrity, respect and learner-centered
- Favor learner's autonomy that enhances independent learning
- Take into account learner's emotions and psychosocial distress
- Checks for learner's understanding of clinical reasoning, plan, etc.
- Checks learner's retention of new information
- Anticipates with the learner the next steps/learning goals

We provide learner-centered teaching

- Defines learner's needs & answers learner's needs

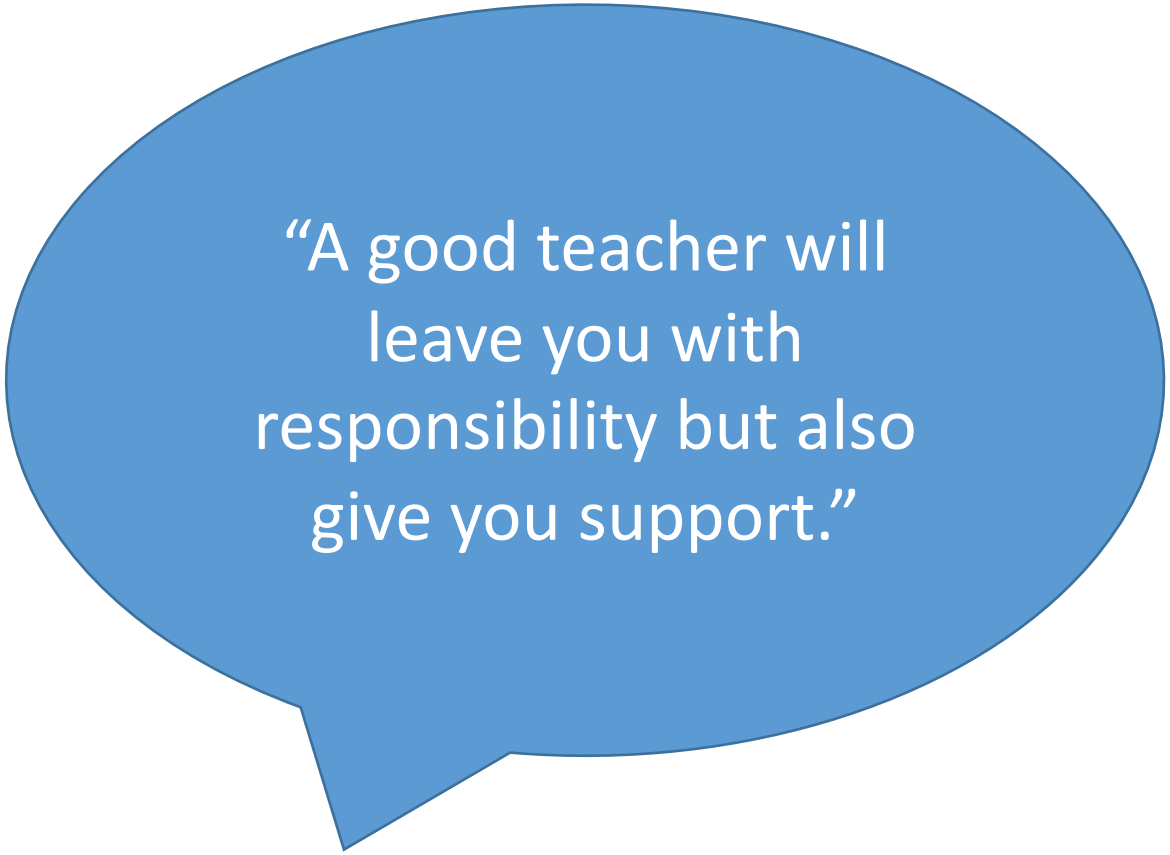


We provide learner-centered teaching

- Establishes a positive learning climate using empathy, integrity, respect and learner-centered

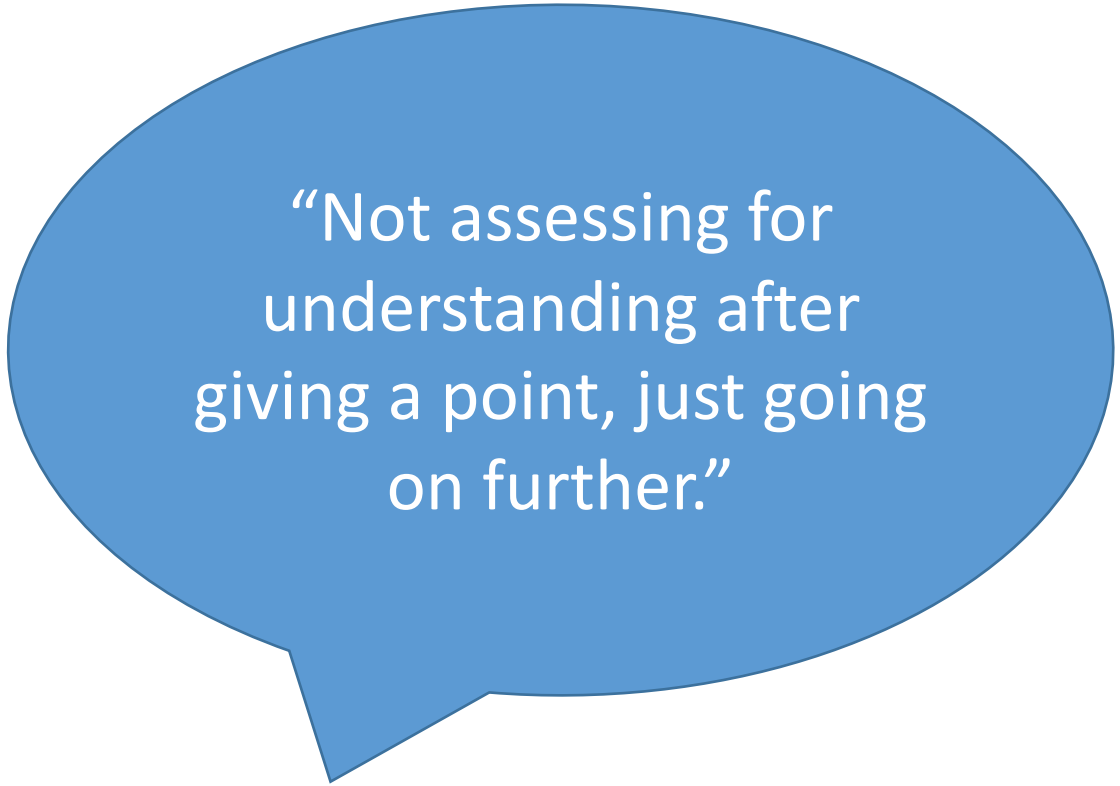
We provide learner-centered teaching

- Favor learner's autonomy that enhances independent learning

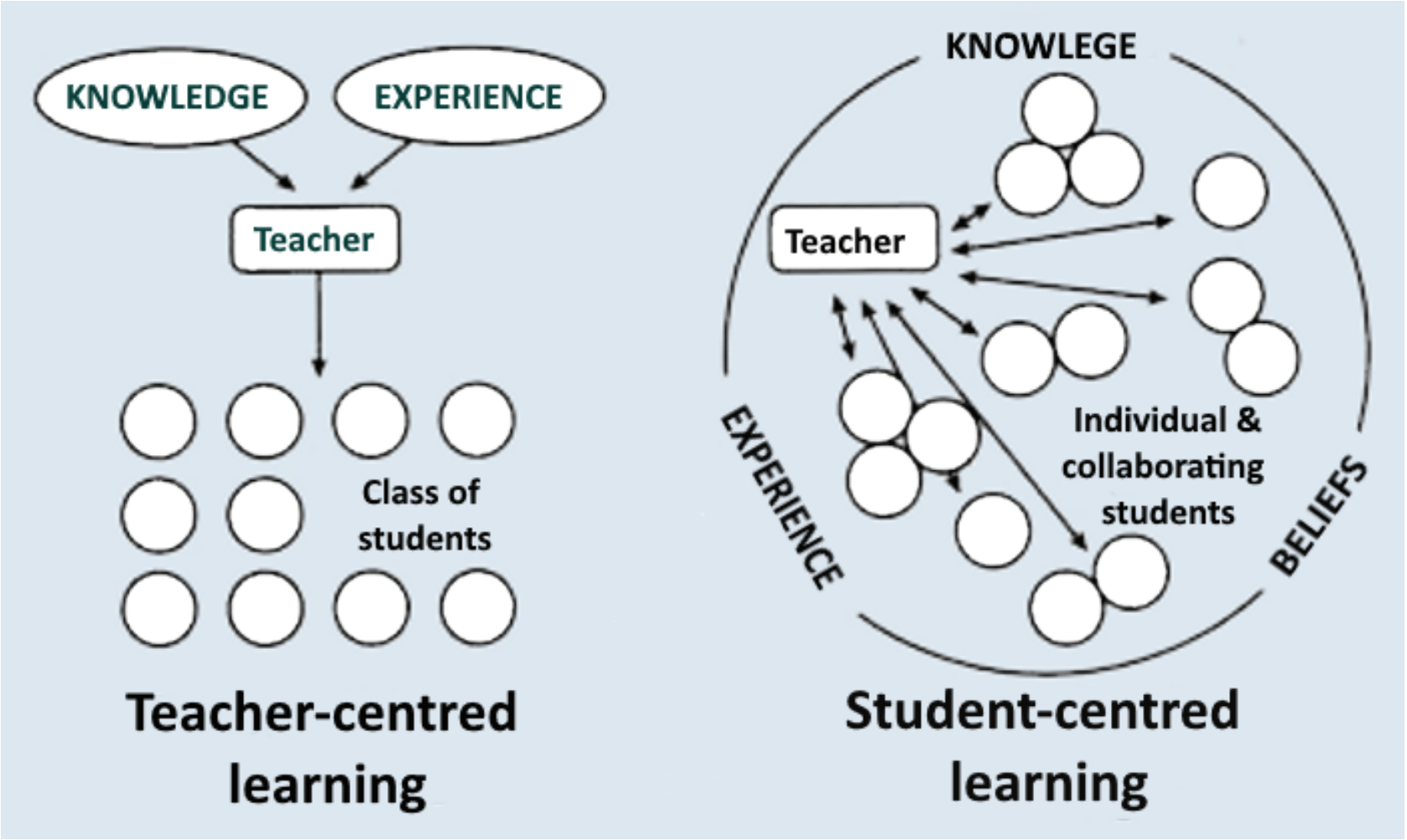


We provide learner-centered teaching

- Checks for learner's understanding of clinical reasoning, plan, etc.



Why should we promote ’learner-centered’ teaching?



What is the role of the learner in medical education?

“Low-level” vs “High-level” Clinical Teaching

- Low-level
  - Reporting
  - Reading
  - Summarizing
  - Giving directions
  - Asking directions
  - Asking about facts
- High-level
  - Comparing
  - Contrasting
  - Evaluating
  - Synthesizing
  - Predicting
  - Hypothesizing

“Medical students will become better problem-solvers when provided with opportunities to engage actively in problem-solving, whereby the student rather than the teacher solves the problem.”

(Foley)

Training the next generation . . .

"Infrequently asking students questions which challenge them to interpret, synthesize, or assess data may encourage the creation of good medical dictionaries rather than skilled practitioners." (Foley)

"I expect you all to be independent, innovative, critical thinkers who will do exactly as I say!"

Training the next generation . . .

"Sometimes . . .

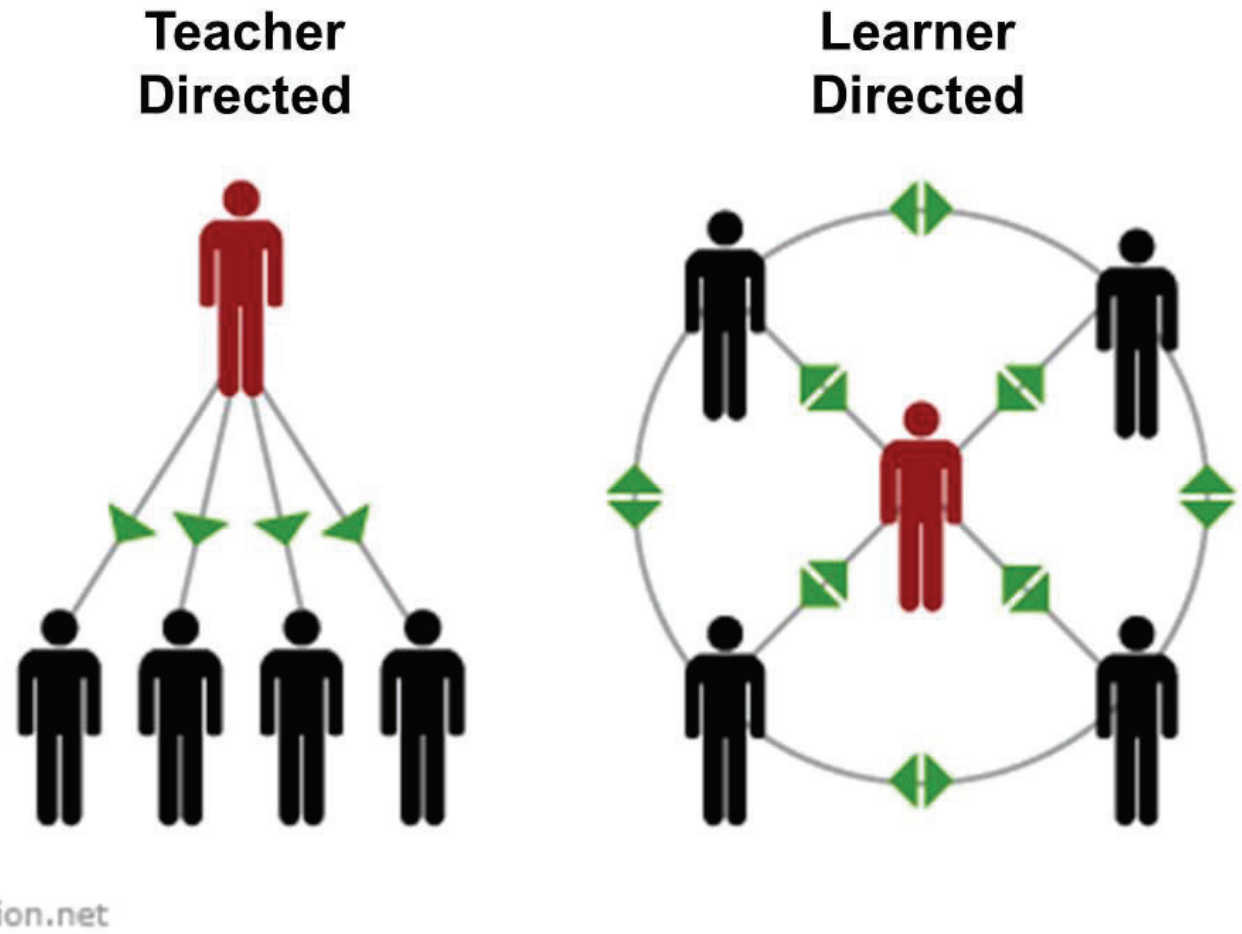
I just recite my plan and feel like a secretary."

"Allowing the student to draw things our for themselves, not just giving them the answer."

"I expect you all to be independent, innovative, critical thinkers who will do exactly as I say!"

Learner-centered teaching

SNAPPS! A structured bedside teaching model



SNAPPS! A structured bedside teaching model

→ The learner is “active and directive in the educational encounter”

→ the “instructor’s role is no longer to deliver but to guide.”

SNAPPS learner-centered bedside teaching model

- Summarize
- Narrow
- Analyze
- Probe
- Plan
- Select

SNAPPS

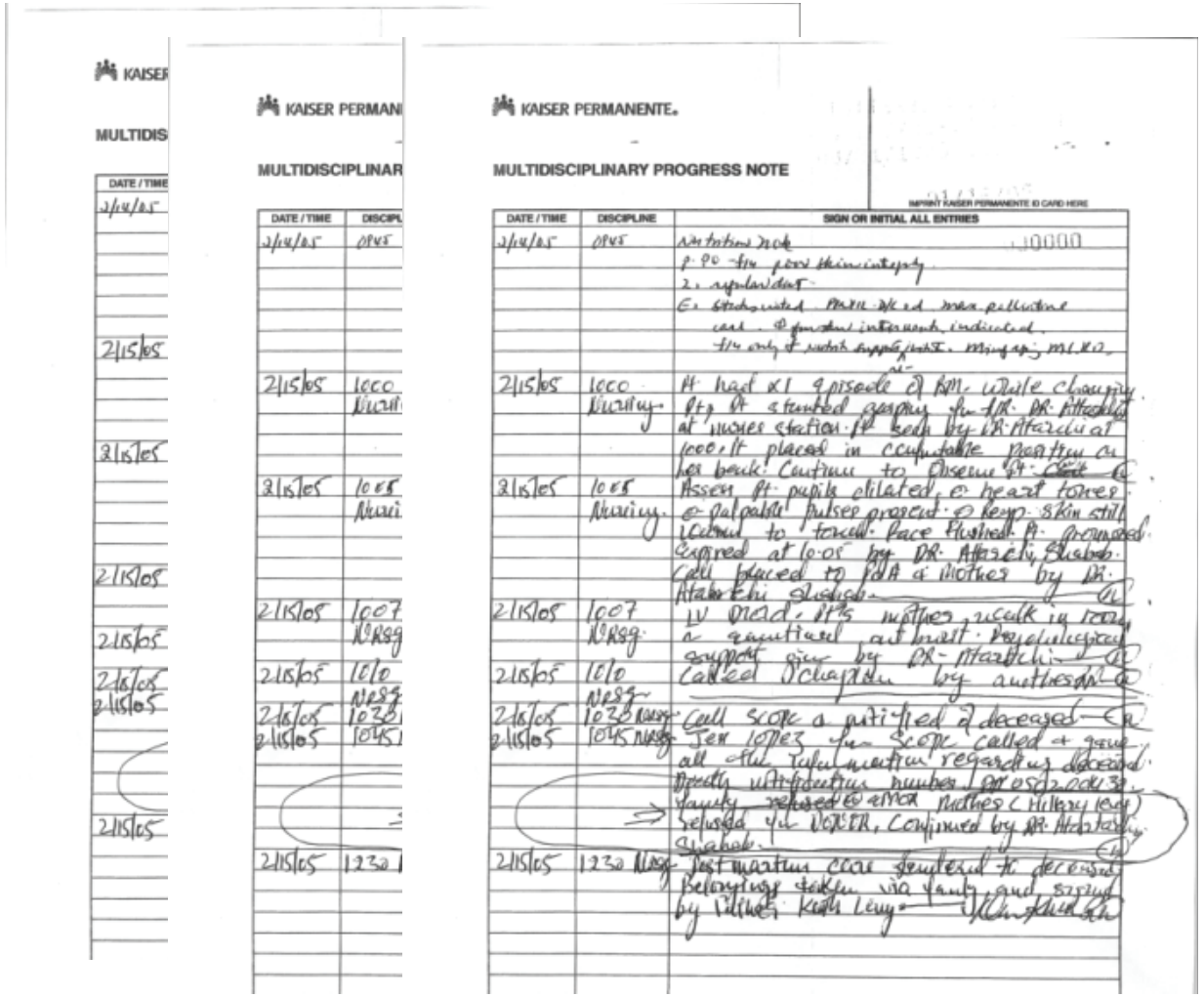
- 1) Summarize briefly the history & physical exam
- Narrow
- Analyze
- Probe
- Plan
- Select

Summarize

SNAPPS

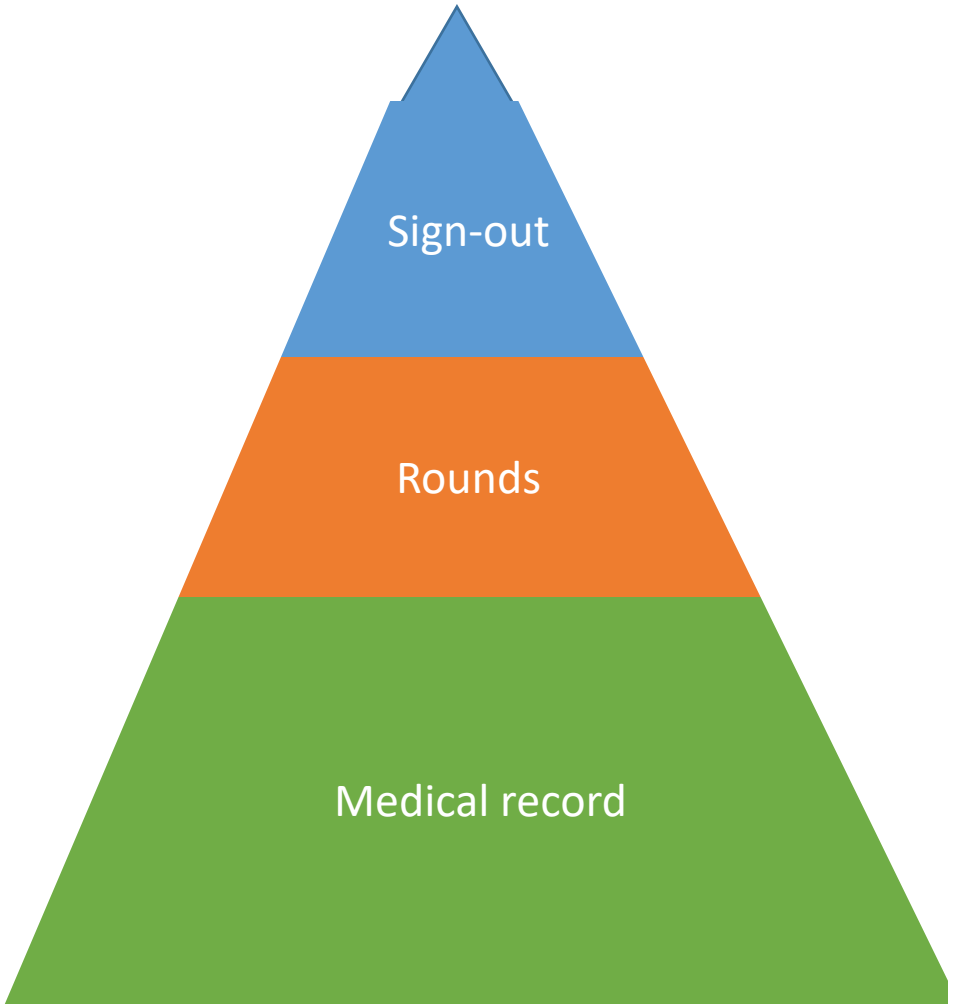
- 1) Summarize ***briefly*** the history & physical exam
- Narrow
- Analyze
- Probe
- Plan
- Select

1) Summarize ***briefly*** the history & physical exam

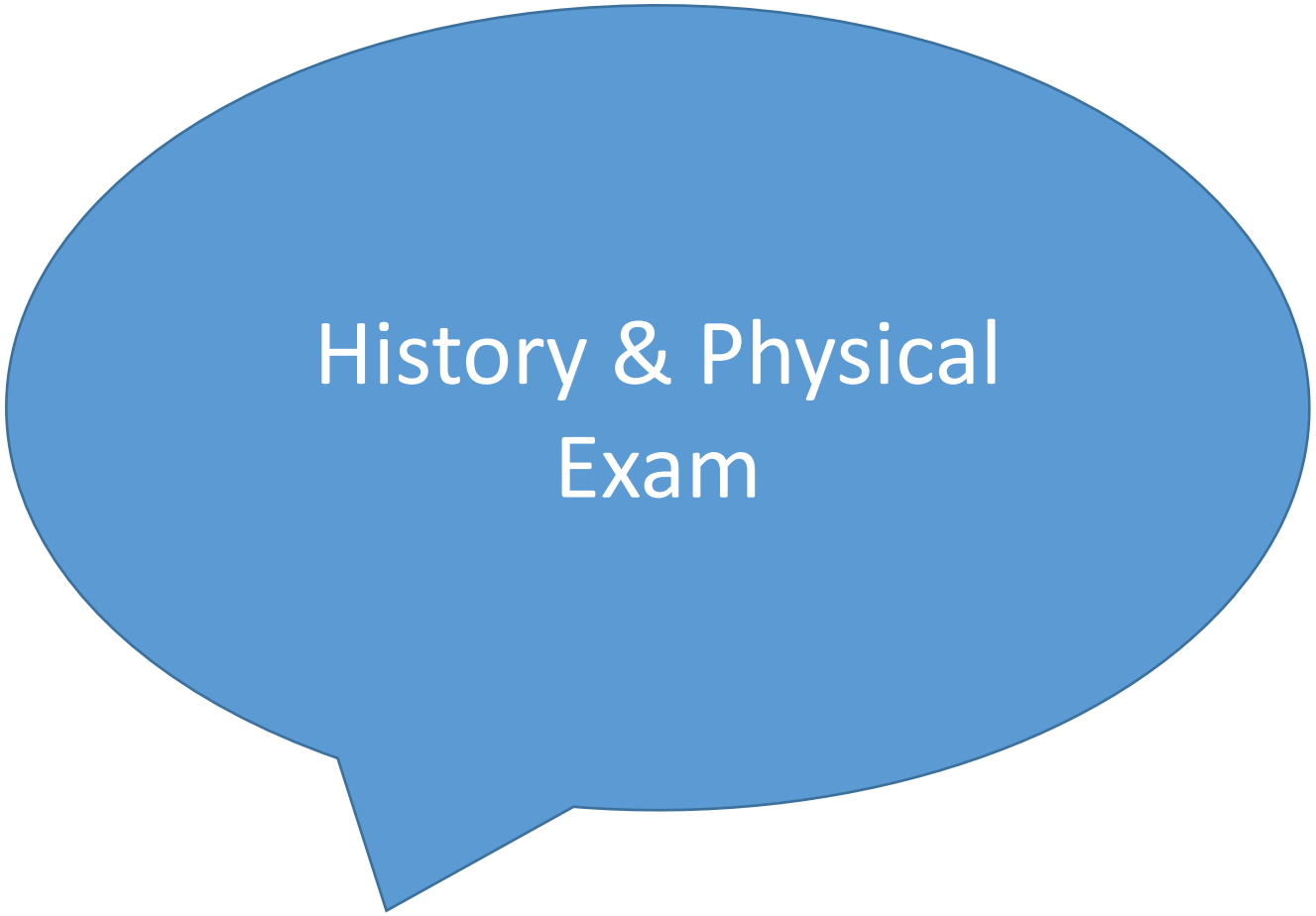

KAISER PERMANENTE.

MULTIDISCIPLINARY PROGRESS NOTE

“The Triage Triangle of Information”



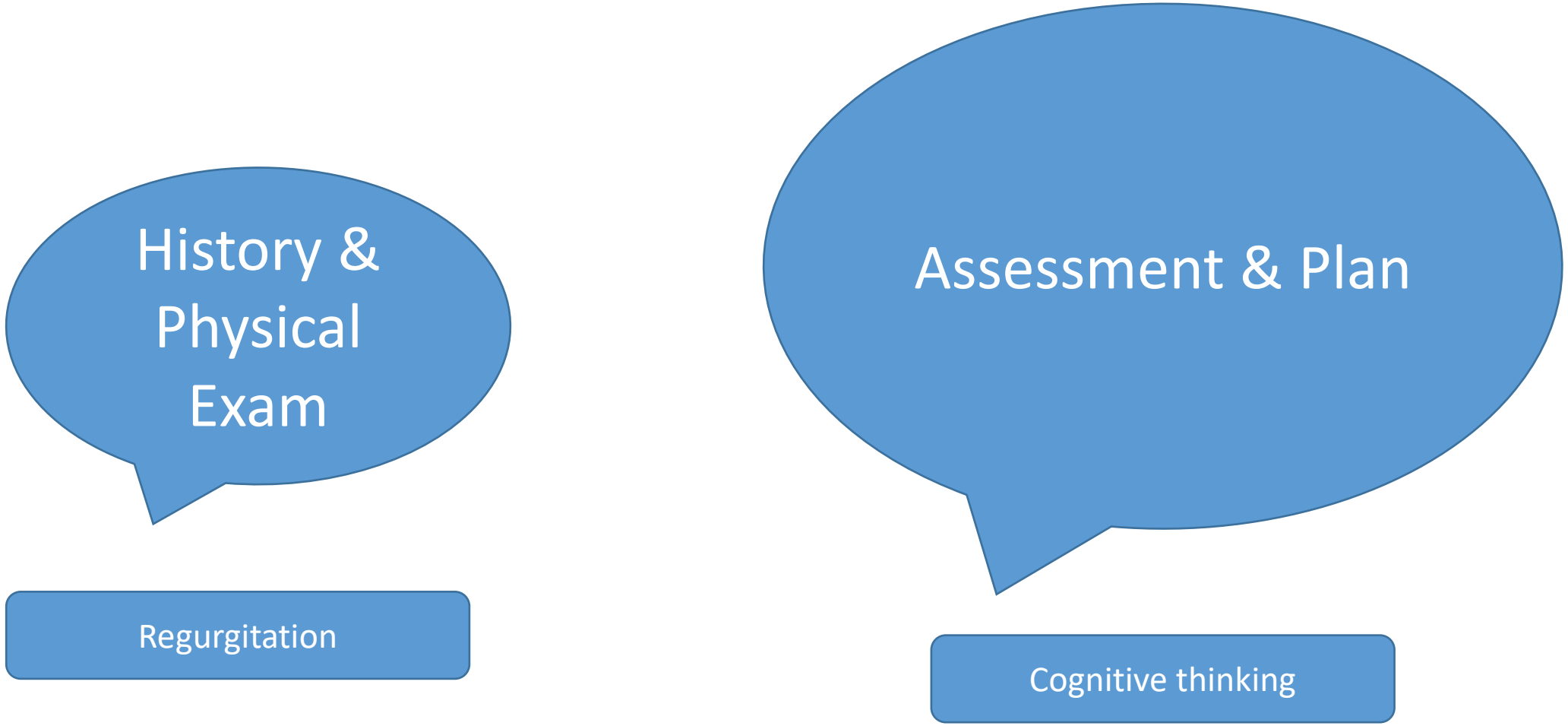
1) Summarize ***briefly*** the history & physical exam



Regurgitation

Cognitive thinking

1) Summarize ***briefly*** the history & physical exam



1) Summarize ***briefly*** the history & physical exam

1) Summarize ***briefly*** the history & physical exam

- Summary should not be more than 50% of the presentation
- Consultant can easily ask for more information as needed
- Encourage medical terminology
  - e.g. “yesterday”→ “acute”
  - e.g. “third time” → “recurrent”

SNAPPS learner-centered bedside teaching model

- Summarize ***(*Assessment goes here!)***
- Narrow
- Analyze
- Probe
- Plan
- Select

SNAPPS

- Summarize
- 2) Narrow the differential diagnosis to 2-3 possibilities
- Analyze
- Probe
- Plan
- Select

Narrow

2) Narrow the differential diagnosis to 2-3 possibilities

2) Narrow the differential diagnosis to 2-3 possibilities

What if the diagnosis is already known?

- Use your patient problem list!!

Narrow ‘non-medical’ issues

SNAPPS

- Summarize
- Narrow
- 3) Analyze the differential by comparing and contrasting the possibilities
- Probe
- Plan
- Select

Analyze

3) Analyze the differential by comparing and contrasting the possibilities

SNAPPS

- Summarize
- Narrow
- Analyze
- 4) Probe the consultant by asking questions about uncertainties, difficulties or alternative approaches
- Plan
- Select

Probe

4) Probe the consultant

Don’t be afraid to Probe!!

- What were your curiosities about this patient when you pre-rounded?
- There is no “stupid” question
- This is your chance to learn!

Can the Probe improve our patient management?

SNAPPS

- Summarize
- Narrow
- Analyze
- Probe
- 5) Plan management for the patient
- Select

Plan

5) Plan management for the patient

"Not just agree or make changes to plan, but to explain the reason why."

SNAPPS

- Summarize
- Narrow
- Analyze
- Probe
- Plan
- 6) Select a case-related issue for self-directed learning

Select

6) Select a case-related issue for self-directed learning

"Given assignments, but never asked to present back."

Let’s practice!

Questions? Thoughts?

G.8 Residents-as-teachers: "Leadership workshop"

Appendix G.8

Residents-as-Teachers

“Leadership workshop”

Self Awareness & Self Management

Emotionally Intelligent Leadership

Adelaide Barnes, MD

August 29, 2018

Objectives

- Discuss the concept of Emotional Intelligence and how it relates to Leadership
- Focus on Self Awareness and Self Management aspects of Emotional Intelligence including:
  - Personal Mission Statement
  - Time Management
  - Burnout and Wellness

Ground Rules

- This is going to be an interactive day…we encourage you to actively participate!
- Cell phones, Ipads, etc… should be put away (unless you are on call)
- Housekeeping items

Why is leadership training in medicine important?

"Most medicine is delivered by teams of people, with the physician, in theory, the team captain. Yet, we don't train physicians how to lead teams or be team members. This should begin in medical school."

~Atul Gawande , Author & Surgeon

Activity

- Discuss (5 min)
  - Think of the BEST leader you have ever worked with. What made him or her the best? What did that leader do or not do?
  - Think of the WORST leader you have ever worked with. What made him or her the worst?

Best/Worst Leaders

Best

- Are passionate about their work
- Believe in and encourage others' efforts
- Set clear expectations
- Give their people "stretch" assignments
- Provide guidance, but don't micromanage

Worst

- Give conflicting or unclear goals
- Manipulate others
- Berate their people, sometimes in public
- Are poor listeners
- Micromanage

Richmond, Sharon L. *Introduction to Myers Briggs Type and Leadership.* 2nd Edition.

What is Emotional Intelligence?

- Self awareness
- Self management
- Social awareness
- Relationship management

Self Aware Example - 2; 1:12-3:20

Goleman D. Emotional Intelligence: Why it can matter more than IQ. Bantam Books 1995.
Nowacki AS, et al. Emotional Intelligence and Physician Leadership Potential: A Longitudinal Study Supporting a Link. *The Journal of Health Administration Education.* Winter 2016.

EI Based Leadership Curriculum

Resident and Chief Resident Leadership Sessions (based on emotional intelligence model)

	Personal Competence	*Social Competence*
Recognition	**Self Awareness** Myers Briggs Indicator (CR I) 1 min autobiography/mission statement (Res) Your ideal self (Res) Physician Wellness (Res)	**Social Awareness** Middle Management (CR I) *Systems thinking (CR II)
Regulation	**Self Management** *Effective Communication (Res) Mentoring (CR II) Time Management (Res)	**Relationship Management** Conflict Resolution (CR I) Effective Feedback (Res/CR I) Being an Emotionally Intelligent Leader (CR II) Leading a Team/Teamwork/Teambuilding (Res) Patient Quality and Safety (Res)

*Content not yet created – for future sessions

Farver CF, Smalling S, Stoller JK. Developing leadership competencies among medical trainees: five year experience at the Cleveland Clinic with a chief residents' training course. *Australasian Psychiatry*. 2016

Self Awareness

The knowledge, understanding, and assessment of one's own strengths, weaknesses, and personality in a way that enables a person to pinpoint how such things impact one's own behavior as well as those around you

Self Awareness Example - Start at 1:13-3:35

https://study.com/academy/lesson/emotional-intelligence-self-awareness.html

Physician, Heal Thyself

- Leading a team or being a Leader in general begins with developing one's self

Self Awareness Reflection Activity

- What are my strengths? Weaknesses?
- Am I a reader, listener, talker, or writer?
- Do I work better alone or with others?
- What are my values? What motivates me?

Drucker P. Managing Oneself. Harvard Business Review. 2005.

Write Your Mission Statement

- Mission statements enable you to stay aligned with the values that are most important to you. It forces clarity and helps you define purpose.
  - What is important to me?
  - Where do I want to go?
  - What does the “best me” look like? (your ideal self)
  - How do I want to act?
  - What kind of legacy do I want to leave?

www.andyandrews.com/personal-mission-statement/
www.daveramsey.com/blog/mission-statement-101

Example Mission Statements

"To be a teacher. And to be known for inspiring my students to be more than they thought they could be." ~Oprah Winfrey

"To use my gifts of intelligence, charisma, and serial optimism to cultivate the self-worth and net-worth of women around the world." ~Amanda Steinberg, founder of DailyWorth

Self Awareness Summary

- The more we know about ourselves, the better able we will be to listen to and accept another's narrative.

- If you are aware of your feelings, you are better able to manage them; if you are able to manage your emotions, you will know how to appropriately respond to difficult situations.

Dobie S. Reflections on a Well-Travelled Path. *Acad Med.* 2007; 82(4):422-427.
https://study.com/academy/lesson/emotional-intelligence-self-awareness.html

Self Management Skills

- Self confidence
- Persistence
- Resilience
- Patience
- Perceptiveness
- Emotional Regulation
- Time Management

www.study.com

Self Management Skills

- Self confidence
- Persistence
- **Resilience**
- Patience
- Perceptiveness
- Emotional Regulation
- Time Management

https://study.com/academy/lesson/self-management-skills-for-the-workplace.html

Let's Chat!

How do you define wellness?

Burnout & Wellness

- The definition of wellness is…
  - Personal
  - Contextual
  - Changeable over time

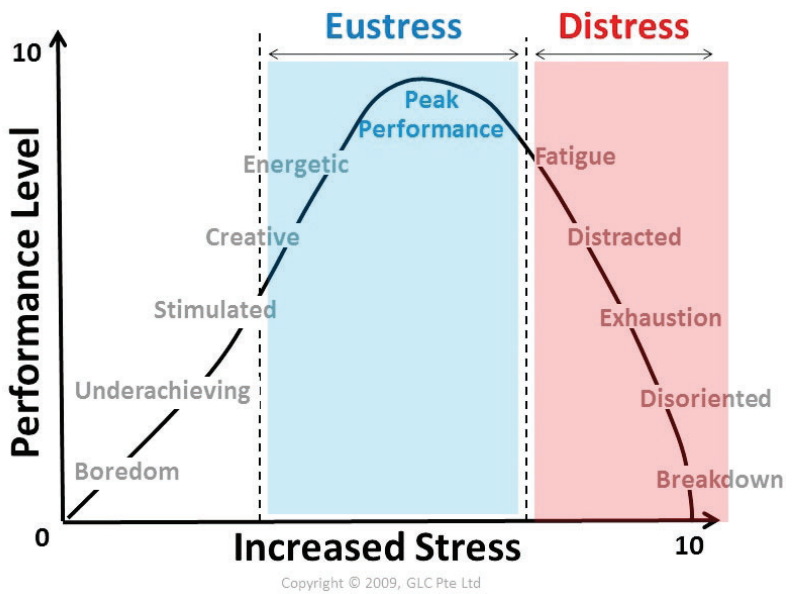
"Wellness is a conscious, self-directed, and evolving process of achieving full potential…. an active process through which people become aware of, and make choices toward, a more successful existence."

– The National Wellness Institute

Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

What is Stress?

- Stress is a subjective experience rooted in a physiologic response
  - Has physical, mental, emotional, and behavioral triggers and manifestations
  - Stress can be a positive, neutral, or negative driver of productivity and satisfaction



Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

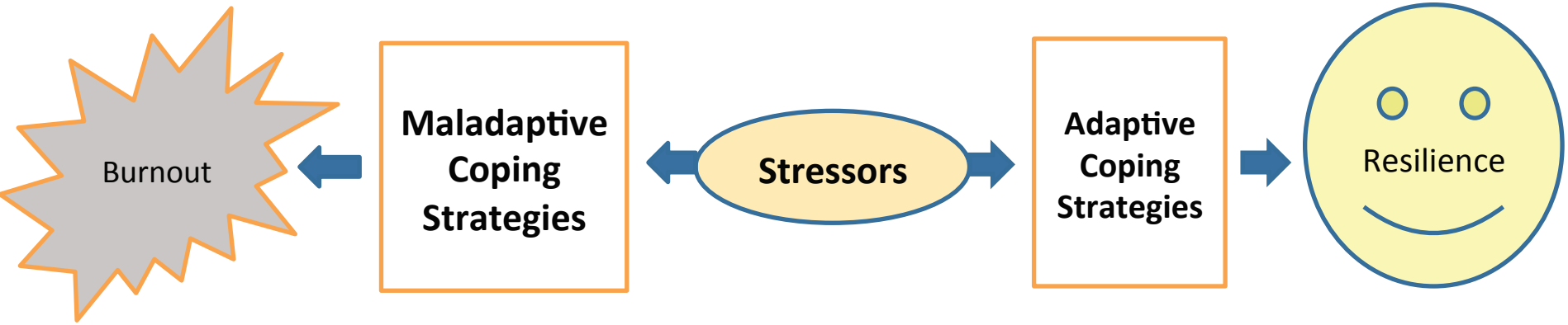
Acute stress vs chronic stress

What the stress response is good for:

What the stress response is not good for:

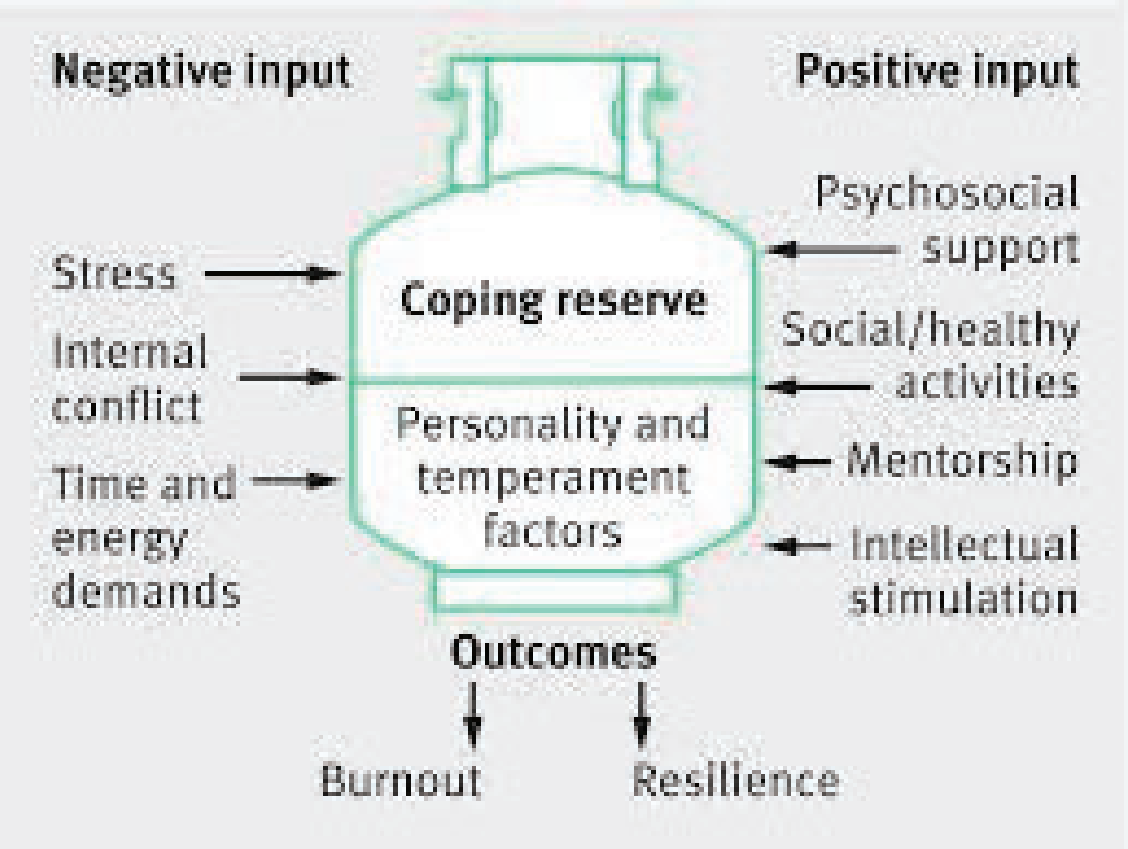
Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

Thinking about Stress and Wellness…



Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

The Coping Reserve



"The coping reservoir is drained and filled repeatedly as students confront the many competing demands for their time, energy, and cognitive and emotional resources. The process is dynamic, not static."

Dunn et al, 2008

Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

A Physician's Time

- Unique physician stressors:
  - Unpredictable schedules
  - Unconventional hours
  - Fatigue

Shanafelt. *Arch of Intern Med*. 2012

Registrar Stress & Burnout

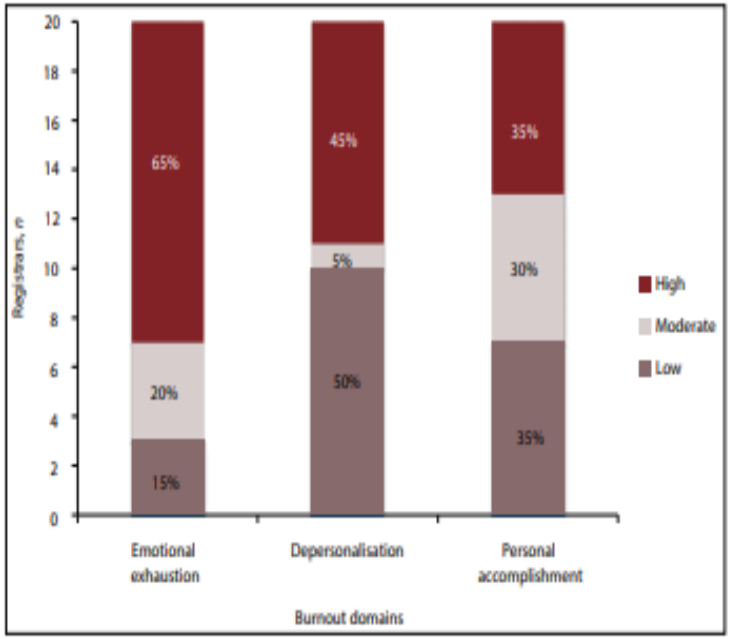


Fig. 1. Burnout experienced by clinical registrars working at the Princess Marina Hospital in Gaborone, Botswana (n=20).

- *Emotional Exhaustion* – Depletion of emotional resources
- *Depersonalization* – negative and cynical attitude towards others
- *Reduced personal accomplishment* – negative and dissatisfied evaluation of oneself

Westmoreland KD, et al. Registrar wellness in Botswana: Measuring burnout and identifying ways to improve wellness. *African Journal of Health Professions Education.* September 2017;(9)3:98-102.

Elements of Burnout

Element	Definition	Examples	What you might say to yourself
Emotional exhaustion	Feeling like you do not have the energy to face daily challenges	- Wishing for the weekend already on Monday - Struggling to come to work in the morning	- "I just can't do this anymore." - "I can't believe Family X is asking to see me again. I don't have it in me to go in there again."
Depersonalization	Difficulty empathizing with the suffering of others or seeing things from another person's perspective	- Cynical jokes about patients - "Othering" patients and colleagues by attributed negative qualities to them	- "10/10 pain? Yeah, right! Clearly they have never been in real pain before." - "Not another ____. I hate these admissions."
Reduced sense of personal accomplishment	Feeling either that the work you do does not matter or that you are not able to do good work.	- Difficulty contextualizing mistakes and forgiving oneself for mistakes - Imposter syndrome	- "I can't believe I forgot to put in that antibiotic order. Maybe I am not meant to be a doctor." - "I'm slower than all the rest of my teammates. I wonder if everyone can tell."

Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

Registrar Stress & Burnout

Table 2. Factors leading to burnout as identified by clinical registrars working at Princess Marina Hospital in Gaborone, Botswana (n=18)

Factor leading to burnout	n (%)
Insufficient salary	17 (94)
Limited resources	16 (89)
Long working hours	13 (72)
Overnight calls	13 (72)
Insufficient support from ancillary staff	11 (61)
Work-life balance	9 (50)
Overwhelmed by too many patients	9 (50)
Insufficient support from administration	8 (44)
Insufficient support from consultants	6 (33)
Inadequate knowledge base	5 (28)
Medical complexity of patients	2 (11)
Difficulties coping emotionally with death of patients	2 (11)

Table 3. Stress reduction techniques practised by clinical registrars working at Princess Marina Hospital in Gaborone, Botswana (n=18)

Stress reduction technique	n (%)
Spending time with family and friends	13 (72)
Alone time	11 (61)
Entertainment events	10 (56)
Exercise and sports	9 (50)
Sleeping	9 (50)
Church	9 (50)
Taking holiday	8 (44)
Shopping	6 (33)
Cooking	4 (22)
Listening to or playing music	3 (17)
Hobby	2 (11)
Going out partying	2 (11)
Being outdoors	2 (11)
D[illegible]hol	1 (6)
[illegible]	1 (6)

Westmoreland KD, et al. *AJHPE.* 2017.

Contributors to Resident Burnout

- Time demands
- Lack of control
- Interpersonal conflicts
- Inherently difficult situations
- Uncertainty about the future
- Home-work balance challenges
- Financial distress
- Sleep deprivation
- Isolation from social supports
- Lack of time for coping behaviors
- Others?

Ishak et al, 2009

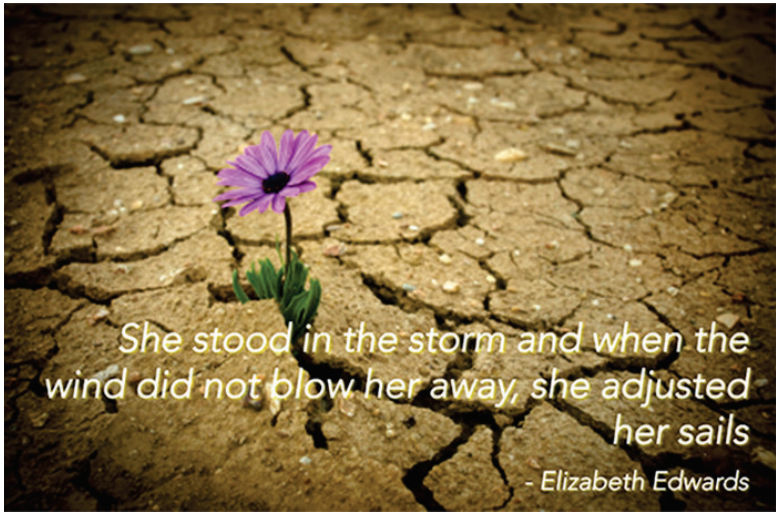
Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

Is there any good news???

The good news is that resilience is a skill that can be learned and strengthened!

Resilience, Defined

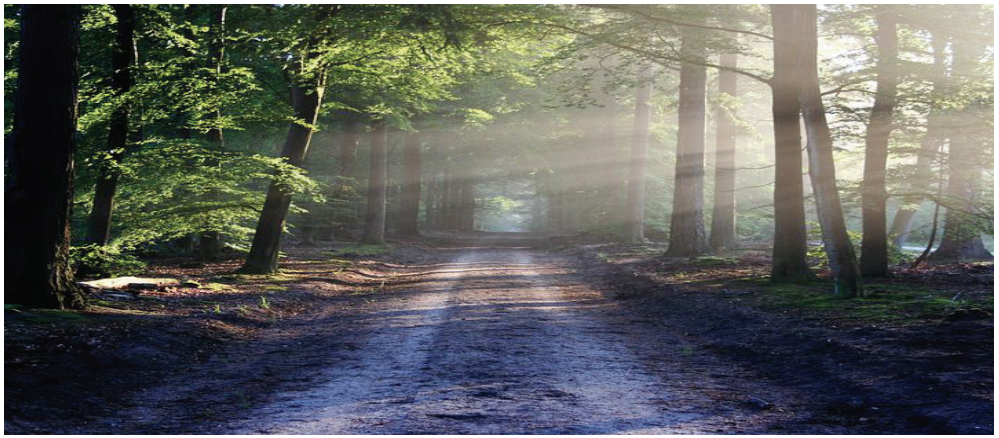
- The ability to overcome setbacks
- The ability to withstand adversity
- The ability to stay focused on your long term goals
- The capacity to respond to stress in a healthy way
- Resilience is sometimes thoughts of as a trait, but it is a skill that can be learned and strengthened over time.



Slide adapted from: Miriam Stewart. Wellness and self care during residency. 2018

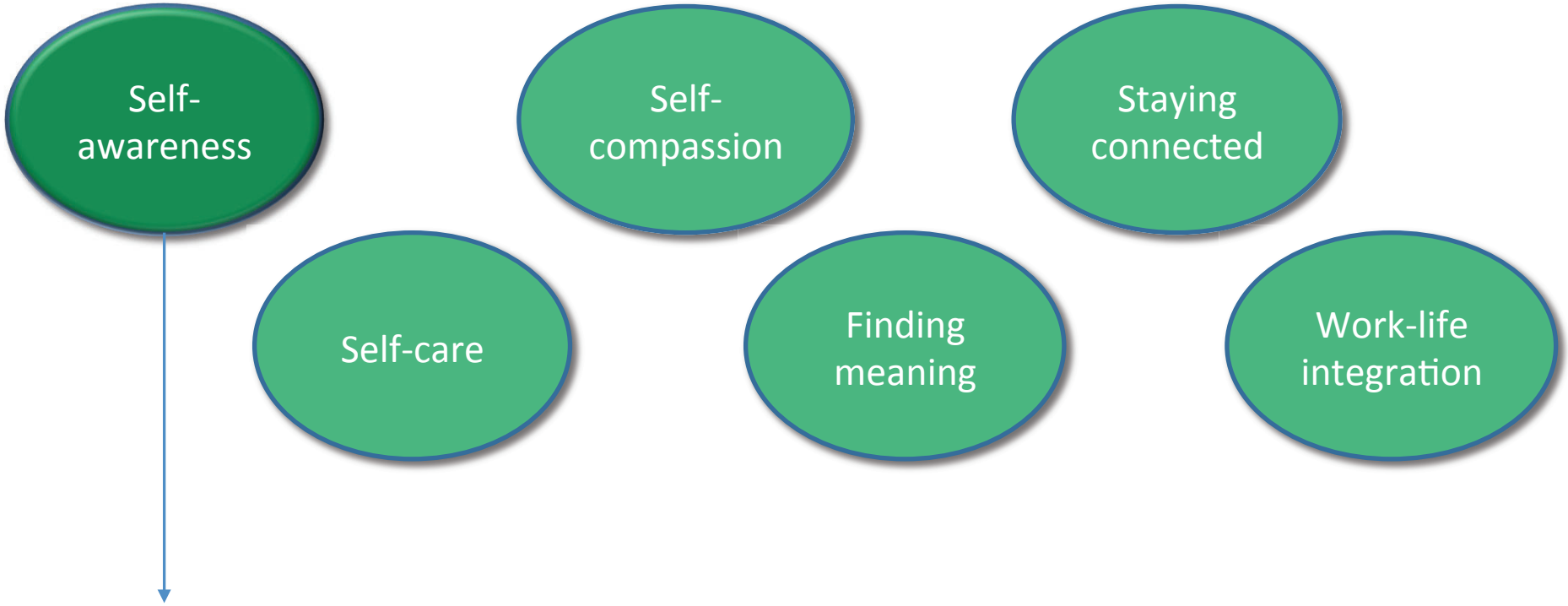
The Path to Resilience

- Self-awareness
- Self-compassion
- Staying connected
- Self-care
- Finding meaning
- Work-life integration



Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

The Path to Resilience



- Learn your stress symptoms and triggers
- When you feel yourself becoming stressed, get in the habit of responding by doing something to break the cycle of stress

Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

Exercise: Identifying Stress Symptoms

Stress Warning Signs and Symptoms	
Cognitive Symptoms	**Emotional Symptoms**
■ Memory problems ■ Inability to concentrate ■ Poor judgment ■ Seeing only the negative ■ Anxious or racing thoughts ■ Constant worrying	■ Moodiness ■ Irritability or short temper ■ Agitation, inability to relax ■ Feeling overwhelmed ■ Sense of loneliness and isolation ■ Depression or general unhappiness
Physical Symptoms	**Behavioral Symptoms**
■ Aches and pains ■ Diarrhea or constipation ■ Nausea, dizziness ■ Chest pain, rapid heartbeat ■ Loss of sex drive ■ Frequent colds	■ Eating more or less ■ Sleeping too much or too little ■ Isolating yourself from others ■ Procrastinating or neglecting responsibilities ■ Using alcohol, cigarettes, or drugs to relax ■ Nervous habits (e.g. nail biting, pacing)

http://www.thestudentdiet.com/how-to-live-stress-free-in-college/identifying-stress-warning-signs-symptoms/#main

Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

The Path to Resilience

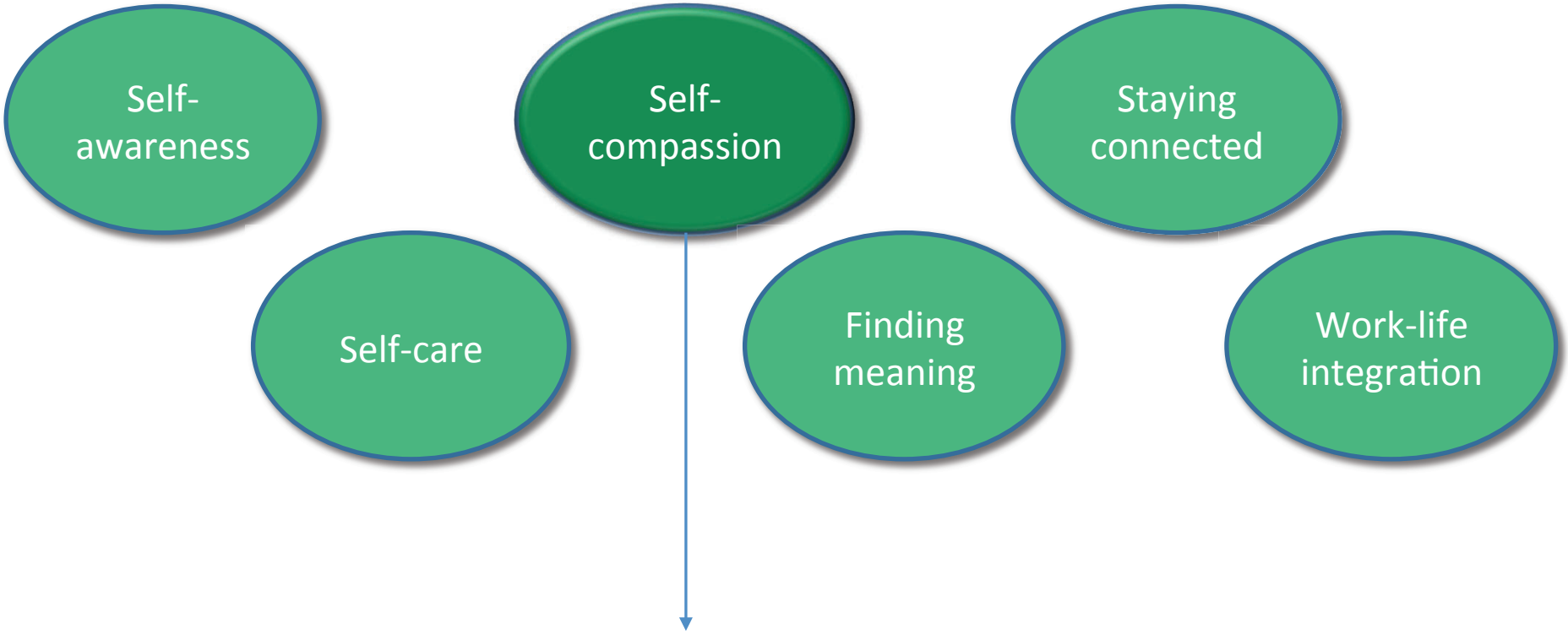
- Learn which activities contribute most to your sense of well-being
- Self-care requires planning, prioritization, and flexibility
  - Schedule small (ideally < 30 minutes) opportunities for self-care in advance
- Activities of self-care are easier to accomplish when they become habits

Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

Avenues of self-care

Quality time with friends and family
Religion/Spirituality
Fitness
Outdoor activities
Journaling
Adequate Sleep
Meditation
Social gatherings
Art and music
Community service
Hobbies
Vacation planning

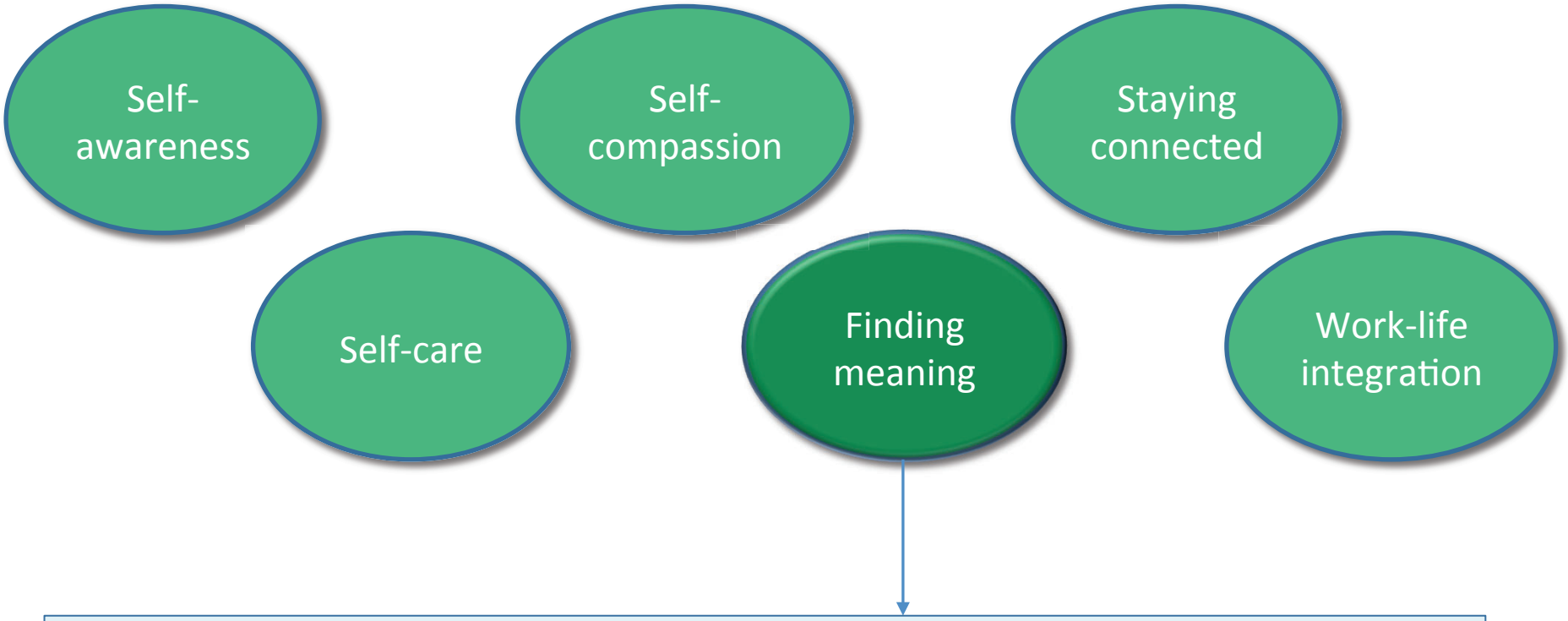
The Path to Resilience



- Relate to yourself as you would to your best friend, with kindness and understanding
- "Imperfection is not our personal problem – it is a natural part of existing." —Tara Brach

Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

The Path to Resilience



- A sense of meaning in one's work and identification with a higher purpose has been found to be protective against burnout
- Holding on to meaning can require intention: reflective writing, nurturing relationships with patients and their families, engagement with a spiritual or creative practice

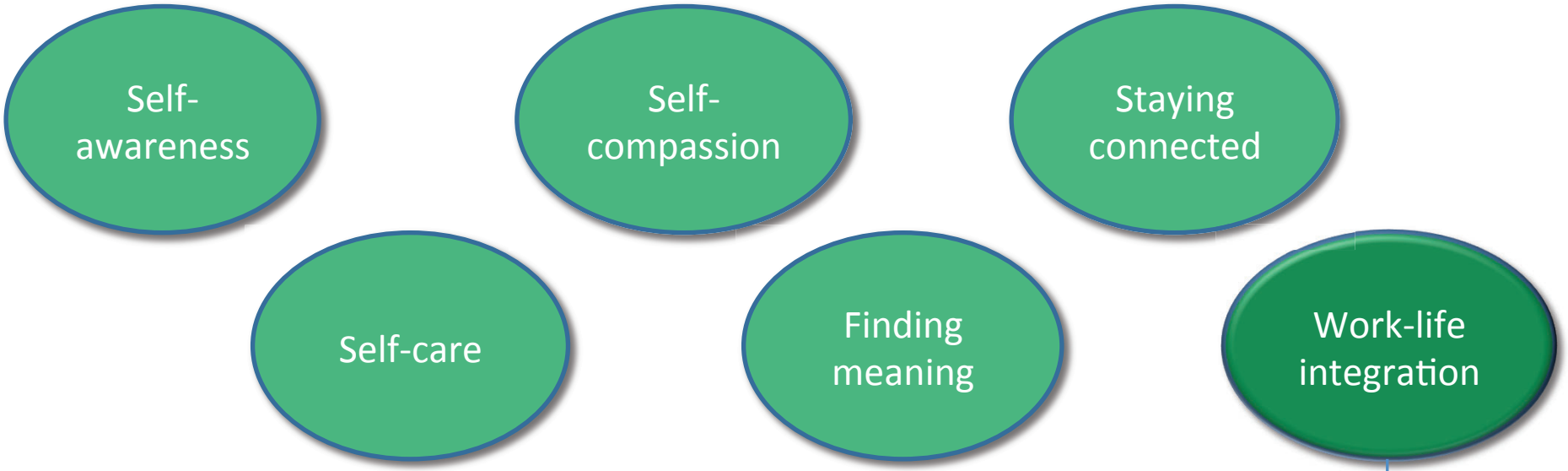
Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

The Path to Resilience

- Relationships are an important source of meaning and support for most people both at work and outside of work.
- Relationships are easily threatened when time demands are high – they take time and presence and attention.

Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

The Path to Resilience

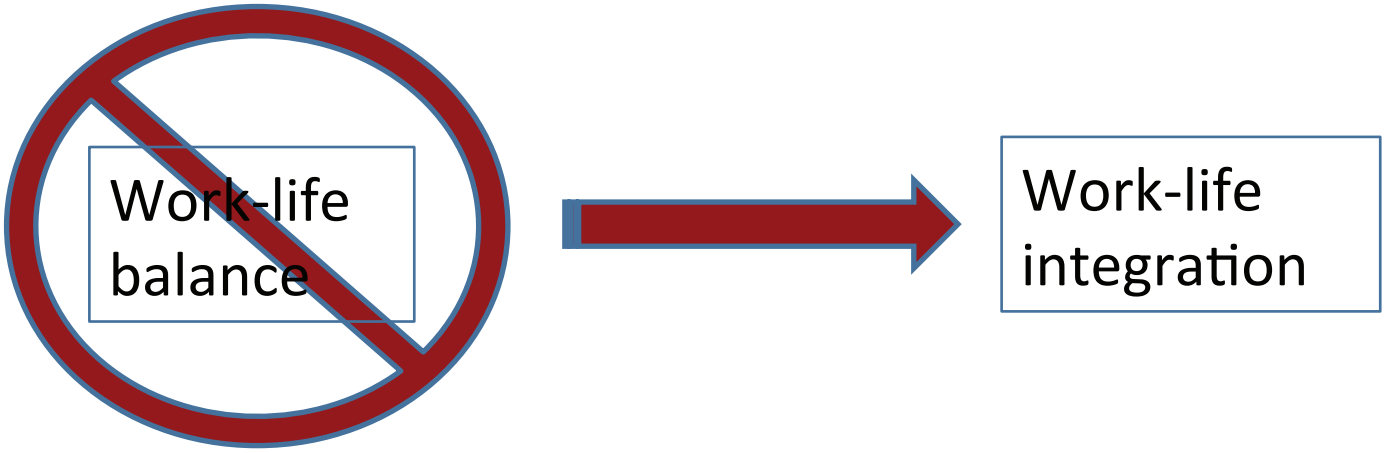


- Achieving wellness means finding meaning, purpose, and pleasure across all of life's domains
- Work-life integration is a constantly moving target, shifting from day to day, week to week, month to month, and year to year
- Go for the small wins!
  - ✓ Do what you can, when you can
  - ✓ Small gains in the area of work-life integration can yield huge gains in your quality of life

Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

Work-life integration

- The idea of "work-life balance" creates a problematic competition between work and life, when in fact work is a (huge) part of life
  - Most employed adults spend the majority of their waking hours working – never more so than during residency!
- If you are miserable at work, even fewer hours at work will not result in your feeling a sense of wellbeing in life
- Achieving wellness includes finding meaning, purpose, and pleasure in your work!



Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

In the End, Wellness is…

- A choice
- A habit
- A practice
- Something only you can cultivate in yourself and which no one else can take away

"Happiness is not something that comes ready made. It comes from your own actions."

—The Dalai Lama

Slide Credit: Miriam Stewart. Wellness and self care during residency. 2018

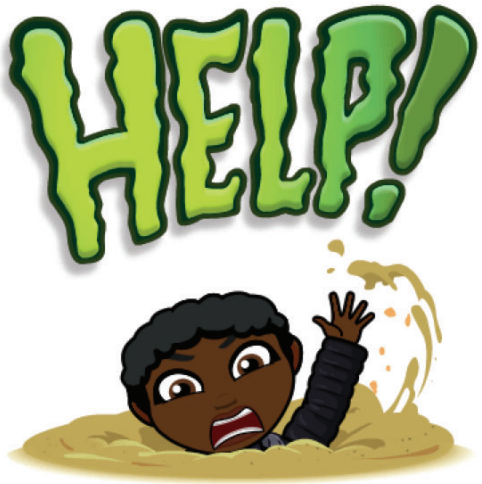
Self Management Skills

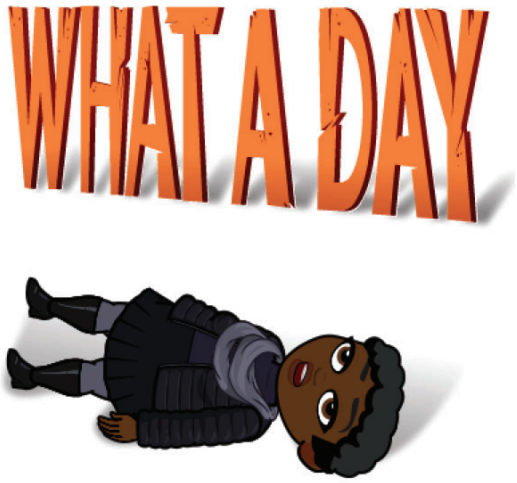
- Self confidence
- Persistence
- Resilience
- Patience
- Perceptiveness
- **Emotional Regulation**
- Time Management

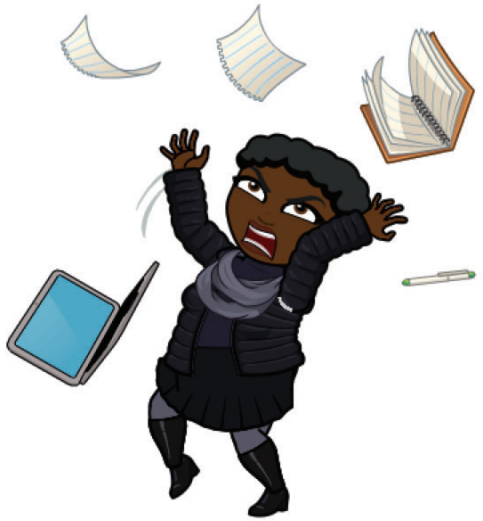
https://study.com/academy/lesson/coping-strategy-definition-lesson-quiz.html

Emotional Regulation

- Okay, we just spent the last few minutes talking about general wellness, but what about some strategies for acute stressors???



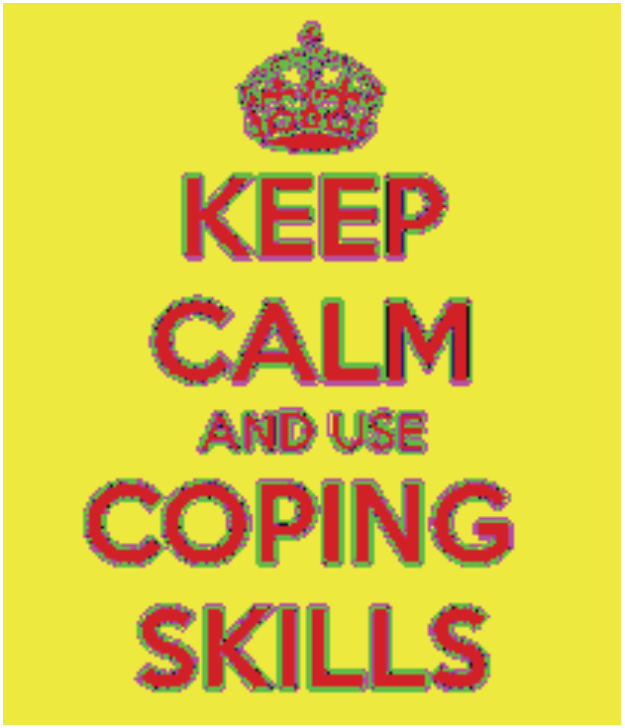




Coping Strategies

Emotion Focused Strategies

- Counting to 10
- Letting off steam by venting to friends or family
- Keeping yourself busy to keep your mind off the stressor
- Seeking encouragement, moral support, sympathy, and understanding from others
- Turn to rigorous activities like sports to distract attention from stressor



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Coping Strategies

Problem Focused Strategies

- Put other activities on hold in order to concentrate on and cope with the stressor
- Actively remove or work around the stressor
- Wait until the appropriate time to act
- Seek concrete advice, assistance, or information

https://study.com/academy/lesson/coping-strategy-definition-lesson-quiz.html

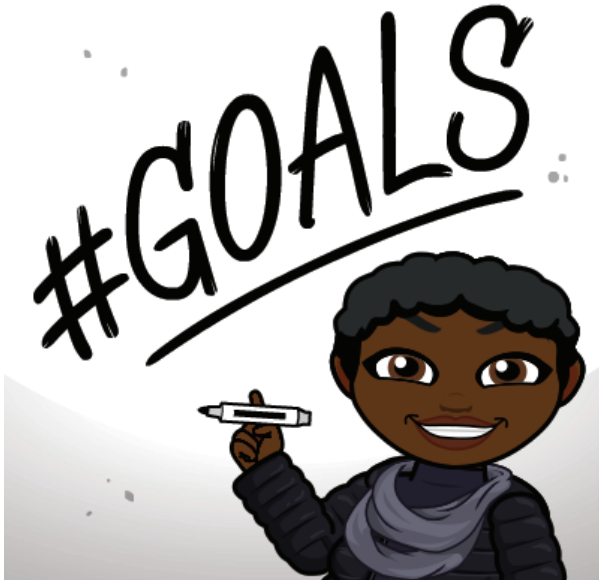
5 minute break!

Self Management Skills

- Self confidence
- Persistence
- Resilience
- Patience
- Perceptiveness
- Emotional Regulation
- **Time Management**

Physician Time Management

Maximal Productivity, Minimal Stress



Workshop adapted from Indiana University SOM, created by:
Cory Pitre, MD, Katie Pettit, MD, Lauren Ladd, MD, Carey Chisholm, MD, Julie Welch, MD

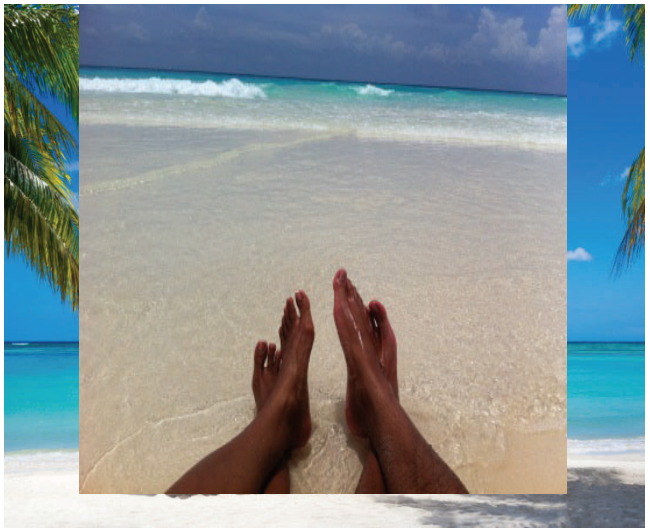
Learning Objectives

1. Recognize critical value of effective time management for physicians.
2. Describe cognitive limitations and common practices that contribute to mismanaged time.
3. Discuss the importance of identifying and maintaining prioritized goals.
4. Compare strategies for structuring workflow to effectively manage time.

The Struggle is Real…

Image: https://pixabay.com/en/hurry-stress-time-management-2119711/

Why does managing your time matter?



What has medical education taught us about managing time?

What do medical trainees learn about time management?

- Constant cycle of doing…
- Inability to recognize Individual limits

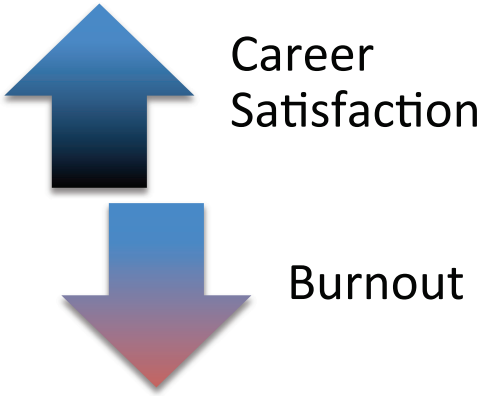
- **Produces**…
  - Learn poor time management skills
  - Increased stress
  - Decreased productivity
  - Lost personal identity

Reflection

Image: https://pixabay.com/en/judge-consider-thinking-300556/

Controlling Chaos

Data suggest that **control over schedule** may be a key driver for physician career satisfaction.



Leigh. *BMC Health Serv Res*. 2009

https://study.com/academy/lesson/coping-strategy-definition-lesson-quiz.html

4Ds of Time Management

#1
DROP
certain
unimportant
tasks

#2
DELEGATE
work that is
not necessary
for you to do

#3
DELAY
work that is
not needed
immediately

#4
DO
what is
essential &
what adds the
most value

Procrastination

Image: https://pixabay.com/en/break-business-cafe-clock-2297832/.

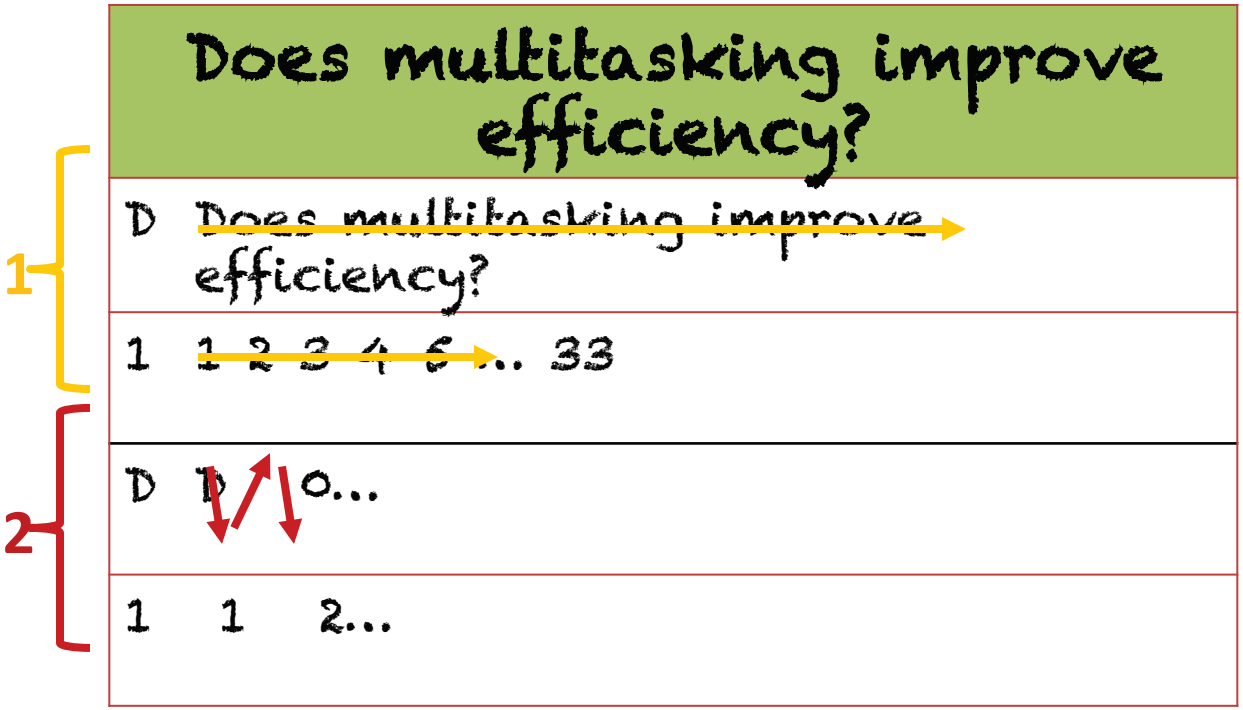
Priorities & Goals

- **Identify individual values, priorities, goals**
  - Core values/beliefs, identity, aspirations, roles, responsibilities, motivations
  - Mission statement
- **Allocate time accordingly**
  - Promotes control
  - ↑ Productivity
  - ↑ Career satisfaction

Image: https://pixabay.com/en/person-mountain-top-achieve-1245959/.

How many use multitasking as a time management strategy?

Image: https://pixabay.com/en/man-office-businessman-business-1633667/.



Adapted from Crenshaw's *The Myth of Multitasking* (2008).

Reality of "Multitasking"

- Disrupts cognitive focus
- Reduces efficiency & productivity
- Diminishes learning
- Increases mistakes
- Increases stress

"If you don't have time to do it right, when will you have time to do it over?"

–John Wooden

Image: https://pixabay.com/en/clock-time-watch-fashion-hours-407101/.

Where is time *really* spent?

- Eliminate time wasters
  - Distractions
  - Multitasking
  - Tasks lacking goal association

- "Hijacked" time
  - Renegotiate priorities
  - Reallocate time

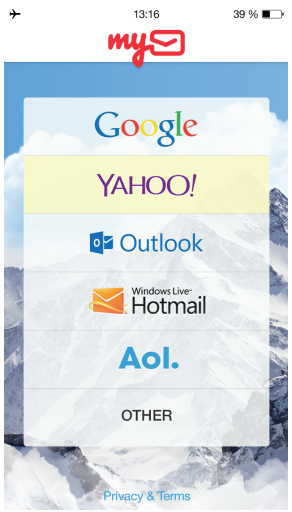


Image: https://pixabay.com/en/time-spiral-droste-clock-hours-1752164/.

Managing Workflow

Allen's 5 states

Collect → Process → Organize → Review → Do

Allen. *Getting Things Done* (2002).

Images: https://pixabay.com/en/agenda-appointment-calendar-pen-2295709, https://pixabay.com/en/agenda-screen-social-phone-1928419/.

Generate a System

Collect & Organize

One way to collect everything

- Organized
- May be simple
- Trust your system
- Readily accessible

Allen. *Getting Things Done* (2002).

Establish Regular Habits

Process

- Prioritize
- Define tasks
- Allocate time

Review

- Goals & next steps
- Re-prioritize
- Reallocate time

Allen. *Getting Things Done* (2002).

Time Management Inventory

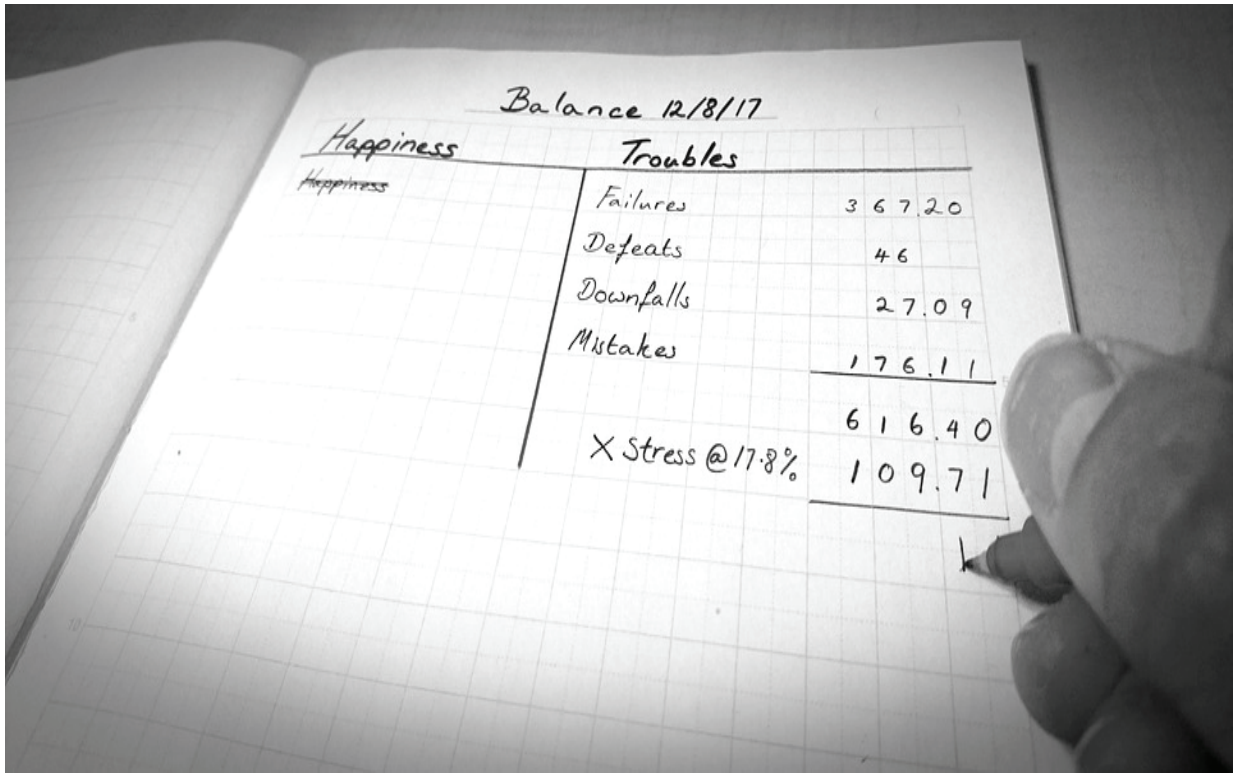


Image: https://pixabay.com/en/calculations-balance-sheet-stress-2401116/.

Focus area?

1. **Identifying goals, values, & priorities**
   - Identifying individual values and priorities *(DONE EARLIER IN THE SESSION! ☺)*
   - Generating effective goals
   - Create a plan!
2. **Managing workflow**
   - Capturing ideas & tasks
   - Defining specific goal-related tasks
3. **Allocating time**
   - Scheduling tasks
   - Leveraging technology

Summary Points

1. Time is a highly valuable commodity for physicians – *spend wisely*.
2. Managing time can increase physician career (and life) satisfaction.
3. Start small, build over time.

List of References

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What is the one thing that you learned today and plan to use after this session?

Image: JPG image by TeroVesalainen, made available under Creative Commons License CC0, accessed 8-31-17 from https://pixabay.com/en/thought-idea-innovation-imagination-2123970/.

"It is vital to recognize that personal qualities like self-awareness, self- confidence, self-control, self-knowledge, personal reflection, resilience and determination are the foundation of how we behave."

- NHS Institute for Innovation and Improvement
Academy of Royal Colleges 2010

KE A LEBOGA!

DANKE!

MERCI!

GRACIAS!

THANK YOU!!!

Important Social Skills for a Leader

Conflict resolution
Active listening
Effective communication
Praising

Honestly acknowledge who you are
Slow down, analyze what you feel, and think before you speak
Don’t jump to conclusions about someone’s behavior, look beneath the surface, and learn to read body language

G.9 “GIVING AND RECEIVING FEEDBACK”

Appendix G.9

Teach-the-Teacher & Residents-as-Teachers

“Giving and Receiving Feedback”

Feedback – Working through 'real-life' example problems

→ 1) Learning is promoted when learners are engaged in solving real-world problems. (5 minutes):

- Handout small slips of paper with example scenarios of everyday clinical teaching challenges derived from faculty in the department. (May also draw from qualitative data.)

- Example scenario: You are taking the post-intake. The on-call resident is presenting about a patient and gets confused about the difference between URI and PNA – you try to explain the difference when she starts to cry.

- Example scenario: You are on rounds and are trying to get through seeing patients and teach but you keep getting interrupted by phone calls, nurse questions, needing to look up lab, can't find chart, etc.

- Example scenario: You assign a reading assignment, but the next day, the residents and students haven't read as agreed.

- Example scenario: You assign a reading assignment, but the next day is so hectic you can't go over the material with the trainees.

- Example scenario: You ask a question on rounds, but no one attempts to answers.

- Example scenario: You admit a patient to monitor her blood pressure while starting a new antihypertensive, the student reads her daily note and it doesn't mention the patient's BP. You look to the resident, and she shrugs.

- Break into groups to discuss how you might handle the situation. (5 minutes)

→ 2) Learning is promoted when existing knowledge is activated as a foundation for new knowledge. (5 minutes):

- Share with the group some of your approaches to the problem. (5 minutes)

→ 3) Learning is promoted when new knowledge is demonstrated to the learner. (10 min)

- Present each participant with the Observation & Learning Tool and go through in detail the expectations of a 'great' clinical teacher.

→ 4) Learning is promoted when new knowledge is applied by the learner. (5 min)

Break into small groups and use the observation & learning tool to practice with the same scenarios.

→ 5) Learning is promoted when new knowledge is integrated into the learner's world. (5 min)

Debrief – questions and answers. Ask participants to use on the ward this week.

Giving & Receiving Feedback

Department of Paediatrics

September 2018

- *“positive feedback encourages you; constructive criticism can give you edge to improve”*
- *“negative feedback needs to be constructive, not demoralizing or hurtful”*
- *“they criticize you in a way that you’ll be able to learn tomorrow; don’t tell you you’re wrong, but let you think how you could have done it differently”*
- *“continuous feedback during the rotation would be better than just at the end; need the chance to show you’ve incorporated the feedback during the rotation”*

- *“sometimes we get feedback we don’t agree with, but we can’t give feedback to our seniors; the feedback is one-sided; our voices aren’t heard”*
- *“we don’t get enough feedback, so you’re left wondering ‘did I do a good job?’”*
- *“I got feedback on my miniCx on the last day of my rotation and was told I’d omitted a lot of things, but no one had told me during the rotation, but if we got continuous feedback during the rotation we’d do better on our miniCX”*

- *“constructive criticism helps me identify where I can improve”*
- *“feed-back is one-sided, learners don’t get a chance to give feedback to faculty”*
- *“never get an opportunity to tell a specialist how they could have helped you with a patient”*
- *“need feedback from the learners to know if you’ve been doing it well or not”*
- *“feedback from students is encouraging that I’m doing a good job teaching”*

- *“we just criticize the juniors and we should praise more often”*
- *“you need that feedback to gage where you are as a learner”*
- *“feedback makes learning more fruitful for the learner, without feedback, it’s a disaster”*

UNIVERSITY of BOTSWANA

FACULTY OF MEDICINE

Giving & Receiving Feedback

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Wednesday 12 September 2018

Outline

- Activity: feedback & you (discussion: self-awareness)
- Defining feedback
- Purpose of feedback
- How to give feedback
- Feedback rules
- Giving difficult feedback

Activity

- Why is feedback important/ necessary?
- It is an important educational tool
- Information given closes gaps between current understanding & what is desired
- Questions to you:
- Your experiences with feedback?
- Receiving feedback?
- Giving feedback

Activity: feedback & you (self-awareness)

- How comfortable do you feel in giving feedback in the following circumstances?

- Try to remember specific instances to help you analyse your feelings about this.

ACTIVITY: feedback and you

	WHEN	VERY COMFORTABLE	QUITE COMFORTABLE	NOT VERY COMFORTABLE	UNCOMFORTABLE
1	Giving positive feedback to a junior you know well				
2	Giving negative feedback to a junior you know well				
3	Giving positive feedback to a junior you do not know well				
4	Giving negative feedback to a junior you do not know well				
5	Giving positive feedback to a senior you know well				
6	Giving negative feedback to a senior you know well				
7	Giving positive feedback to a senior you do not know well				
8	Giving negative feedback to a senior you do not know well				
9	Giving positive feedback to a peer you know well				
10	Giving negative feedback to a peer you know well				
11	Giving positive feedback to a peer you do not know well				
12	Giving negative feedback to a peer you do not know well				
13	Giving positive feedback to a person you like				
14	Giving negative feedback to a person you like				
15	Giving positive feedback to a person you dislike				
16	Giving negative feedback to a person you dislike				

Definitions

- What is the difference between evaluation & feedback?
- Evaluation:
  - Judge/ calculate the quality, importance, amount/ value of something.
  - Subdivided into: formative & Summative assessment
- Feedback:
  - = Opinion
  - Information/ statements of opinion on what can be done to improve a performance
- So: evaluate (judge) then give feedback
- Feedback can be positive or negative
- Both +ve & -ve MUST be CONSTRUCTIVE!
- What is the difference between criticism & feedback?
- Criticise:
  - To express disapproval of (someone or something): to talk about the problems or faults of (someone or something)

Giving effective feedback is complex

- Involves someone's interpretation of another's performance (subjectivity is part of it!).
- The ability to give and receive effective feedback is a life-long skill.
- Based on specific performances (not generalizations).
- Reflection can help process –ve feedback & can help in the development of improvement plans.

Important thing:

- ***Awareness*** *of where you feel comfortable & where you do not*

- *Consider the relationship between you & the person to whom you are giving the feedback.*

How to give feedback

- Many ways of giving & receiving feedback
- **Best** way = face-to-face
- certain elements must be included to make it **effective** & complete

Effective feedback requires preparation

When done with little preparation or thought it can be very damaging to the receiver & lead to loss of self-esteem & diminished confidence.

Feedback that promotes learning

- Appropriate time & place
- Based on observed performance
- Small digestible quantities
- Non-judgmental language
- Encourage self-assessment
- Permit response from trainee
- Well-defined plan of action

Ende, 1983; Hewson & Little, 1998; Holmboe et al, 2004

What about praise?

- ***Praise aimed at the person & not at specific aspects of performance is not a very effective feedback technique.***

Contents lists available at SciVerse ScienceDirect

Best Practice & Research Clinical Anaesthesiology

journal homepage: www.elsevier.com/locate/bean

7

Giving feedback – An integral part of education

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Keywords:
clinical competence
education medical/standards

Feedback is an integral part of the educational process. It provides learners with a comparison of their performance to educational goals with the aim of helping them achieve or exceed their goals.

Perspective of the learner

1. Where am I going? Clearly defined **learning goals** – desired practice or competence

2. How am I doing? Concrete **evidence** based on observed performance

3. Where to next? **Action** needed to close the gap between observed and desired performance

Hattie & Timperley, 2007

Reasons for poor feedback

- Focus on assessment only
- Feedback not captured on paper
- Importance not recognised
- Lack of skills and /or training

Norcini & Burch, 2007

Published feedback tools

1. Mini-clinical evaluation exercise	Norcini et al, 1995
2. Clinical encounter cards	Hatala & Norman, 1999
3. Clinical work sampling	Turnbull et al, 2000
4. Direct observation of proc. skills	Wragg et al, 2003
5. Blinded patient encounters	Burch et al, 2006
6. Case-based discussion	http://www.mmc.nhs.uk
7. Multisource feedback	Foundation programme, UK

IT IS EQUALLY IMPORTANT TELL PEOPLE WHEN THEY ARE DOING WELL.

LISTEN!

LISTEN!

LISTEN!

Giving difficult (negative/corrective) feedback

- Many models exist: (note your personality type: e.g. MBTI)
- Sandwich technique
- PEARLS approach

PEARLS approach (from Milan et al[22]).

Partnership for joint problem-solving
Empathetic understanding
Apology for barriers to the learner's progress
Respect for the learner's values and choices
Legitimation of feelings and intentions
Support for efforts at correction

- Reflective feedback conversation (adapted Pendleton model)

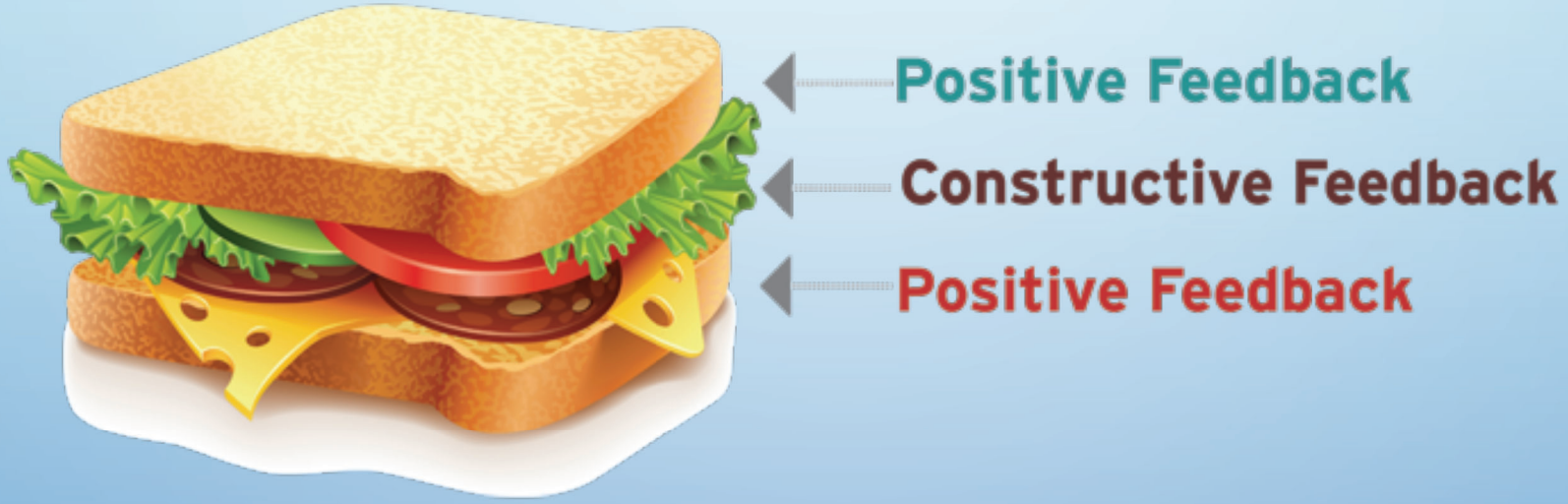
Reflective feedback conversation (adapted from Cantillon and Sargeant[21]).

1. Teacher:	asks learner to identify areas of concern or that need improvement
2. Learner:	describes areas of performance that need improvement
3. Teacher:	provides feedback about performance and offers support
4. Teacher:	asks learner to reflect on how performance can be improved
5. Learner:	offers improvement ideas
6. Teacher:	elaborates on improvement ideas, modifying or adding to them
	assesses learner's understanding of areas of concern and improvement plan

Schartel, SA, 2012

"Sandwich technique"

Begin positively & establish empathy



Giving difficult (negative/corrective) feedback

Have facts/ evidence available

Review the detail of specific incidents: always be concrete

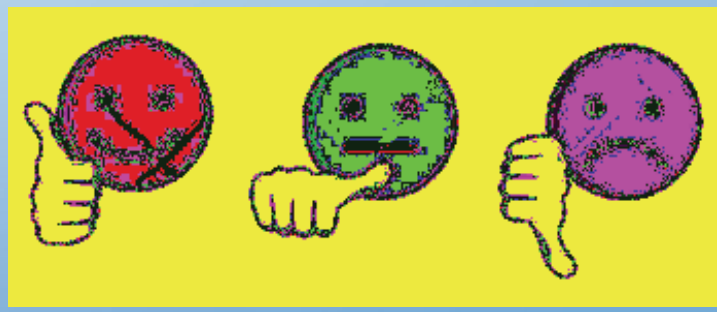
Encourage the receiver to accept some responsibility

Point out patterns of behaviour

Analyse any resistance & discuss

Allow 'time out' if needed

Negotiate



What are the learner's likely responses in difficult feedback?

- Acceptance:
  - I didn't know, i'm sorry, what should I do?
- Grudging, reluctant acceptance:
  - Yes that did happen but…
- Denial:
  - That's not true, it didn't happen like that
  - That person doesn't like me
  - Etc.

Giving difficult (negative/corrective) feedback

LISTEN!

LISTEN!

LISTEN!

ACKNOWLEDGEMENTS

To GOD be the honour glory & praise in Jesus' Mighty Name!

Thank you!
Questions? / Comments?