Thesis title:

"The graduates of the Postgraduate Diploma in Community Eye Health: how do they manage?"

By

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DECLARATION

I, DEON MINNIES, hereby declare that the work on which this dissertation is based is my original work (except where acknowledgements indicate otherwise), both in concept and execution, 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.

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Signature:

Signed by candidate

Deon Minnies, 24 April 2020.

Dedication & Acknowledgements

This thesis and the knowledge generated through it is dedicated to Hilton, my soul.

I hereby acknowledge and thank my supervisors (Steve Reid, Colin Cook and Nadia Hartman) for their contribution to this work.

I further wish to thank the following people who helped me take on this mighty challenge, namely Detlef Prozesky, Paul Courtright, Lucy Gilson, Eric Hofstee and the UWC SKILLS programme. Caroline Kewley, Rodney Ehrlich, Gregory Hussey and Tony Hawkridge collectively set me off on the path of academia, and I am highly indebted to them.

Thanks to my family for allowing me to be a little busier and more distant than usual.

Most importantly, to the graduates of the PgDCEH, past, present and future: a massive thank you for the opportunity to be enriched and enthralled by the intricacies of your personal and professional lives.

Finally, all glory to the Almighty God!

Deon Minnies, June 2019.

Abstract

The Postgraduate Diploma in Community Eye Health (PgDCEH) has been offered at the University of Cape Town, South Africa since 2009 to develop management capacity in support of the delivery of effective and efficient eye care services in sub-Saharan Africa.

We investigated how graduates applied the PgDCEH-acquired management competencies and the factors that enabled or constrained them to apply these competencies. A multiple case study design was used, employing mixed methods of data collection and analysis. Data collection comprised of a questionnaire survey, in-depth interviews and review of various supporting documents, including assignments submitted by students. Twenty-six of the 34 students who graduated from 2009 to 2014 submitted completed questionnaires. Of these, 15 purposively selected graduates and their secondary key informants participated in in-depth interviews.

We found that the PgDCEH elicited some positive effects on the graduates, especially in their ability to perform management tasks and the level of confidence they have in their abilities. There were some personal achievements, but no significant programme improvements were observed. This study provided evidence that the PgDCEH as a health system strengthening intervention struggled to generate the anticipated response of improved eye care programme performance.

Personal motivation, suitability of the training and opportunity to apply were the main factors determining how graduates apply management competencies. The utilization of the project management approach, a greater focus on health system maintenance and attention to the dynamic of change in people's lives are critical determinants of success in eye health programmes. The research also highlighted the importance of health care workers' personal motives and motivations as drivers of success and achievement on programme level, and that line management support, supervision and proper performance management are required to attain this.

This research broadened understanding of how PgDCEH graduates interact with their work environment and uncovered ways to improve the design and delivery of management training for eye health workers in the future. Revision of the criteria for selection, strengthening focus on leadership, project and relationship management topics, and integrating the training into health professions' education programmes may substantially improve the impact of health management education.

The study concluded that the constituent elements of the health system are not inanimate objects, as commonly portrayed, but people, who are connected in intimate, complex and multi-dimensional ways through communication, relationships and team dynamics to deliver health outcomes.

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Conventions & formats used

The Harvard form of referencing is used

Numbering [##] and [##s] where ## is the Graduate and ##s is the associated Secondary Key Informant

Throughout this dissertation, direct quotes of study participants occur mostly in-paragraph and are formatted in italics and enclosed in quotation marks to minimize interruption of text flow.

Acronyms and Abbreviations

CEHI	Community Eye Health Institute, University of Cape Town, South Africa
CSR	Cataract surgical rate (number of cataract surgeries per million population per year)
DR	Diabetic Retinopathy
IAPB	International Agency for the Prevention of Blindness
LMICs	Lower- and middle-income countries
MoH	Ministries of Health (generic reference to government health departments)
NBPC	National Blindness Prevention Committee
NGO	(International) Non-governmental (developmental) organisations
NHS	British National Health System
PAMCs	PgDCEH-acquired management competencies
PgDCEH	Postgraduate Diploma in Community Eye Health
RAAB	Rapid Assessment of Avoidable Blindness
SKI	Secondary key informant, a line manager of the graduate
SSA	Sub-Saharan African region
UCT	The University of Cape Town, South Africa
UK	United Kingdom
WHO	World Health Organization

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Glossary

- **Community eye health** is the application of health promotion and disease prevention, together with the delivery of curative services, at the primary, secondary, and tertiary level of health care, to reduce eye disease, visual loss and disability in a community. Community eye health extends the traditional clinical practice of ophthalmology applied to individual patients to a consideration of the eye health of whole populations or "communities", and how these can be assessed and provided for. This requires training in specific skills not usually included in conventional clinical ophthalmology training. [1]
- **The Community Eye Health Institute** is a unit of the Division of Ophthalmology in the Department of Surgery in the Health Sciences faculty at the University of Cape Town, South Africa, whose core business is support of eye care programme development through training, management consultancy and research in community eye health in low- and middle-income country settings.
- **Eye care programme** is the collection of structures, people and activities that has a common goal to provide eye health care services to the population of a geopolitical entity. [1]
- **Health system building blocks** is an analytical framework used by the World Health Organisation (WHO) to describe health systems, disaggregating them into 6 core components: leadership and governance (stewardship), service delivery, health workforce, health information system, medical products, vaccines and technologies, and health system financing. [2]
- **Health system**: (i) All the activities whose primary purpose is to promote, restore and/or maintain health; (ii) the people, institutions and resources, arranged together in accordance with established policies, to improve the health of the population they serve, while responding to people's legitimate expectations and protecting them against the cost of ill-health through a variety of activities whose primary intent is to improve health. [2]
- **Human resource development** refers to a broad spectrum of activities that take place in order to build a staff establishment for a given activity. These activities include the identification of staffing needs, the training and the recruitment and deployment of staff, in the context of the strategic, policy and professional requirements of an initiative. The term "human resource development" is differently interpreted when referring to individual, facility, programme, national or global levels. [1]
- **Human resource management** deals specifically with a more direct organising and control role as exercised by a dedicated unit, established specifically for that purpose. In public health programmes, managers can be expected to be involved in a mixture of human resource development and human resource management functions. [1]
- **Human resources**: All the individuals, their skills and attributes and utilization in performing work in a programme or organisation. [1]

- **Management capacity**: The collection of resources and competencies that ensures the meeting of organisational or programme goals through carefully planned, organised and controlled actions. [1]
- **Management competencies**: The collection of knowledge, skills and understandings that facilitate the performance of tasks associated with managing people, systems and resources. [1]
- **Projects and programmes**: Projects are characterised by short duration, SMART objectives, defined resources and central focus on achieving the results of the objectives. "Programmes" on the other hand, have no specified time limit and are focused on the process of meeting strategic objectives. Most health programmes use projects to achieve short-term goals with dedicated funding. The crucial difference lies in the emphasis on process in programmes versus results in project. In programmes, the health worker can be there, follow procedures and may not necessarily be actively producing outputs that directly lead to results, whereas in projects, obtaining pre-determined results is the central aim. [1]
- **Recognition of prior learning (RPL):** The RPL portfolio is an assignment which requires the candidate to answer questions about their education, employment and professional achievements, including central involvement in management, teaching and research publication. The candidates also need to provide proof of past and current attempts to further their knowledge around the subjects related to eye health management. A practical component is included which requires the candidates to make a rapid assessment of eye care services, using a template. This is to assess the candidates' ability to collect relevant information in their work settings, while at the same time giving them an idea of the type of activities they would be involved with during their studies, and beyond. [1]
- **Supervision** is one of the elements that helps in creating an enabling environment, cited as conditions for effective management and leadership, according to the WHO Management and Leadership workgroup. (WHO, 2007a) The other three conditions are adequate numbers, appropriate skills and availability of functional support systems. There are several interpretations of the term "supervision", but typically supervision is the activity carried out by supervisors to oversee the productivity and progress of employees who report directly to them. [1]
- **VISION 2020 targets**: Disease control, human resource and infrastructural development targets to eliminate avoidable blindness by the year 2020, VISION 2020: the Right to Sight. [1]
- **Vision loss**: (i) Blindness is defined as having a visual acuity of less than 3/60 in the better eye with presenting correction. (ii) Severe visual impairment is defined as having a visual acuity of less than 6/60 but more than 3/60 in the better eye with presenting correction. (iii) Moderate visual impairment is defined as having a visual acuity of less than 6/18 but better than 6/60 in the better eye with presenting correction. Field of vision is used to characterise low vision. [1]

[1] Working definitions used in the Postgraduate Diploma in Community Eye Health
[2] Definitions in this glossary sourced from WHO publications, unless otherwise indicated.

Chapter 1: Introduction

Globally, there is a high level of blindness and visual impairment (Bourne et al, 2017) that results in poor quality of life, dependency, poverty (Chan et al, 2017), and excessive strain on struggling health systems in low-and-middle-income countries (LMICs).

In 2015, the International Agency for the Prevention of Blindness (IAPB, 2017) estimated that there were 253 million visually impaired people in the world, of which 36 million were blind, and 217 million were severe to moderately visually-impaired, according to World Health Organisation (WHO) definitions of vision loss. This represents a global prevalence of blindness of 0.50% and of moderate or severe vision impairment of 3.01%. These figures do not include an estimated 1.8 billion people living with presbyopia (Fricke et al, 2018) needing reading glasses.

People living in LMICs carry more than 80% of the burden of blindness and visual impairment. (Bourne et al, 2017) The sub-Saharan African region, with a total population of 959 million, has 17.46 million living with moderate or severe visual impairment, and 4.28 million are blind. A further 101 million are near-vision impaired, needing reading glasses. (IAPB, 2017 & 2019)

Cataract is the main cause of blindness globally, and in most countries in Sub-Saharan Africa, followed by glaucoma, refractive error and trachoma (IAPB, 2017 & 2019), see *Table 1*. Childhood blindness and diabetic retinopathy are emerging priorities for blindness prevention in most countries due to their impact on education and employment. More than 90% of vision loss (including blindness) is avoidable: either preventable through healthy lifestyle choices or curable through simple and low cost means such as cataract surgery and refractive error correction.

Table 1: Global causes of blindness and visual impairment, 2015 (Source: IAPB Vision Atlas)

CAUSE	Blind (millions)	Moderate & severe visual impairment (millions)	Blind + moderate & severe visual impairment (millions)
Cataract	12.6	52.6	65.2
Other	9.04	28.13	37.17
Refractive error	7.42	116.34	123.76
Glaucoma	2.96	4.05	7.01
ARMD	1.96	8.41	10.37
Corneal opacity	1.28	2.89	4.17
Trachoma	0.4	1.6	2
Diabetic retinopathy	0.36	2.57	2.93
TOTAL	36	217	253

However, there are critical shortages of staff, equipment, medicines and funds to implement the above-mentioned interventions on a large scale. There is also inadequate information and awareness about blindness and its prevention in Sub-Saharan African countries. (IAPB, 2017) In addition to the shortage of skills, including doctors and nurses for clinical service delivery, managers are also needed to plan and organise services and ensure effective and efficient use of limited resources. (WHO, 2005)

1.1 The VISION 2020 strategy and the Global Action Plan

Despite the population growth and aging populations, there has been a gradual reduction of blindness and visual impairment since the establishment of the VISION 2020: *The Right to Sight* campaign, in 1999. (Stevens et al, 2013) This strategy is an initiative of the WHO in partnership with the IAPB, an association of blindness prevention organisations which include non-governmental development organisations (NGOs), suppliers and service providers. (Ackland, 2012) The strategy involves increased disease control and human resource and infrastructural development with the aim of eliminating avoidable blindness by the year 2020.

The WHO-IAPB partnership mobilised governments to agree to develop national blindness prevention committees and national eye care strategic plans and mobilise resources for increased service delivery. (Ackland, 2012) These originally focused on the main causes of avoidable blindness, namely cataract, refractive error, trachoma, onchocerciasis and Vitamin A deficiency. Glaucoma and diabetic retinopathy were added later. The partnership also targeted vector-mediated causes of blindness such as onchocerciasis and trachoma.

Through the concerted efforts of the IAPB and its members, with increased advocacy and increased capacity and infrastructural development, many successes had been achieved over the first ten years of the VISION 2020 strategy. (Ackland, 2012) These include the successful African Programme for Onchocerciasis Control, eradication of trachoma in many areas and increasing the funding contribution of NGOs. Advocacy to mobilize government ownership and community awareness also reaped many benefits, resulting in improvements in service delivery, human resource and infrastructural development.

However, many of the old challenges (e.g. low budgets for eye care in LMICs, lack of adequate human resources for eye care and shortage of equipment and medicines) remained unresolved whilst some new challenges emerged. The latter include the migration of eye care professionals away from the public sector in LMICs, either to the private sector or to countries where work conditions and benefits are more attractive. The funding from NGOs decreased gradually over time, with many governments meant to increase financial contributions concomitantly, but mostly slow to realise these. (Ackland, 2012)

Following reviews of the performance of the VISION 2020 strategy, the WHO approved a new resolution for universal eye health, namely "A Global Action Plan", for the six years leading up to 2019. (WHO, 2013a) This global action plan considered the achievements and challenges of the preceding decades and set targets with a goal to "reduce avoidable visual impairment as a public health problem and to secure access to rehabilitation services to the visually impaired". To date, many countries have adopted the Global Action Plan, and country reports indicate reasonable progress.

Yet many eye care services in sub-Saharan Africa are still characterised by increased service backlogs, higher pressure on the existing staff to deal with greater demand, low motivation of staff and low confidence in the service by the service users, leading to decreased uptake of eye care. The morale of the eye health workers also suffers. The effects of these are ineffective, inefficient and poor performing eye health services in most settings in LMICs, ultimately resulting in increased morbidity, dependency and poverty and weakening of the health system, see *Figure 1*.[1]

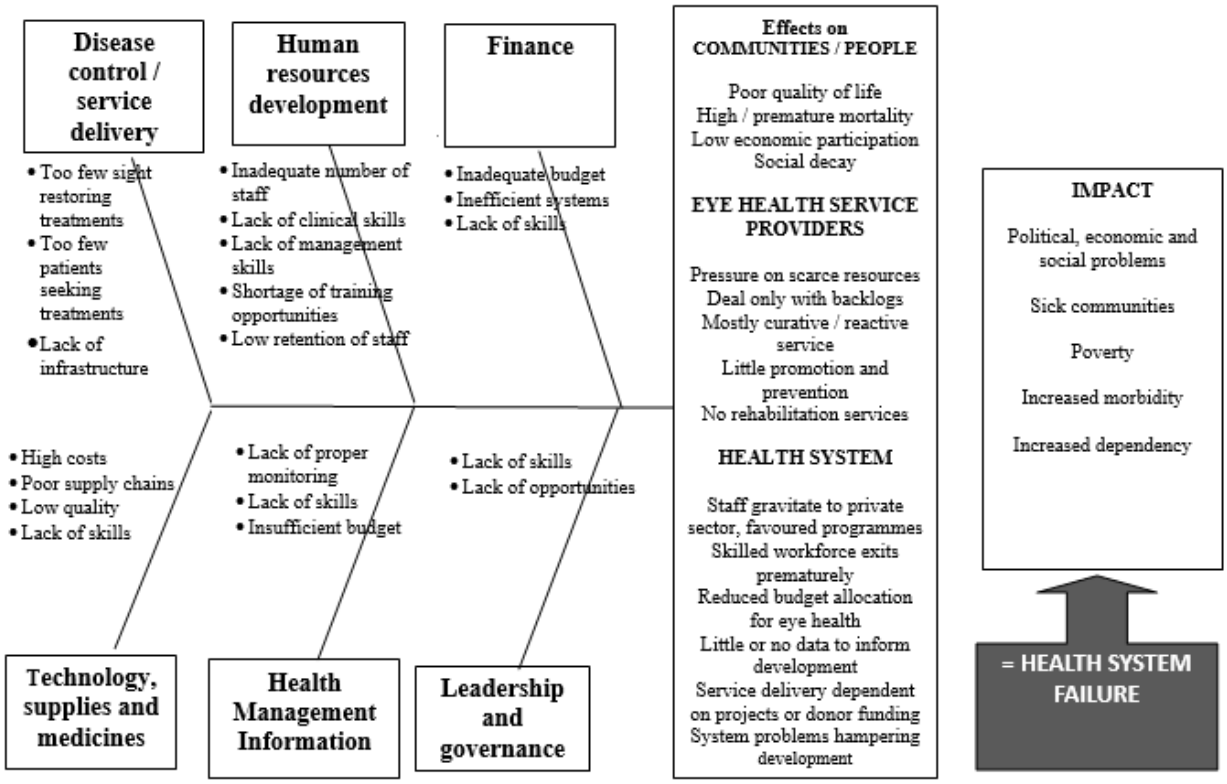


Figure 1: Causes and effects of blindness and visual impairment (Source: PgDCEH materials)

[1] This modified fishbone diagram is a combined construct of inputs from students of the Postgraduate Diploma in Community Eye Health (Appendix A) as part of their coursework and practical assignments (Appendix S: PgDCEH assignment schedule). Student-generated documents are one of the three sources of data used in this research and will subsequently be tagged as "PgDCEH materials". The other two are survey responses and in-depth interviews.

1.2 The need for training in eye care management

National eye care coordinators attending IAPB-organised capacity development workshops between 2009 and 2014 reported several non-clinical causes of low eye programme performance (see excerpt of report in *Appendix N*). These include low staff numbers, a lack of adequate supplies, insufficient funding, inadequate equipment and facilities, economic issues, a lack of skills and poor working environments. (IAPB, 2010) Most of these are within the scope and responsibility of management.

Analysis of VISION 2020 Report Cards (abridged situational analysis tools used for teaching and learning, see *Appendix J*) completed by Postgraduate Diploma in Community Eye Health (PgDCEH) students indicated that many eye health programmes function in under-supported, sometimes even isolated physical or functional configurations. Some programmes frequently only have one eye health clinician like an ophthalmologist, or in some countries, an ophthalmic clinical officer within the central authority. With many struggling with high clinical workload, many of these clinicians are not able to deal with the "management" side of things.

This low level of effective management, whether by low ability or low availability, is a critical element in producing poor service performance, resulting in poor health outcomes. Even when poor outcomes can be directly attributed to a lack of surgical skill, low productivity of staff members, poor stock control or inefficient use of funding or the lack of effective resource management may still be key factors.

Adequate management capacity is one of the key requirements for achieving desired health outcomes. (WHO, 2005) The lack of adequate management capacity to effectively overcome challenges of shortage of adequate funding, inadequate health care personnel and infrastructure deficiencies can lead to a failure to meet service delivery targets, that are meant to eliminate avoidable blindness. This is a significant weakness, contributing to the high occurrence of needless blindness and visual impairment in the region.

Increased management competencies can lead to better eye health outcomes increasing the capacity of management in individuals and by increasing the numbers of individuals in teams with increased management capacity. (ICEH, 2010) In the case of the management training provided by the PgDCEH, the increased knowledge, skills, and understanding of management by graduates should lead to increased competencies which should allow for increased application of management skills. (Du Toit et al., 2010a) The resultant effect would be better performing eye health programmes which lead to better eye health outcomes. Furthermore, the increase in the number of individuals trained in eye care programme management results in the increased availability of managers, which should lead to better health planning, implementation and management and subsequent better eye health outcomes (*Figure 2*).

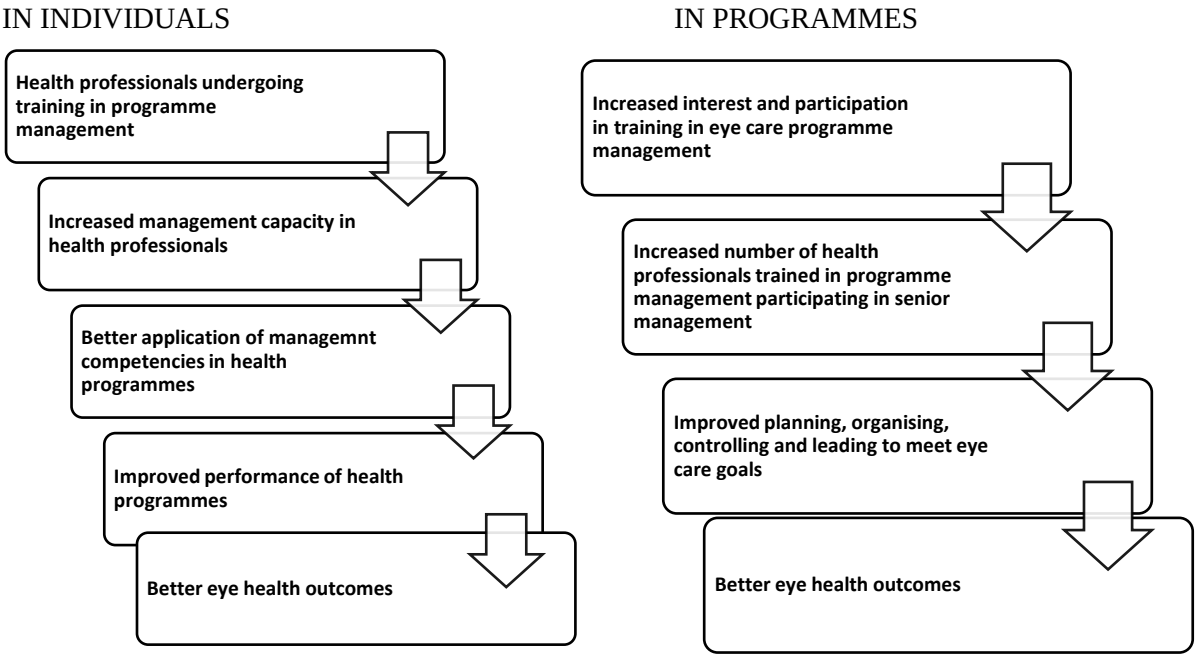


Figure 2: Management's role in achieving better health outcomes (Source: Author)

To this end, it is contended that strengthening management capacity in eye care programmes is a critical and necessary strategy to improve eye care programme outcomes. Effective management involves informed strategic and operational planning, optimal, timely and efficient organising of human and infrastructural resources, careful monitoring and control of utilization of these resources, and institution of suitable risk management strategies to ensure the meeting of the programme's strategic targets, namely improved outcomes, financial sustainability and responsiveness to its end beneficiaries.

This notion is centrally supported by the WHO leadership and management framework. (WHO, 2007a) In the Sub-Saharan African region, there has been a multitude of approaches to strengthen management (Bradley, Taylor & Cuellar et al., 2015 and Yeager & Bertrand, 2015) in health programmes, mostly with the emphasis on leadership development.

Most universities in sub-Saharan Africa provide opportunities for management and leadership development, in a variety of forms. Africa.com, a leading web-based media company sharing news and information for business across the continent, lists a range of top business schools in Nigeria, South Africa and Kenya, for example. At least two universities in South Africa (University of Stellenbosch and University of Witwatersrand) offer online, in-service and self-study programmes. The University of Cape Town's Oliver Tambo Fellowship Programme and the University of Warwick Leadership Development Programme are examples of leadership training initiatives for health managers.

1.3 Addressing the management training need

One of the first steps towards strengthening management in Sub-Saharan African eye care programmes was the *"Planning and management of eye care services"* certificate course offered at the London School of Hygiene and Tropical Medicine in the United Kingdom (UK) since the early 1900s. In 2005, through funding from the Nuffield Foundation, a UK-based charity, two spin-offs of this training were launched in Africa, one in Tanzania and another in South Africa. (ICEH, 2010) The South African course, named the Certificate Course in Community Eye Health was offered at the Groote Schuur Hospital in Cape Town over an 8-week period, using faculty from the University of Cape Town.

In 2008, the funder conducted an evaluation which included a recommendation that the Certificate course is upgraded to an academic programme to improve certification and uptake from prospective students and funders. The Certificate Course material and curriculum were re-formatted to create a proposal to develop a Postgraduate Diploma in Community Eye Health (PgDCEH). This was accepted by key eye care stakeholders. The PgDCEH was registered at the South African Qualifications Authority with National Qualification Framework level 8 qualification. (SAQA,2012) The first intake of students was in 2009.

1.4 The PgDCEH structure and function

The PgDCEH is a one-year management training programme designed to provide training for eye care professionals in programme management. Through applying their PgDCEH-acquired management competencies, graduates should contribute significantly to the improvement of the performance of the eye care programmes resulting in improved eye health outcomes.

The PgDCEH curriculum was designed in consultation with key stakeholders of blindness prevention programmes in the Sub-Saharan African region and comprising competencies that were decided on during the review discussed in section 1.3. The curriculum comprised of four parts:

- a section on the epidemiology of blindness and visual impairment in LMICs and strategies to eliminate avoidable blindness;
- a section on the human resource development and strategies to structure eye care services in the district health system paradigm;
- a section on key management aspects of eye care programmes focusing on planning, organising, controlling and leading functions; and
- a section during which students were required to apply the skills learned in their local programme setting, with support, coaching and supervision from the course faculty.

Since its inception, the course has been taught by faculty members with expertise in ophthalmology, optometry, nursing, health professional education, public health and health service management, derived locally from the University of Cape Town. The teaching staff has been complemented with visiting faculty from other South African and international universities and NGOs working in eye care.

The faculty applied adult teaching methods in designing course lectures, exercises and materials, basing the learning content on relevant and up-to-date knowledge, through access to university libraries, peer-reviewed publications, industry references and contextual experiences. Multiple modes of teaching were available to the students including face-to-face didactic lessons, assignments to exercise experiential learning and problem-based learning. Several online resources and linkages were also available.

The PgDCEH assessment included frequent formative as well as summative assessments and progression rules were tightly aligned with similar-level qualifications in the postgraduate course prospectus of the university. As per the university requirement, the qualification was moderated by an external examiner of high academic standing and with expertise in community eye health programme design and health professional education. The assessment emphasis leaned more strongly towards understanding and applying knowledge and skills than knowing and recalling information.

At enrolment, the student's education ranged from 2 to 8 years after school-leaving. They scored a median final examination mark of 61%, with a 41% to 73% range. By this token, there was no clear relationship (correlation coefficient is 0.18) between the academic performance (final examination marks) and the type and level of education at entry (years of tertiary study) (*Figure 3)*. In fact, some of the highest qualified students performed in the average range, compared to some of the lowest qualified ones. More detailed information about the course participants appear in *Appendix B*: Who are the graduates?

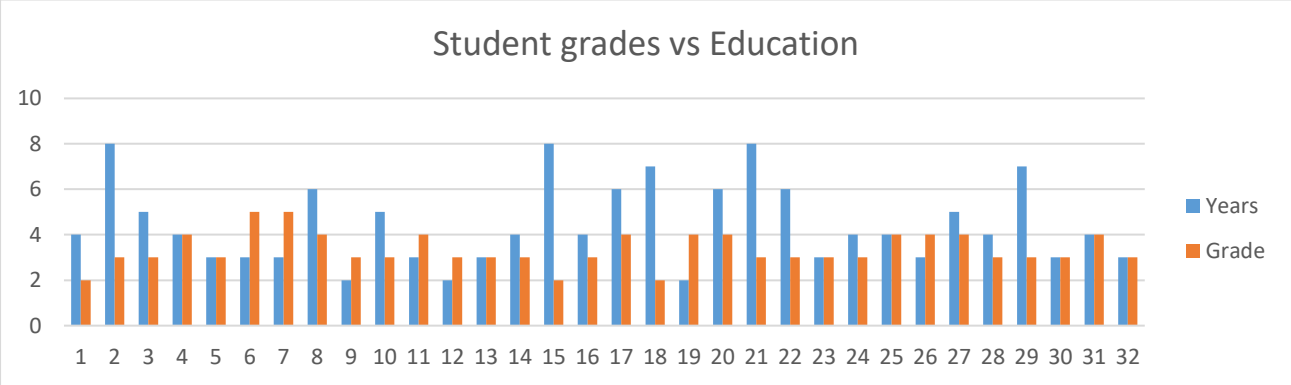


Figure 3: Student grades compared with Years of Tertiary Education (Source: PgDCEH materials).[2]

[2] Grade 5=40-49%, Grade 4=50-59%, Grade 3=60-69%, Grade 2 = 70-79%, Grade 1 = 80% or more

The students' perspectives of the PgDCEH suitability, effectiveness and relevance were periodically tested by their completion of the course and modular evaluation questionnaires. The questionnaires contained questions directed at assessing the relevance, usefulness, quality and sense of acceptability of the training, from the perspective of the student, using Likert-type grades. At the end of the modules, the responses were analysed and interpreted along modular and faculty levels. See *Appendix O* for an example of student evaluations of training questionnaire and summaries.

Although many commentators insist that the student evaluations of teaching have low validity (Feistauer & Richter, 2017, Hornstein, 2017 and Uttl, White & Gonzalez, 2017), the longitudinal analysis of the responses over a medium to long-term has shown favourable patterns when relating to the quality of material, relevance and usefulness of the training, amongst others. These were also anecdotally supported by qualitative comments written by students. In contrast, there have been some instances of unfavourable responses, which mostly relate to "time too short", logistics and the intensive pace of the contact periods.

From 2011, the enrolees of the PgDCEH were asked to complete a baseline expectations questionnaire before the commencement of the course. Of those submitted in the 2009 – 2014 period, more than half of the responses to the question of expectation was to "learn about eye care programme management". Some students specified the acquisition of skills like project management, monitoring and evaluation and advocacy. These are competencies covered by the PgDCEH curriculum.

1.5 Modes of capacity development

There are several ways in which individuals can improve health outcomes in programmes through management capacity development. This can be through training programmes like the PgDCEH, through experience and self-study and enablement and through inherent personal factors like leadership.
In addition to imparting the requisite knowledge and skills, the PgDCEH also provides a qualification, which may increase opportunities for demonstrating abilities and real-world application. The other means of developing management capacity (through experience, opportunity, personal leadership) are less formal and do not necessarily yield an extra qualification or certification.

Table 2 shows how formal studies like the PgDCEH may serve as a conduit to provide the knowledge, skills and understanding (competencies) necessary to improve eye health outcomes in blindness prevention programmes, compared to other means. The PgDCEH graduates should possess these competencies, which should result in increased management capacity in these programmes.

Table 2: Elements of capacity development through different training modes (Source: Author)

ELEMENTS OF CAPACITY	Formal studies e.g. PgDCEH	On-the-job experience, self-study	Apprenticeships
Acquiring knowledge & skills	YES	YES	MAYBE
Obtaining a qualification	YES	NOT SURE	MAYBE
Building relevant competencies	YES	YES	MAYBE
Demonstrating increased ability	YES	YES	YES
Changing behaviour (adoption)	NOT SURE	MAYBE	YES
Real world application	NOT SURE	NOT SURE	NOT SURE

However, the adoption of changed behaviour and real-world application of the competencies does not automatically follow from any of these training modes, because it takes place in variable contexts. (Johns, 2001) Translating capacity into successful application is beyond the scope of a training programme like the PgDCEH, but it is important to investigate the factors that enable or inhibit this process. This is to improve the design and delivery of the PgDCEH for optimal effectiveness, relevance and usefulness. Therefore, it is critical to understand how the PgDCEH graduates apply their management competencies in their real-life contexts.

1.6 The research question

There is a need to increase management capacity in eye care programmes in LMICs. The PgDCEH is one of a few programmes that provide training for eye care programme management development in Sub-Saharan Africa. It has been running for several years and yielded more than 50 graduates by the end of 2017. It is important to know how useful, relevant and effective this training has been in addressing the need for management capacity building as this will inform strategic and operational decisions about how training should be structured in the future.

It is not known to what extent the PgDCEH is relevant, useful and effective in providing the necessary competencies to improve eye health outcomes in blindness prevention programmes in Sub-Saharan Africa. Therefore, there is a need to better understand to what extent the competencies acquired through the PgDCEH were adopted by the graduates and then applied in their places of work. Many findings of management application are based on self-reported, subjective assessments and views of management knowledge, skills and understanding, or with issues of uptake, and availability of resources. (Matovu et al., 2011) There is little literature investigating the underlying factors that drive service delivery, including the role of management in the delivery of health outcomes.

An underlying assumption of the study is that there is a low management capacity in eye care programmes in Sub-Saharan Africa. This was one of the reasons for poor eye care programmes, which results in failure to meet desired eye health outcomes.

The aim of this study is to determine how graduates applied the PgDCEH-acquired management competencies (hereafter abbreviated as "PAMCs") and identify the factors that enabled or constrained the graduates to apply these competencies in the eye care programmes in which they worked. This was done in order to determine how the PgDCEH can be improved for greater impact on eye care programmes. Educators responsible for design and delivery of the training programme would benefit, as well as eye health programme management and funders and future students enrolling for the course. Ultimately, the end-users of the eye care services would benefit from better performing eye care programmes.

The study had the following objectives:

i. To describe the health systems in which eye care services are delivered where the PgDCEH graduates worked;
ii. To determine to what extent the graduates were able to apply the PAMCs;
iii. To identify the factors that enabled or constrained the graduates to apply the PAMCs;
iv. To determine how these enablers or constraints have affected the graduates' achievements and the performance of the eye care programmes in which they worked;
v. To determine how the PgDCEH can be revised to enhance its impact on eye care programme development; and
vi. To develop the methods to collect and analyse the data and interpret the findings.

Through this study, we hoped to learn how graduates have been able or not to translate knowledge obtained during the course, within their personal, programme or health system contexts. This would help us to better design and deliver training for eye care programme managers to ensure better health outcomes through strengthening health systems.

A key assumption of the study was that the PgDCEH curriculum design and delivery was sufficient to develop the appropriate competencies in graduates for meeting the management capacity needs for eye care in Sub-Saharan African eye care programmes. In other words, this was not an evaluation of the curriculum, but rather an assessment of the impact of the PgDCEH, relevant to the contexts in which they would be expected to apply the competencies. It was expected that the graduates' application of their PAMCs would result in improvements in programme performance, yielding better eye health outcomes.

Chapter 2: Literature review

The research aimed to determine how graduates applied the PgDCEH-acquired management competencies (PAMCs) and identify the factors that enabled or constrained the graduates to apply these competencies in the eye care programmes in which they worked. Through this study, we wanted to learn how the PgDCEH can be improved to ensure better eye health outcomes through better management in eye care programmes.

This chapter makes a detailed review about what is known about the problem of inadequate management capacity in eye care programmes, which is an impediment to achieving improved health outcomes, a key element of health system strengthening. We also explore the intersections between the fields of management, education and health systems and where they relate to the study's focus area of graduate application of eye care programme management competencies.

These are the key topics focused on for this literature review:

1. An exploration of the conception of "management";
2. The need for improved management capacity in eye care programmes in Sub-Saharan Africa;
3. The mechanisms by which education can address the need for management capacity improvement; and
4. The mechanisms by which improved management capacity can improve eye health outcomes.

In our exploration, an extensive literature review was conducted, using the academic search engines PubMed, Science Direct and Google Scholar, with the keywords 'management', 'training', 'eye care', 'programme', 'curriculum', 'health system', 'Sub-Saharan Africa', 'education', 'competencies', 'application', 'perceptions', 'knowledge', 'skills', individually and in combination with each other. Much of the literature resourced was accessed through download from the internet. A small number of seminal resources were accessed by library loan or used as reference material.

Each resource was scanned and assessed for suitability for use in the dissertation. The process of determining suitability was based on the suitability checklist (*Table 3*) below.

Table 3: Literature suitability checklist, Author synthesis of conversations with Ehrlich (2014)

1. Was this published in a peer-reviewed publication? 2. Is the research question clearly stated? 3. Is the article about new data? 4. Are the arguments easy to follow? 5. Is the literature review sufficient?	6. Is there a clear description of methods? 7. Was the data collection suitable? 8. Is the interpretation relevant and correct? 9. What does the article contribute to the topic? 10. How can the information be used in my research?

2.1 What is management and management capacity?

2.1.1 What is management?

In its simplest form, management is the collection of activities that ensures that the results of an initiative are achieved. There is a multitude of definitions for management, with a good justification for the notion that each country should develop its own definition of what a health manager is. (WHO, 2007a) Amongst others, management is defined as the process of "establishing and accomplishing pre-determined objectives using human and other sources" (Longest, 2015) and "designing and maintaining an environment in which selected goals are achieved" (Olum, 2014). In other words: management is facilitating the achievement of the desired results of an entity.

In common parlance, management is frequently referred to as the act of "getting things done, usually through others' efforts", "getting it right" and "getting others to do *it*". Managers get most of their results through other people**,** as human resources are central to health organisations ability to produce results. (Gowen, 2006) Every individual involved in an initiative such as an eye care programme could be participating in "management" activities at some stage in the initiative. However, the WHO's international consultation on strengthening leadership and management reserves the title of health manager to those who spend "significant amounts of time" managing services, resources and relationships. (WHO, 2007b) It is commonly accepted that somebody must be ultimately responsible for key "management" functions in programmes, usually called the manager.

A typical manager has a broadly specific and general skill set in relation to his/her roles and responsibilities and to his or her qualifications, experience and relationship management styles. Depending on the size of the management unit in question, a manager usually assumes a senior level in terms of authority and decision-making. Because of this non-descript profile of "managers", there is a veritable tension where managers have jurisdiction over staff who have qualifications that belong to the classical professions like doctors and nurses, for example. (Pillay, 2008)

In health care, managers ultimately "manage" service delivery, i.e. determining which health improvement activities take place where, when and within which quantity and quality parameters. (WHO, 2008) To achieve this, health managers take responsibility for human resources, infrastructure & technology, information systems and finance, and quality and risk management. (Purnell, 1999) A successful manager ensures that organisational goals are met, human resources are optimally utilised and material and other resources are effectively and efficiently used to produce the intended results.

Managers aspire to utilise the human and material resources at their disposal, effectively and efficiently, through several management activities and fulfilling a variety of roles. These have been grouped by Fayol (1901) in four core functions, namely planning, organising, controlling and leading, see (*Table 4*). (Pryor & Taneja, 2010, Wood & Wood, 2002)

Table 4: The four functions of management (Fayol, 1901) explained

Planning: • Preparing for the work to be done • Consider resources including time, money and abilities of the staff • NB: before the work starts!	Organising: • Dealing with change that can affect any parameter of the programme • Making arrangements so that the work gets done despite problems, changes and unexpected events
Controlling: • Setting or adhering to standards • Making sure that the work is done within the limits set for time, cost, and quality, usually by re-organising utilization of resources	Leading/directing: • Providing motivation, purpose and meaning to achieve the aims of the initiative • Strategy / approach and methods usually directly connected with vision, mission and core values of the organisation

In 1990, Mintzberg proposed a set of 10 management roles[3], broadly grouped into three categories: interpersonal, informational and decisional roles. (Nguyen, 2011) Each of these roles required specific skills, attributes and positions of mind, in other words, competencies. His theories about management roles later extended to organisations. Olum (2004) divided the roles managers perform into technical skills (ability to know, understand and apply "tools of the trade"), human skills (ability to establish and maintain productive relationships in the workplace); and conceptual skills (ability to ensure the beneficial use of the people-context-situation interplays).

[3] These were Representative, Leader, Liaison, Monitor, Disseminator, Spokesperson, Entrepreneur, Trouble-shooter, Resource allocator and Negotiator roles.

During the design of the PgDCEH curriculum, it was found that the conception of the roles of eye care managers varied amongst ophthalmologists, government- and NGO- programme eye care managers, see (*Table 5*). (du Toit et al., 2010b) The resultant curriculum used an inclusive definition of roles.

Table 5: Management role definitions according to key stakeholders (Source: du Toit, 2010)

	Planning, implementing and evaluative		**Human resources**	**Services**	**Promotion**
Ophthalmologists' definition of the role of an eye care manager	To plan and organize optimum utilization of resources	To ensure quality of output	To provide a conducive environment for clinicians to perform their duties	To ensure those in need are reached and their needs met	Promote the eye care service
Managers' definition of the role of an eye care manager	To plan, coordinate, communicate, lead, monitor and evaluate			To provide a link between eye care service providers and recipients or donors	To do social marketing and public relations
Generic job description for a district Vision 2020 eye care manager, according to the heads of such programs	To implement and manage a district Vision 2020 program. This includes the management of: Human resources Finance Infrastructure				Service delivery (including "surgical centre" and "community outreach" components)

Management is the collective act of getting things done through the utilization of resources, which includes staff. Managers use the functions of planning, organising, controlling and leading collectively to ensure that the activities of an initiative / programme or organisation lead to meeting the entity's objectives, i.e. success. The roles of people in management positions can vary considerably between entities, depending on the need for management. To manage effectively, a range of skills or competencies is required, which relates to management capacity in the individual or the entity.

2.1.2 What is management capacity?

Merely increasing the human and material resources is not enough (Buchanan et al., 2013) to achieve health outcomes. There must be a commensurate increase in capacity to use these resources effectively and efficiently. Management capacity is the collective capability of performing management tasks with the aim of meeting organisational goals.

This “capacity” is usually thought of on two levels: that of the individual and that of the organisation or team. (Buchanan et al., 2013) The former relates to the individual attributes, knowledge, skills and structures usually acquired through training, education and experience. The latter refers to organisational attributes like categories of staff, numbers, distribution and application, usually acquired through human resource development and associated practices like recruitment and performance management.

Buchanan et al. (2013) refers to six dimensions of management capacity, related to the individual (capabilities, engagement and motivation and numbers) and organisation (resources and infrastructure, clinical-managerial relationship and ability to generate requisite variety). A four-way model, namely the capacity of the health system, the organisation, the health workers and the service users was presented by LaFond, Brown & MacIntyre (2002). The United States Agency for International Development Performance guide (USAID, 2004) defines capacity as the “potential coverage” of a service; utilization is the “proportion of the service target in the population” and the service output is the “actual coverage”. This is a useful convention to be used in this context.

Capacity building is a process that increases the ability of an individual, team, organisation or health system to do what is necessary for meeting the objectives of that entity. (LaFond, Brown & MacIntyre, 2002) Potter and Brough (2004) illustrated with a four-tier pyramid of capacity how structure, systems and roles enable effective use of staff and infrastructure, which in turn enable effective use of skills, which in turn enable effective use of tools. Conversely, tools require skills, skills require staff and infrastructure, and staff and infrastructure require structures, systems and roles to be fulfilled. By optimising these, management capacity is built.

The term “human resource development”, when used to imply a process, is frequently used synonymously with the concept of capacity building. However, capacity building is much broader as it is not just training but includes improvements in staff skills, staff numbers and staff distribution. It can also mean qualitative and quantitative increases in material resources, for example, equipment, supplies, physical and virtual workspace. Potter’s systemic capacity building framework, when applied, relates to increasing technical, human and contextual skills. (Olum 2004)

Management capacity relates to the ability in people to manage an initiative to successfully meet the entity’s objectives. In addition to the material resources, support systems and structures, the mandate or authority to do this, indicated by the example of decentralised power in the framework, are critical for building management capacity. The next section explores the link between the high occurrence of avoidable blindness and visual impairment in Sub-Saharan Africa and low management capacity.

2.2 The need for improved management capacity

Sub-Saharan Africa carries a disproportionately high burden of blindness, causing disability and poverty in vulnerable communities. (WHO,2011) This high magnitude of blindness has multiple adverse effects on the people directly and indirectly affected by vision loss as well as the eye health service providers. Poor quality of life, dependency and poverty are worsened as lack of access to restorative services remain limited.

According to reports of the effects of blindness presented by PgDCEH students, eye care programmes in general struggle to cope under the pressure of high co-morbidity and the increasing backlog of patients to treat, resulting in multiple adverse effects (see *Table 6*). Ultimately, health system failure is imminent, as the growing burden of morbidity incapacitates the health system to do enough to address the backlogs.

Table 6: Effects of blindness and visual impairment (Author synthesis of PgDCEH materials)

Group affected	**Primary adverse effects**	**Ultimate effects**
People directly affected by blindness or visual impairment	Poor quality of life Low economic participation Increased dependency	Increased poverty High co-morbidity rate High or premature mortality
People living with those affected by blindness or visual impairment	Less opportunity to maximise potential Limited access to resources Decreased economic participation	Increased poverty
Eye health service providers	Staff overworked, demotivated, stagnation Lack of funding, equipment, supplies limit ability to apply skills	Public sector staff go to the private sector Increased attrition
Health system	Pressure on scarce resources Mostly curative, no preventive No rehabilitation services	Inability to deliver desired health outcomes = health system failure

More than 75% of blindness can be avoided through prevention and effective, low-cost treatments, like cataract surgery. (Lecuona & Cook, 2011) However, several non-clinical causes contribute to the failure to implement these interventions. These include social, technical and political causes (see *Table 7*), each with different strategies to address the problem.

Table 7: Broad causes of avoidable blindness: examples and strategies (PgDCEH materials)

Cause	Example	Strategies
Clinical	Cataract, glaucoma, refractive error, diabetic retinopathy, childhood blindness	Screening, diagnosis, treatment
Social	Poverty, illiteracy, stigma, family and cultural issues	Awareness raising, health education, free services
Technical/ professional	Lack of skills, poor quality instruments and materials, lack of information, inappropriate use of technology	Planning, organising controlling
Political	Lack of access to eye care services, inequity, lack of community participation, poor service delivery, corruption, lack of funding	Advocacy, fundraising, strategic planning, leadership

Most of the strategies listed above involve the effective and efficient use of available resources, including personnel, equipment, facilities and supplies, as well as being responsible for finances, information and stakeholder (beneficiary and funder) relationships. These are mainly the tasks of management.

Management is considered a key requirement for health programmes to deliver good outcomes. According to Bradley et al. (2015), "strong management enables the achievement of large end with little means". In LMICs, resources are extremely limited, hence, using them optimally is essential. (LaFond, Brown & MacIntyre, 2002) Through effective management, the causes of blindness and visual impairment could ultimately be addressed. Effective management assigns or assumes responsibility so that things get done. It also provides support for critical specialist functions in the health programme, such as clinical and surgical services.

For managers to be effective several conditions need to be met, including that they have autonomy and authority, with clear and formal job descriptions. (WHO, 2007b) The availability of incentives (including remuneration, rewards for achievements), focused performance management, and motivation and support by supervisors are also important. Despite policies, procedures and systems being in place in most health departments, managers frequently do not perform as planned and expected. (HST, c2009a) There is, therefore, a need for management capacity development in eye care programmes in Sub-Saharan African countries. We will now briefly explore why and how management capacity should be developed.

2.2.1 Why should management capacity be developed?

Managers are a vital part of the health workforce, according to WHO's "Towards better leadership and management in health" (WHO, 2007a). However, at the helm of many health care programmes, there are people with little or no formal management and leadership training and experience. (Matovu et al., 2011)

The lack of adequate management capacity can render service delivery to be ineffective, inefficient, inequitable and unresponsive to the needs of the communities requiring the service. (WHO, 2007) This, in turn, can result in low service uptake by the communities, causing further increases in the magnitude of disease. The overall effect is the failure to increase the level of population health and increasing the level of health inequities. (De Savigny et al., 2012) This inadequacy is more observable through its effects (poor service outcomes, low effectiveness and efficiency of health initiatives) than through quantitative measurement. In one South African survey (Lecuona, 2007), management problems were identified primarily as reasons for low cataract surgery output.

Many challenges facing eye care programmes can be solved through improved management capacity. *Table 8* (below) is an author synthesis of groupwork activities of PgDCEH students over the study period.

Table 8: Effects of management capacity. (Source: Author synthesis of PgDCEH materials)

Group affected	**Low management capacity effects**	**Improved management capacity effects**
People directly affected by blindness or visual impairment	Poor quality of life High or premature mortality Low economic participation Increased dependency	Improved visual function resulting in improved quality of life Increased economic participation Decreased dependency
People living with those affected by blindness or visual impairment	Reduced opportunity to maximise potential Limited access to resources	Increased freedom from limitations of caring for disabled person Increased access to resources Overall improvement of wellbeing
Eye health service providers	Pressure on scarce resources Deal only with backlogs Mostly curative, no preventive No rehabilitation services	Greater job satisfaction Opportunities for self-development and recognition
Health system participants	Overburdened, on verge of collapse	Improved retention of staff Improved health outcomes

Insufficient and ineffective line management affects the ability of midlevel staff, the main cadres responsible for service delivery, to provide patients with adequate care. (Bradley et al., 2013) The notion that a lack of infrastructure limits the effective use of resources, particularly in funded health programmes is correct, but it means that the lack of competent management at all levels in the health system is the actual infrastructure that is needed. (Filerman, 2003) The lack of management capacity can render organisations incapable to deliver the goods and services they set out to do. (European Commission, 2006)

There is, however, little agreement as to what "adequate" capacity is. In a study of management in the British National Health System (NHS), Buchanan et al., (2013) found that the low concentration of managers caused low motivation in the incumbent managers because of the high work pressure. This, in turn, resulted in a further reduction of the management capacity. Since the NHS had only 45000 managers out of almost 1.5 million employees, the authors considered the NHS as under-resourced with regards to management capacity. This study gives an idea of what the management capacity is in a well-resourced health system in an industrialised country, and regards this as insufficient. Comparing this ratio to Sub-Saharan African health systems, it could easily be regarded as an over-managed system. The "capacity" in Sub-Saharan African health systems is significantly lower. This shows that the definition of capacity, as well as that of managers, is very specific to the health system under question.

There is growing evidence that investments in management improve the health of the population. (WHO, 2007) As most of these findings have been derived from facility or disease-based studies, they have doubtful applicability in country or wider health system settings. (Bradley, 2015) It has been demonstrated that, as management training increases, more of the expected outcomes are met. Hence, improved management improves health sector outcomes. (LaFond, Brown & MacIntyre, 2002 and West et al., 2015)

Management is the key competency required for the successful implementation of health interventions. (Ravilla & Joseph, 2011) This provides the base skills needed to put systems and structures in place to help solve performance problems in health programmes. It also supports, assists, enables and facilitates the development of human and material resources. More skilled managers and administrators are needed in these programmes. (Lewallen, 2009) For this, health programmes must have well-defined manager posts with clear responsibilities and job descriptions and have adequate numbers.

The need for increased management capacity can arise either because of an unsatisfied demand or an insufficient supply. In this context, this need is characterised by the increasing focus laid on management capacity requirements in health systems. *Table 9* summarises PgDCEH students' reasons for low management capacity in eye care, including a lack of posts, skills, knowledge, opportunities or funding.

Table 9: Reasons for low management capacity (Source: PgDCEH materials)

POSTS	SKILLS	KNOWLEDGE	OPPORTUNITIES	FUNDING
Lack of posts/ positions	Lack of training, experience or suitable qualifications	Lack of training options	In misaligned post	Lack of funding to fill vacancies
Low retention/ high attrition of staff	Lack of skills	Lack of available staff to undergo training	Line management not facilitative	Lack of funding to pay for training

Although a general increase in training opportunities for clinical and technical staff has been reported (Ackland, 2012), the focus on management training has been largely inadequate. There is a critical need to create and fill more posts, especially in management positions to allow greater integration (Blanchet & Patel, 2012) of eye health services within the health care structures. This is especially important as eye care services should be included in strong, comprehensive and integrated systems (Ackland, 2012), as opposed to the vertical and separated way they have been structured in many settings. (Blanchet & Lindfield, 2010)

There are few eye care programmes in Sub-Saharan Africa with effective management, causing failure to meet targets set to reduce the burden of avoidable blindness and visual impairment. A clear link between effective management and improved health outcomes has been demonstrated, therefore it is necessary to increase the development of management capacity in the region.

2.2.2 How should management capacity be developed?

The WHO's strategy for human resources for health (WHO, 2006) is based on the goal of achieving the health of the population as the main outcome. To achieve this, the health system performance should meet the targets of equitable access, efficiency and effectiveness, and quality and responsiveness. Appropriate skills, as acquired through training like the PgDCEH should lead to managers being adequately equipped with the relevant competencies to ensure the workforce objectives of coverage, motivation and competence are met. Meeting the conditions for building leadership and management capacity in health are also important. (WHO, 2007b) *Figure 4* shows the WHO workforce objectives and the respective human resource actions needed to achieve them. (WHO, 2005)

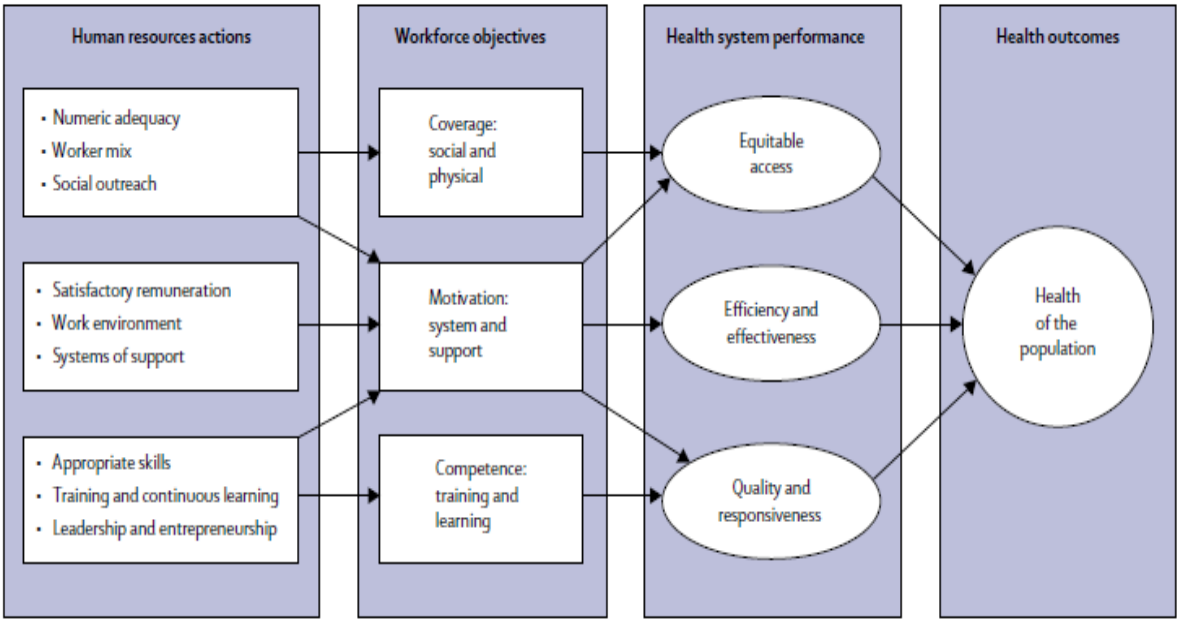


Figure 4: The WHO's strategy for human resources for health (Source: WHO, 2005)

Management capacity building is defined as "all the means through which (an organisation) gathers and strengthens knowledge and competency" (European Commission, 2006). The means to acquire the skills needed fall in three broad strategies namely training, acquiring advice (consultancy) and sharing knowledge through networking and research. Increasing the management capacity is mostly addressed a) qualitatively as a set of attributes that health workers require and b) quantitatively as a representation like the ratios that underlie sufficiency arguments in human resource for health guidelines, for example, doctors' ratios per 100000 population.

Quantitative need (distribution)

The quantitative need is a complicated paradigm, as it needs to take cognizance of contextual, programme and health system factors. Globally, the district health system is a typical health management unit, aligned with the WHO global programme committee recommendation of 250000 to 500000 population per district. (HST, 2013) The health management units are usually defined based on geography, demography or common social or economic characteristics within a population.

One of the key indicators of a successful eye care programme, according to the VISION 2020 strategy, is the attainment of a minimum cataract surgical rate (CSR) of 2000, i.e. to perform 2000 cataract surgeries per million population per year in any given health management unit. Populations with greater proportions of people over 45 years old will require higher minimum CSRs as service delivery targets.

The VISION 2020 strategy recommends specific quantities for key human and infrastructural resources to meet such service delivery targets. (Foster, 2001 & 2003) For example, a typical VISION 2020 programme is required to have a minimum of four ophthalmic surgeons and 10 ophthalmic trained nurses per million population and one ophthalmic surgical centre per million population. Like all health programmes, such programmes need effective management. (WHO, 2007a)

The community eye health training which started in 2005 (see Section 1.2 and 1.3) was based on the suggestion that eye care programmes need to have one manager per district or similarly demarcated health management unit. By 2014, this has not been reflected in the Strategic Plan for Human Resources for Eye Health. (IAPB, 2013) Of the 750+ health districts in the Sub-Saharan African region, fewer than 50 have dedicated eye care managers. While none of the other, similar-priority disease-based programmes are known to have made any such claims, there may be no "equity-based" justification for such a concession. This may have contributed to the notion that eye care is thought of as an isolated or a vertical initiative within health systems in Sub-Saharan Africa. (Blanchet & Lindfield, 2010)

Health service supply and health service demand can be considered to be tightly linked and appropriate and relevant strategies for optimal outcomes have been suggested. (Potter, 2004) Aligning needs, demand and supply in health care require intricate investigation and planning. For example, where supply and demand of human resources are deemed to be weak, long-term training strategies should be invested in.

In Sub-Saharan Africa, where there is low concentration of trained managers, management training should be a wise investment. Effective demand is the need derived from uptake (like patients attending eye clinics), and potential demand is the need based on epidemiological estimates (i.e. the number blind that must be treated per year to effectively reduce the prevalence. (Lopes, Almeida & Almada-Lobo1, 2015) Meeting the demand requires an integrated approach, where the supply is productive, has the appropriate skills mix, and the gap is filled with an inflow through training and performance management.

Implementing such strategies requires resources like staff, equipment, facilities and training. In addition to the staff providing direct service to the patients, having a certain set of clinically-related competencies, managers are necessary to ensure the acquisition, establishment and maintenance of the resources used for these activities.

The current low distribution of management trained eye care professionals in public health programmes has been shown to be the cause of failure to meet health system targets. (Blanchet, 2012) Increasing the rate of output of trained eye care managers will accelerate the development of management capacity, which in turn could result in improved eye health outcomes.

In principle, then, it could be construed that the quantitative need for management capacity for eye health is one "suitably" trained manager per health management district of approximately 1 million population, where "suitably" in this context implies eye-sensitised or eye-trained (eye-favouring). Therefore, increasing the number of trained managers in a health programme providing eye services should be a reasonable target to pursue.

Qualitative need (competencies)

Management competence is an essential pre-condition for programme success. (DPSA, 2008) The personal attributes required for increased management capacity in individuals and teams include personal suitability (in terms of geography, demography and some psychological aspects) as well as qualifications, experience and relevant competencies.

The Oxford dictionary defines "competencies" as "… the ability to do something successfully or efficiently". It refers to the potential or ability to do a task (of a person) but falls short of whether the person performs the task, in other words, of applying. This is a key differentiation to note of in this study.

A competency can be defined as a "…blend of knowledge, skills, behaviour and aptitude that a person can apply in the work environment, which indicates a person's ability to meet the requirements of a specific post". *(*DPSA, 2008) The National Institute for Health Research offers a somewhat vague definition: "an underlying characteristic of a person that leads to or causes superior performance". (Hartley, 2008) Bloom's definition is more detailed: "a specific, identifiable, definable, and measurable knowledge, skill, ability and/or other deployment-related characteristic (e.g. attitude, behaviour, physical ability) which a human resource may possess, and which is necessary for, or material to, the performance of an activity within a specific business context" (Anderson & Krathwohl, 2001) While a key consideration is how certain aspects of competencies can be or should be measured, the actual measurement of these competencies are implied by the trainees having met the learning objectives. This study goes beyond this and focuses on how the management competencies are applied in the real-life setting.

Competencies are the skills, knowledge and attributes which enable a person to do a job. (DPSA, 2007) A competency is a combination of tacit and explicit knowledge, behaviour and skills, which gives someone the potential for effectiveness in task performance. (Draganidis & Mentzas, 2006), "the adequacy of knowledge and skills to perform tasks to a given standard" (Rossouw, 2004), "a blend of knowledge, skills, behaviour and aptitude" (HST, c2009a). From these definitions, competencies can be seen to relate skills and attributes directly to specific tasks to perform.

There are many frameworks available to base competency levels on, including that of the Organisation for Economic Coordination and Development's Competency framework (OECD, 2017) and that of the South African Public Service Department. (DPSA, 2007 & 2008) The latter uses five levels of competencies, namely Pure operational, Diagnostic, Tactical, Parallel processing and Pure strategic. Another framework categorises the competencies into five critical domains: Communication and Relationship Management, Leadership, Professionalism, Knowledge of the Healthcare Environment, and Business Skills and Knowledge. (ACHE, 2018) Generic management and leadership skills are considered critical to function at district level (Bradley, 2015), and there is also a different competency set for each management role.

Key leadership and management competencies include communication, problem-solving, planning, people management, project management, financial management, change management and technical knowledge and skills. (DPSA, 2007) Pillay (2008) derived a list of 39 management competencies from the literature in a study to determine the most important competencies necessary for hospital managers. Skills related to people management, health service provision and self-management ranked amongst the most important listed by the respondents. Bradley (2015) recognises performance management, political analysis and community engagement as further necessary competencies for health service managers. In a management competency assessment survey of the South African national and provincial government public service, five core competencies were identified, namely strategy and leadership, people management, programme, financial and change management. (Makhubela, 2013) A further five process competencies (knowledge, innovation, problem-solving, customer, communication) were designated as standards to adhere to. The competencies covered in the PgDCEH compare well to those proposed in the literature and are summarised in *Table 10.*

Table 10: Key management competencies included in the PgDCEH curriculum, 2014

1. Human resource development and management	11. Business administration
2. Performance management	12. Information management
3. Team building and empowerment	13. Change management
4. Conflict management	14. Promotion and marketing
5. Organisational development	15. Problem solving
6. Stakeholder management	16. Resource management
7. Strategic leadership	17. Quality management
8. Planning	18. Communication and reporting
9. Monitoring and evaluation	19. Project management
10. Budget management	20. Contract management

2.2.3 Summary

It is evident that the lack of management capacity is a critical gap in the VISION 2020 strategy. Although the need for management capacity development is widely commented on, there is insufficient data to describe the actual need. This is in terms of quantitative distribution, either in relation to the requirements of the eye health strategy (VISION 2020, Global Action Plan, or other global strategy) or in relation to established health sector guidelines for management involvement in eye care service delivery.

The high burden of blindness and visual impairment in the sub-Saharan African region, due to clinical and non-clinical causes, have effects on individual, programme and system level. Adequate management capacity is required to deal with these. The WHO framework for human resource development can be applied to address inadequate management capacity in eye health programmes in the region: increase coverage, instil motivation and build competence.

Improving management capacity can have positive effects on health service outcomes. This can be done by a) increasing the number of trained managers in a health system, b) increasing the support for management application, c) increasing the importance assigned to management in the health, d) increasing the competency level of individuals and e) increasing the competency levels in teams or organisations. The effect of improved management capacity is discussed in the next section.

2.3 How improved management capacity can improve health outcomes

The poor state of health systems in LMICs is one of the greatest barriers to increasing access to essential health care. (Roncarolo et al., 2017) However, problems with health systems are not confined to poor countries. (Schutte, Acevedo & Flahault, 2018) Some countries have large populations without access to care because of inequitable arrangements for social protection. (Gwatkin, Bhuiya & Victora, 2004) Others are struggling with escalating costs because of inefficient use of resources. (WHO, 2013b) This section explores the question of how improved management capacity can lead to improved eye health outcomes.

2.3.1 How is management capacity represented in the health system?

Effective management in health will help to get treatment and information to those in need of them on time, efficiently and effectively, thus ensuring that health outcomes are achieved. (WHO, 2002) Amongst others, effective management will correct the imbalances in the health workforce, which manifest along professional, speciality, geographic, institutional and services, as well as public/private and gender lines. These imbalances are replicated in other areas of the health system too.

There are several examples of how strengthened leadership and management led to improvements in health outcomes (HST, c2009a; Galer, Friesendorp & Ellis 2005 and Kruk, 2008) or health workforce performance. (O'Neill, 2013; Perry, 2008) Hartwig et al. (2008) also showed how management capacity development resulted in an improvement in hospital care in Ethiopia.

According to the WHO Health System Performance Framework the goals of health systems are "improving the health of the population they serve, responding to people's legitimate expectations and providing financial protection against the costs of ill-health". (WHO, 2010a) The WHO's Action Plan for Health System Strengthening, *Everybody's Business* (WHO, 2007c) reminds us that "a health system consists of all the organisations, people and actions whose primary intent is to promote, restore or maintain health." This is a broad construct, including all efforts to meet the health system goals, which are improving the health and health equity of the population, by making the most efficient use of available resources. To achieve these goals, health systems need to perform service delivery, in its various forms, through the health workforce which is supported by several key functions. (WHO, 2010b) These are termed as the building blocks of health systems and are contained in the WHO's framework for action. (WHO, 2007c) We will briefly discuss health systems here.

The health systems strengthening framework comprises six building blocks (service delivery, workforce, information systems, access to essential medicines, financing, and leadership and governance) working in tandem to meet the goals of improved health, responsiveness, fair risk distribution and equity. (*Figure 5*)

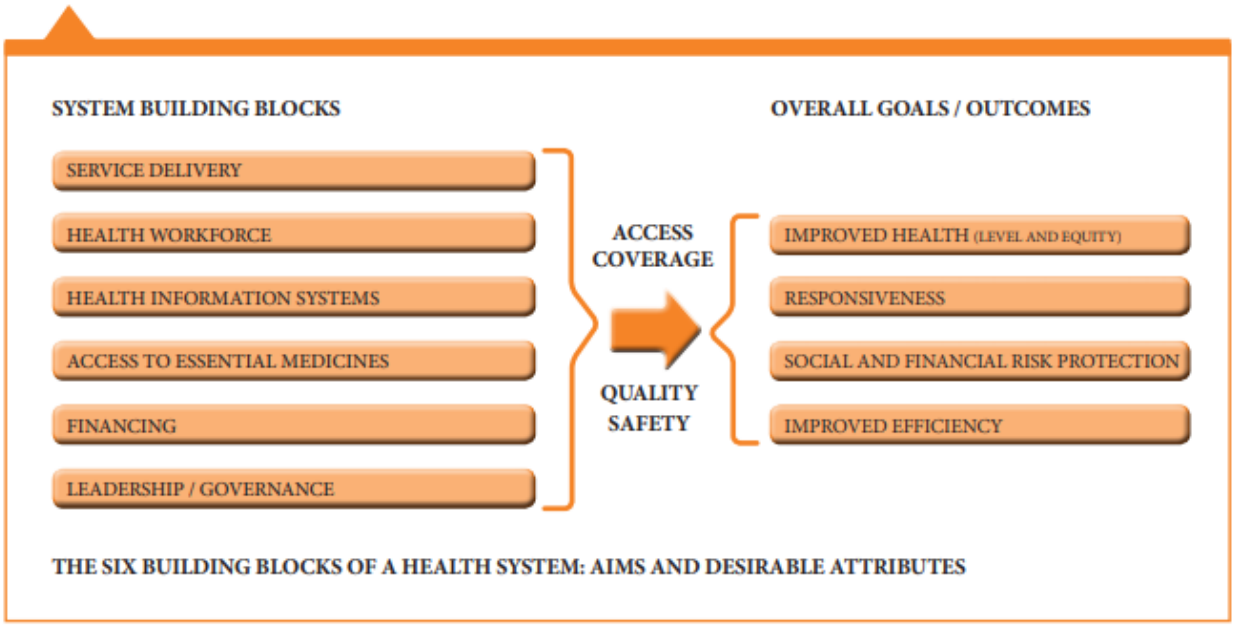


Figure 5: The WHO's Health system building blocks (Source: WHO, 2005)

Although leadership and governance are prominent building blocks, the concepts are not as clearly defined as the others in the framework. More critically, management is not a prominent concept in any of the discussions around health systems structure and function. This neglect of management in the conceptual space of the health system may be pointing to a pragmatic effect of this oversight as well.

A framework for building leadership and management in health (WHO, 2007b) attempts to address this oversight, by stating that "better leadership and management are key to using increased resources effectively to achieve (measurable results)". It goes on to summarise the necessary conditions for effective management as adequate numbers, appropriate competencies, better support systems and enabling working environment. This is aimed at meeting the Millennium Development Goals, though no direct link is made to the WHO health system strengthening framework. (WHO, 2007c)

Health systems have been described as "self-organising, constantly changing, tightly linked, governed by feedback, non-linear, history-dependent, counter-intuitive, resistant to change". (WHO, 2009) Other descriptors of health systems include being "embedded, fluid, connected and unique" (Blanchet, 2010), and "fluid, dynamic and interactive with the organisation and its activities" (Buchanan, 2013), but are also similar in some ways. (Plsek & Wilson, 2001)

These characteristics of health systems relate to complexity and unpredictability, but also interdependency and sensitivity to change. Functionally, health systems perform erratically. "Countries with similar income, education and health expenditure differ in their ability to attain key health goals" (Murray & Frenk, 2010). Plsek (2001) refers to the health system as a complex adaptive system where relationships are central and generative. Complex adaptive systems typically involve multiple interconnections with partners, self-organisation, coevolution and system adaptation. (Ellis, 2011) The environment extends beyond the organisation (the health system) through the community, country and external contexts, according to Galer, Vriesendorp & Ellis (2005), and referred to as the "macro context" by Handler et al. (2001).

A system is any collection of related parts that interact in an organized way for a purpose. (Adam & De Savigny, 2012) Systems must adapt to survive. (Boisot, 2011) The complexity of the adaptive strategy must match the complexity of the environment. Where the environment is more complex, the mismatching can be removed by either increasing the complexity of the strategy or reducing the complexity of the environment. In nature, organisms evolve to meet the complex requirements of their habitats. In the context of health systems, adequately capacitating human resource development aspects will have the effect of reducing the complexity of the external environment.

Referring to Ashby's (1958) law of requisite variety, Boisot (2011) argues that systems can be seen to operate through three regimes of complexity, namely the ordered, the complex and the chaotic regimes. These characteristics of health systems are partly explained by complexity theory. Accordingly, Mennin (2010) argues that "complexity breeds self-organisation". Open systems which are not in equilibrium embedded in a multi-faceted environment can allow multiple non-linear interactions to take place. Learning and change, if driven by curricula which are self-organising, takes place in these systems.

A useful distinction between systems made by Norman (2011) put them as complicated (contain many variables that combine in predictable ways with predictable outcomes), complex (in addition to complicatedness also contains unknowns that make it difficult to represent reality), or chaotic (non-linear relationships with unpredictable outcomes). The Cynefin Framework identifies four different contexts, simple, chaotic, complex and complicated. (OECD, 2017) Plsek (2001) likens the differences to simple (recipe), complicated (formula), and complexity (theory) approaches. Chaos theory emphasises the need to learn to observe, describe and value disorder and turbulence without forcing patterns onto meaningful chaos. (Patton, 2002)

This notion of accepting complexity and chaos may be too unrestricted, hence, incompatible with the need for organised structure and procedures which are so necessary for performance measurement and improvement. Systems thinking helps to decode the complexity of a health system. (Campbell, 2009) The hard systems thinking used in the logical framework approach, where inputs are supposed to lead to outputs cannot work, according to Morgan (2005), because of difficulty to plan for the future.

Intriguingly, effective systems are characterised by many of these same features, namely openness, purposefulness, multidimensionality, emergent property and counterintuitive behaviour and acting together as a whole. (Gharajedaghi, 2011) Although the complexity and chaos of systems are puzzling, Plsek (2001) sees the opportunity for innovation in complex adaptive systems.

Considering chaotic systems as controllable because of greater understanding of chaos seems agreeable to Plsek (2001), who highlights the importance of the relationships between the parts, not only the parts themselves. Systems are always changing, its component parts acting and interacting and reacting, often in counter-intuitive ways. Changes to systems cannot be undone, meaning that the system will not revert to its prior state after the intervention has been removed. Unpredictability and irreversibility are therefore key attributes of systems. (Bragg, 2013)

The complexity of health systems is difficult to explain, let alone control and measure, perhaps because of "lack of the capacity to measure or understand their own weaknesses and constraints". (De Savigny, 2009)

The answer seems to be systems thinking which involves dynamic as opposed to static thinking, "forest" as opposed to "tree-by-tree" thinking and "loop" thinking as opposed to "straight-line" thinking. (Adam & De Savigny, 2013) Systems thinking works to decode the complexity of a health system then applies this understanding to design and evaluate interventions that maximize health and equity. There are many directives of how to conduct systems thinking in the literature, including Adam (2014), Keynan et al. (2014), Morgan (2005), Stroh (2006) and OECD (2017). Some common keywords in literature include "change", "relationships", "counter-intuitive" (Campbell, 2009) and the need to "learn and experiment".

It may also be useful to follow the practical directives based on the critical thinking idea, as proposed by Facione (2016), Paul (2006) and others. Patton (2016) goes further to claim that synthetic thinking is required to explain systems behaviour, suggesting that the essential properties of a system are lost when separated. He argues that synthetic thinking, as opposed to analytical thinking yields an understanding of the whole rather than the parts. This approach sees analysis and synthesis as complementary and that synthetic thinking brings the advantage of revealing function, i.e. how things work. Even so, Campbell (2009) admits that there is no agreed formula of how to strengthen health systems, despite it being a core principle of the WHO. This may be more to do with the health system structure than function. One of the structural anomalies is the issue of development aid and the other is the private sector.

Management capacity is poorly represented in the prevailing paradigm of health system strengthening. Given the acknowledged non-linear characteristics of health systems globally, including complexity, fluidity, unpredictability and seeming randomness, it may be difficult to reconcile with the attributes assigned to management: planned, organised, controlled and led towards clearly defined goals (outcomes). Yet, this is what is expected from a management training programme like the PgDCEH.

2.3.2 How is eye care positioned within the health system in a country context?

In many health systems in Sub-Saharan Africa[4], eye care is a secondary level discipline situated partly under hospital services (for ophthalmology) and partly under health programmes (for primary care, optometry and rehabilitation services). Under health programmes, it is positioned under non-communicable diseases which in turn has several sub-programmes. Eye care usually falls under one of these sub-programmes, either called disability or chronic or a similar designation. Apart from this, the implementation structure of eye care is extremely varied, both between countries and within national health systems. This results in complicated eye care programme structure and function in the region, as well as lower access to resources for service delivery, research and advocacy from health budgets.

[4]Author's observation derived from Rapid Appraisals of Eye Care Services conducted by PgDCEH students.

In the WHO's African Region, there are 46 countries of which 40 are classified as LMICs. The region has a population of 11.9% of the global population, harbouring 15% of the global blindness but have only 1% of the human resources for eye care. The same region carries 24% of the global morbidity load, have 4.8 million blind and 16.6 million visually impaired people, yet have less than 1% of the total number of ophthalmologists in the world. (Ackland, 2016 and Bourne et al., 2017a)

IAPB Vision Atlas analysis of 102 countries for which data was available in 2015, found the median cataract surgical rate (CSR), to be 1500, while Sub-Saharan Africa's median was approximately 500. (IAPB, 2017 & 2019) The interquartile range for the SSA region was 350 – 800. The VISION 2020 / GAP recommendation of 80% for the cataract surgical coverage (CSC), at VA < 6/18 was met by 11 of the 36 countries for which data was available. The highest CSC for a SSA country was 52% for Botswana. Guinea-Bissau was lowest at 32%. Both the CSR and CSC are proxy indicators for eye care service performance, although the CSC is a better measure of how a service meets the demand for cataract surgery. (Ackland, 2016) The link between the CSR and the GDPs of countries could mirror the link between blindness and poverty, as observed by He (2016).

The IAPB Vision Atlas (IAPB, 2017 & 2019) further shows that a total of 64 countries (of the 197 countries in the database in the world) had National Blindness Prevention Committees (NBPC) in 2015. SSA countries had a proportionally equivalent number (17 of 47). These NBPCs were key agents involved in advocacy and development of eye care services in their countries with support from the IAPB. A slightly greater proportion of SSA countries had RAAB surveys done (21 out of 68). An even greater proportion of SSA countries had national eye care plans in place (18 out of 51).

Data from the same source (IAPB, 2019) paints a bleak picture of human resources for eye health. In 2015, there were a median of 42 ophthalmologists per million globally, with inter-quartile range (IQR) 17-67. The median number of ophthalmologists in SSA countries was 2 (IQR 1-3). Similarly, there were 42 (IQR 11-106) optometrists per million globally and 4 (IQR 2-12) per million in SSA countries. The relevant ratios for allied ophthalmic personnel were 43 (IQR 13-83) per million globally and 10 (IQR 5-14) per million in SSA countries.

All the above compare poorly to the requirements of the VISION 2020 strategy. (Ackland, 2016) Unsurprisingly, few programmes have delivered successfully against the VISION 2020 targets (see *Table 11* for illustrative success indicators). While there is evidence that blindness prevalence is lower than estimated previously (Bourne, 2017), the global burden of blindness and visual impairment has increased due to, amongst others, population growth and aging. (IAPB, 2017)

Table 11: VISION 2020 success indicators (Source: PgDCEH materials)

Effectiveness:	Efficiency:	Equity, access and affordability	Responsiveness	Sustainability
Cataract surgeries: 2000 p.a. / million	**Cataract surgical consumables cost:** under $100 per procedure	Service uptake by predominantly needy people	Treating the major causes of visual impairment and blindness	Cost recovery and income generation;
Cataract surgical outcomes: 85% operated patients have Visual Acuity better than 6/18.	**Cataract surgeon performance:** minimum of 500 operation per year.	Affordable cost of services	Providing the service where it is most needed.	Government budget for eye care available.

It is fair to state that eye care is struggling as a programme outcome in health systems of LMICs. This may be true for other health programmes as well. The collaborations between governments and civil society have made for some significant achievements, but they seem not enough. In eye care, some NGOs are in positions where they influence some Ministries of Health in developing policy, as in the case of competency frameworks for eye care midlevel workers. (IAPB, 2016)

2.3.3 What are the achievements and challenges in eye health systems?

According to the WHO's (*Health) Everybody's Business*, insufficient health spending causes a further 100 million people to be poor globally. (WHO, 2007c) There are large health inequalities between rich and poor countries and even within countries. In 2007, the healthcare industry was worth 8% of the global economy, which is about US$3.5 trillion. African governments spend 33% less on health compared to the global percentage of GDP. (WHO, 2014)

The health situation in Sub-Saharan Africa is the worst of all the WHO regions. (WHO, 2014) With a population of 892 million (47 countries) which is approximately 12% of the global population, it hosts a disproportionate burden of non-communicable diseases. The disability-adjusted life years (a measure of the impact of the disease on life quality) of 511 per 1000 population is almost twice the size of the next highest region. The low workforce to population ratio is part of the explanation.

In many countries, human resources operate under extremely challenging conditions (Necochea, Badlani & Bossemeyer, 2013), resulting in low effectiveness. These deficiencies can exist in the structural, operational or support components of the Human Resources for Health (WHO, 2016a) strategy. In addition to the general health system challenges of the shortage of human resources, low availability of essential medicines and technology, eye care faces unique challenges related to its positioning in the hierarchy of health care programmes and the diverse models of service delivery in the region.

The lack of adequate human resources for eye care is recognised as one of the main reasons for poorly performing eye care programmes. (WHO, 2013c) In 2010, the African region had on average only one ophthalmologist per million of the population at the time (Resnikoff et al., 2012) By 2015, this ratio had not improved at all. (Bourne, 2017) There are also huge gaps in the adequacy of most of the other cadres performing key roles in the provision of eye care services, see *Table 12*.

Table 12: Human resources for eye health in Sub-Saharan Africa (adapted from IAPB, 2016)

Cadre	Key roles	Targets	Available	Gap
Ophthalmologists & ophthalmic surgeons	Leadership, Surgery	1/250000	1814	2186
Optometrists & refractionists	Correction of refractive error	1/250000	6895	
Allied Eye Health Professionals	Diagnosis, treatment, wards, theatres	1/100000	5003	4997
Primary Health Care Workers	Basic treatment & referral	1/10000	10000	90000
Community Health Workers	Eye health promotion	1/1000	100000	900000

Although there has been an increase in the absolute numbers of ophthalmologists globally (Resnikoff et al., 2012), they are still inadequate in most Sub-Saharan African countries. Moreover, there are limited technical and management skills available to plan, implement and deliver effective eye care services. (Lewallen, 2009) This is mostly due to a shortage of training opportunities.

Another challenge is the low availability of financial resources, forcing eye care programmes to make do with an inefficient supply chain, information and health technology management systems. (IAPB, 2011) This general lack of supportive administrative and management facilities causes many programmes to function sub-optimally (Lewallen, 2009) and perform too few sight-restoring treatments to significantly improve service delivery outcomes where needed.

The RAAB surveys conducted in the region consistently report low cataract surgical coverage rates, even when services are available, according to the RAAB Repository (RAAB, 2019), see *Table 13*. This may be due to various patient-centred barriers, including poverty (Kessy & Lewallen, 2007), cost, culture, ignorance, quality perceptions and distance to a hospital. (Geneau et al., 2008)

Table 13: Summary of key RAAB results in Sub-Saharan Africa (Source: RAAB Repository)

Country	Blind - PVA <3/60: (% in 50+)	Low vision - PVA<6/18-3/60 (% in 50+)	Functional Low Vision	Cataract (% of all blindness)	Cataract Surgical Coverage (%)	Cataract surgeries Good Outcomes (%)
Malawi	3.3%	12.2%	3.1%	48.2%	39%	38%
South Africa	4.9%	11.3%	2.5%	69.2%	44%	54%
Mozambique	7.1%	9.6%	2.9%	73.0%	10%	29%
Mozambique	3.2%	14.4%	2.9%	55.1%	40%	38%
Rwanda	1.2%		1.0%	56.5%	68%	71%
Botswana	5.2%	9.7%	3.2%	41.5%	76%	60%
Mozambique	6.4%		2.6%	64.6%	33%	43%
Tanzania	2.7%	14.0%	1.3%	61.5%	54%	60%
Zimbabwe	3.7%		2.8%	67.2%	50%	56%
Tanzania	4.6%	10.6%	1.4%	70.5%	49%	55%
Zimbabwe	3.6%			65.2%	53%	60%

The high magnitude of avoidable blindness renders more people in poor communities with a poor quality of life (Naidoo, 2007) due to high morbidity, increased social exclusion and low economic interaction. (Cook, 2007) The already depleted health workforce is forced to utilize the limited resources available to render mostly curative services, neglecting the other critical elements of the health care package (promotive, preventive and rehabilitative care).

Furthermore, bottlenecks occur at every level of service delivery, with patients, in their anguish to access service jumping queues and flooding secondary and tertiary care facilities with complaints that could be dealt with at primary care level. This results in increased attrition, demotivation and skills depletion (Kruk, 2008), causing further challenges to the health system. (WHO, 2005) To address this, the WHO resolved that vision impairment as a public health challenge needs to be addressed at all levels of the health system. (IAPB, 2016)

Through the VISION 2020 and GAP strategies, the WHO-IAPB collaboration has increased governments' commitment to eye care programme development, which in turn generated increased resource mobilization, including development of human resources. In many countries, the prevalence of blindness has decreased, and many successful interventions were instituted on programme, country and regional level. The contributions of international developmental NGOs played a big role in these. However, most of the earlier challenges remained, like shortages in eye care staff, lack of infrastructure and low availability of government health budget funding. The lack of management capacity is a frequently under-reported challenge and is likely to be the underlying cause of some of these failures.

2.3.4 What are the management challenges in the health system?

Work pressures in the district health systems were highlighted as one of the main challenges district managers face by the District Management Survey (HST, c2009a), conducted in 2008 in South Africa. The diversity of activities district managers must fit into their workdays, and the intricate network of role-players (HST, 2013) they must manage, makes for a very congested typical workday. The underlying weaknesses include unstable and a changing work environment, inadequate distribution and density of managers, a lack of decentralization, limited skills in finance, stock management and basic personnel management. (HST, c2009a) Managers also feel "alone and isolated at every level" (Gilson, 2011).

These mostly external challenges compound the challenges of low capacity (low numbers of trained managers, low competency) and structural incapacity (Wunsch, 2008) to manage the facilities and operations required at service delivery level. The frequent turnaround of senior management leaves little scope for stability and contingency. Subordinate managers therefore frequently do not have capable and available senior managers as a resource to support, supervise and moderate their actions.

Fragile leadership in health systems may also have adverse effects on organograms, either failing to retain key positions or failing to ensure proper alignment between the different levels of health management. This results in very complex lines of command (HST, 2013) in districts, including dual/multiple reporting, reporting outside the functional sphere of operation and no rational reporting lines at all.

Because of poor leadership in senior management, proper authority is not assigned to operational managers. (HST, 2014) In the British National Health System (NHS), managerial responsibilities are distributed amongst more than 30% of the total staff (Buchanan, 2013), presenting a different problem with the same effect. Staff holding hybrid (management plus clinical duties) positions are four times more than the full-time managers and they are usually not trained in management. Although no such data is available for Sub-Saharan African countries, this may be a general trend in health care.

In South Africa, health management strengthening was identified as a core element of health system strengthening, according to the Negotiated Service Delivery Agreement for 2010-2014. (HST, 2009b) Successful health outcomes are dependent on a strong focus on human resource development as well as the development of support structures for finances, information and regulation. (Gilson, 2011) Weak or inappropriate management strategies and implementation challenges at an operational level are two of the main factors contributing to failure to achieve good health outcomes. (USAID, 2004)

Health systems' failure to meet the conditions for strengthened management (WHO, 2010) is the main reason managers are challenged in health programmes on a day to day basis. The question is, however, how can these conditions be brought about? Are the agents responsible for making these changes/improvements, not the managers themselves, the same ones for whom these conditions should be met? Clearly, this is another challenge specifically aimed at health system managers in leadership positions. In addition to the conditions for effective managers (WHO, 2007) autonomy, authority, supervision and performance management are needed. Clear and formal job descriptions, standard administrative protocols and incentives and motivation are also listed. This is also the work of a manager.

But the level of interest in management in eye care programmes is sub-optimal, as illustrated by the lack of management topics in the scientific programme of an eye health conference programme. (IAPB, 2016) Less than 10% of topics focused on "management", this being such a key requirement for the high performance of health systems. Another example is showcased by the results of a situational analysis showing the targets and gaps for human resources in eye care in Sub-Saharan Africa (see *Table 12* in section 2.3.3) which does not include "manager" as a cadre, as if there is no need for management. (IAPB, 2014) It is likely that this trend is mirrored in the activities in other health system disciplines too.

A brief detour to explain the leadership/management divide is necessary here. The concepts of management and leadership are frequently confused, used interchangeably (Barasa et al., 2015), or presented as opposing entities. (MSH, 2017a and Forbes, 2017) While the latter is useful to emphasize the key differences, they may strengthen the idea that the two concepts are separate and opposite. How West (2015) explains the "clear evidence of the link between leadership and a range of important (health service) outcomes including patient satisfaction, organisational performance, staff motivation, quality of care" is perhaps one such example. At the 2011 Innovative Health Management in the Public Sector conference, which focused on change management, system improvement and leadership and management support, health managers used the terms "leadership" and "management" almost interchangeably. (Doherty, 2011) There is clearly some confusion in the use of these two concepts.

Many philological attempts have been made to stem the confusion between leadership and management. Earlier in this chapter, we defined "management" as "establishing and accomplishing pre-determined objectives using human and other sources". (Longest, 2014) The functions of management according to Fayol are discussed in section 2.2.1. (Pryor & Taneja, 2010 and Wood & Wood, 2002) Leading, one of the "management" functions is also the core activity of leadership. Leadership is the responsibility to create a vision, direct and align team and organisation goals. (West, 2015) According to Leithwood (2004), leadership is as simple as creating and realising a "defensible" vision and as complex as that, despite all the different "labels" given to it. *Table 14* (below) comprises a summary of comparative definitions for management and leadership. Many of these definitions are slogans or catch-phrases and the essential meaning of what the differences are, are frequently missed.

Table 14: Definitions of leadership and management from the source indicated*

Management, managing and managers	**Leadership, leading and leaders**	**Source***
Managing means planning and using resources efficiently to produce intended results	Leading means mobilising others to envision and realise a better future	Galer (2005)
Managers are those who utilize resources for results.	Leaders are people who mobilize others for results	Management Sciences for Health
The manager is the one who must manage change	The leader is the one who produces change	Rossouw (2004)
Directing and controlling a group of one or more people or entities for the purpose of coordinating and harmonizing that group towards accomplishing a goal.	The ability of an individual to influence, motivate, and enable others to contribute toward the effectiveness and success of the organizations they represent	https://www.diffen.com (accessed 9 January 2018)
Doing things right	Doing the right things	Gilson (2009), Drucker (1973)

The distinction drawn by Gilson (2011) between managing and leading, using the terms "managers that administer" and "managers that lead" is useful, but the examples given are possibly misrepresented. It is true that managers may have "lapses" of competency in one or more of the functions of management, but it does not mean that they are not "managing" if they do not exhibit "leading" characteristics all the time. It is possible that it can be about who they are, instead of what they do. (Rossouw, 2004)

Academic and commercial literature is awash with definitions and characterizations of these two concepts. There are at least two errors that thread through this. The concepts are firstly branded as opposites, and secondly, when referred to as actions or agents (e.g. leading or leaders), they are mostly idealised. The suggestion is that leadership and management roles and attributes are not located in the same individual. (Bradley, 2015)

Management involves planning and efficient use of resources to produce results for success. (Longest & Darr, 2014 and Galer, 2005) Leading means mobilising others to envision and realise a better future. (Galer, 2005) According to West, (2015) "the leadership task is to ensure direction, alignment and commitment within teams and organisations". Gharajedaghi (2011) suggests that leadership is about managing upwards, influencing the things one cannot control.

Managers and leaders can be the same person (Bradley, 2015) and the concepts should not be separated. (Mintzberg, 2013) The leader produces change and the manager manages change. (Rossouw, 2004) Generic leadership and management skills are needed across health system structures and functions (Bradley, 2015), and even trained leaders still need experiential learning. (Doherty, 2015)

Leadership can be likened to management outward (stakeholders) upwards (strategic) and downwards (operational), according to Moore (2013). This is typical of slogan-type characterizations assigned to these concepts, but the distinction is broader than this. Individuals in leadership or management positions behave according to what the circumstances dictate at a given time and space coordinate.

Leadership is required to set direction, create alignment and gain commitment amongst followers to continue providing quality health care. From almost 35000 leadership effectiveness evaluations done from 2000-2009, Patterson (2016) ranked as the most important: leading employees, resourcefulness, straightforwardness and change management, and as the least important: confronting problem employees, compassion and sensitivity and putting people at ease for success in health care organisations, clearly illustrative of the conundrum.

The University of Warwick's Leadership Development programme (2015) uses a model that shows improved work climate and improved management systems as intermediary steps to the improvement of the capacity to respond to change. This is a useful schema for conceptualizing the interactions and differences between leading and managing. The programme also proposes to reverse the portrayal of leaders as individual heroes by creating leadership "constellation" in which several individual leaders fulfil different types of leadership roles, in a strategic context. This could have meant to be "managers".

Plsek (2001), while recognising the need to successfully deal with (in other words managing), through "complexity leadership" makes the same mistake. His idea of minimum specifications replacing "complicated" plans is an example of the latent opposition to the idea that management and not leadership provides the impetus to operationalise health objectives.

The district health manager is described as "… a mid-career medical officer … with little training in management and much responsibility … with little authority … who sees themselves as doctors and not managers … in a professionally disabling environment" by Dorros (2006). District management is "in transitional states" (HST, 2009a) with continuous restructuring taking place, resulting in health workers being affected by "dual reporting" and several vacancies in senior management, being constantly under-resourced, low authority, ineffective use or lack of management information systems (HST, 2013) and a lack of support and awareness. (USAID, 2004) The availability of adequate line management support which encompasses proper performance management, supervision and with a keen interest in and knowledge of the work of the subordinate is a key resource necessary for optimal performance. Suitable competency in leadership and management is required. While the WHO recognises management as a priority, it is deemed a cross-cutting function necessary for success in all building blocks (Bradley, 2015) and is indeed the critical infrastructure needed (Filerman, 2003) to ensure the efficient use of resources.

While Pfeffer (2015) regards the entire leadership development movement as a failure, as no real improvement is seen, the NHS Medical leadership framework (2009) proposes that leadership competence development should be an integral part of doctors' training. Greater focus should be on instrumental leadership (like task and strategy-related expertise) rather than just transformational–charismatic types. (Antonakis & House, 2014)

The UK's General Medical Council made leadership a key part of the professional requirement for doctors practising in the National Health Service. (NHS, 2009) A section called "Managing services" is included in their Medical Leadership Competence Framework, along with "Demonstrating personal qualities", "Improving services", "Working with others" and "Setting directions". Here too, the leadership and management themes seem to overlap or lend to confusion.

The importance of doctors in leadership and management positions should be highlighted here as another challenge in management. Leading and managing physicians is more demanding on managers (Von Knorring, De Rijk & Alexanderson, 2010) as doctors' views are more easily supported, compared to other cadres (e.g. nurses) with management roles or with management training. Managers see physicians as having a high status and expertise, with lack knowledge of the system and can do what they want.

This may be because doctors enjoy automatic superiority in the health system. Doctors exert influence through more than one of the six bases of power, namely legitimate (positional), expert, informational, reward (transactional), coercive and referent power. (Gabel, 2012) Doctors acquire power through education (expert or informational power) and through their position in the health system (legitimate and transactional power) is further consolidated by them being members of an elite profession.

The theory of jurisdiction (Abbott, 1988) says strong professions assume more power than weaker occupations. Hence, physicians hold undisputed professional roles in health organisations, whereas managers' jurisdictions are not so clearly demarcated. Therefore, the latter cannot be regarded as "professional" in the classical sense. The formal association, higher education, closed associations, protective titles, ethics codes, journals and language (Dahl, 2015), allow members to group together as in tribes. (Frenk et al., 2010) In law, advocates exert influence on similar grounds. (Lester, 2015)

Managers should be able to recognise and exercise the right type of power (expertise and legitimacy) singly or in combination to achieve successful interactions and appropriate influence. Study of leadership and management should receive increased emphasis in postgraduate medical education.

Returning from our digression from the "conditions for strengthening management" discussion earlier, it could be suggested that "leadership" is the strategy that could ensure these conditions are met. We refer to *Table 14* above where it states "leadership is thought to produce change"; this is the change that needs to be envisioned.

The WHO endorsed a set of key principles (WHO, 2007b) for developing management and leadership in low-income countries. This includes the need to be in alignment with the entire health system and to be harmonised in terms of the use of resources. These principles speak strongly for integration and reduction of vertical systems but may be in contradiction with the need for development funding which drives much of health care programmes in Sub-Saharan Africa. If so, these principles may be difficult to adhere to.

Poor health system performance can be the result of low management capacity (WHO, 2007a), even though this has not been conclusively proven. Several management challenges in SSA health systems have been highlighted: frequent job migration of managers, professional exclusivity, structural incapacity, high work intensity and transition, poor leadership and disinterest in management, etc. (WHO, 2009) These are massive stumbling-blocks to management effectiveness. Many of these challenges could be overcome if adequate management capacity was available in eye care programmes. However, even if managers are deployed in positions where they should be able to perform optimally, their effectiveness can be hampered by challenges related to leadership, organograms and finance.

There are tools available to overcome the challenges, including the WHO conditions for management, which needs leadership for initiation. Our sense is that the leadership / management dichotomy is poorly made sense of in health systems, and it is central to the persistent challenges. The PgDCEH addresses this through specific focus of these two concepts in theory and practice.

2.3.5 How are management competencies applied and measured?

Application of management competencies in health is difficult to measure, and research into this field deals mostly on the potential of applying these competencies. As application of competencies occur in a work context, issues of labour regulation and confidentiality are relevant, because of links to institutional goals as well as individual remuneration and career aspects. Measuring the effects, though having the potential to yield the best results, has its own problems of causality, agency and temporality. This may explain why empirical research on the actual application is so scanty.

Despite this, more data is becoming available from mostly subjective commentaries and surveys. Findings indicate that management competencies are sub-optimally applied (Makhubela, 2013), with reasons ranging from the specific location (position) in the health system, the type of cadre, gender and level of seniority. More often, it seems implementation does not happen, despite policies, procedures and systems being in place. (HST, 2009a) For example, even after improvement of the management of services and resources were reported, district health teams were still constrained by the excessive degree of centralization imposed on them from the national level. (Conn, Jenkins & Touray, 1996) This underlines the need for improved management capacity.

There is a paucity of data on how management competencies are applied in eye programme settings. Much data is available from subjective survey methodologies that characterise the perceptions and views of participants on the application of their competencies but contribute little to the understanding of how management competencies are applied. This study investigates this phenomenon empirically.

2.3.6 What are the factors determining whether competencies are applied?

Acquisition of competencies alone will not guarantee that they will be applied in the workplace setting. The obstacles and limitations have been covered extensively in the preceding sections. The disconnection between theory and practice is well known. Chinitz and Rodwin's (2014) "dimensions of gaps", explains why organisations fail to learn from management theory and separate policy from practise in their organisational structures. The blame can be put at the individual level, where individuals, through learning and experience develop a frame of reference, through which change can be initiated. (Mezirow, 1997)

Where this process is inadequate, the application also fails. For a change to happen, the enabling forces must be stronger than the constraining forces. (Harrison, 2010) The rate at which a change happens or a new idea (such as the use of management competencies) has to do with the diffusion of innovation theory. In a review of Roger's diffusion theory, Sahin (2006) explains that adoption is a decision of full use of innovation whereas rejection executes a decision not to adopt an innovation. Diffusion is the process in which an innovation is communicated throughout several channels over time among members of a social system. For adoption to take place, the community must be engaged and sensitised. (Yamey, 2012)

Machiavelli's famous quote "There is nothing more difficult to take in hand, more perilous to conduct or more uncertain in success, than to take the lead in the introduction of a new order of things" rings true here. Rogers' (2003) five stages diffusion of innovation model (simplified *Figure 6* below) illustrates the progress of innovation though "awareness" to "adoption", via specific communication channels. It has a high resemblance to Lewis' Purchase funnel (Awareness-Interest-Desire-Action), funnelling potential to suspects to prospects to customers (Lewis, 1898), likening "adoption" to "sales".

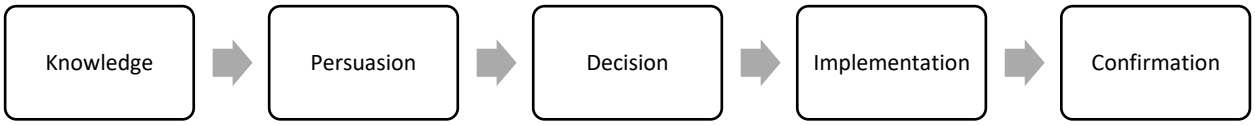


Figure 6: Roger's Diffusion innovation model (simplified, Author construct)

The application of the graduates' management competencies effectively requires **change** to happen. A change in practice and changes in attitudes towards certain practices and the agents of change needs to happen. Change happens all the time and affects everybody and every aspect of our lives (Lobe, 2005), and is a process and not an event. (Hall & Hord, 2015) The successful implementation of change follows the same steps as requires diffusing an innovation described above.

Another factor which can influence how managers apply their competencies has to with the reasons why they would want to do it. There are many theories that attempt to explain how and why people are motivated to work or perform. (Chand, 2018 & Pardee, 1990) The most common theories cited include McGregor's XY theory (some people need to be driven to perform and others are self-motivated), people are motivated differently due to their different needs (Maslow's Hierarchy of needs) and it is not always or only about money (Herzberg's motivation and hygiene theory). (Pardee, 1990) People's input relating to the output towards them (Adams equity theory) is another one commonly applied in employee motivation. (Adams and Freedman, 1976 and Miner, 2005)

According to Maslow (1953), a person must satisfy his own base needs before going on to attempt satisfying higher needs. His model features base needs which include food, sex and safety at the bottom of a pyramid, ascending stepwise through five other core needs then culminating with the need to self-actualization, where the person wants to contribute to a higher purpose. Fallatah and Syed's (2018) critique of Maslow's theory emphasizes the simplicity of his hierarchy of needs and the lack of sufficient empirical evidence and that the term "motivation" is differently interpreted. The simplicity of motivational theories is intriguing, mostly in their disregard for time and place and the changes associated with each. There is also scant empirical evidence that the theory can be applied universally and that some concepts such as satisfaction and self-actualization are difficult to define.

Other motivation theorists (such as McGregor, Herzberg, Adams, McClelland, Handy, Vroom, etc.) follow largely similar rationales. Schneider and Alderfer (1973) postulated the "existence, relatedness and growth" (ERG) theory of motivation, which prioritizes making a living through work, belonging and progressing through life as an individual. McClelland's (1985) theory of motivation is similar but substitutes Alderfer's (1972) "existence" with "power".

High motivation clearly leads to better performance, but employees need proper performance management, not only periodic inspection and monitoring. (Bradley, 2013) The latter is the prevailing standard in many health programme settings. Yet others' idea of performance management is self-appraisal. Supervision, support and feedback are necessary for optimal performance and further development (Baloch, 2016) of individuals and teams. Purcell (2009) links the "psychological contract" employees have with the level of performance they produce.

The rate of diffusion of innovation is the classical determinant of adopting new practices and is also one of the key factors that determine whether trainees apply their competencies in their work settings. The ability to manage change, i.e. the change in the person's knowledge, attitude and behaviour and the disposition in relation to their work setting is another important factor. Both these are however dependent on a common, overriding factor: motivation. Motivation combined with opportunity may be central to whether a trainee will apply a competency or not.

2.3.7 Summary

The poor performance of health systems in LMICs may be a direct effect of the lack of adequate management capacity to support and facilitate the implementation of service delivery strategies in health districts. Furthermore, eye care is frequently allocated low proportions of already over-burdened and limited health budgets, mostly insufficient to cover costs of service delivery and adequate staffing.

The challenges eye care programmes must overcome far outweigh the successes achieved over the last two decades. These are further aggravated by general challenges due to management issues in district health systems, and the different conceptions of leadership and management application. These inefficiencies in themselves need correction in order to correct the lack of management capacity in eye health programmes.

2.4 How education can address the need for management capacity

Training programmes are grounded in certain educational principles and procedures, from advertisement, enrolment, teaching, assessment and outcomes guidelines. (Fry, Ketteridge and Marshall, 2009) While they are aimed at developing the skills to plan and implement health services to meet the service delivery targets, management training specifically builds capacity to help meet other, non-health system and civil society responses. This requires that the structure and delivery of educational interventions are suitably grounded in the appropriate learning paradigm, whether in Freirean transformative learning (Gadotti and Torres, 2009), experiential learning a la Dewey (Ord, 2012) or social learning systems. (Wenger, 2009 and Smith, 2003) To ensure alignment between the changing contexts of students, the instructional design should adopt a competency-based approach (Frenk et al., 2010) in developing training curricula.

The ever-increasing need to improve health outcomes of LMICs demands greater emphasis on educational development for health care. (Necochea, 2013) Like health, education has also undergone remarkable changes over the last 100 years or so. The new millennium needs system-based reforms where health and education form an integrated synergy to meet competency-driven targets. (Frenk et al., 2010) Problem-based learning and the science curriculum from the early 1900s rang in a new era with the central strategy of education being instructional and institution-based. Now, decision-makers in health care are implored to interrogate this transformational paradigm in their quest for education.

The multiple benefits of education are common knowledge. These include individual capacitation and community and system development. Torres (1996) contends that adult education has a stimulatory effect on the economy by increasing diffusion of knowledge and innovation and productivity. It also generates demand for further education and mobilizes resources.

Education can address the need for management capacity improvement through four mechanisms, namely: increasing knowledge and skills, assigning qualifications, setting standards and health system strengthening. This section explores these mechanisms.

2.4.1 What are the mechanisms of strengthening health systems through education?

Education, as a general strategy, can strengthen the health system through increasing knowledge and skills of the trainees if these are to be applied in health programme activities aimed at meeting health system outcomes (improved health, increased coverage and increased risk aversion. (WHO, 2007c) After identification of educational needs, knowledge and skills can be increased through the educational processes of teaching and learning. These, and in association with the relevant roles and responsibilities of the trainee, make up the competency sets of such individuals. Assessment of learning and learner evaluation of training (Plaza, 2007) are used to monitor and evaluate the progress of knowledge acquisition.

There are multiple steps between the intention to train (the curriculum) to deliver a health outcome and its observable population-level effect. From defining the learning outcomes to developing and delivering the curriculum, to the eventual application of new knowledge and skills and its resultant patient outcomes, there are a variety of ways in which positive or negative change can occur.

In recent years, we have seen innovative approaches to building management capacity in Sub-Saharan African health programmes (Kebede et al., 2010 and Rowe et al., 2005), but focus on management for eye care is still poorly represented in literature. To improve the performance of eye care programmes in Sub-Saharan Africa, an exceptional degree of innovation (Plsek, 2001), or dynamic change created through a change in knowledge, skills and behaviours of these individuals is required. There is a need for people in senior positions to possess a set of competencies that enable them to manage the resources effectively and efficiently to ensure that their programme targets are met.

Although the education programme stops at graduation, the students' learning does not stop. They continue to extend their knowledge in learning networks, in a social context (Bandura, 1969) or communities of practice (Wenger, 2009), or through a shift in understanding (Akerlind, McKenzie & Lupton, 2010), which should lead to application.

It has been suggested that health services should be made more equitable by "empowering poor people to have a more central role in health system design". (Gwatkin, 2004) Although using the qualifier "poor" in his argument, the term "local" could be as appropriate in this context. The suggestion is to increase the concentration of local, "partisan", or self-interested influence in health service management. In other words, to serve eye services better, the managers making decisions about eye care should be eye trained as well, and they should have a vested interest. This extends the idea of communities of practice where people utilise their relatedness to deal with complexities in the health system.

Hofmeyer and Marck (2008) recognized that health workers perform duties in complex environments of high tension and pressure such as relationships, tasks, policies, procedures, and health systems that are "turbulent". Managers should, therefore, focus on social, ethical and cultural capital more than on generating economical capital. Cultural unity has the potential to overcome the difficult challenges presented by health systems. For example, where people combine traditional events with health-promoting actions. (Minnies, 2016)

The mechanisms discussed above (increasing knowledge and skills, assigning qualifications and setting standards) collectively work towards health system strengthening, which in turn works towards improving the health outcomes of a population. According to the WHO, improved health outcomes, amongst others (De Savigny, 2009) can be achieved by increasing the capacity of any one or more of the building blocks of the health system (WHO, 2007c), i.e. leadership / governance, service delivery, health information, health financing, health technology and health workforce. The effects of a change in one or more of these building blocks can result in change in the overall outcomes as well as change within the elements themselves (Gilson, 2012), requiring a systems thinking approach. (Adam and De Savigny, 2012)

Developing the health workforce is a key strategy for health system strengthening (Gilson and Agyepong, 2018) with system-wide effects. (Adam and De Savigny, 2012) Through training and education, the knowledge, skills and behaviours of trainees can be changed to elicit the desired effect of increased competencies. These, in the presence of an enabling contextual environment, should, in theory, ensure that trained individuals produce improved health outcomes. (Gilson, 2011) For example, a health workforce that is quantitatively (ratios per population) or qualitatively (skills and qualifications) improved, can increase access to health care, which can lead to increased coverage, quality and safety of health services, ultimately resulting in improved health of the population. (WHO, 2009)

Health systems in LMICs employ a variety of strategies to manage services and resources, frequently utilizing a combination of personnel to perform management tasks. (WHO, 2009) However, there are too many interacting variables, rendering the relationship between the training and the eventual outcomes extremely complex. The further development of human resources (creation and filling of more posts, increased teamwork and motivation), may have other system-wide effects like better funding provision (health finance), improved health information and technology, and better access to essential medicines. This is especially true if human resource development results in an increase in the management capacity in health programmes. Management-trained individuals have sharpened leadership and advocacy skills, which can result in improved leadership and governance in health programmes, which in turn can make the health programmes more responsive to the needs of the populations they serve. (Kruk, 2008)

The educational aspect of human resource development is a critical step towards securing a desired health outcome. (WHO, 2005) In addition to providing new or useful and relevant knowledge, skills and behaviours, it also provides legitimacy, relevance and reference, in other words capacity building on a larger scale. This is because education results in changes in career options (Zwanniken, 2014), in work application through knowledge translation, and towards a positive impact on the health system.

2.4.2 What are the issues to be considered in the training of health managers?

The main issues that need to be considered in the training of health managers include a) the target group, b) the expected outcomes, c) the quality, relevance and usefulness of the training, d) the structure (and mode?) of the training and e) the challenges facing management training in LMICs.

a. An ad hoc internet search for "admission requirements for acceptance into health management education programmes" yielded a variety of criteria including "holding positions of responsibility in health care", "particular work experience in health care" and "minimum qualifications". These are requirements from educational institutions' perspectives. When viewed from the perspective of the need for management capacity development in health programmes, the eligibility criteria may be more specific. The target group for management training for health should be those who are either incumbent managers with identified needs for training or aspirant health managers, earmarked for a future management function. Incumbent managers have the benefit of existing job descriptions, post structures and line management structures. Selection of a suitable training programme can, therefore, be based on addressing the demands of the current post. Generic management training should be the preferred choice for aspirant managers, as it is adaptable and has long-term and broader cross-cutting benefits. (HST, 2009a) The target group for the PgDCEH is typically adults working in eye care programmes in LMICs, with aspiration to develop careers as eye care programme managers.

b. The possession of appropriate and adequate knowledge and skills to manage in calculated chaos (HST, 2013) and in increasingly complex (Stefl, 2008) and turbulent (Hofmeyer and Marck, 2008) health systems should be the expected outcomes of the training programme. Management training should focus on every day, hands-on competencies, like supervision, control and monitoring of responsible and efficient use of material resources including finances and information-based assets, with in-service training opportunities to be favoured above academic training. (Filerman, 2003) This means that the PgDCEH training should elicit a change of increased management competency in the individual, and of increased capacity to manage resources and processes effectively in the programme.

c. To ensure quality, relevance and usefulness, the teaching methodology should be aligned with appropriate educational standards and apply appropriate approaches. For example, in the South African District Management Study (HST, c2009) three core streams of management training (human resource management, general management and advanced management) are thought to be critical for senior managers. This is slightly different from the Health Leadership Alliance's (2010) five competency domains for health care managers featuring communication and relationship management, professionalism, leadership, knowledge of the health care system and business skills and knowledge. The Project Management Institute uses a Competency Checklist (Udo, 2004) to identify the skills and attributes required to be effective managers of projects, for example. Although project management is a subset of broader management, most of the competencies required are relevant, albeit applied in more clearly defined formats. Appropriateness of the competencies acquired during the training and transferability of the knowledge and skills should be optimised, perhaps through practical fieldwork, case study analysis and coaching / mentoring engagements. Considering the variations in training expectations during instructional design can greatly contribute to comprehensive skills sets for managers.

d. The type of training, qualification or certification obtained, and accessibility of the training are key issues to consider when designing training programmes. To this end, training can be designed and delivered in many different variants (Buch, 2002): part-time or full-time, contact, remote or in blended format, didactic teaching, exploratory or experiential learning, individual or in groups. These considerations should be informed by the candidature, expected outcomes and standards aimed for. Adult, professional learners are particularly sensitive to these attributes of training. Also, the training should be structured in a relatable way, in other words, fit the life and work style of the trainee rather than the other way around. The delivery mode of training is also important. Formal, residential training offered by reputable higher education institutions may be the first prize for those who want to exit with a valuable extra qualification, but this may not fit in with these same candidates' time and money availability. While more informal, shorter and distance training modes are usually more accessible, management training programmes of this type are often very discipline specific. (WHO, 2007a) The shortage of human resources makes for interruption of clinical work when practising clinicians should be absent from work for studies. Hence, ample consideration should be made for motive, opportunity and expectations from both parties: the trainees and the trainers.

e. It is also important to consider the challenges that face management education in eye care. At the 9th and 10th General Assembly of the IAPB respectively, Graham (2012) and Patel (2016) discussed the issues of limited opportunities, the high cost of training and the low availability of high-quality resources

for eye care training in most LMICs. In health care, management training enjoys lower priority for funding and execution than clinical training for example. (Cancedda et al., 2015) This may be related to the uncertain return on investment. In some instances, "management" is likened to "administration", so lower professional clout is assigned to it. For management training, additional factors like inadequate curricula and low concentration of training programmes make the situation worse.

Training of health managers should target aspirant managers who possess the will or desire to make things happen on a programmatic or organisational (as supposed to individual or patient) level. The training entity should have the capacity, reputation and resources to deliver high quality and relevant training. There should be a trainee-training programme as well as a trainee-eye care programme match to ensure that the training is suitable both strategically and operationally for the individual who wants to be an eye care manager.

2.4.3 How should a training programme for health managers be designed and delivered?

Like any other programme activity, thorough planning is essential. (Finch, 2001) A good starting point is to identify the training need. This can be done by using a tool such as the Cause and Effect or Fishbone diagramme, which was made popular by Ishikawa (Mindtools, 2017a) and is used to investigate a problem and identify possible causes. Through using this technique in management education, the desired training outcomes can be determined.

The need that a training programme should address is commonly considered only from the perspective of what problem the training needs to address. In other words, the gap in competency that needs to be addressed. Another need that should be heeded is the need for an individual or organisation to gain qualification or certification from the training. This is commonly overlooked in instructional design and only seems relevant for training administration and registration.

There are many models of instructional design, mostly variations of a theme of the programme planning cycle, aimed at achieving results through planning. The planning cycle is comprised of a number of steps that follow each other, from determining the need, through definition of the aims and objectives to description of the activities and establishing targets. (Mindtools, 2017b) At the end of one cycle, evaluation takes place, which forms the basis of the next cycle. The cycle can be repeated, incorporating changes and improvements prompted by monitoring and evaluation. *Figure 7* is an author synthesis of a generic cycle of instructional design. Most planning models follow this cycle.

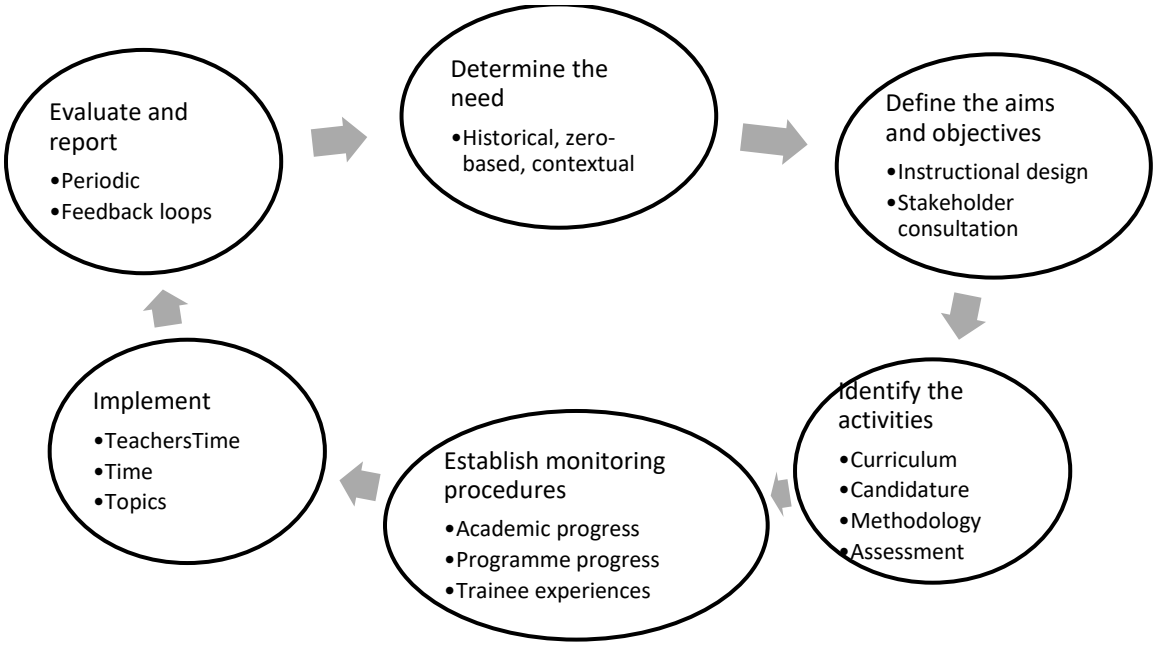


Figure 7: Instructional design cycle (synthesized, Author construct)

The ADDIE (Analysis, Design, Develop, Implement, Evaluate) model is one of the most prominent models of instructional design in use. (Instructional Design, 2017) The ARCS (Arousal, Relevance, Success expectancy, Satisfaction) model incorporates the main elements of motivation (Keller, 2000), while the ASSURE model (Analyze learners, State standards, Select strategies, Utilize technology, Require participation, Evaluate and revise) (Kim and Downey, 2016) is a close approximation of the planning cycle paradigm.

A few models divert from this paradigm. Kern's 6-step model for curriculum development incorporates multi-directionality between the steps and includes an "Educational strategies" step. (Sweet and Palazzi, 2015) The Backward Design model (Wiggins and McTighe, 2006) initiates design from the perspective of the final assessment learners undergo. Collins, Brown and Newman's (1989) cognitive apprenticeship model is a variant of the classical mentor-mentee relations where a trainee (mentee) acquires the competency through direct engagement with an expert (the mentor). Whichever model of instructional design is used, it should be learner-centred, goal-oriented and performance manageable. (Branch, 2009)

In eye care, the clinical team uses a mixture of competencies to achieve results in the programme, namely diagnostics and surgery (ophthalmologist), general nursing and eye care (ophthalmic nurse) and refraction and optics (optometrist). This mixture of cadres is referred to as skills mix and can also be achieved by having a combination of skills in individuals. (WHO, 2000) Managers are typically required to have a wide range of skills, including knowledge of topics related to the work of the staff that report to them.

Once the desired training outcomes have been decided, the training objectives should be determined. In academic settings, this refers to instructional design, including the development of a curriculum. There are many factors to consider in instructional design, centrally involving the students and interlinking with many other aspects, as illustrated by curriculum mapping produced by Harden (2001).

To equip trainees with the competencies required to perform specific tasks, the training programme should be appropriately designed and delivered and meet reasonable diligence criteria. *Table 15* is a checklist that can be used by course designers or evaluators to assess appropriateness of design.

Table 15: Checklist for instructional design[5]

Design	Do training outcomes address the need?
	Is the need clearly defined?
	Do training objectives lead to outcomes?
Delivery	Are the trainers suitably qualified and experienced to deliver the training objectives?
	Are the trainees from a clearly defined target group and receptive for the training?
	Are the methods used adequate and conducive to deliver the training objectives?
	Are the resources sufficient and appropriate for the training outcomes desired?
Diligence (author synthesis)	Are the assessment methods appropriate to ensure fair progress and progression?
	Is continuous evaluation done to determine trainees' perspectives of the training?
	Are feedback loops in place to ensure that the broader impact of the training is known?

The design of a programme to train eye health programme managers should take cognizance of the need to target adult health professionals, who need to acquire management competencies for the purpose of applying them in their programme settings. Appropriate measures for monitoring and evaluation of the implementation of a well-structured instructional design strategy should be in place. Aligning the training programme's objectives with the organisational strategy of the trainee should be the ultimate aim.

2.4.4 What aspects of teaching and learning theory need to be particularly addressed?

In addition to curriculum aspects of training, it is worth considering that management training usually involves trainees who are adults, professionals and working in health systems with their own peculiar

[5] Derived from proceedings of the EyeXcel Expanding Global Eye Care Workforce through Excellence in Training, held from 11 – 14 August 2010 at the Lions Aravind Institute of Community Ophthalmology in Madurai, India.

complexities. The importance of context in education was emphasized by Reid (2014). Health education practices should, therefore, be designed around key principles of teaching and learning.

Applying teaching and learning theories is a critical requirement for education programmes. Marton (2004) describes learning as the "acquired knowledge of something, the process of becoming capable of doing something". The act of teaching does not automatically lead to learning but does facilitate learning, that is, puts measures in place so that the learner can take up this learning. Hence, the conditions for teaching to produce learning may include those related to the teacher, those related to the learner, those related to the lessons and those collectively grouped as the contextual environment.

The choice of training approach, whether formal (academic or vocational) or informal (in-service training, coaching and mentoring), depends on the training goals targeted. (Fry, Ketteridge & Marshall, 2009) The training methodology should also be the most appropriate for delivering the training to the trainee group. The training mode could be through self-study, contact lectures, practical assignments and other methods.

Kerrigan and Luke (1989) strongly favour action learning for knowledge, understanding and skills, technical as well as administrative, whereas formal training is considered favourable mainly for knowledge acquisition. The availability of training resources (facilities such as training venue and equipment and study material) and technology (such as computers, internet and access to digital libraries) is a further consideration to be made for adequacy and relevancy of a training programme.

Training mainly adults, educated and professional students require further considerations of the aptness of the training techniques and approaches. (Fry, Ketteridge & Marshall, 2009) These fall outside the scope of this treatise, but the "outcomes" aspects of how the trainee exits the training programme fall within it.

Training changes trainees, not only with regards to their knowledge and skills but also their attitudes and mindsets. According to Freire (2005), education either converts students to the current perspective of the world or enables them to participate in changing the world they are living in. Trainees may be gaining other benefits from studying and not be learning, as studying does not necessarily mean learning. (Dirkx, 1998)

The transformative learning approach allows for elaboration and change of a students' point of view, to the end that they become self-critical and more reflective (Mezirow, 1997) for transformation. Like Freire, Dirkx (1998) believes that transformative learning is a meaning-making process aimed at "liberating" participants. Teachers and learners engage in the lives of the individual and collective "student" and "worker" (for those in postgraduate education), influencing the learning process, but have

little control over what they do with their learning, in other words, if and how they apply. There is a contradiction in this premise, because the teaching, if designed properly, should be directed towards specific change in behaviour.

If the steps Taylor (2008) poses for transformative learning, namely that the intended knowledge and skills have been acquired, an understanding of the meaning has occurred, and reflexive practice has taken place, there can be some measure of control in if and how trainees apply their learning. Instead of control, confidence may be another appropriate attribute that can be considered. However, teachers need to steer away from oppressive practices, one of which Freire (2005) refers to as "banking" practice in education, where the teacher deposits and the students withdraw knowledge. Gadotti and Torres's (2009) review of Freire's education for development likens the paradigm of students teaching each other with freedom, to "become professors within days". In these settings, called "circles of culture" or "citizen schools" the teachers create and impart knowledge together with the learners.

There is a growing demand for learning outside the classroom (Patel et al., 2016) and the opportunities are also expanding. The current trend of open learning is gaining much interest and subscription, because of the users' freedom to use, adapt, reuse and share training resources. This "movement" of free access, online learning is proliferating in the health sciences, as an attempt to address the limitations to access prevalent in this sector.

The benefits of online learning appear to be self-evident, and learning takes place everywhere, anytime and by almost everyone with access to the internet. There are limitations to distance learning, including referential power, certification and accreditation and logistical issues such as time availability, internet connectivity, and language. The impersonal interface may also not be the best approach, particularly for communication and relationship-based disciplines such as management. The quality of a training programme is further improved if assessment, evaluation and feedback strategies are diligently implemented. This can be in the form of alumni networks, newsletters or active follow-up of trainees to learn what they have experienced after training.

The broad educational paradigms employed in learning theory are Behaviourism, Cognitivism and Constructivism. (Belanger, 2011). Belanger's study guide on adult learning and education describes behaviourism as the idea that learning occurs through reinforcement of contiguous events, in other words, learning through repetition. In cognitivism, learners use rational thought to link elements to understand how to solve a range of simple to complex problems. Constructivism relates to the processes involved in creating meaning out of new knowledge, within their own contexts. This means that no two persons will

interpret experiences the same way. (Persson, 2016). This can extend to experiential learning, where the person is directly involved in the learning event. (Gentry, 1990) Learning by doing, testing and making mistakes while doing so, are forms of experiential learning.

Kolb's experiential cycle is explained by Konak et al. (2014) in the context of their experiment to improve students' learning in computer laboratories. The cycle starts with the conceptualization (where the Thinking activities predominate), followed by active experimentation (Doing) while consciously reflecting on the experience (Watching), followed by concrete experience (Feeling). At this stage, experiential learning can be said to be complete. This notion of learning only applies to learning within the confines of a training programme, where there is a veritable external time or space boundary.

Conceivably, everything one learns after formal education can be classified as experiential learning. Something similar is engaged learning, where students engage actively in the "world-as-it-is", thereby continuing the learning process. (Nagda et al., 2003) While "engaged learning" is a concept generally referring to curriculum-based education, it can also be thought of as "applied learning"; in other words, application of education separated from the constraints of time, place or opportunity. Here practical assignments play a crucial role as it forces direct engagement, discovery and personal commitment by students to meet their own learning objectives through experiential learning. (Ord, 2012)

When learning happens through accumulated experiences in a group or organisation, it is in the context of "communities of practice". (Wenger, 2009 and Smith, 2003) The benefits of this type of learning are largely unavailable for management trainees, due to the low concentration of managers in any given work setting.

According to Vygotsky's social development theory (1930, 1978), learning occurs before development, which implies that students must learn or acquire knowledge first before they can perform "higher" complexity tasks, i.e. applying lessons learned. (McLeod, 2014) This is contrary to transmissionism or the instructionist approach in which the teacher transmits the information to the students and the students collect, decode and consume.

In social learning, this transmission occurs from higher knowledge to lower knowledge, which means that the "teacher" in a teaching and learning relationship can also be the learner. This is true in management training, where the "learners" are adult professionals with knowledge and experience about their own work environment. They then act as teachers, teaching the teacher and fellow learners about their areas of expertise.

Vygotsky's (1962) stance that the space in which learning occurs, "the zone of proximal development", is in the area between supervised teaching and learning and the area of self-study. (McLeod, 2014) This can be extended to infer self-learning, as in learning through practical observation, and/or guidance through coaching (Lefebvre, 2003) and mentoring. (Lee, 2007)

Differentiation is made between three approaches to teaching and learning methodology, with varying combinations of teacher and learner involvement, namely instructional, learning and collaborative engagement. (Longo, 2015) The collaborative approach is most likely to be useful for management training, because of the opportunity to co-create knowledge and learn through multi-disciplinary problem-solving techniques. This approach can serve to instil ownership of the education in the student, a suitable antidote to Freire's (2005) claim that education is owned by educators to subvert the lower classes..

On the other hand, Saljo's (1979) five different conceptions of learning, as summarised by Richardson (1999), is based on the content of the training rather than the agent of learning. In each of these conceptions, learning is the increase of knowledge, as memorising, as the acquisition of facts, as the abstraction of meaning and as an interpretative process aimed at understanding and can be directly linked to specific learning outcomes. This is useful, as it can be the basis for learning evaluation, akin to Bloom's (1956) taxonomy of learning. The cognitive domain, one of Bloom's three domains of learning, comprises Knowing, Understanding, Applying, Analysing, Synthesising and Evaluating. (Anderson, 2001)

Other theories of learning, including Gagne's (1966) 5 conditions of learning, Kolb's (1984) four-stage experiential learning (Konak et al., 2014), Rogers' Facilitative learning (2003) and Piaget's (1934) Theory of Cognitive Development (Stevens-Fulbrook, 2019) have variable applicability in contemporary educational practices. Using some of these in combination may be more commonly practiced.

The PgDCEH curriculum design, delivery and diligence accommodate many of the abovementioned paradigms, including the focus on communication, transactional relationships and experiential learning. The Freirean philosophy of transformative justice is a useful approach to incorporate in future versions of the training. Exploring and applying other philosophies, like the hierarchical relationships of Confucius, the communitarian method (the African concept of "ubuntu") and personal identity theories (Epner and Baile, 2011) may yet fashion the PgDCEH as an instrument of liberation, in the true sense of the word.

2.4.5 How should such a training programme be monitored and evaluated?

Academic education programmes are required to comply with strict regulatory guidelines to ensure their design, delivery and diligence meet the standard for the qualifications they generate and certification they

engender. Some industry or professional standard generating authorities are also responsible for regulating qualifications and certifications of vocational training programmes, up-keeping the standard, e.g. the South African Higher Education Qualification Framework. (SAQA, 2012)

For training assessment, many models have been tested in academic institutions. The Dreyfus model (1980) of skill acquisition is based on recollection, recognition, decision and awareness. It proposes that students pass through five distinct stages of skills through formal instruction and practicing: novice, competence, proficiency, expertise and mastery. The progression is from rigid adherence to rules and principles to an intuitive mode based on tacit knowledge.

Management capacity building is a long-term strategy, with performance improvements likely to be only observable years after the training. (Bradley, 2015) Hence, outcomes monitoring of knowledge, skills and understanding at the end of training may be only marginally useful. Using integrated assessments where learning and assessment occur in tandem may be a more suitable approach. An appropriate learning evaluation theory (Downes, 2019a, 2016b & 2016c) could be applied to assess the learning that took place in a training programme.

When the two commonly used training evaluation models (Kaufman and Kirkpatrick) are compared, much agreement is found (Downes, 2016a and Downes, 2016b) , with the main difference in the labelling of the strategic location of the training. For example, where Kaufman refers to the levels as “inputs” and “processes” (Kaufman and Keller, 1994), Kirkpatrick labels them as “1a” and “2a”, referring to “resource availability” and “process acceptability” respectively. Subsequently, Jasson and Govender (2017) added return on investment to Kirkpatrick’s framework. This highlights the perspective of organisational targets (as opposed to personal targets) for measuring the effectiveness of training.

Bloom’s taxonomy (1956) is widely used, not only in instructional design but also in assessment, and can conceivably be applied to training evaluation. However, as the focus of Bloom’s taxonomy is on learning, its application is not suitable to evaluate the implementation of learning or the application of competencies which is the focus of this study.

While monitoring takes place continuously throughout any programme cycle, evaluation takes place periodically, usually using a longer time-cycle. For the eye care programme manager training programme, the regular “measurement” of performance against indicators (such as “hours on self-study”, “marks for assignment”, etc.) occurs throughout the academic cycle. In this way, various data sets are generated, which can be analysed and used to track progress and identify problems for action.

These data, and data generated through other means, could then be used to evaluate the training programme. Evaluation looks for evidence of effectiveness, efficiency, relevance and sustainability (amongst others) from a broader programme or organisational perspective.

2.4.6 Summary

A training programme for eye care programme managers cannot deliver its intended outcomes without considering the various theories of teaching and learning, the individual and interactive roles of the teacher and the learner in teaching and learning and the changes wrought through these. Through education, knowledge and skills are increased, qualifications are allocated, standards are set for service delivery and human resources, thereby strengthening health systems.

Education can strengthen health systems if it increases the capacity of health workers to deliver service that improves health outcomes in the health system. The key factors to consider when developing and delivering management training for eye care programmes in LMIC settings include suitability of the teacher, capability of the learner, the design of the curriculum and the methods of teaching and learning.

The main theoretical principles of education that target adult professionals should find common ground where the relevance and usefulness of social learning, transformative learning, community of practice and experiential learning intersect to the greatest benefit for the learner. The competencies that should be included in the training should be derived from a needs assessment, from which learning outcomes and objectives should be developed and ultimately, a curriculum is developed and delivered as intended.

2.5 Concluding remarks

The issue of management training has been explored in depth so far, starting with the need for management training and concluding with how management training should be structured and delivered. Health programmes can surely benefit from effective leadership, the same way that health systems can benefit from effective management, though leadership training is much more organised and professional than management training at this stage.

Inadequate attention is given to management in the design and implementation of eye health programmes. While the WHO recognises management as a priority, it is deemed a cross-cutting function necessary for success in all building blocks. In this section, the critical differences between leadership and management were discussed. Leadership is essential to develop strategy, whereas management is essential to actualize the implementation of such strategy, by planning, organising and controlling ground-level activities. The

lack of management competence in the health system may be critical in determining whether eye health programmes succeed or fail to meet their desired outcomes.

A multitude of factors can influence a health care outcome (Bandura, 1969), and not only the management application. These include personal factors relating to the perceptions, activities and ideals of the individuals, the characteristics of the PgDCEH as an educational programme and the multiple layers of structural and functional hierarchy that makes up the health system. Thus, a rich layer of factors, including personal, work-related, environmental and others are created, each affecting the others. This may influence the contextual environment around the students (see *Figure 8*) and their behaviour and achievements following training. (Prozesky, 2000)

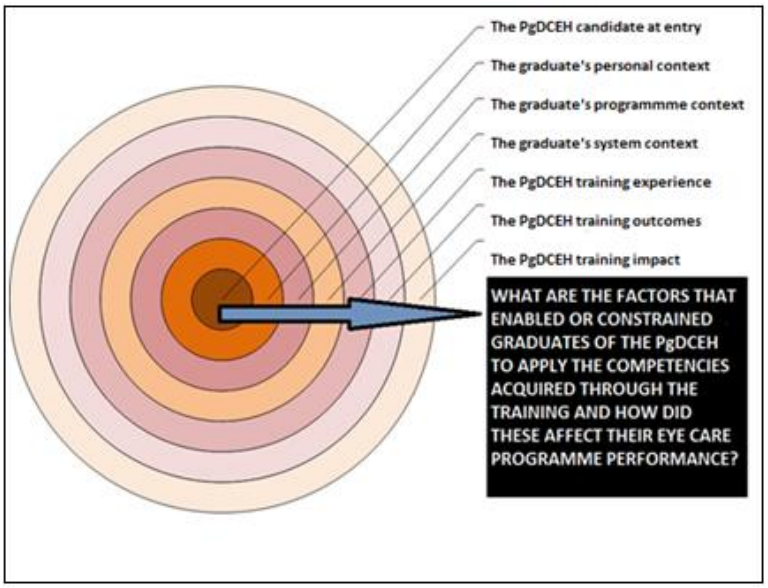


Figure 8: The PgDCEH graduate and the health system (Source: Author)

The graduates' conceptions, experiences and achievements play important parts in constructing their perceptions and beliefs (Brousselle and Champagne, 2011) about what works and does not work in their settings. Any intervention meant to elicit change in knowledge, attitude and behaviour, must pass through all these factors. It is understandable how difficult it must be to relate any specific effect (i.e. the learning outcomes or impact of the training) to a particular cause (e.g. the PgDCEH as a training intervention).

This chapter presented what is known about management training in health programmes, the role of education policies, practices and principles and the intended and unintended responses of individuals and the health systems. There are large gaps in our knowledge of exactly how and why management competencies are applied in eye care programmes. This study aimed to provide further insight into this.

Chapter 3: Theoretical framework

In the preceding chapters, we argued that poor outcomes in Sub-Saharan African eye care programmes could be due to inadequate management capacity, amongst other factors. Increasing management capacity is a health system strengthening activity and should contribute to the improvement of eye health outcomes in programmes, according to the Health Systems Framework. (WHO, 2007c)

The Postgraduate Diploma in Community Eye Health (PgDCEH), a one-year management training programme is such a health system strengthening intervention, designed and delivered to develop management capacity in eye care programmes to improve health sector outcomes. The explanatory model of the PgDCEH is illustrated in *Figure 9*. The increased management competencies obtained through completion of the PgDCEH, builds capacity in graduates and in programmes to deliver improved outcomes in their eye health programmes. While acknowledging that other interventions and resources may also contribute to or detract from this, the study's focus is on the role the PgDCEH had on how graduates applied their management competencies and the factors that enabled or constrained their application.

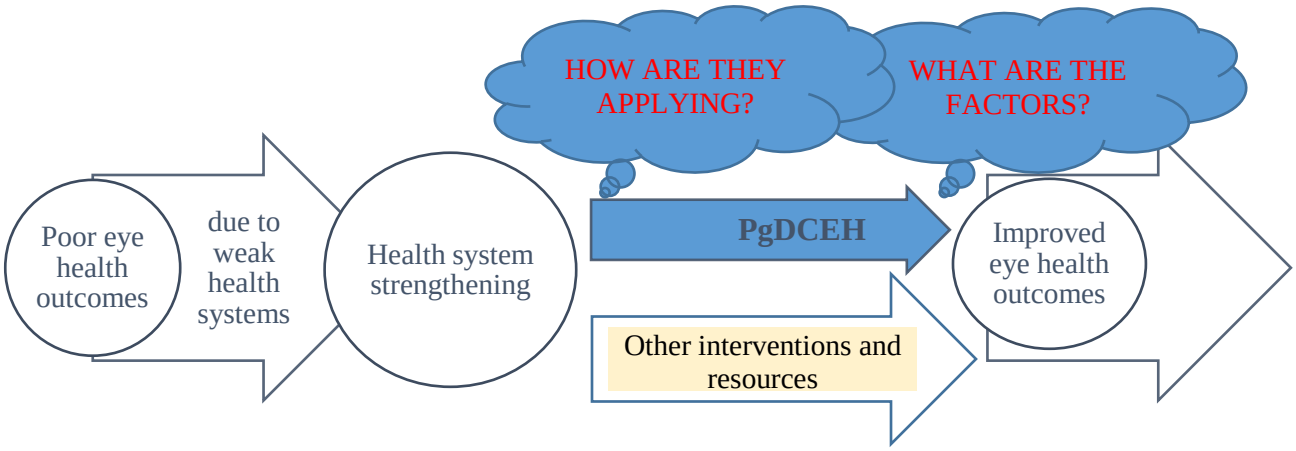


Figure 9: The PgDCEH explanatory model, Author construct

We used the Health System Strengthening Monitoring and Evaluation Framework (*Figure 10*) (WHO, 2010) to construct a theoretical framework for the study. The framework is a typical "theory of change" (Mayne, 2015) construct with indicators defined at input, process, output, outcome and impact stages of the result chain. Indicators are defined along the unit standards, relevant to the extent of the programmatic activity. For example, in a national health programme, prevalence indicators will be measured through population surveys.

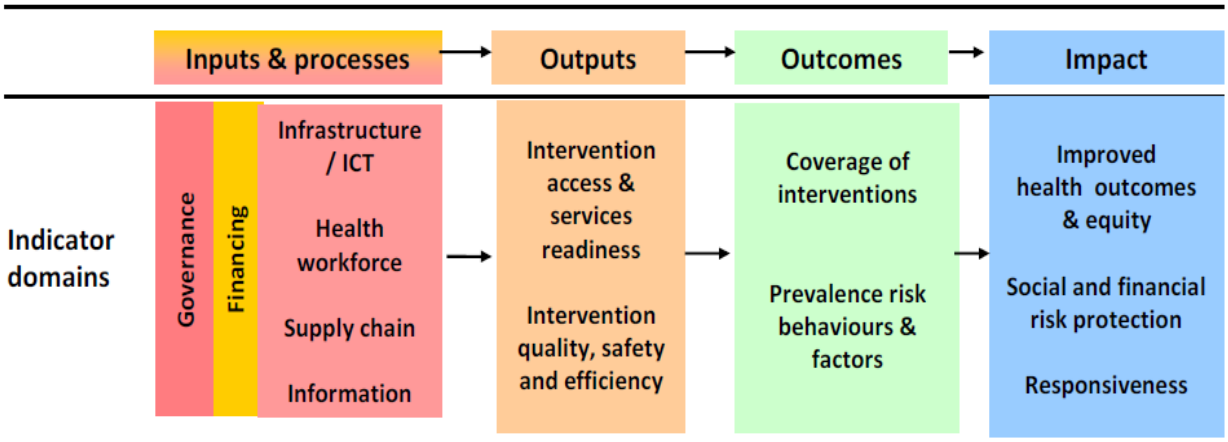


Figure 10: The WHO Health System Strengthening Monitoring and evaluation framework (WHO, 2010) showing the result chain.

The PgDCEH is located in the health workforce component of the "inputs and processes" block of the health system framework. The "outputs" of the PgDCEH include assessment results, course evaluations, academic progression and programme completion indicators. For this study, our focus was mainly on the "outcomes" and "impact" components of the framework. In the schema above, the study made assumptions in the Input, Process and Output domains, made analysis in the Outcomes domain and made evaluation in the Impact domain. The respective data collection, analysis and synthesis activities are also illustrated. (*Figure 11)*

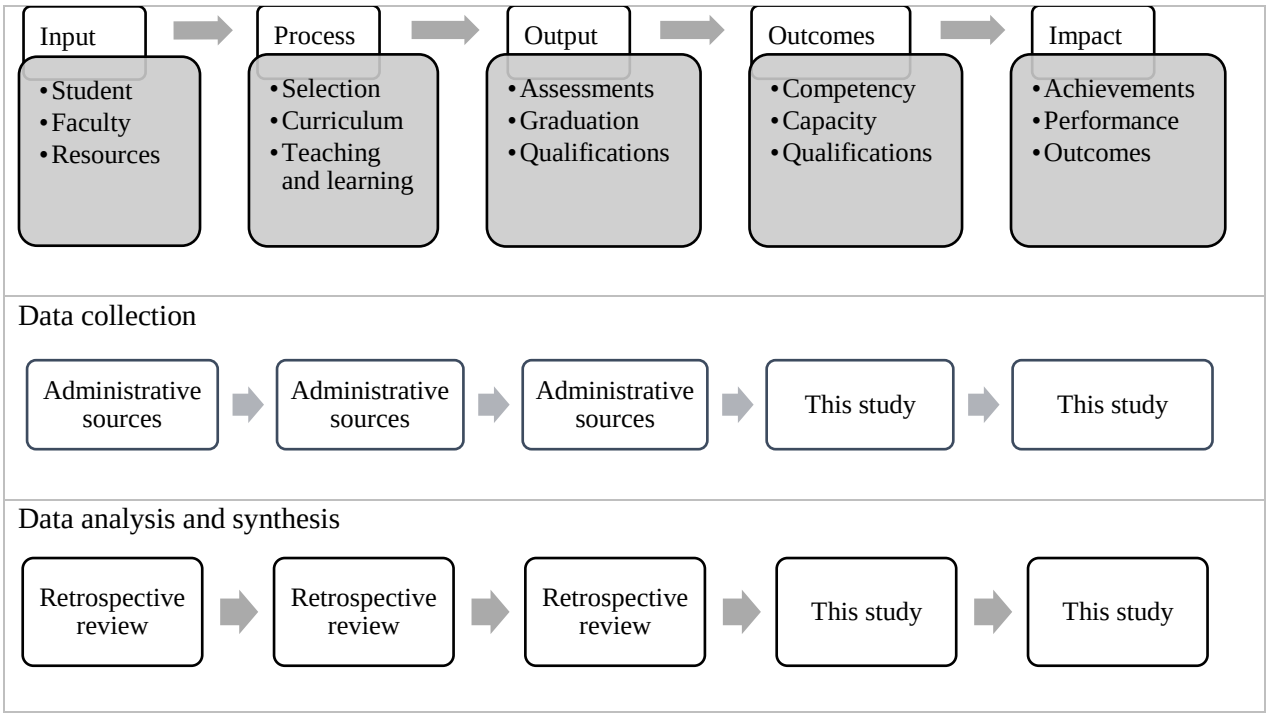


Figure 11: The PgDCEH indicator domains and research processes, Author construct

The health system strengthening theory is based on the premise that health systems are made up of components, called building blocks. These building blocks serve as "inputs and processes" (see framework, *Figures 9 and 10* above) through which health outcomes are achieved. The theory premises that strengthening these building blocks will result in improved health system performance (Kruk and Freedman, 2008), leading to improved health outcomes. Health services behave as systems comprised of sub-systems, the agents, structures and processes aimed at creating outcomes, which is improved health.

The PgDCEH graduates are sub-systems of a larger system which is eye health services, which in turn is a sub-system of the larger health system and they are all interconnected and interacting to produce the results sought. The health system is a sub-system of the broader social order of the world. How the graduates applied their PgDCEH competencies could therefore be dependent on factors beyond their immediate sub-system context. This interconnectedness is a key characteristic of systems theory.

Systems theory, originally conceived by Bertalanffy (1975) was touted by Chen & Stroup (1993) as a "unifying framework for science and technology education" because of its "ability to bring together the natural and human worlds" in multidiciplinary analysis. This is the most appropriate lens through which this study was viewed, as it allowed the researcher to focus on the result chain of a specific health system intervention (the PgDCEH), zoom in on the system attributes of the health system and filter out entry-level factors (input, process) that have more to do with learning than knowledge translation. This theory was used because it was a realistic portrayal of the location of the case (the graduate) in its natural environment and was aligned to related theories such as complexity theory, change theory, diffusion theory and evaluation theory.

Evaluation theory is the other paradigm applied in this framework. While there are different applications of evaluation theory, most are aimed at putting monitoring activities to use for developing social programmes. Utilization-focused evaluation (Patton, 2003), Values-Engaged evaluation (Greene et al., 2006) and Theory-driven evaluation (Chen, 2012) are examples of these. The models used mostly for training include the Kirkpatrick and Kaufman's Levels of Education (Downes, 2016a and Downes, 2016b), Brinkerhoff's Success-case model (Downes, 2016c) and the CIPP (Context, Inputs, Process, Product) model. (Stufflebeam, 2003)

The literature refers to evaluation models as ways of applying the theory of change in the form of a result chain. The concepts of "change theory" and "theory of change" warrant brief differentiation. Change theory is the theoretical and empirical conception of how change happens or can be made to happen. (Reinholz & Andrews, 2020). Theory of change on the other hand is a description of activities that will

lead to enhanced outcomes over time. (Anderson and Anderson, 2001) It is integral to health systems in that a certain state of the system requires a change to deliver improved outcomes. Application of the theory of change to the PgDCEH result chain is illustrated in *Figure 12,* which shows how the indicators are derived from the initial change requirement (impact sought).

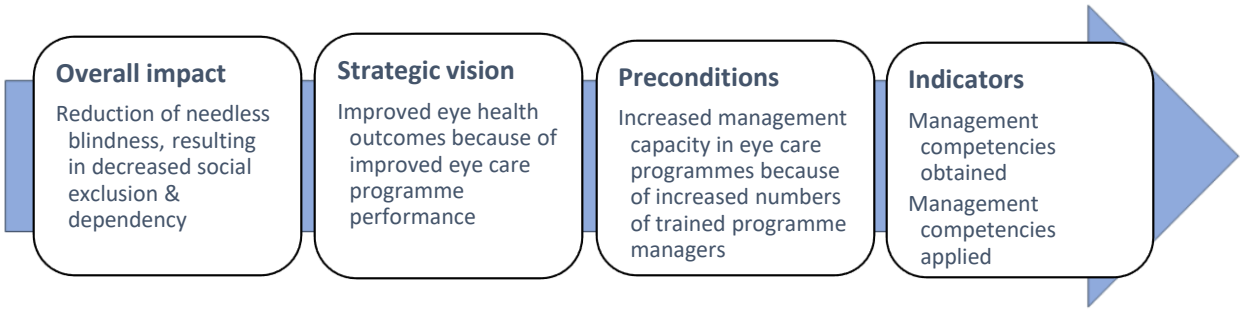


Figure 12: The PgDCEH theory of change, Author construct.

The indicators (management competencies obtained and applied) were derived from the ultimate change (impact) sought though strategic vision and pre-conditions being met. In other words, it was necessary to know what the main determinants of successful change were to ensure that the change sought (reduction of avoidable blindness) could be achieved by increasing management competencies and capacity.

The health system framework is based on the theory of change. (Anderson and Anderson, 2001 & Mayne, 2015) The evaluation theory was considered to be the linkage with systems theory because of the evaluative nature of the questions asked in this research. The resultant construct, namely system evaluation theory, described by Renger (2015), has the advantage of considering the characteristics of systems as they are in association with the evaluation endpoints used in the result chain. A further advbantage is that it makes provision to accommodate deviation from linear frameworks (as represented by the Kaufmann, Kirkpatrick and Brinkerhoff models) and illustrated in *Figure 11*. The systems evaluation theory therefore maximizes the advantages of both individual theories, while minimizing the disadvantages of applying either one individually in the context of this research.

The “logic model” approach of systems theory comprises only of “inputs”, “processes” and “outputs” as operational elements in an open system (Brouselle and Champagne, 2011 and Taylor-Powell, 2008) because this approach originates in manufacturing and industrial production. However, to allow for strategy-linked services evaluation, it was necessary to incorporate the additional elements of evaluation theory, hence the inclusion of “outcomes” and “impacts” in the theoretical framework.

This study's theoretical framework (*Figure 13)* suggests that students, located in eye care programmes, struggling to overcome multiple challenges, enter the training programme with intentions and expectations to acquire a set of management competencies. These competencies would be applied upon exit (or re-entry into their eye care programmes). This would lead to improved programme performance, thereby contributing to the improvement of eye health outcomes. This was based on the systems theory of an intervention in one part of a system having a corresponding effect in another part of the system. The steps from entry to exit are measurable if packaged according to the elements of the result chain according to the expanded logic model of evaluation: a systems evaluation frameowork.

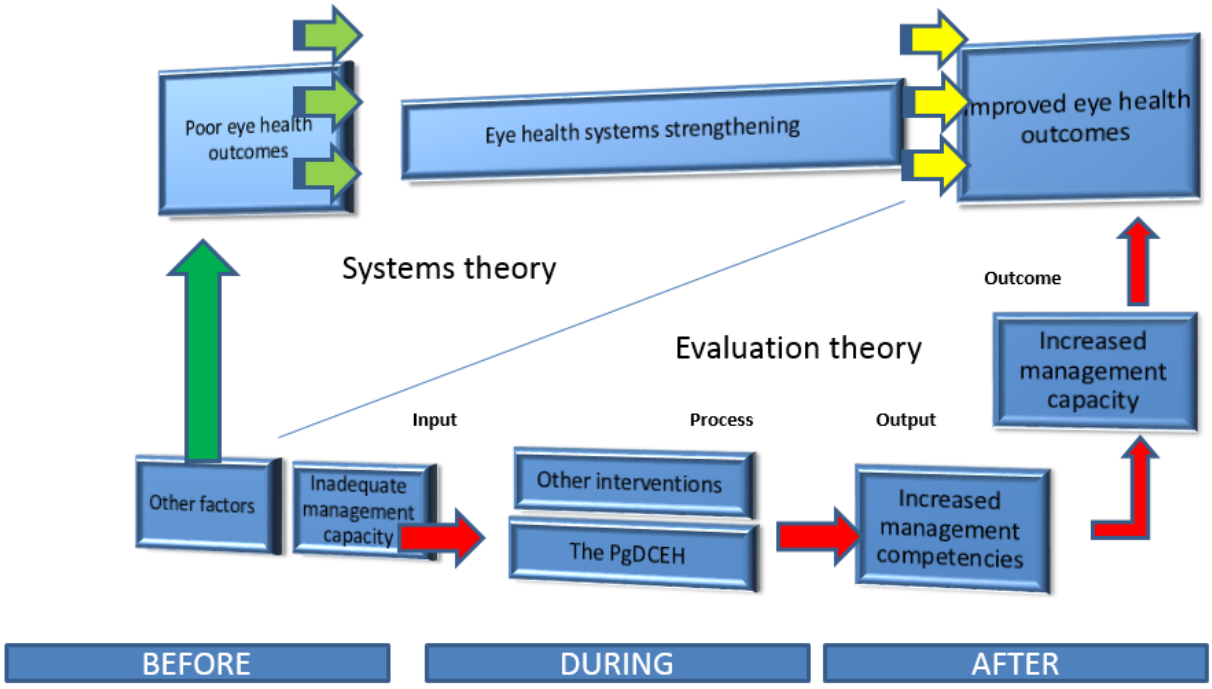


Figure 13: Theoretical framework of the study, Author construct

The Theory of Change paradigm uses visioning, causal pathways and indicators to identify, track and monitor procedures and progress towards pre-defined results. Applying this to the PgDCEH as change intervention, the OUTPUT is increased management capacity, the OUTCOME is improved management application and the IMPACT: improved eye programme performance as seen in *Figure 14.*

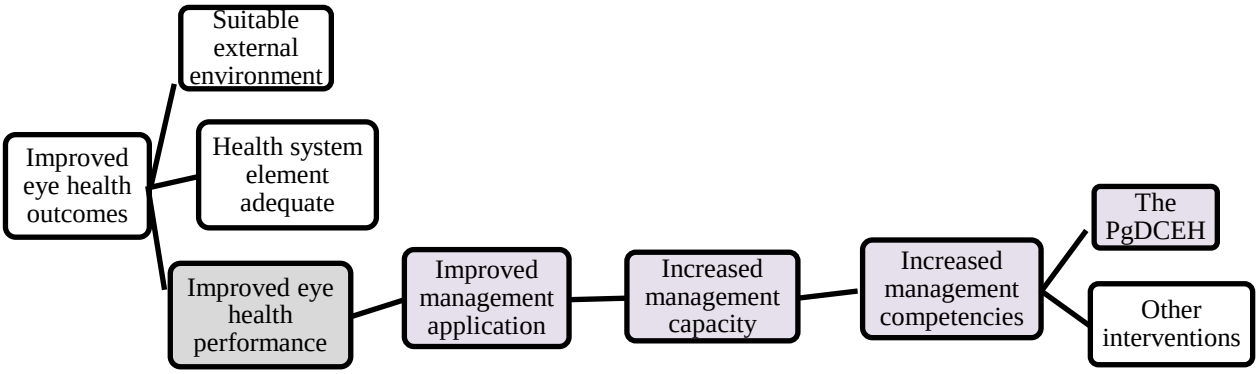


Figure 14: PgDCEH Theory of change (elaborated), Author construct

The interaction of the students with the PgDCEH from entry to exit and beyond, throughout this "result chain" is briefly summarised here:

- The inputs included the staff, the facilities, the students, time, the learning resources and additional materials.
- The processes included the curriculum, the systems and rules that regulate teaching and learning, the assessments and the time-and-space setting of the training.
- The outputs were the results obtained through completion of actual teaching and learning events, students graduating and attaining the necessary competencies as verified by the in-course assessments and the qualification.
- The outcomes included the knowledge, skills and understandings (i.e. the competencies) acquired by the students, which are directed by the learning objectives of the training programme.
- Impact was the effect of the PgDCEH on the graduate, their programme and the broader health system in which they operate.

In this study, the theory was applied in the context of the health system strengthening framework, which posits that health system building blocks (sub-systems) interact through certain standards (effectiveness, efficiency, responsiveness and quality) to meet the desired health system outcomes. The origin and synthesis of the theoretical framework used in the study is based on the systems evaluation theory. (Renger, 2015) This framework was used as a guide not only to collect and analyse the data, but also to demonstrate the framework's value or limitations. In selecting the systems evaluation theory as our operational framework for the research, many other theories, (including activity, diffusion, complexity, chaos and management theory) were deemed unsuitable for this study because they were too presumptive, complicated, or not within the scope of our investigation.

Chapter 4: Research methodology

This study was conducted to determine how graduates applied their PgDCEH-acquired management competencies, how these affected the outcomes of the eye care programmes in which they worked and to investigate the factors that enabled or constrained the ability of graduates to apply them. This was done by investigating the effects of the training on the attitudes, abilities and practices of these graduates, from an eye care management perspective. To do this, the most appropriate methods in study design, sampling, data collection and analysis were required. The methods used to conduct the research are now discussed.

This chapter describes how the aims and objectives of the research were intended to be achieved to ensure that the findings, analysis and interpretation would lead to the conclusions and development of the thesis. The chapter starts with a reminder of the aim and purpose of the research in relation to the research question, then proceeds with an elaboration of the researcher's expectations and interface with the study and the research paradigm. The research philosophy is then elaborated, after which the methodological steps taken to conduct the study are described, including the data collection and analysis instruments used for this purpose. The chapter continues with the discussion of issues of quality and validity and the ethical aspects, the limitations and the assumptions of the research. In conclusion, the actual method of study design, sampling, data collection and analysis used is described. The schema (*Figure 15*) shows the methodological schema of the chapter, highlighting the main components and their constituent parts.

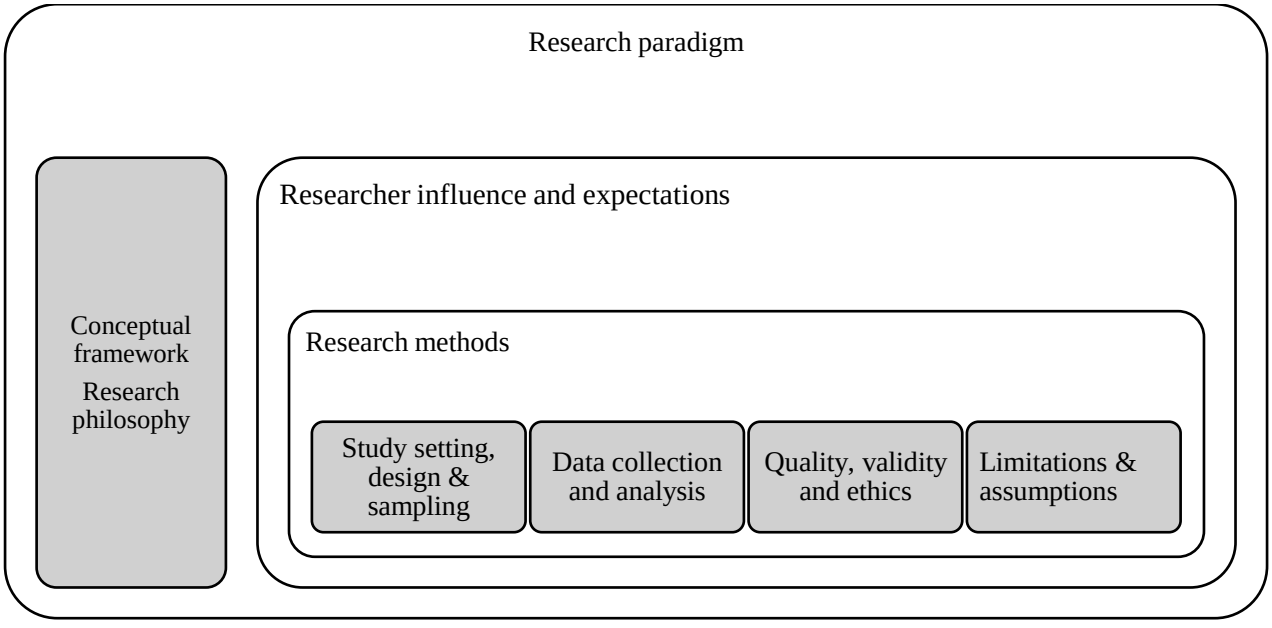


Figure 15: Methodological schema of the study

4.1 What was the conceptual positioning of the study?

The literature review highlighted pertinent issues of instructional design, programme performance and eye care programme management. This shaped the research paradigm, which comprises the research strategy, research design, research approach and research methodology. Within this paradigm, the conceptual basis of the study is found, which ensures that the research methods used are appropriate for the research objectives to be met.

Conceptually, the study looks at the changes brought about by the PgDCEH. Health practitioners in eye care programmes are struggling to overcome multiple challenges. They enter the PgDCEH training programme with expectations to acquire a set of management competencies, which, upon exit (or re-entry into their work programmes), they would be able to apply in their eye care programmes. When the PgDCEH graduates apply their management competencies in eye care programmes, improved eye care programme performance can be expected, which would lead to a meeting of the desired health outcomes. Along with competencies, several other aspects of the graduates may also change. (*Table 16*)

Table 16: Proposition of change brought on by PgDCEH

Aspects related to programme management	Graduate BEFORE completing the PgDCEH	Graduate AFTER completing the PgDCEH
Thoughts, feelings, beliefs, attitudes, knowledge, understanding and behaviours	Incomplete, inappropriate.	More relevant, appropriate, adequate
Management competencies	Inadequate	Adequate

Although theoretical and conceptual framework terms are sometimes used interchangeably (Green, 2014), there is a difference in scope. (Regoniel, 2015) The conceptual framework is a smaller, more focused unit, a subset of the theoretical framework. The conceptual framework depicts "how the intervention is theorized to work" (Adam and De Savigny, 2012) and what is expected to be found. (Maxwell, 2005) The conceptual framework is derived from experiential knowledge, existing theories, available literature, empirical research and thought experiments. Jabareen (2009) refers to conceptual framework as a "network of interlinked concepts". This is expanded by Baxter and Jack (2008), who contends that the conceptual framework "does not contain relationships between the elements, but these will emerge through analysis". Vaughan (2008), citing Miles and Huberman (1994), states that the conceptual framework "explains the main things to be studied and the presumed relationships amongst them". This could be tentative, as is frequently the case in qualitative research.

The conceptual framework of this study holds that the PgDCEH provides the knowledge, skills and understanding of programme management competencies, which if applied, can result in improved eye care programme outcomes. The aim was to determine why and how, as well as whether (Gilson, 2011) the training affected their conceptions and application of management.

Our understanding of others' realities may not necessarily align with others' theories and perceptions. (Maxwell, 2005) For PgDCEH graduates, reality lies in their individual contexts, the challenges and opportunities they encounter in their individual life and work settings. For the researcher and the research question, the reality was a synthesis of the combined realities of the graduates. As this synthesis was performed by the researcher, as a key instrument of the study, this synthesized reality took on a new meaning. This meaning was what was sought and was defined by the overall philosophy of the research.

The philosophical perspectives of research can be conceptualised as objectivist (or realist), idealist (or rationalist), relativist or pragmatist. (Luo,2011) For each of these broad paradigms, the nature of reality (or the truth, or knowledge), how knowledge is generated and where the researcher is positioned relative to the data are specific and different. How this relates to the research question is illustrated in *Figure 16* in an adaptation of the Honeycomb Model of research methodology by Wilson (2013).

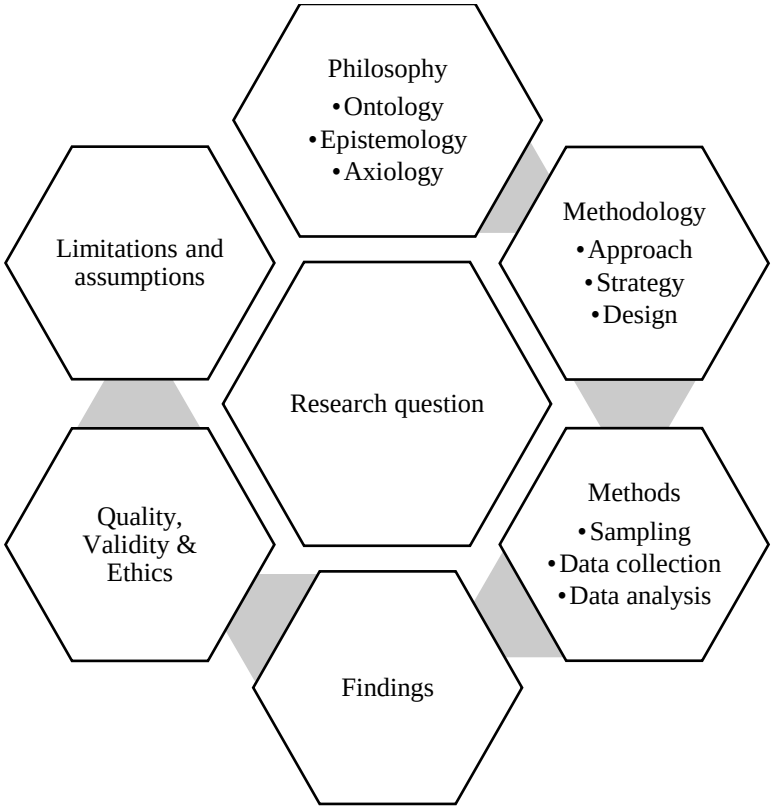


Figure 16: Application of Honeycomb model of research methodology (Adapted from Wilson, 2013)

This study's paradigm is constructivist as opposed to interpretivist or positivist, because of the relativist reality of the phenomenon. The positivist approach is not used as it requires data that is verifiable based on own experience / experiment. (Patton, 2002) In this relativist realm, there are multiple truths, which can change over time as changes in context occurs.

One of the main benefits of the constructivist approach is that is also tuned into more emotive, first-person oratory than the positivist approach, which is detached and in the third person. While close engagement with the data leaves fertile ground for reflection (by the researcher), it increases the potential for bias creeping in. The research is intent on meaning-making or generating and transmitting. Reality can be elusive, and truth can be difficult to determine. (Patton, 2002) While the constructivist approach may be less sturdy compared to the positivist or post-positivist paradigms, prone to subjective influences and multiple realities, it facilitates the collection of data with rich meaning, necessary for this study.

Epistemologically, the realist and idealist mode of knowledge creation is through measurement of the properties of the research interest and deductive reasoning respectively. The relativist mode of knowledge generation is largely constructed through inductive engagement with the research phenomenon. As it is important for the study to generate the knowledge sought by the research question, the realist view would be unsuitable. This also means that an insider (emic), as opposed to an outsider (etic) approach to epistemology should be applied. Here, knowledge is constructed rather than discovered. The interactive researcher-participant situation uncovers deep meaning and insight into the realities faced by the graduate.

The researcher was an integral part of the knowledge-generating process. Because of the multiple interactions that occurred between the researcher and the study participants during and before the study, it was nearly impossible to separate the researcher form the experiences of the graduates. This close positioning of the researcher is further discussed in section 4.2.

4.2 What was the researchers' influence in the study?

4.2.1 Researcher interactions

The researcher has had multiple interfaces with and interests in the PgDCEH (*Figure 17*). Primarily, the researcher has been directly involved in the teaching and convening of the PgDCEH since 2009. The PgDCEH is also a key strategic objective of the Community Eye Health Institute at UCT, where the researcher fulfils a business manager role. Furthermore, the researcher is an active consultant in eye care programme management in the Sub-Saharan African region and crosses paths with graduates and their line managers on a regular basis, either through personal contact or via telecommunication means.

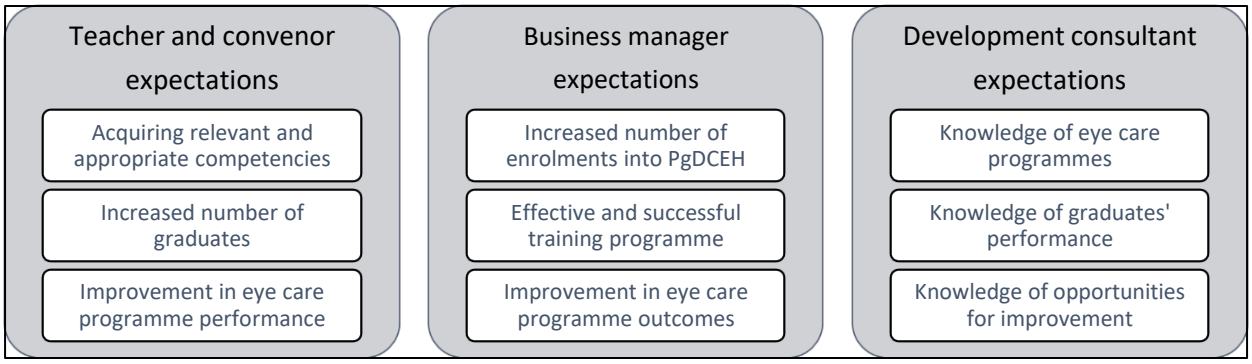


Figure 17: Researcher interfaces with and interests in the PgDCEH

The teacher and convenor's interests lie in the fact that the effectiveness of the training was a direct expectation of the researcher's teaching. During the 2009-2014 period, the researcher was involved in almost half of the total classroom time during the contact blocks and the same proportion of the coaching, supervision and assessment activities during the remote component. Apart from being centrally responsible for the academic assessment of the students as they studied towards meeting the learning objectives, the researcher was also key in monitoring their expectations, perceptions of the training and the administrative aspects of their studies. Therefore, it was of prime importance to the researcher for the training to lead to high achievement and improvement in eye care programme performance.

Another intersection was between the researcher and the students' personal situations. As most of the students held full scholarships, central responsibility and authority for administration and financial management lay with the researcher. The researcher dealt with course applications, scholarship applications and ad hoc interactions with the students' work environment from time to time. Invariably the students' welfare, their career ambitions and personal challenges became known to the researcher during this intersection. Therefore, much information about the graduate was available to the researcher.

The business manager role of the researcher had several areas of interest, including that the course should be perceived as well run and have been beneficial so that its sustainability is secured. A further concern was that the course should be worth doing and that there would be continued interest from prospective students. Furthermore, the course design and delivery modes should have been appropriate for developing management capacity in eye care programmes.

In the role as a programme development consultant, the researcher had two parallel interfaces with the graduates. Firstly, the investigations and evaluations done in the catchment region gave the researcher much knowledge and experience of the students' programme and environmental contexts.

Secondly, working in a unit with a strategic aim to establish a strong footprint in development consultancy, the researcher wanted to make sure that the relationships with graduates were conducive to collaborative partnerships in the future, therefore exacting cordiality in interpersonal relationships.

Parallel to these and therefore adding to the background knowledge and familiarity with the students, the researcher was the driver of an internet-based network, sharing information and resources, including a newsletter aimed at alumni and distributed across the graduate, trainee and partnership networks.

This multi-pronged and reciprocal familiarity between the graduates and the researcher could potentially influence the data and findings, thereby biasing the results. The researcher attempted to implement effective means to minimise the researcher-induced biases during the data collection and analysis stages so as not to compromise the quality of the research.

4.2.2 Researcher expectations

Before the start of the data collection, the researcher recorded a reflection as suggested by the academic supervisors, responding to the question: "What is your expectation of the effect of the PgDCEH on graduates' application of the competencies? In other words, what do you think you will find?" The purpose of this was to extract from the researcher his pre-conceived ideas of the results. This helped to explicate the preconceptions, biases and expectations of the researcher. The following is a summary of the expectations formulated, which were discussed with the supervisors:

- High graduate participation in data collection for the study, because of the reciprocal cordial relationships with the students.
- High availability and willingness of graduates to participate in the study for the same reason mentioned above.
- Moderate availability and willingness of the line managers to participate in the study, judging by the distant attitudes of line managers during network communications.
- Moderate response rate of the questionnaire survey, because of the general workload of the graduates, and that some of the questions might have been difficult to answer.
- The implementation of the interview phase of the data collection to be moderately affected by infrastructural shortcomings and logistical difficulties in the field.
- The quality of data collected during interviews to improve as the study goes on, as questioning technique, transcription and analysis should improve.
- That some interview questions may be misunderstood, because of language issues and the current relationship dynamics between the researcher and the graduates.

On a more personal level, the researcher aimed to obtain a doctorate degree from the thesis and complete a landmark study to determine the impact of management training in eye care programmes in Sub-Saharan Africa. In addition to the production of a dissertation, the researcher intended to publish several papers in peer-reviewed journals and submit a research report to the various stakeholders of the PgDCEH.

4.3 What methodological approach was taken to investigate this topic?

In this section, we describe the steps followed to conduct the study, namely, study design, population and sampling, data collection, data analysis and Interpretation and quality, validity and limitations. Each of these subsections comprises a discussion of what it is, how it connects with previous sections and justifications for following or diverting from an intended methodological path.

4.3.1 Study design

In contrast to Wilson's (2013) Honeycomb model for research methodology, Maxwell (2005) introduced the terms "design mapping" and "design matrix" as aids in developing the appropriate research design. A design map of the research is a schematic picture of the research, showing the interactions between the parts of the study, namely the research question, goals of the research, conceptual framework, the methods and validity measures. A design matrix is a linear ordering (as opposed to the honeycomb structure) of the same elements that make up the study, illustrated in the top part of *Figure 18* (below). The bottom part shows how the matrix can be populated with the relevant responses of the PgDCEH research.

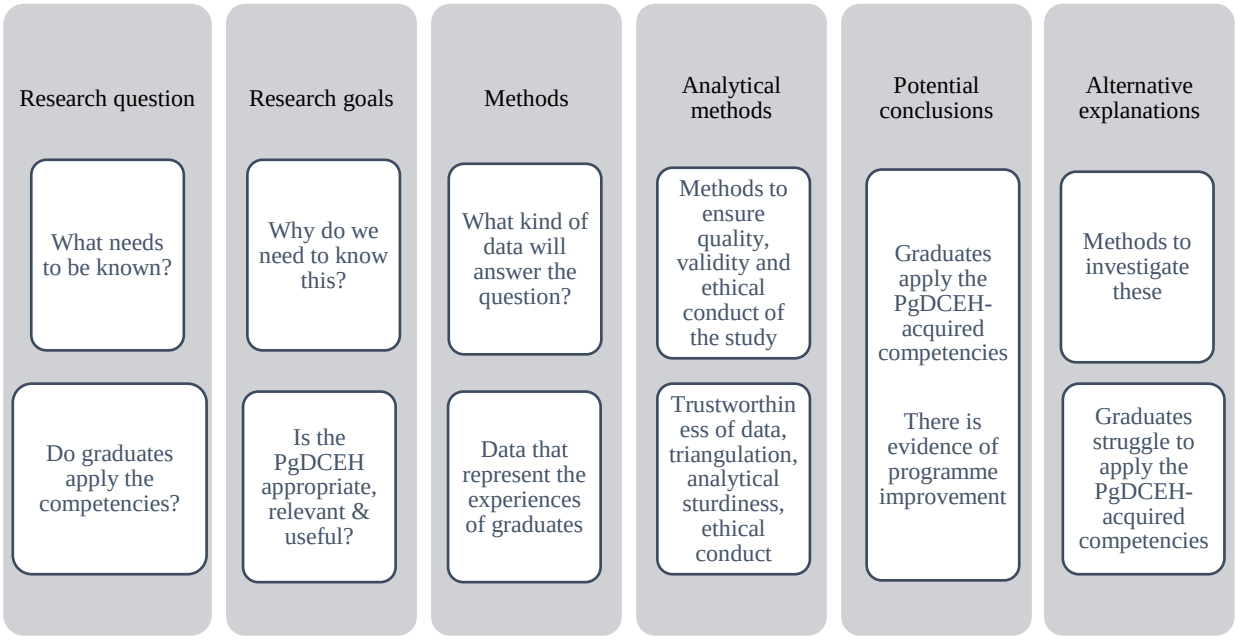


Figure 18: Maxwell's design matrix and application in the PgDCEH study

There are numerous study designs to choose from, as illustrated in see *Figure 19.* (Crowe and Shepard, 2010) The design chosen for this study was based on the need to investigate the phenomenon as deeply as possible. Maxwell (2005) itemised many factors that can influence the choice of study design. This can include the researcher expectations, participant issues, funding and sponsor issues, the research setting and availability of existing data sources. These and other factors can steer the researcher to select the appropriate research methodology, approach and design.

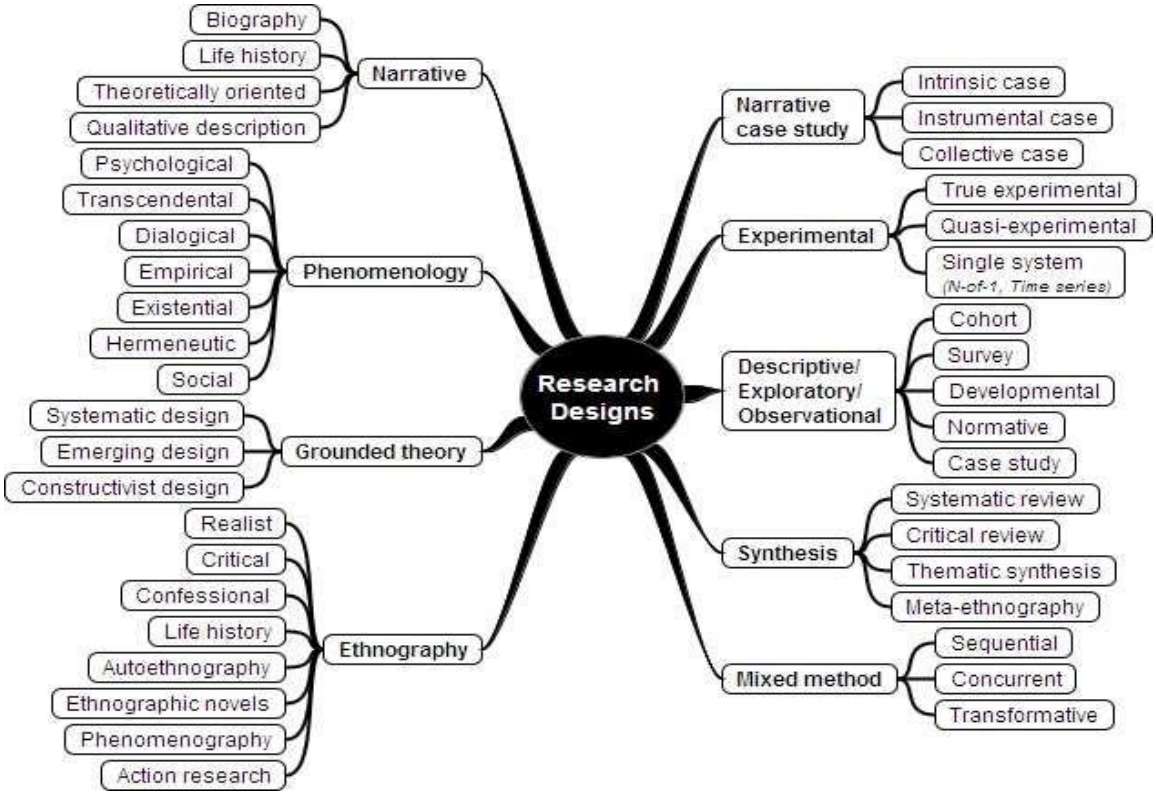


Figure 19: Research designs (from: Crowe, 2010)

Broadly speaking, study designs can be grouped into qualitative, quantitative and mixed methods. In many fields, quantitative research is still seen as "real" research, leading to actual results, while qualitative data is seen to fulfil an illustrative part, hence the quantitative design "still dominates quantitative research textbooks and research practice" (Flick, 2009).

Quantitative designs include descriptive, correlational and experimental studies, while qualitative research designs include phenomenology, grounded theory, ethnography and case studies. Mixed methods research designs' main types are sequential and concurrent. They can also come in several combinations of qualitative and quantitative and is shorthanded as a+b, A+a or B+b or a+A or b+B or A+b or a+B (Brannen, 2005), where a is qualitative, b is quantitative, and the capitalization status denotes dominance. *Table 17* summarises the differences between qualitative and quantitative study designs,

Table 17: Comparison between QUALITATIVE and QUANTITATIVE research[6]

	Qualitative	**Quantitative**
General	Insider's perspective/Emic	Outsider's perspective/Etic
Purpose	When trying to understand behaviours	When looking for facts or causes
	Exploratory/Explanatory	Confirmatory
	Hypothesis/theory generating	Hypothesis/theory confirming
	Understanding (how, why, what?)	Measuring (how many/much, when)
Methods	Words, language, experiences (stories)	Numbers, measurements, statistics
	Less structure, dynamic	More structure, static
	Coding and themes	Statistical analysis
Sampling	Small, manipulated	Large, representative
Looks at	Nature, meaning	Amount, measure
Philosophical position	Non-positivist	Positivist
	Situationally constrained	Independent of context
	Authenticity, trustworthiness	Reliability
	Researcher is involved / engaged	Researcher is detached
	Different ways of knowing	Best way of knowing (sturdy science)
	Focus concise and narrow	Focus complete and broad
	Reasoning logistic, deductive	Reasoning dialectic, inductive
	Uniqueness	Generalization
	Inductive and discovery	Deductive and verification
Writing, reporting	Less formal, personal style	Scientific and impersonal style

[6] Synthesised from Patton (2002), Lichtmann (2013), Yin (2011) and Maxwell (2005).

Qualitative methods

Qualitative research is the study of the whole rather than specific variables. (Lichtmann, 2013) The informal style of reporting is regarded as a weakness in comparison with quantitative research. Interpretations are based on the researcher's experience and background. Qualitative research can be either exploratory, descriptive or explanatory. Exploratory and descriptive type research asks *who, what, where* and *how much* questions, whereas explanatory research provides answers to *why* and *how* type questions. (Gilson, 2012)

Qualitative designs are appropriate when investigating a phenomenon in its real-world setting (Yin, 2011), where the boundaries between the phenomenon and the context are vague and causal relationships cannot be identified or explained. The aim of qualitative design is to gain new insight into these phenomena and relate them to each other and other phenomena, and ultimately, to generate theory.

Qualitative research uses text as data. (Flick, 2009) The text can be derived from speech, sound, images, words in documents, and incorporates aspects of the participants' diversity and the reflexivity of the researcher. Qualitative research is highly person-centric, holistic, developmental, naturalistic, dynamic, ideographic, regards reality as subjective. It also captures and discovers meaning and yields thick descriptions, direct quotations and in-depth reflections. (Patton, 2002) A further benefit of qualitative research is that human emotions, abstract thinking and understanding can be measured. (UNISA, 2016)

In qualitative research, an understanding of human systems (Savenye and Robinson, 2004) is sought, through investigating the phenomenon in natural settings. The appropriate methods are developed as the study is progressing. Other strengths of the qualitative method include the embedded contextual depth, accounting for multiple realities, that is from all the participants' viewpoints, as well as that of the researcher. The main benefit is that complex issues or complex settings can be investigated, such as the context in which PgDCEH graduates are located to apply their management competencies.

Quantitative methods

Quantitative research design, on the other hand, is used when looking for facts or causes, is confirmatory as opposed to exploratory, descriptive or explanatory. (Lichtmann, 2013 Where the focus of qualitative research is holistic and open, quantitative research is defined and closed. Where words, text, pictures and sounds are the main format of data used in qualitative research, numbers or non-numeric values against variables are used in data collection and analysis.

Compared to qualitative designs, other research methodologies have critical limitations including the inability to study a wide range of topics as required, difficulty to establish "perfect" conditions for the research, difficulty to secure big enough samples for high statistical confidence and the challenges associated to studying past events. (Yin, 2011)

For this study, we required the rich, thick descriptions derived from in-depth interviews, record reviews and open-ended questionnaire questions. A quantitative research methodology would be too inflexible and non-natural to yield this type of information. A quantitative approach was used as an adjunct to the qualitative methodology because of the need to perform a simple descriptive analysis of respondents' work roles, abilities, programme performance and their health systems. This was necessary to illustrate the individual and cohort-specific contexts of the PgDCEH graduates. Flexible design looks for confirmability, dependability and credibility, whereas fixed design ensures reliability and construct validity. (Gilson, 2012) Precise measurement is unattainable in qualitative designs.

Mixed-methods design

Research questions that require investigations of real-life phenomena, observed and measured from multiple perspectives, combined with a need to quantitatively examine some aspects of the phenomenon can be studied using the mixed methods design. Mixed methods research is useful for generating important research questions and providing answers for those. (Johnson, Onwuegbuzi &Turner, 2007)

The mixed methods research design "allows for more complete and synergistic use of data" (Wisdom and Creswell, 2013). Four types can be distinguished, namely explanatory sequential design (a quantitative phase followed by a qualitative phase), exploratory sequential design (first qualitative then quantitative), embedded design (qualitative data generated before, during and after quantitative data collection) and multiphase design, involving stakeholders from both service provider and user groups in multiple qualitative and quantitative stages. Chiang-Hanisko et al. (2016) group the mixed methods design into three types, namely parallel, sequential and conversion types.

Whilst utilizing the best qualities of the qualitative approach for certain aspects of the study, the best qualities of the quantitative approach are utilized for other aspects of the study. (Leppink, 2017) New insights may be uncovered that might not have been so obvious if either the quantitative or qualitative approach was being employed exclusively. However, mixed methods research is not merely a combination of qualitative and quantitative research designs. It is located separately from qualitative and quantitative designs and inhabits a conceptually new space between the constructivist and positivist paradigms of research. (Creswell, 2007)

The mixed methods approach is more difficult to design and implement, hence a wide variety of skills is needed. (Goodell, Stage & Cooke, 2016) Data collected at a one-time instance can influence the data collected at a later interval. For example, an interesting, extreme or surprising encounter can alert the researcher to similar experiences later in the study. This can result in disagreement between the qualitative and quantitative data or even dubious or conflicting results. (Wagner et al., 2012)

Case study design

According to Chmiliar (2010), a case study design is a methodological approach that involves the in-depth exploration of a specific bounded system, utilizing multiple forms of data collection. It is "an empirical enquiry that investigates a contemporary phenomenon within its real-life context" (Yin, 2009) The case is a separate entity in terms of time, place or physical boundary. Multiple-case designs or the use of collective case studies involves the extensive study of several instrumental case studies. The case study approach is consequent and allows for the integration of different perspectives on the case. (Flick, 2009) *Table 18* shows the strengths and weaknesses of case study designs, synthesised from various sources.

Table 18: Strengths and weakness of case study designs[7]

Strengths	**Weaknesses**
Can examine a case or cases in depth in its real-life context	Less statistical but more analytical (logical inference) generalization
Can obtain first-hand understanding of people or events	Risk of confusing evidence (findings) with interpretation (discussion)
Case selection can be based on extreme, unique or revelatory attributes	Regarded as low rigour, because subjectivity of views can introduce bias
Multiple sources of evidence help with triangulation or creating convergence	The skill of doing good case studies is not standard, it must be learned
Non-prescriptive analysis techniques	Tendency to answer too broad questions'
Help to answer how, why questions	Cannot establish cause and effect dynamics.
Can be reported by telling a story, providing a case report or addressing propositions	Can be time-consuming and costly, as it produces great amounts of text to be analysed
Computer programmes can be used to work with bulk data	Findings can have low reliability and generalizability and has potential for bias

[7] Synthesised from Patton (2002), Lichtmann (2013), Yin (2011) and Maxwell (2005).

The case study methodology allows the researcher to mine a vast range of data sources, data formats and information modalities to investigate the research question (Yin, 2004), especially when the type of research question is “how?” or “why?”, and can be effectively applied in novel research. (Baxter and Jack, 2008)

Case studies are often classified as neither qualitative nor quantitative (Zucker, 2009), so mixed methods are an indicated methodology. Case study is used to “uncover patterns, determine meanings, construct conclusions and build theory" (Kohlbacher, 2005) Therefore it is useful when little is known about a phenomenon and exploratory, descriptive or explanatory investigation is required. Furthermore, case studies help to zoom into specific issues, in specific settings or participant groupings that are difficult to examine through other means.

The case study approach helps to create an understanding of complex issues and the interrelationships they have with each other, the contextual environment and/or in historical terms (Goodell et al., 2016) This extends to rare and extreme phenomena and events within particular time and space contexts.

Choice of design

While the qualitative research approach brings with it the advantages of deep rich information, taking place in natural settings, engaging with lived experiences, including human thoughts, feelings and history, and from the inside, there are many disadvantages. A key disadvantage is that findings are not overly generalisable to the subject field of the research; in the case of this study, management education for eye care programme development. Other hindrances include the non-standard measurement that is used, that it is context-sensitive, and that there is a strong possibility that the researcher influence will bias sampling, data collection, analysis and interpretation, and is based on highly subjective data collected.

However, much could be learned about how the graduates apply their PgDCEH-acquired competencies in their eye care programmes. It is important to remain relevant enough to increase the body of knowledge about management education for eye care programme development. The main challenge to overcome in constructing the study design was the wide variety of country contexts and candidate cultures. If a baseline assessment was available with which to compare candidate and programme status at the time of data collection, it would have been possible to compare before- and after-effects more accurately. However, the countries presented in the study were broadly similar in political and socio-economic status. This extended to the health system contexts as well: facing similar challenges, dealing with the same issue, just perhaps in different proportions, therefore, this was not regarded as a problem.

The use of an embedded multiple case study design is an apt choice. To ensure that sturdy criteria for interpreting the findings are in place, theoretical propositions were developed to guide sample selection, data collection and data analysis. (Yin, 2004) The propositions of the research question are:

- that graduates would apply their PgDCEH-acquired management skills if they were currently employed in **management roles**;
- that graduates who had **significant career achievements** attributable to the PgDCEH would have done so because they were working in an open or enabling environment;
- that those who did not have significant career achievements were working in less open or limiting environments, making it difficult for them to excel at work; and
- that graduates who are operative in **higher levels of the organisational hierarchy** may be more inclined to positively influence programme outcomes than those in lower levels.

4.3.2 Population and sampling

In qualitative research, the sample size is not defined in advance; sampling finishes at data saturation. (Flick, 2009) While there are no formal guidelines for eventual sample size in qualitative research, Patton (2002) suggested 30 cases, Mason (2010) found a range of 1 – 95 (mean 36), and Reid and Mash (2014) thought that a sample size of between 5 and 15 interviews should be sufficient to obtain sufficient range of responses. There should be a "diminishing return" (Mason, 2010) as the point of data saturation, that is when new data does not add any new information (Glaser and Grit, 2013) is reached.

There are four main sampling methods, namely purposive, theoretical, convenience and snowball sampling. (Flick, 2009) In purposive sampling, the sample is selected according to relevance to study. In theoretical sampling selection is based on analytical insights, while a convenience sampling is done for ease and convenience). When participants are selected through nomination of other sampled participants, it is called snowball sampling.

If purposive sampling is used, the researcher can select participants who are most likely to contribute special information to the study, (JHUSoPH, 2000) or their contributions are "illuminative". (Patton, 2002) Criteria used for purposive sampling include extreme case, typical case, special criterion, maximal variation, critical case and sensitive case. (Talya, 1999) In case studies, the theoretical propositions form the basis of criteria for purposive sampling. (Yin, 2004)

The aim of this study is to explore the issue as deeply as possible but to draw data from a broad enough variety of contexts to enhance representativeness. Appropriate sampling methods should be applied to ensure optimal opportunity to collect the data that will answer the research question.

The target population was the total number of students (n = 34) who had completed the PgDCEH training from its commencement in 2009 to 2014. Each graduate in their context constituted a case or unit of analysis. These students came from 20 countries in Sub-Saharan Africa, were mostly eye care practitioners (ophthalmologists, ophthalmic nurses, optometrists and ophthalmic clinical officers) and worked in government or NGO-funded eye care programmes. A specially designed questionnaire was sent to all the students who graduated from 2009 to 2014. No specific exclusion criteria were applied.

After analysis of the survey questionnaires, sixteen (16) out of a total of 34 graduates over the 2009 – 2014 period were selected, using the purposive sampling method, for in-depth interviews. Each case was carefully selected so that it either predicts similar results (a literal replication) or produces contrasting results but for predictable reasons (a theoretical replication). This also facilitated flexible case selection to allow selecting (after initial data collection) cases different from those identified, while being careful not to change the research proposition.

In performing the purposive sampling, participants who were likely to express the extremes of each criteria based on the theoretical propositions, were deliberately sought. For example, graduates in mainly management (or administrative) roles and those mainly in clinical roles, graduates in highest or lowest levels of the organisational hierarchy and graduates least and most likely to have had significant career achievements. The latter attributes were derived from the researcher's network communications, discussed in section 4.2.

Before launching the interview phase of the data collection, a pilot study was conducted to test the questionnaire, the interview guide and the logistics of the interview process. The candidate was chosen based on convenience, needing only an hours' drive from the university. After conducting the pilot study interviews, the researcher reviewed the interview guide and logistics and made the necessary adjustments before proceeding to perform the rest of the data collection.

At least one secondary key informant (SKI) was identified for each case. This was the line manager, supervisor and/or team leader of the graduate who could provide accurate information about the graduate's achievements at the programme level. The selection of the secondary key informants was based on the work organisation of the primary key informant.

4.3.3 Data collection preparation

The data collection comprised of three phases (*Table 19*): the first the questionnaire survey (n=34; 26 respondents), the second the in-depth interviews with graduates and secondary key informants (16 graduates selected) and the third the supplemental graduate documents review. Here follows a discussion of the preparatory activities for data collection.

Table 19: The three phases of data collection

Phase 1	Conducting a preliminary survey with all participants using a semi-structured questionnaire. This was done to obtain a "high level" course, individual and programme feedback to be used for developing a conceptual framework and methodology for the second data collection strategy.
Phase 2	Conducting in-depth interviews with a sample of the graduates (and their secondary key informants) to deeply explore the factors that enabled or constrained the ability to apply the PgDCEH acquired competencies in their eye care programme setting
Phase 3	Perusing supporting documents such as graduates' CVs, job descriptions, course evaluations, student assignment scripts and comments and reviews obtained from students during and after the study year to learn how students experienced their work before graduation.

Developing the questionnaire

The first phase of data collection was a quantitative design to obtain high-level information about the graduates' contextual and programme environments as the background for the in-depth investigations. The main steps in preparing the questionnaire for use were a) design the questionnaire, b) test the questionnaire, c) distribute via email, d) collect/collate responses, e) analyse and f) use to identify candidates for purposive sampling.

The questions to obtain this data were included in a questionnaire developed especially for this study. The questionnaire was meant to collect information about the graduates' current workstation, designation, position in their organograms and involvement in management activities. The questionnaire also posed questions asking the graduates about their ability to apply thirteen key management competencies, information about their eye care programme and health system, as well as their views on how they (individually) and their programmes performed towards improved eye health outcomes. These questionnaires were sent to all the students who had graduated between 2009 and 2014.

The questionnaire also included fields to fill in personal and demographic information which was necessary for the researcher to identify the graduates and do simple descriptive statistical analysis. A five-page questionnaire was produced comprised of a "sticker" page (requiring the respondent to complete demographic and work-related information about themselves), three pages of mixed Likert-style questions and one set of open questions (*Appendix D*).

After checking the questionnaire for errors, ambiguous questions and difficulties of clarity, it was sent in one email to all the 34 students who graduated during the study period. A cover letter accompanied the questionnaire, giving them more details and the rationale for the research. Clear instructions accompanied the questionnaire, which was attached as an editable MS-Word[8] document.

Developing the interview guide and additional data collection tools

The second phase of data collection was by in-depth interviews, a version of "Quant-QUAL" mixed methods that emphasized qualitative approaches but used a quantitative approach as supplemental data. The instruments for the qualitative data collection were developed after analysis of the questionnaire survey data. This included an interview guide, question sets for the graduates and the secondary key informants, as well as templates for the harvesting of data from documents available for review.

An interview guide, which sets out the broad issues that required exploration through open-ended questioning was developed which contained the standard procedures to be followed during the interview phase of the data collection. This included steps to follow for activities before, during and after the interviews, as well as the materials and equipment to prepare for each interview.

Conducting the pilot study

Before embarking on the interview phase of the data collection of the PgDCEH research, a dry run was conducted to test the logistics, procedures, tools and equipment. The selection of the candidate for this was based on her proximity to the researcher's location and on her eagerness to be part of the study.

The pilot study tested everything from making the first arrangement for the interview to production of a print transcript of the interviews for initial coding. Inbetween, aspects taking consent, posing the questions, taking of notes, recording of the interviews and the transcription methods were tested against a variation of Seidman (2006)'s checklist to appraise the workings of data collection during the pilot study.

[8] MS-Word is a word-processing programme which forms part of the Microsoft Office suite.

A file containing documents relevant to the participant's programme context were prepared for use during the interviews. Further details of the pilot study appear in *Appendix K*.

Drafting the visit schedule

Following the selection of candidates for the interview phase of the data collection, a preliminary visit schedule was drafted and distributed to the indicated graduates. This contained proposed dates for the field visits and stretched over a six-month period initially but was later extended to 15 months as the data collection schedule needed to accommodate other activities the researcher was involved in.

Revising interview guide and key questions

Following a further review of the pilot study findings, the interview guide was revised, together with the key interview questions templates, in keeping with the recommendations posed, see *Appendix E*: Interview guide. The questions were aimed at answering an aspect of the research question. Face to face interviewing would allow the researcher to observe the participants in their natural settings.

We checked that questions measured one dimension only, are not sensitive or threatening or leading and are aimed at respondents who can answer. In preparing the interview questions, the advantages and disadvantages of open and closed questions as noted by Yin (2011), Baxter and Jack (2008), Patton (2002), Boyce and Neale (2006) and Reid and Mash (2014), amongst others, were considered. The mode of conduct, i.e. whether face-to-face or via other types of interaction like telephone, email and online, each have their own advantages and disadvantages. (Opdenakker, 2006)

Arranging logistics for the interviews

Following amendments made to the data collection interviews after our pilot study experience, *(Appendix G)* arrangements were made for the interview phase (refer to *Table 19*). The graduates selected for this phase were distributed across several countries in the southern, eastern and western parts of the African continent. The distribution was loosely representative of the full study cohort.

4.3.4 Data collection procedures

The researcher engaged directly with the participants, through their shared experiences, by probing, being attentive and raising the participants' interest in the phenomenon being studied. The personal connections set up another level of data generation (reflexivity, clarification, summarising, conforming), which enriched the data yield. We will next discuss the data collection procedures that were followed.

Promoting the study

Before the study started, graduates were informed about the intention to do the research via direct email messages. The graduates were also introduced to this information through earlier mentions in the periodic newsletters that the institution distributed across its network from time to time. Early feedback from most students showed interest and willingness to participate.

Submission of completed questionnaires

The questionnaire survey was conducted via email, and telephone calls were made to participants who had not submitted their responses within 30 days of the first approach. The first completed questionnaire submitted arrived within two days after the despatch of the questionnaire. Subsequently, 24 more questionnaires were returned by the graduates. The 26th and final questionnaire was completed through personal administration. This was from a graduate who did not return a completed questionnaire during the three months window period. Of the nine questionnaires that were not returned despite reminders, two graduates had died, two were from the year 2014 and one from an Asian country.

Informing the participants[9]

Before the interview phase started, graduates were informed about the intention to proceed with it through the email and newsletter media mentioned above. All the graduates were included in this message and no indication was given as to who would be visited at this stage. The graduates responded enthusiastically and indicated their availability for the interviews, given adequate notice.

Conducting interviews with graduates

Individual interviewing is the main source of information obtained for qualitative research (Reid, 2014) and can provide the most detailed information about a phenomenon. Through exhibiting openness, sensitivity, awareness, understanding, and empathy, the data richness was enhanced, yet not compromising neutrality. (Flick, 2009)

In-depth interviews are intensive discussions (Boyce and Neale, 2006) where the interviewer asks questions to which the interviewee responds with detailed information about a specific topic. The interaction can involve repeated asks for clarification and offers of summaries, to which the interviewee

[9] The terms "respondent" and "interviewee" were used to distinguish the two sources of data from the survey questionnaire and in-depth interviews respectively. The term 'participant' as opposed to the interviewee, informant or subject was used when referring to a contributor in non-specific terms.

can respond, adding to the completeness of the information. The advantages of this iterative form of questioning include the rich detail that is obtained, as well as the close connection the interviewer makes with the interviewee and the data. There are disadvantages though: there is a high potential for bias, is very time-consuming and the findings are only relevant in the interviewee's context. The advantages and disadvantages of in-depth interviews over self-administered questionnaires are summarised in *Table 20.*

Table 20: Face to face interviews and self-administered questionnaires[10]

	Advantages	**Disadvantages**
Face to face interviews	Two-way conversation Can be recorded Personal connect	Can be costly, time-consuming Interviewers must be appropriately skilled Responders may be unwilling to talk Maybe unsafe, expensive to travel
Self-administered questionnaires	Simple, quick and easy to initiate Get rich information with low outlay Allows contact with inaccessible	Impersonal May take many reminders, time-consuming Low response rate Misunderstanding questions

Interviews can be structured or unstructured. Structured interviews have carefully phrased questions which determine how the respondent should respond. Unstructured interviews, on the other hand, have no prescription of how and to what a respondent should respond. The main question could be a very general, open question such as "What do you think about X or Y?" Planning is crucial to ensure that researchers gain maximally from the interview encounter. Even with the phenomenological interview approach, where the interview question is open-ended, the researchers must be prepared with the correct follow-up questions or responses to drive the data collection process to optimal capacity.

Qualitative interviewing works on both a factual and a meaning level (Valenzuela and Shrivastava, 2006) and to prepare for an interview a setting with least distraction needs to be chosen. Interviews allow interviewees to select relevant parts from their wealth of experience and fashion them into their stories. (Seidman, 2006) The initial question closely resembled the research question while subsequent questions dealt with more specific aspects of the question. (Reid and Mash, 2014) The interviewer can thus obtain a deeper understanding of people or a phenomenon from their perspective. Interviewing provides access to the context of people's attitudes, beliefs and behaviour.

[10] Synthesised from Yin (2011), Baxter (2008), Patton (2002) Boyce & Neale (2006) and Reid & Mash (2014).

The main skill required is good listening. The interviewer should listen to the spoken words, to the way in which they are expressed and to the non-verbal body language that accompany them. (Seidman, 2006) This gives the interviewer an understanding of what was being said, why it was being said and possibly what was not being said. Furthermore, good interviewers limit their speaking and allow the interviewee to talk. They are non-directive, neutral, maintain rapport and analyse while interviewing. (Yin, 2011) The interview event may have resulted in various unintended effects from the interview participants which are summarised in *Table 21*.

Table 21: Effects of interviews on interview participants, adapted from Tjitra (2011)

Effects of interviews on respondents	**Effects of interviews on researchers**
○ Opportunity to talk about important things for them ○ Reflection can result in new insights / changes ○ Memories that can be happy or sad ○ Concerns about risks of exposure / vulnerability ○ Expectation that material will be used in research	○ Can become exhausted, overwhelmed ○ Opportunity to see respondent's perspective ○ Reflection can result in new insights ○ Memories can be happy or sad ○ Anxious to obtain meaningful data ○ Concerns about risks of data loss ○ Sense of accomplishment

The first graduate was interviewed three months after the completion of the pilot study. During the interviews, the researcher made handwritten notes of the discussions, observations and questions that came up and incorporated these as reflexive memos for analysis. The interviews were audio-recorded.

The interviews were conducted in a once-off, direct, person-to-person session of approximately one-hour duration. For participants to be able to give detailed responses to the questions asked, arrangements were made that were suitable with regards to time, venue and other logistics. Participants were interviewed in their local settings, all in person, except one by means of an audio Skype call.

The researcher sharpened his vigilance to detect other things going on during the interview procedure, including face and hand expressions of the graduate. These could indicate thoughts, feelings or emotions such as excitement, uncertainty, fear, etc. This was also potentially an opportunity for the researcher to engage, discuss issues or conduct mentoring or coaching activities. For the respondent, it could have been an opportunity for revision or to ask for advice and obtain further information about some aspect of the eye care programme management.

The aim of the interview was to have the participant reflect on his/her experiences and then relate the experiences to the interviewer in such a way that the two came to a mutual understanding of the meanings of the experiences. It was expected that, through interim analysis, the questioning may take an iterative nature, seeking a deeper explanation of some themes. It was also possible that some themes recurred in subsequent samples, indicating possible data saturation. This aspect was closely moderated in consultation with the supervisors. The interviews were conducted open-mindedly and in dialogue style, collecting and analysing the data simultaneously and in agreement with the participants. A questioning thread that started with a lead question which approximated the research question was used. At the end of the questioning cycle, the participants' responses were summarised. Having heard the responses to these questions, the interviewee was probed for clarifications, further explanations and examples to obtain a rich picture of the concepts, experiences and achievements. The techniques of active listening (Reid and Mash, 2014) to capture the rich meaning were embedded in the responses. Using the iterative style of questioning, the exploration was deep rather than wide, creating rich descriptions of the graduates and their relationships with their eye care programmes.

For the in-depth interview phase, an interview guide was developed, containing key questions that were asked of graduates and secondary key informants. Reviews of key documents were conducted to verify information obtained from the participants. After 15 graduates and their SKIs were interviewed, data saturation was high, hence data collection ended.

Conducting interviews with secondary key informants (SKI's)

The interviews with the secondary key informants explored the achievements and challenges of the eye care programme, their perceptions about the PgDCEH graduate in relation to the management, verification of graduates' roles and responsibilities and general comments that were relevant to the study. These interviews were also conducted using a semi-structured questionnaire containing the questions seeking to verify the graduates' roles in the programme and to obtain an understanding of the SKIs' orientation, relative to the graduate and the eye care activities (see *Appendix F*). We conducted direct, person-to-person interviews to obtain their views on how the PgDCEH enabled the graduates to apply their management skills in their eye care programme.

The same techniques used for the interviews with the graduates were applied to these interviews, including those of being a good listener, being inquisitive and considerate about others' time and information. Here, too, the iterative style of conversation was applied.

Transcribing recordings

The graduate interviews were recorded using digital sound recording devices and transcribed into a word processor by a typist. The researcher compared the transcripts with the sound recordings and corrected any errors or omissions identified. The audio recordings were kept secure in a folder on an access-controlled storage device, with plans to be destroyed after completion of the study.

Originally, it was thought to send the transcriptions back to the participants for clarification and verification. This idea was aborted because of the logistical difficulties and the extensive delay in feedback from graduates anticipated.

The duration of the interviews ranged from 30 to 100 minutes and were recorded using a digital voice recorder. After checking the audio quality of the recordings, they were sent to a professional transcription service. About a week later, a verbatim transcript was received in editable Microsoft Word format, with numbered lines and in dialogue style. Validity checking was done by parallel listening. (von Knorring, De Rijk & Alexanderson, 2010) The main errors needing correction were transcriptions of non-language sounds whilst a small percentage of content errors were also corrected.

Preparing for analysis

The transcribed data was copied and pasted into a Microsoft Excel[11] spreadsheet and printed with a wide margin for analytic notes. Texts were cleaned by removing the introduction and conclusion sections of the interviews which mainly contained the informed consent taking process and the formalities associated with conclusion of the discussion. The cleaned transcripts followed several routes in preparation for analysis, including printing and copying into Excel spreadsheets. Two computer programmes used for qualitative data analysts namely ezText®[12], and Nvivo®[13] were initially experimented with. Despite the latter programmes' functionalities, manual methods were used.

The transcribed texts were read and phrases with broad meanings relevant to the research question (data bites) were identified, underlined and then assigned codes which were written in the margin. After having gone through the whole interview transcript the data bites and codes were reviewed, refined and renamed as indicated. These codes were transferred to an A0 sized sheet of coloured paper and combined into relevant categories. Relationships between these categories were shown using lines, arrows and brackets. In the findings section, these were used as the in vivo quotes to retain proximity to the data.

[11] Excel is a spreadsheet programme which forms part of the Microsoft Office suite.
[12] EzText is a Centers for Disease Control programme which can be used to code and analyse qualitative data.
[13] NVivo is a more comprehensive package with which interrelationships can be viewed in graphic illustrations.

The data collection process started with communication that went out to graduates and their line managers to promote the study. There were three sources of data: a survey questionnaire, in-depth interviews and additional documents review. Instruments for data collection were developed specifically for this study, including a survey questionnaire, interview guide and interview questions for the graduates and their secondary ley informants. The researcher applied good qualitative data collection techniques, including effective listening and iterative questioning, aimed at collection of good quality data. Preparation for data analysis included the transcription and cleaning of the audio recordings of the interviews.

4.3.5 Data analysis

Both quantitative and qualitative data analysis took place. The analytical process followed two routes: a simple quantitative analysis of the survey questionnaires returned and qualitative analysis of the transcripts of the interviews performed. Additionally, graduates' assignment scripts, CVs and job descriptions were perused to provide further options for triangulation. (Flick, 2018)

What is qualitative data analysis?

The aim of qualitative analysis is to obtain a complete, detailed description of the phenomenon from which to derive interpretations with ever-increasing levels of abstraction. Data collection and preparatory analysis generate patterns and themes, which provide room for deeper analysis and for the patterns and themes to be confirmed. Qualitative uses non-standard methods of analysis, meaning that the analysis methods may be developed and devised by the researcher, as opposed to an industry-standard technique.

Qualitative analysis transforms data into findings. (Patton, 2002) Popular texts contain no set formula of how to perform qualitative data analysis but only provides guidance. This is because every qualitative research study is different and requires a unique approach. The appropriate analysis and interpretation methods should be used, and the integrity of the data should be uncompromised. In other words, no data tampering, no data fabrication and no omission of "inappropriate" data should take place.

Qualitative researchers use coding as a key component of analysis. A code is "a word or a phrase that assigns a summative, salient, essence-capturing and or evocative attribute to portion of a language-based or visual data" (Saldana, 2009). Coding organises the data into indexed text that can be searched for patterns and linked to theoretical explanations. (Glaser and Grit, 2013) Both coding and qualitative content analysis produce an information base, which must be further analysed to answer the research question.

Coding is a form of qualitative content analysis reducing data without losing meaning (Adu, 2013), an interpretive act and an exploratory technique. (Saldana, 2009) Codes can condense or summarise data. Decoding is when we try to decipher data, whereas encoding is when we assign a specific code. Qualitative codes are essence-capturing and essential elements that when clustered together in patterns facilitate the creation of categories. Codifying, on the other hand, is the sorting or grouping of codes to categorise the data.

The main types of analysis are thematic (where coding is used) and content types (where categories and relations are used). Thematic analysis is the identification, analysis and reporting of patterns called themes. (Braun and Clarke, 2006) It is usually the first type of analysis performed in qualitative research and its main advantage is its flexibility. A common misunderstanding is the idea that all themes emerge passively from the data, whereas the researcher's active engagement with the data really does this.

The second type, namely content analysis is the detailed and systematic analysis of the contents of a data set. (Alasuutari, Bickman & Brennan, 2012) Qualitative content analysis extracts the relevant information from the data set. Another type of analysis, discourse analysis, uses the interpretative repertoire as the unit of analysis. (Talya, 1999)

Data analysis employs two broad forms of reasoning, namely deductive and inductive, according to Aristotle. (Stanford University, 2000) Deductive reasoning starts from general ideas and moves to specific. The aim is to test a hypothesis with the data collected. Through a sequence of formal steps of logic, from general to the specific, a valid conclusion is deduced from a specific premise. (Stock, 2015)

Inductive reasoning follows the reverse path i.e. it starts with the specific and moves to the general. The aim is to generate a hypothesis or theory with the data collected and analysed. Analysis creates categories comprised of similar themes, whereas synthesis generates new insights from the interrelationships amongst different categories. The alert observer can discover important relationships, "with sufficient data, even without any preconceived idea of their significance or meaning", according to Bacon (1902).

For analysis in multiple case study design, inductive reasoning allows for immersion in the data, which aids discovery (Potter, 2002), leading to synthesis. Synthetic thinking is one of five styles of thinking employed by individuals. (Harrison and Bramson, 2000) The others are analytical, realist, pragmatist and idealist. Synthetic thinking is characterised by the ability to create or synthesize new constructs from seemingly disparate things. It is useful because it questions the common assumptions made about things and is seen as the opposite of analytical thinking. Systemic thinking is the combination of analytical and synthetic thinking. (Bartlett, 2001)

How was data analysis done?

Figure 20 shows the processes involved in analysis of the study data. For the data collected via the questionnaire survey, quantitative data analysis was done. The data collected through in-depth interviews were analysed both qualitatively and quantitatively. For the latter, simple descriptive analysis was performed using SocSciStats.[14]

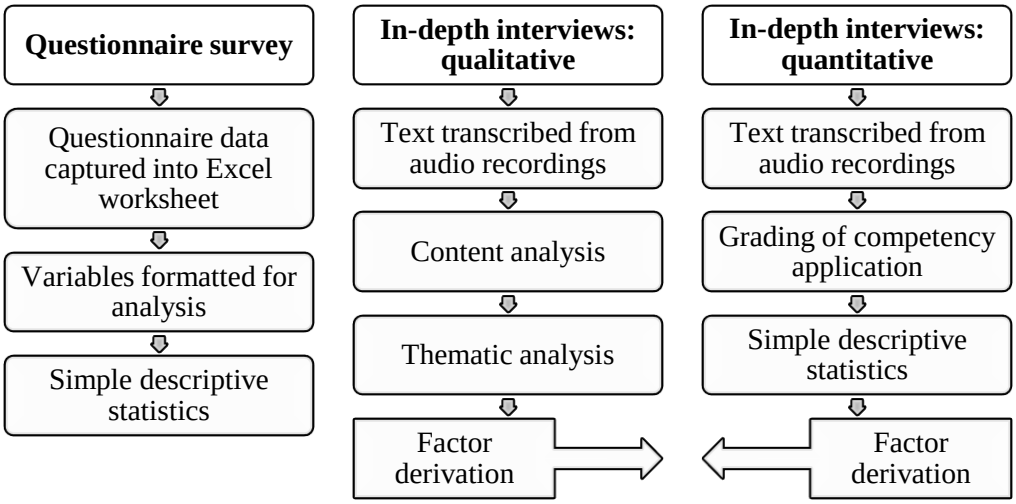


Figure 20: Schema to show the processes involved in analysis of the study data.

For the analysis of the questionnaire survey data, the responses were copied in a Microsoft Excel worksheet which was specifically prepared for the quantitative analysis. The worksheet comprised of fields which represented variables related to the questions asked in the questionnaire (see *Appendix F*). Derived variables were created to format the data for analysis and interpretation. The analysis of the data then followed. Simple descriptive statistics (frequency, means and medians) was used to analyse the data. A statistical package (EpiInfo[15]) was used to investigate the relationships between the variables through factor analysis. This provided a high-level understanding of the PgDCEH graduates' roles, their skills and their performance in the context of the eye health systems in which they worked.

For the analysis of the in-depth interview data, two processes of analysis was performed, qualitative and quantitative. Using mainly inductive reasoning, content analysis was performed through codification of the text, followed by thematic analysis. The data obtained from other miscellaneous documents provided a reservoir of data bits that portrayed the concepts relating to the research propositions.

[14] https://www.socscistatistics.com/ Accessed June-October 2019

[15]EpiInfo is an open access statistical programme, geared mainly to record and analyse epidemiological data. It is a product of the Centers for Disease Control, Atlanta, Georgia, USA.

These concepts were then selectively categorised according to the patterns observed until themes emerged that addressed the research question. After the first few participants' data had been analysed, the findings were discussed with the research supervisors. From these review discussions, ideas for improvement of interview techniques, approaches to remain focused on the research question and increased external validity were incorporated into the data collection strategy. This occurred constantly throughout the data collection and analysis processes.

After nine participants had been interviewed and the transcripts had been analysed, the data revealed some prominent themes. The researcher changed the interview strategy to focus more on verifying or confirming the themes. This was then applied to the next batch of interviewees. With one more sampled participant left, it was felt that the data patterns became repetitive, with low yield of new information. Data collection was therefore stopped because of data saturation.

After completing the qualitative analysis of the interview data, quantitative analysis followed. As can be seen in *Appendix O*, the PgDCEH training comprises teaching a total of 23 competencies, delivered in various modalities throughout the academic year. Two other competencies are common in the skills base of the students i.e. clinical skills in ophthalmology and computer skills. Adding these two to the 23 management competencies created a framework of 25 competencies.

In order to perform quantitative analysis on the interview data, a rubric was created, comprised of five grades of increasing endpoints of the ability and the application axes of the competency framework described in Chapter 2. The grades were defined with clear endpoints and were assigned Likert scale weightings from 1 to 5. The grading process enabled the researcher to perform quantitative analysis to determine how graduates applied their PAMCs, on a scale from 1 to 5.

Working through the interview transcripts, the observation notes and the supporting documents, the researcher scrutinized the data for evidence of application of competencies and allocated appropriate grading according to how the graduates applied the 23 management competencies in the framework. The two non-management competencies were used to compare how these skills affected the application of PAMCs. The researcher passed through the transcripts several times to ensure consistent grading. Finally, simple descriptive statistics were calculated.

Graduates were categorized as low, medium or high applying of PAMCs according to the cumulative grades. The relationships between these grades of application, the structural and functional dispositions of the graduates and the themes derived from qualitative analysis (see *Appendix P*) were investigated for patterns and interdependencies to identify the factors influencing application of PAMCs.

4.3.6 Summary

An embedded multiple case study design was used as described by Yin (2004), employing qualitative measurements to analyse three entities, namely the curriculum, the graduates and secondary informants who are knowledgeable about the management activities of the graduates.

The full cohort of 34 students who had graduated with the PgDCEH was targeted for the questionnaire survey, of which 26 returned completed questionnaires. A sample of 16 graduates was purposively selected to undergo in-depth interviews along with their SKIs. Eventually, data saturation was reached after 15 graduates and their SKIs had been interviewed.

The questionnaire data was analysed using simple descriptive statistics. In addition to these findings, the responses from open-ended questions were used to triangulate findings from the interview data. The interview data was analysed using qualitative techniques. Through deeper scrutiny of the data, grades of application of the PAMCs were determined. These grades were used to determine the factors that enabled or constrained application of the PAMCs.

4.4 How have we ensured quality, validity and ethical conduct of the study?

All study designs have specific strengths and weaknesses, which should be considered when selecting the appropriate research strategy. The research question, the purpose of the research, the availability of existing knowledge about the topic, the availability of data to be collected and the researcher's own knowledge, expertise and philosophical assumptions determined the study design selected.

For qualitative research, Yin (2011) recommends the following competencies in the researcher: listening, asking good questions, knowing the topic, caring about the data, ability to do parallel tasks and perseverance. Many of these skills are frequently acquired during the conduct of the research, mainly because the requirements for doing qualitative research are rarely understood up front.

4.4.1 Quality

Quality of data was secured by selection of the appropriate study design, utilization of sturdy methods which incorporate measures for optimal validity and reliability. These were checked by Thomas and Harden's (2008) twelve criteria for the quality of studies. Additionally, conscious effort was made to hone the researcher's skills in the conduct of good quality research. These includes listening, asking questions, knowing the topic, caring about data, doing parallel tasks, persevering, managing the research, setting and maintaining standards and ensuring ethical conduct of the study. (Savenye and Robinson, 2005)

Furthermore, industry standards of data safety and integrity were adhered to, including using safe and secure computer and internet facilities, making regular backups up of data on a separate data storage device, observing version control of protocols, appendices and data collection tools and securing access to study data to the researcher only.

4.4.2 Validity and trustworthiness

Bias can creep in at every point of the research. (Stock, 2015) This needs to be controlled, for but may not be entirely avoidable. (Simundic, 2013) Achieving trustworthiness and credibility is necessary for the reliability of data generated using qualitative research methods. (Lincoln & Guba, 1985 and Schwandt, Lincoln and Guba, 2007) Interviews provide secondary, interpreted or constructed data which highlights the issues of reliability due to recall and social desirability bias. (Booth, 2008) Analysing the data requires the researcher to make his own discoveries, which may further distort the findings.

Throughout the course of data collection and analysis, the researcher implemented strategies to ensure confirmability, dependability and credibility was secured as far as possible. *Table 22* shows the strategies that can be employed to strengthen trustworthiness of the research findings.

Table 22: Measures to ensure the quality of research findings[16]

	Components of trustworthiness	**Description**	**Strategies**
Objectivity or neutrality	Confirmability	Findings are the product of the inquiry and not that of the researcher	Audit trail Triangulation Reflexive journal
Reliability	Dependability (consistency, passing audit)	Variations explained when repeated	
Internal validity	Credibility (truth value)		Referential adequacy Prolonged engagement Persistent observation Peer debriefing Negative case analysis
External validity	Transferability	How can the findings be applied in other settings	Thick description Purposive sampling

[16] Synthesised from Yin (2011), Lincoln & Guba (1985) and Lincoln, Guba & Schwandt (2007).

Throughout the data collection and analysis stages of the research, the researcher constantly reflected on the interview responses from the graduates and the SKIs, the observations of their spatial and interactive behaviours and the information gleaned from the additional sources perused. This was done by perusing the written notes taken and repeat listening to the audio recordings. The researcher constructed graphic illustrations of situations and relationships to aid self-reflexivity. In thinking about this, the researcher always kept foremost in the mind the critique of the intended audience of the research (the academic supervisors and the broader eye care stakeholder group).

Additional measures implemented to strengthen credibility included triangulation methods (Flick, 2018) involving the line manager verification and perusal of supporting documents. Prolonged engagement and reflexivity of the researcher also contributed to the credibility of the data and findings. For increased dependability, the three supervisors of the research study audited the research process at various stages and from different perspectives.

As the researcher engaged personally with the phenomenon, neutrality and the presence of mind was essential. (Patton, 2002) Chan, Fung and Chien (2013) demonstrated the use of "bracketing" whereby researchers are required to put aside their (own) knowledge, beliefs, values and experiences to accurately describe their participants' experiences. However, it is acknowledged that pre-understandings could not be eliminated or bracketed in this study.

Regular consultation with the research supervisors further contributed to counteract the inherent weaknesses of qualitative enquiry. This is further discussed in Chapter 8 under "Reflections on the study procedures". For external data security checks, data integrity was made, along with corrections after each interview. Being a real-life-setting study and using a total sampling strategy strengthened the study's external validity.

4.4.3 Ethics

Murphy and Dingwall (2007) speak of ethical theory that relates to a common set of goals that decision makers seek to achieve in order to be successful. Four of these goals include beneficence, least harm, respect for autonomy and justice (Chonko, 2018), briefly defined below:

- Non-maleficence - research should inflict least harm of participants.
- Beneficence - research on human subjects should produce some positive and identifiable benefit rather than simply be carried out for its own sake.
- Autonomy or self-determination - research participants' values and decisions should be respected.
- Justice - all people should be treated equally.

Ethical clearance

Ethical clearance was sought from the University of Cape Town before embarking on the second phase of data collection, i.e. in-depth interviews with the sampled graduates and their SKIs. This included requests for approval of a new consent form and additional data collection tools. Approval was also obtained from the various employers (Ministries of Health, non-governmental organisations and facility managers) before proceeding with the second phase of data collection.

Informed consent process

For the survey, respondents were advised that submission of the completed questionnaire implied consent. The aspects of beneficence, autonomy and confidentiality were explained in the cover message which accompanied the questionnaire.

All participants in the interview and document review phases of the study were required to provide informed consent, as stipulated by the University of Cape Town's Research Ethics Committee. Information and consent documents (*Appendices C, H and I))* were provided to prospective participants before the commencement of the interviews, in addition to the verbal explanation of the key elements of the research, that is the aims, purpose and objectives. The consent document spelt out the rights of the participants, in relation to confidentiality and autonomy as well as risks and benefits of participation in the study.

To give consent, the researcher explained the aim and purpose of the study and answered any questions the prospective participant may have had. Only after they assured that they wanted to participate, participants were asked to sign the consent form. Only graduates who have signed consent were eligible to participate. Participants were also asked to give permission to the researcher to utilize their records produced during their training. Participants received a copy of the signed consent form which contained a summary of the key information of the study.

Privacy and confidentiality

The questionnaire survey was conducted via email. There was no exchange of the data contained in the completed questionnaire between participants or between participants and any other individuals. The researcher was the only one who had access to that information. The data security measures described above were strictly applied and adhered to. The in-depth interviews took place in privacy with only the researcher and the participants present. The interviews were recorded for transcription purposes and the recordings were archived for destruction after completion of the study.

Reimbursement for participation

Participants received no remuneration for participation. The study provided a small gift as a token of appreciation for affording the researcher the opportunity to do this study.

Emergency care and insurance for research-related injuries

This was a low-risk study and as such no research-related injuries were foreseen. The protocols of the host institution were applied should emergencies have occurred during the time of the researcher's interaction with the participants.

What happened at the end of the study?

After the field work was completed, the research team made data analysis and interpretation, formulating it into a dissertation. At study completion, electronic and paper records will be archived, and the participants will receive a copy of the research report and links to all relevant papers that will be published from the dissertation.

4.4.5 Summary

Measures to ensure high data quality and validity were implemented from adoption of the methodological approach to the collection and analysis of the data. Trustworthiness was strengthened through constant reflexion, triangulation within and between data sets and maintaining adequate referencing of the data. The researcher's embeddedness in the participant's real-life contexts strengthened validity. Purposive sampling helped to ensure that the phenomenon was studied in rich detail.

4.5 Delimitations and assumptions

The research was limited to the perspectives of the PgDCEH graduates of 2009 to 2013 (inclusive) and the eye care activities and achievements associated health system effects within the contexts of the health programmes in which the graduates worked up to the time of the enquiry. The influence of previous management training and experience was not taken into account in the interpretation stage. Only the qualitative need for management capacity development in the settings under investigation was determined and made no quantitative assessment of need. No attempt was made to assess the graduates' knowledge, skills and understanding of management concepts or focus on any achievements outside the health system.

The main assumptions included the following:

- That the PgDCEH curriculum was delivered as intended;
- That improving management capacity was health system strengthening; and
- That graduates had attained the knowledge and skills proposed in the curriculum.

4.6 Concluding remarks

The study investigated the personal, work and programme changes that occurred after the graduation of PgDCEH students, in relation to their application of PAMCs. Inductive engagement with the graduates and their contextual environment enabled the researcher to construct the knowledge base through which the findings were generated. This meant that the researcher was an integral part of the knowledge-generating process, hence sturdy methodologies were necessary.

The research approach was mainly inductive but deductive when doing quantitative analysis. The research strategy was two-phased, using mostly qualitative and some quantitative strategies. The research design used was that of embedded multiple case studies as described by Yin (2004). The data collection strategies included a questionnaire survey, in-depth interviews and data reviews. The data analysis techniques included thematic and content analysis as well as simple descriptive statistics.

Throughout all the processes (sampling, data collection and analysis), the researcher constantly tested the theoretical propositions of the study. The study instruments, including the survey questionnaire, the interview guide and questioning schedule were designed to extract data to answer the research question. The researcher consciously aimed at limiting the effect of bias, through effective questioning and listening techniques. The data thus collected was analysed using a combination of simple descriptive statistical analysis and qualitative analysis. The study complied with all ethical provisions and no protocol violations occurred.

The methods used in the study to investigate how the PgDCEH graduates applied the PAMCs have now been described. The next section deals with the findings of the research and is comprised of three chapters entitled: *"The graduates in context", "Application of the management competencies" and "Factors influencing application".*

Chapter 5: The graduates in context

The Postgraduate Diploma in Community Eye Health (PgDCEH) is a one-year, part-time, blended learning programme aimed at developing management competencies in eye care programmes. The next three chapters present the findings of the research to determine how the PgDCEH graduates managed to apply the competencies acquired during their studies after returning to work, what the factors were that enabled or constrained them, and how these affected the performance of the eye care programmes in which they worked.

The study design was that of an embedded multiple case study, using mixed methods of data collection, construction and analysis. At the time of commencement of the study, a total of 34 students had graduated from the PgDCEH since its inception. The full cohort was invited to complete an exploratory questionnaire, of which 16 were selected purposively for in-depth interviews.

In this chapter, the characteristics of the graduates of the PgDCEH between 2009 and 2014 are discussed along demographic, education and employment lines, mainly derived from the survey questionnaire they completed and returned. Their work roles, position and professional status at the point of investigation are a further expansion of their employment status. The graduates self-reported abilities are described, related to management functions and their conception of the performance of the eye care programmes and the health systems in which they work. This is concluded with a description of their own work performance and the challenges and achievements on a graduates and programme level.

5.1 Who are the graduates?

Between 2009 and 2014, 36 students enrolled for the PgDCEH, 34 graduated and two failed to complete the programme. The students came from 14 different countries in Africa and two countries in Asia. There were more males than females (61.7% vs 38.3%), aged between 31 and 56 years and were mostly eye care professionals. The majority had diploma-level eye care qualifications. There were six with advanced degree qualifications and two with certificate level education. Eight of the candidates were accepted into the programme through the Recognition of Prior Learning policy (see *Glossary* for explanation).

Of the 34 graduates, a total of 26 graduates (16 males and 10 females) returned completed questionnaires by the end of the data collection phases (*Figure 21*), a response rate of 76.5%. The median age of the survey respondents was 43 years with a range of 35 to 56 years of age.

Nineteen (19) of the 26 survey respondents were from the southern African region, of which six were South Africans. Of the rest, one each came from Central and West Africa respectively, four from East Africa and one from Asia. Survey participants were broadly representative of each of the years, as detailed below. Interviewed participants were selected from 2009 to 2013, inclusive, although no 2009 graduates were amongst those interviewed.

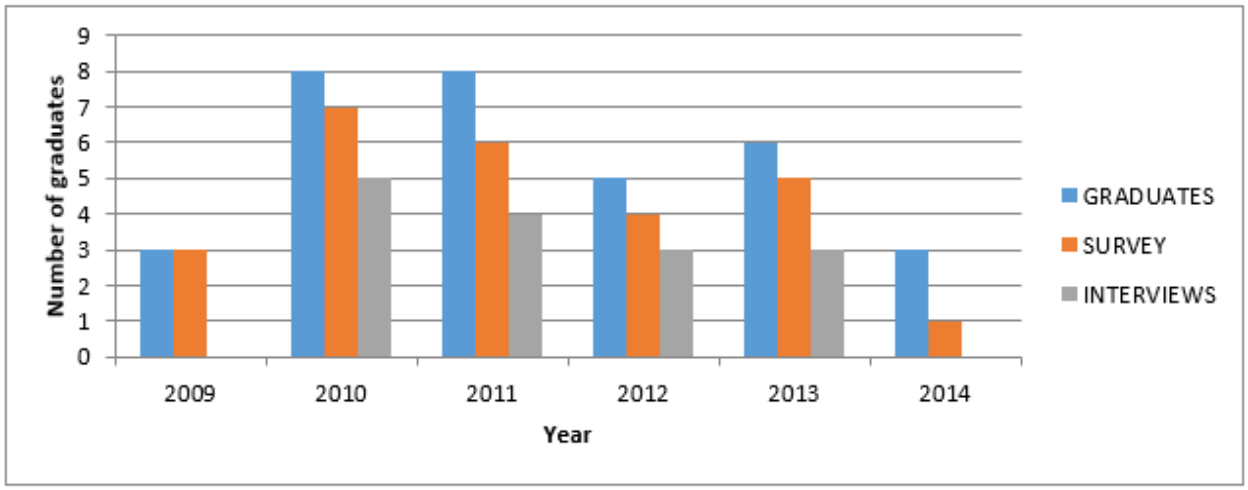


Figure 21: Number of graduates, survey respondents and interview participants per year

Sixteen respondents were mid-level eye care workers (either ophthalmic clinical officers or ophthalmic nurses). The rest was made up of four optometrists, one ophthalmologist, two medical officers, a clinical nurse practitioner and two health administrators.

Before the PgDCEH, 16 survey respondents completed their highest qualification at universities and ten at colleges and other institutions. Most of the respondents held qualifications in the ophthalmic and optometric fields, with a few qualified in general nursing, general medicine and non-eye health degree programmes. Further educational characteristics are summarised in *Table 23* (below).

Table 23: Educational characteristics of survey respondents

	Master or doctorate	Bachelor's degree	Diploma or certificate	Total
Duration of study (2 or 3 years)	0	3	9	12
Duration of study (4 or 5 years)	0	6	3	9
Duration of study (6 years or more)	5	0	0	5
Total	5	9	12	26

The survey respondents' work stations were based at a health care facility (n=5), district (n=7), provincial (n=4), national (n=8) and in NGO (n=2) directed programmes. Twenty (of 26 respondents), i.e. 76.9% were employed by the Ministry of Health and 16 (i.e. 61.4%) were in coordinator roles, with the rest in clinician roles. The coordinators' main work role involved administration and organisation of activities to ensure that clinicians can deliver direct patient health care. The coordinators' work scope ranged from district to national level. Those working in the Ministry of Health were mostly deployed in programmes, whereas those working in NGOs were deployed in projects.

Seventeen (65.4%) of the survey respondents' studies were funded to study through NGO-provided scholarships, of which 12 were administered by the University of Cape Town's Community Eye Health Institute. A further seven (26.9%) were funded by the Ministries of Health and two were self-funded. The South African and Namibian Health Departments provided bursaries for all their employees doing the course. The main NGO sponsors were CBM, Fred Hollows Foundation and the Nuffield Foundation that supported a combined total of 12 students over the period.

Ten of the respondents' job titles (at the time of submission, i.e. after qualification) included their cadre name, twelve included the terms "coordinator" or "manager" and the rest had "tutor", "advisor", "officer" or "director" in their job title. The majority (n=15, i.e. 57.7%) cited "Director"-level persons as their direct line manager, with "clinicians" and "managers" also featuring. Fifteen subordinates, mostly clinicians were supervised by the respondents, with nurses and nursing staff as the most common. A few high-ranked respondents were responsible for the supervision of coordinators (n=5) and managers whilst two reported that they did not supervise anyone.

The respondents reported a wide range of activities that made up their daily tasks, including management, clinical, administration, organising and marketing duties. Seventeen respondents reported management duties (staff, equipment, supplies, finance, stakeholder relations) comprising more than 75% of their workload, whereas three reported that management tasks made up between 0 and 20% of their workload.

The minimum time respondents spent after graduation with the PgDCEH until completion of the survey questionnaire ranged from two to 6 years, see *Figure 22*. Because of the small, purposively selected sample, it was not possible to determine whether this variation in exposure had any effect on the level of application of PAMCs by the graduates.

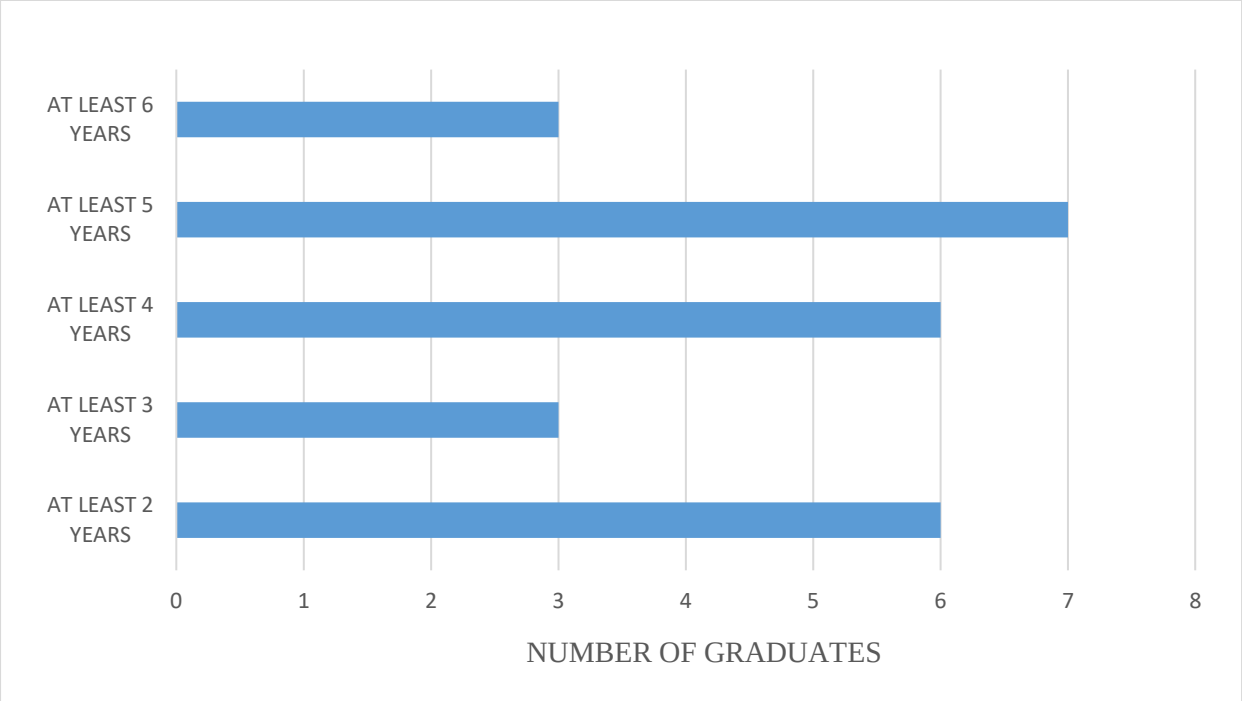


Figure 22: Graduates' time since graduation to apply their PgDCEH competencies

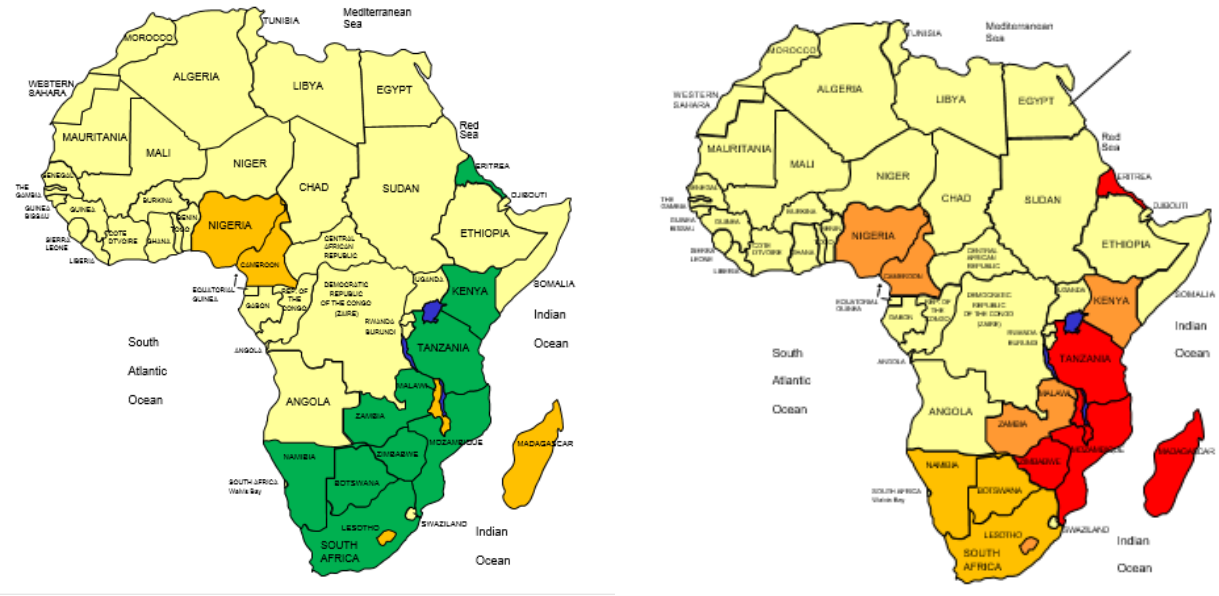
5.2 Where are the graduates?

The graduates work in health systems which share many similarities in terms of socio-economic status, health infrastructure and services and population characteristics and dynamics. Although some countries are differently classified according to income status, they all have high poverty rates, high disease burdens and bell-shaped population pyramids which are typical of LMICs.

Of the 16 countries represented over the study period, graduates from 14 countries returned completed questionnaires. While no countries were specifically excluded from the interview phase of the data collection, the purposive selection process resulted in seven countries not represented. Participants from Nigeria and Cameroon (West and Central Africa), Madagascar (French-speaking graduate), Malawi (country with most graduates after South Africa) and Lesotho (most recent graduates) were not included. This may represent a limitation to the thematic generalization of the findings.

The maps (*Figure 23*) illustrate the distribution of study participants by type of contribution and according to the World Bank Income classification[17].

[17] Created through http://www.mapsfordesign.com/free-samples/ Accessed 23 August 2018



	QUESTIONNAIRE & IN-DEPTH INTERVIEWS		LOW INCOME
	QUESTIONNAIRE ONLY		LOWER MIDDLE INCOME
	NOT PARTICIPATING / NOT REPRESENTED		UPPER MIDDLE INCOME

Figure 23: Study participant distribution maps

There are commonalities in areas such as the bureaucracy of the health systems and the challenges faced when attempting to improve eye care services. They all have shortages of an adequate health workforce, funding and infrastructure for eye care. The differences relate mainly to the involvement of the private sector in health care, political changes and the access to free services to the poor in the population.

The focus of eye care services in most graduates' programmes is on blindness prevention initiatives, with the prevalence of avoidable blindness between 0.5 – 0.75%. Cataract, refractive error, glaucoma, diabetic retinopathy and childhood blindness are the main causes, although corneal scarring due to trachoma is endemic in some areas. The cataract surgical rate (CSR) is well below a target of 2000 whereby only 400-1000 cataract operations are performed per million population per year.

The graduates' perceptions of the adequacy of the eye health elements of service delivery, referred to here as "disease control", human resource development, infrastructural development and availability of funding, derived from the questionnaire responses, are illustrated in *Figure 24* (below). The questionnaire provided for the survey respondents to rate these elements as "adequate", "inadequate" or "not sure" based on the statistics reported on the same template.

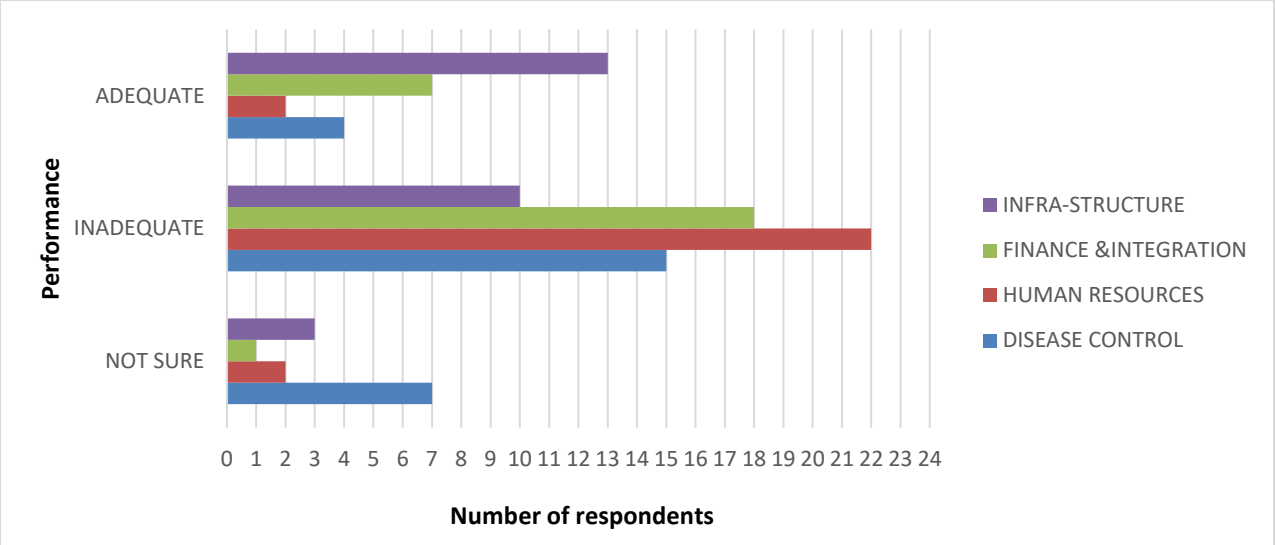


Figure 24: Eye care programme performance, as rated by the survey respondents

Most survey respondents reported inadequate eye care programme performance, typified by failure to meet disease control targets, a lack of adequate human resources, low financial provision and limited infrastructural resources for eye care. Some respondents returned an "adequate" ranking, and mostly so for "infrastructure". The "unsure" ranking was mostly due to unavailability of up-to-date information about the relevant eye care programmes. This related mostly to respondents not directly involved in eye care programme management.

Only four (15.4%) of the 26 survey respondents thought that disease control in their eye care programmes was adequate, while fifteen (57.7%) thought it to be inadequate. A relatively large proportion (26.9%) was unsure of the adequacy of disease control. Twenty-two (84.6%) thought that human resource development was inadequate, and eighteen (69.2%) thought the same of finance and integration of their eye care programmes. Infrastructural adequacy was reported by 50% of the graduates. This is in keeping with patterns observed through review of supplemental documentation, and reflections of the main challenges in eye care programmes before the training.

Almost 85% of the respondents thought their own performance was "adequate" or "high" while less than 60% of respondents thought the same of the programmes they worked in. The above patterns clearly indicate that some graduates' opinions about their own work were partial and regarded their situation superior to their surroundings. *Figure 25* shows how most of the respondents rated the strengths of their health system as "low", while more than half rated their eye care programme as "adequate" or "high". The "poor" and "very poor" rankings were combined and tagged as "Low" while the "good" and "excellent" ones were combined and tagged as "High".

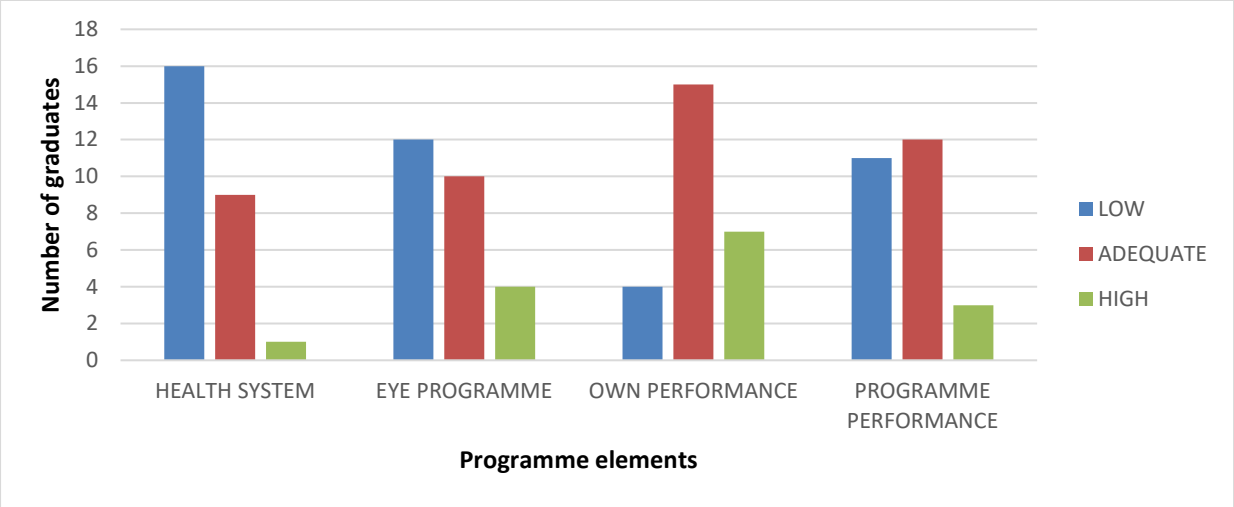


Figure 25: System and programme strength, rated by the survey respondents

In drawing a country profile of the study cohort, only those graduates who were selected for the interview phase were considered. The sample included three graduates from countries[18] *(see Table 24)* with a population around 50 million (South Africa, Tanzania and Kenya), four countries with a population between 10 and 30 million, and two countries with population just over two million. Some (Botswana, Namibia and South Sudan) have a very low population density, due to large surface areas. Others are large, with pockets of high population density.

In most of these countries, the proportion of the population 50 years and older is between 10 and 12%. There is a vast variation in health expenditure, with South Africa and Namibia having the highest (>8% of GDP) and South Sudan as low as 2.7%. All countries except South Africa have very low physician: population ratios and nurse: population ratios. South Africa has the highest nurse density in Sub-Saharan Africa as well as a strong private health sector, compared to the other countries. In the table, selected indicators show the relative similarities and differences between the graduates' countries.

All these countries have cataract surgical rates (CSRs) below the target needed to eliminate avoidable blindness whilst most have a high prevalence of blindness and inadequate numbers of ophthalmic surgeons available to provide sight-restoring treatment. Optometrists, who are centrally involved in restoring sight through correction of refractive error, are in over-supply on average in the Sub-Saharan African region but are poorly distributed so that many countries do not have adequate numbers available.

[18] BOT = Botswana, SAF = South Africa, KEN = Kenya, TAN=Tanzania, MOZ=Mozambique, NAM=Namibia, ZAM=Zambia, ZIM=Zimbabwe, SSU = South Sudan. NK= Not known

Table 24: Selected indicators of participating graduates' countries[19]

INDICATOR	BOT	SAF	KEN	TAN	MOZ	NAM	ZAM	ZIM	SSU
Total population (2015) millions*1	2,26	54,49	46,05	53,47	27,97	2,45	16,21	15,60	12,34
Total expenditure on health as % of GDP (2014) *2	5.4	8.8	5.7	5.6	7	8.9	5	6.4	2.7
Prevalence (%) of avoidable blindness in people > 50 years *3	3.30	1.30	2.50	2.40	3.20	NK	2.3	3.10	NK
Cataract surgical rate (CSR) 2016*3	1490	847	494	518	333	NK	690	631	240
Physician ratio per 10000 population*4	4	7.8	2	0.3	0.4	3.7	1.7	0.8	NK
Nurses ratio per 10000 population*4	33.5	51.1	8.6	4.4	4.1	37.5	7.8	13.4	NK
Ophthalmologists / million population*3	4.4	5	2.1	0.6	0.8	4	1.1	1.4	NK
National eye care coordinator	YES	YES	YES	YES	YES	YES	YES	YES	YES
Active National Eye Care Committee	NO	NO	YES	YES	YES	NO	YES	YES	NO
National eye care strategic plan	YES	YES	YES	YES	YES	YES	YES	YES	NO

All countries have national eye care coordinators and all but one have national eye care strategies in place. Reports of the existence of national eye care committees are unreliable as the activity of these bodies is differently defined from country to country. These committees are instrumental in setting up eye care planning and coordination mechanisms in-country, according to the VISION 2020 strategy. Overall, the profile of those selected for the interview phase resembled that of the entire cohort of 35 enrolled students in terms of demographic, geographic and employment status.

[19] Sources: 1. World Bank; 2. World Health Organisation; 3. International Agency for the Prevention of Blindness (IAPB); 4. Human Resources for Health IAPB Human Resources for Eye Health Strategic Plan

5.3 What are their self-reported abilities?

Simple descriptive analysis of the 26 completed survey questionnaires received revealed that 15 (58%) worked mainly in the management echelon of their eye programmes, holding post titles such as "Coordinator", "Manager" or "Director". The remaining 42% worked as clinicians, providing clinical eye care directly to patients. Respondents self-reported an average of 71% of their workload to be management-type, with a range of 0-100% and a median of 80%. The proportions, which were adjusted following further document review suggested that the average was 59% (range 25-100%) and the median was 50%. This discrepancy is likely due to ambitious self-reporting. Thirteen (50%) of these respondents were in mostly clinician, seven in "administrator" and six in "manager" roles. Ten of the respondents reported to director-level line managers, seven to clinician-type and nine to manager-titled supervisors.

The graduates were asked to rate their ability to perform key management functions/tasks as either "poor", "average", "good" or "excellent". A total of 13 tasks were listed, including aspects of people, information, resource management communication, problem-solving and planning. Their own ratings for two non-management skills, i.e. clinical tasks related to eye care and the use of computers to produce and use documents for management purposes were also requested. These two, while not "management" tasks were important determinants of graduates' academic performance during their studies. *Figure 26* shows that "good" was the most common rating of the 13 abilities, suggesting a high degree of confidence in most competencies, except for those related to finance.

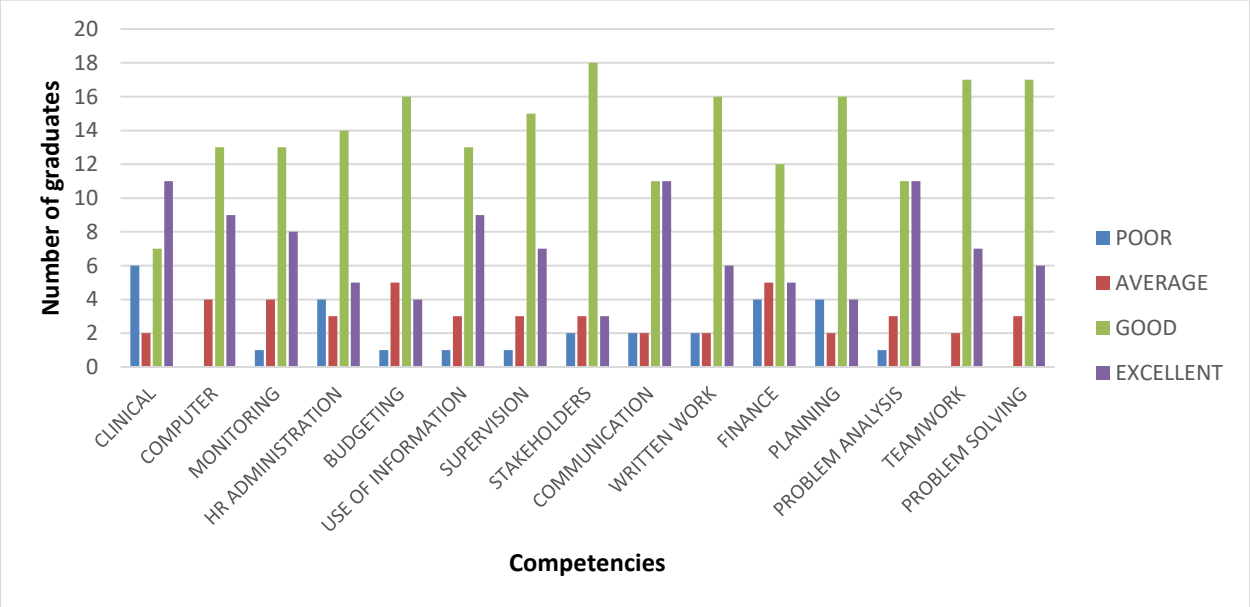


Figure 26: Self-reported abilities of key management tasks (from survey questionnaire)

To compare the respondent skills with their programme contexts, the Likert scales were assigned numerical values: 1 for "poor" and "very poor", 2 for "average, 3 for "good" and 4 for "excellent". A total score was then calculated and coverted to percentage, using the maximum as denominator. Nine of the survey respondents' aggregated ratings of their abilities to perform the 13 management tasks were 80% and greater, 15 were between 50% and 80% and two were 50% and below (see *Figure 27*). A total of 17 (65%) of the respondents rated the programme environment lower than their own abilities, with only 6 (23%) rating it higher than 80%. The programme environment or context rating represented the performance of themselves, the programme and health systems they worked in.

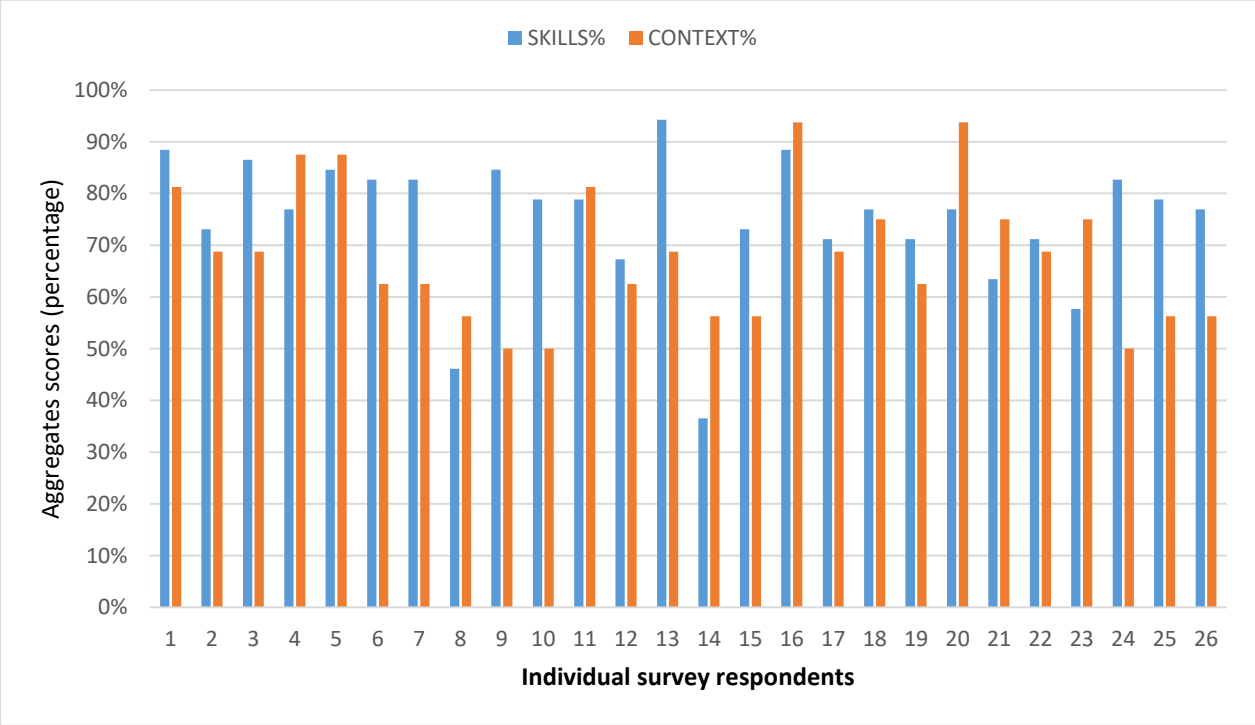


Figure 27: Comparison of Respondent skills (abilities) and Programme context

A further consideration was that the questionnaire responses suggested the confidence the graduates had about their abilities to perform these tasks. This may be quite different from the competency they possess and apply in the real-life setting. For example, after having analysed the interview data, we found that one of the lowest appliers of PAMCs returned the second highest total score. The same participant carded the second most "excellent" ratings. It is suspected that more of these inconsistencies exist between the confidence and the actual competency to perform the task (discussed in the next chapter). While "problem-solving" and "working in teams" were the most frequently self-reported abilities, "human resource management" and "finance administration" were the least applied abilities.

5.4 What are the achievementsand challenges of survey respondents?

The survey respondents were invited to share their frustrations and challenges in response to open-ended questions. They mentioned a few achievements, including career promotions, developing and implementing and managing new projects. However, apart from these few personal, career-related achievements of some graduates, no significant programme achievements were reported.

Table 25 is a summary of the challenges reported by one survey respondent, which is representative of the challenges the graduates reported during their studies. These were also commonly reported by participants of the capacity building workshops held by the IAPB, for building capacity in National Eye Care Coordinators.

Table 25: Survey respondents' challenges and frustrations

CHALLENGES REPORTED
Lack of financial support- no designated budget for eye care programmes.
Eye care not just considered a health priority and not fully integrated into PHC activities.
Inadequate eye care personnel – eye care managers, eye surgeons, ophthalmic nurses, clinical officers.
Lack of designated eye care infrastructure – no eye theatres, no eye wards, in most health facilities no reserved spaces for eye care services.
Inadequate eye drugs, equipment and supplies – No refraction kits, no supply of readymade spectacles and other than tetracycline eye ointment (and other) eye antibiotics
Lack of eye care partner organisations – local/international organisations. Most programme donors / funders not interested in eye care.
Lack of career progression for eye care workers resulting into staff exodus. Most eye care workers have joined other well-funded health programmes.
Eye care qualifications not well recognised and do not attract pay rise nor change of salary scale. This does not attract health personnel to joining eye care teams.
Lack of transport to undertake outreach programmes. No motorbikes and no motor vehicles, hence most of the planned outreach activities remain on paper.
Lack of trained community eye care volunteers.
Lack of referral system for eye patients.
Lack of up to date prevalence data
Lack of eye care managers.

While the abovementioned challenges were mostly expected, a few were completely unexpected. These include challenges related to lack of line management leadership, that the PgDCEH-acquired skills and qualification not recognised by the Ministry of Health and the low support for eye care from the Ministry of Health. These and other challenges are briefly discussed here.

"*Poor line management leadership*" is reported by four of the 26 survey respondents in some form or another. One observed that senior team members "*do not take the initiative*" to advocate for improved eye programme resourcing. Another felt that the line manager was "*not interested in eye care*", with a third one blaming this on the fact that the line manager was "*not trained in management*".

Several survey respondents related their PgDCEH training as a qualification their line managers did not have. Even so, some felt helpless and had "*little power over Ministry of Health structures".* Some went on to either see themselves as "*specialists in management"* wherein most line managers are deficient, or as "*under-utilized resources*". Furthermore, the qualification or the post (eye care programme manager) is not recognised by the employer or by the eye care team, causing some frustration. One respondent could find "*no post in the Ministry of Health to practice new skills*", but applied his skills in a non-eye care project. Two others were "*not in position to apply management skills*", mainly because they were "*not directly working in eye care*".

While the "*low budget available for eye care"* signified a lack of support provided by Ministries of Health for supporting eye care programmes has been a common challenge throughout the region, some respondents identified specific weaknesses in the design of eye care programmes. These include "*no current eye care plan, waiting for national plan"* and *"poor coordination at district level"*. Because of *poor planning and budgeting for eye care"*, in some programmes, "*most consumables must be imported*", and in others, "*ophthalmic nurses work in general wards*".

"Lack of opportunities for professional development" was also a concern for some, while "*cost curtailment*" was affecting programme activities adversely, prohibiting two respondents from performing their duties (one clinical and another administrative). This was worsened in some settings because of "*lack of sponsorship after NGOs withdrew funding*".

One graduate described the "*unhealthy rivalry between ophthalmologists and optometrists"* in rich details, recounting the effect of diminished access to quality, efficient services to the people of his community. Political meddling and opportunism are blamed for this.

5.5 Concluding remarks

The questionnaire survey opened a window onto some key attributes, activities and challenges graduates were experiencing in the workplace, in their quest to apply their PgDCEH-acquired competencies for improved eye health programme outcomes.

The completed questionnaires were submitted by professional level people, with approximately double the proportion of males than females. Pre-PgDCEH qualifications from certificate to doctorate level were represented. More than three quarters of the respondents were employed by the Ministries of Health.

Survey respondents represented 13 countries from Southern and East Africa, and one from Asia. They came from mainly low- and middle-income countries in Africa. Typically, these countries had high prevalence of blindness, low ratios for health care practitioners and low CSRs. One country, Botswana is an outlier, with higher human resource ratios and CSR. The non-representation of West Africa and Malawi is noted as one of the limitations of the study.

According to most of the survey respondents, the health systems of the countries, and the eye care programmes in which they work are generally weak. They felt that the eye care programmes' performance is inadequate with regards to disease control, human resource development and finances and coordination, but infrastructural development was mostly adequate. Surprisingly, respondents declared that they were performing well, despite their programmes not meeting key performance targets.

More than two thirds of the respondents reported that they spend more than 75% of their work time doing "management" work, being responsible for managing staff, infrastructure and stakeholder relations. Respondents regarded their ability to perform key management skills as "good", although some "excellent" and "poor" ratings were given to some skills. Some graduates had longer exposure to the work environment after PgDCEH graduation than others at the time the questionnaire was completed.

The graduates reported many of the challenges that were reported in IAPB publications in the region over the last decade or so, refer to *Appendices M and Q*. However, some new and intriguing challenges and perspectives were reported, which may have relevance in how the PgDCEH-acquired management competencies were applied in the workplace. This is further explored in the next section.

Chapter 6: Application of the management competencies

This chapter deals with how the graduates were applying the PgDCEH-acquired management competencies (PAMCs). Typical low, medium and high applying graduates are presented, highlighting the key differences and commonalities. Cases illustrating unexpected or outlying findings are presented. An analysis of how competencies are applied, individually and in groups, is also presented.

Following analysis of the survey questionnaires, sixteen graduates, deemed to be able to provide detailed information about the application of the management competencies, and the factors enabling or constraining their application, were selected for the interview phase. Eventually, a total of 15 graduates and their secondary key informants (SKIs) were interviewed over a 20-month period, yielding a total of 30 interviews (See *Figure 28*). All but one of the interviews were personal, face-to-face and audio-recorded, subsequently transcribed and then analysed by the researcher. One interview with a SKI was held via telecommunications (Skype).

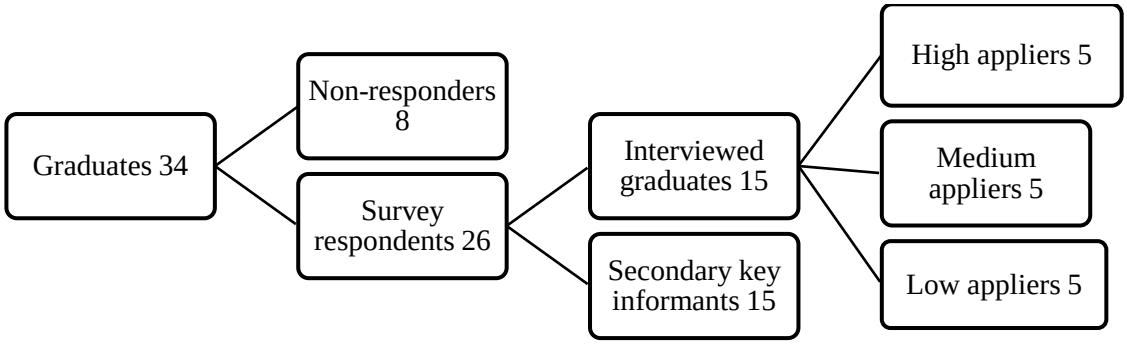


Figure 28: Study participation outline: the categorization into high medium and low appliers was derived from the analysis of data from the interviewed graduates and their SKIs.

The 15 interviewed graduates had a median age of 42 years, ranging from 40 to 62 years of age when they studied for the PgDCEH. Further characteristics of the interview phase participants appear in *Table 26*.

Table 26: Gender, education and employment composition of interviewed graduates

Gender	Male: 9	Female: 6
Education	University: 9	College and other: 6
Employment	Ministry of Health: 9	NGO including private: 6
Role in employment	Coordinating, managing: 9	Clinical and teaching: 6

Table 27 (below) contains the case listing of the interviewed graduates. More detailed case summaries appear in *Appendix Q*. Throughout the dissertation, reference to the individual cases or their verbatim quotes are tagged with their case number in square parentheses. The same graduate's secondary key informant will be assigned a suffix "S". For example, indicating case number 3 will be labelled [3], and the secondary key informant [3S].

Table 27: Graduate case list

Case number	Who is the graduate?	What is the graduate doing?
1	Female, Social scientist	Coordinating district health support programme (not specifically eye health)
2	Female, Ophthalmic nurse	Coordinating national health promotion services
3	Male, Ophthalmic nurse	Coordinating provincial eye care programme
4	Female, Optometrist	Providing clinical optometry services at primary care facility
5	Male, Ophthalmic nurse	Coordinating provincial eye care programme
6	Female, Ophthalmic nurse	Coordinating national eye care programme
7	Female, Ophthalmic clinical officer	Coordinating regional eye care programme
8	Male, Ophthalmic clinical officer	Coordinating national non-eye care project
9	Male, Ophthalmic clinical officer	Providing clinical eye services at primary care level
10	Male, Ophthalmologist	Providing general medical care in private practice
11	Male, Ophthalmic clinical officer	Providing clinical eye care services at district health facility
12	Female, Ophthalmic nurse	Teaching ophthalmic nursing at nursing college
13	Male, Health technician	Coordinating national non-eye care project
14	Female, Clinical nurse practitioner	Coordinating provincial health primary care directorate
15	Male, Optometrist	Providing clinical services in private practice setting

The previous chapter described the graduates in relation to their demographic and geographic distribution, as well as their work and contextual environments. Despite the variations in their physical and career situations after graduating with the PgDCEH, there were broad commonalities which can be constructed as a typical case of the graduates' positioning in their eye care programmes; see the box on the next page.

The typical case

The graduate is of average / median age of 41 years (between 35 and 55 years of age), generally a black African and comes from any one of 17 sub-Saharan African countries. The education level ranges from a one-year post-secondary training certificate to a master level clinical specialty or business qualification or doctorate level optometry training.

At entry, the graduate was automatically eligible or was accepted through Recognition of Prior Learning (RPL). If the graduate studied in the first half of the research period, the process of RPL involved completion of an 8-week Certificate course in Community Eye Health. From 2012 onwards, academically ineligible applicants were required to complete an RPL portfolio which was assessed by the selection committee for suitability.

He is employed as a health professional in the Ministry of Health, or as an administrator in a non-governmental organisation (NGO). He is in a post directly related to his professional qualification (e.g. ophthalmology qualification employed as ophthalmologist) and performing clinical eye care as a major component of his work scope. However, some administrative tasks may be interspersed throughout his workday, with management tasks less frequent. If the graduate is in an administrator type post, he may still possess an eye clinical professional education, having administrative competencies mostly acquired through experiential learning.

The graduate is situated in mutually respectful relationships in his workplace, with high degree of teamwork. There is however, a relatively low connectedness between him and his professional network outside his work circle, although he is in regular correspondence with his former teacher and mentor. From time to time there arise some tensions between himself and his line manager, but they are not serious and defused easily because of the strict hierarchies in health facilities.

The strong deviations from the typical case are found in age (e.g. graduate who was 55 years old at the time of enrolment); education (e.g. graduate entered studies with the certificate level education at enrolment); work role (e.g. graduate in educator position); power to change (e.g. graduate moving from Ministry of Health -MoH- to private), power to decide (e.g. graduate funding own studies) and seniority (e.g. graduate at deputy director / acting director level). Only one of these outliers became a high applier, the one entering with the lowest qualification credentials (see Chapter 6, section 2).

6.1 Analytical procedures

PgDCEH students were exposed to a learning environment that attempted to ensure that 23 core competencies were acquired through the various means of instruction, exploration, practice, assessment and feedback.

These are derived from the PgDCEH teaching framework (*Appendix O*) and is the basis of the method used to measure the level of application of these competencies.

The teaching and learning interventions of the PgDCEH are allocated as follows:

- Basic concepts and applications taught: (23 of 23 competencies)
- Additional resources provided for further study (22 of 23 competencies)
- Activities performed to consolidate learning (17 of 23 competencies)
- Formative and summative assessment of learning (14 of 23 competencies)
- Assignments feedback and support (12 of 23 competencies)
- Coaching and mentoring provided as needed (7 of 23 competencies).

All 23 competencies are covered under the "Basic concepts and applications", at minimum through student-driven learning, tutorials, or taught lessons and assessments. The PgDCEH framework allows for increasing practical and applied teaching and learning techniques to focus on those competencies most relevant for eye care programme management in LMIC settings. The last two, "Feedback and support" and "Coaching and mentoring" are applied specifically to in-programme assignments, related to planning and managing eye care services in a real-world setting, see *Appendix S* for examples.

Each of the 23 competencies was tagged with the functions of management (planning, organising, controlling and leading) they were primarily (i.e. its first occurrence in the course schedule) and secondarily (i.e. its second occurrence in the course schedule) associated with. This was necessary so that differentiation could be made between the functions of management that were more commonly applied than others. Because most competencies are represented in more than one of the management functions, at least the two most prominent ones were identified. The course shedule followed this convention. For example, the "Plan and implement monitoring and evaluation activities" competency was tagged primarily as "Planning" and secondarily as "Controlling", because it was first covered during the "Planning/Project management" sub-module and then in more detail during the "Controlling/Monitoring and evaluation" sub-module. *Table 28* contains the list of competencies.

Table 28: Competencies list used in the analysis of interview phase data[20]

NO	COMPETENCY	PRIMARY FUNCTION	SECONDARY FUNCTION
1	Perform clinical eye care to patients on regular basis	NON-MANAGEMENT	
2	Create documents on computer, use email and internet for work	NON-MANAGEMENT	
3	Plan and implement monitoring and evaluation activities	PLANNING	ORGANISING
4	Perform administrative tasks with regards to human resources department	ORGANISING	CONTROLLING
5	Draw up a budget and prepare tools for marketing	PLANNING	ORGANISING
6	Effectively manage assets including inventory, knowledge and information	CONTROLLING	ORGANISING
7	Supervise staff for optimal performance	CONTROLLING	LEADING
8	Effectively manage stakeholder relations	ORGANISING	LEADING
9	Write reports, attend senior meetings and give feedback to team	CONTROLLING	LEADING
10	Communicate about work to on senior/executive level	ORGANISING	LEADING
11	Administer or manage finances of the programme	CONTROLLING	ORGANISING
12	Develop eye care plan for programme implementation	PLANNING	ORGANISING
13	Problem solving and decision-making at work	ORGANISING	LEADING
14	Build and work with teams to meet performance targets	ORGANISING	LEADING
15	Develop human resources of programme e.g. training, recruitment	PLANNING	LEADING
16	Manage conflict and change at work or in personal life	LEADING	CONTROLLING
17	Exhibit personal leadership at work or in personal life	LEADING	ORGANISING
18	Manage health promotion and service marketing plans	ORGANISING	PLANNING
19	Improve service delivery structure and administration	CONTROLLING	ORGANISING
20	Effectively manage programme quality and risk	CONTROLLING	ORGANISING
21	Perform project management activities, e.g. planning, controlling	PLANNING	CONTROLLING
22	Conduct advocacy and resource mobilization activities	LEADING	PLANNING
23	Organise activities for improved eye care programme outcomes	CONTROLLING	ORGANISING
24	Present work at conferences, national meetings, journals	LEADING	ORGANISING
25	Participate in strategic planning and governance	LEADING	PLANNING

A rubric comprised of Likert-scale grades to the levels of application of the 23 competencies was developed. The grades were assigned numerical (ordinal) values from 1 to 5, signifying to what extent the graduates applied the competency after graduation. A categorical type "level" was also assigned to each numerical level (*Table 29*), similar to Sherman (2002) rating system to assess the application of PAMCs from 1 (needs assistance) to 4 (exemplary), but according to the evidence available to support the grade.

[20] "Clinical" and "computer" are non-management competencies included in the framework for analytical purposes. These two competencies are not taught in the PgDCEH and the most common factors influencing the application of management competencies.

Table 29: Competency application rubric grades

	LEVEL	DESCRIPTION
1	LOW	INSUFFICIENT EVIDENCE TO SUGGEST UTILIZATION OF COMPETENCY
2	LOW	LOW UTILIZATION OF COMPETENCY OBSERVED / REPORTED & VERIFIED
3	MEDIUM	MODERATE UTILIZATION OF COMPETENCY OBSERVED / REPORTED & VERIFIED
4	HIGH	HIGH UTILIZATION OF COMPETENCY OBSERVED / REPORTED & VERIFIED
5	HIGH	EVIDENCE OF MAJOR ACHIEVEMENTS ACCORDING TO MULTIPLE SOURCES

Following the review of data from survey responses, interview transcripts and other miscellaneous documents, grades 1 – 5 (meaning low to a high level of application) to the graduates were assigned, for each of the 23 competencies and the two non-management functional areas, according to the rubric metrics. This process was repeated several times until no changes in the grades assigned occurred. *Table 30* contains examples of 13 of the 25 competencies' typical grade 5 level application.

Table 30: Grade 5 competency application examples

	Competencies	Example of grade 5 application [interviewee]
1	Provide clinical eye care to patients routinely	Patients being fitted with prescribed spectacles [04]
2	Create documents on computer, use email …	Tables and graphs created using Microsoft Excel [07]
3	Plan and implement monitoring & evaluation …	M&E framework, tools and statistics developed [06]
4	Perform administrative tasks in human resources …	Staff recruited and deployed in projects [13]
5	Draw up a budget and prepare tools for marketing	Budget and marketing plan available [07]
6	Manage assets including inventory, knowledge …	IEC materials designed and distributed [02]
7	Supervise staff for optimal performance	Staff and organograms available [09]
8	Effectively manage stakeholder relations	Constructive stakeholder relations [12]
9	Write reports, attend senior meetings …	Reports, meetings, feedback verified [14]
10	Communicate about work on senior- level …	Observed and verified through SKI interview [01]
11	Administer finances of the programme …	Responsible for authorising expenditure [09]
12	Develop an eye care plan for implementation …	Eye care plan developed and implemented [13]
13	Problem solving and decision-making …	Organising resources for eye care campaign [03]

The grading of the competencies was derived from the graduate's interview responses to questions about their typical workday and from responses to related questions in the survey questionnaire. Verification with line manager accounts and review of other documents ensured that a realistic competency application grade was assigned. The gradings were interpreted from two perspectives, the graduate level and the competencies level application. This is discussed under their separate sub-headings next.

When scoring **graduate-level** application, each graduate's 23 (excluding the clinical and computer skills) competency application grades were analysed as a single unit. Because the maximum grade assignable was 5, the maximum aggregate score of graduate-level application was 115. Each graduate's total score was expressed as the quotient of their score and the denominator, expressed as a percentage. The categorical grades of the graduates' application were also tallied to classify them as *low*, *medium* or *high*, according to the rubric.

When scoring **competency-level** application, each of the 23 competencies (excluding the clinical and computer skills) as applied by all graduates were analysed as a single unit. Because there were 15 graduates, the maximum aggregate score of competency-level application was 75. Each competency's total score is therefore expressed as the quotient of the competency score and the denominator, expressed as a percentage. The categorical grades of the competency application are also tallied to classify them as *low*, *medium* or *high*, according to the rubric.

6.2 Graduate-level application

The distribution of aggregate application scores on graduate level is shown in *Figure 29.* The 15 interviewed graduates' mean aggregate score was 66.9 with a median value of 63. Graduate [04] had the lowest aggregate score and graduate [13] had the highest aggregate score. Graduates [02], [03], [05] and [011] scored between 40 and 60% of the aggregate, while graduates [06], [07], [08] and [13] scored greater than 80% of the aggregate.

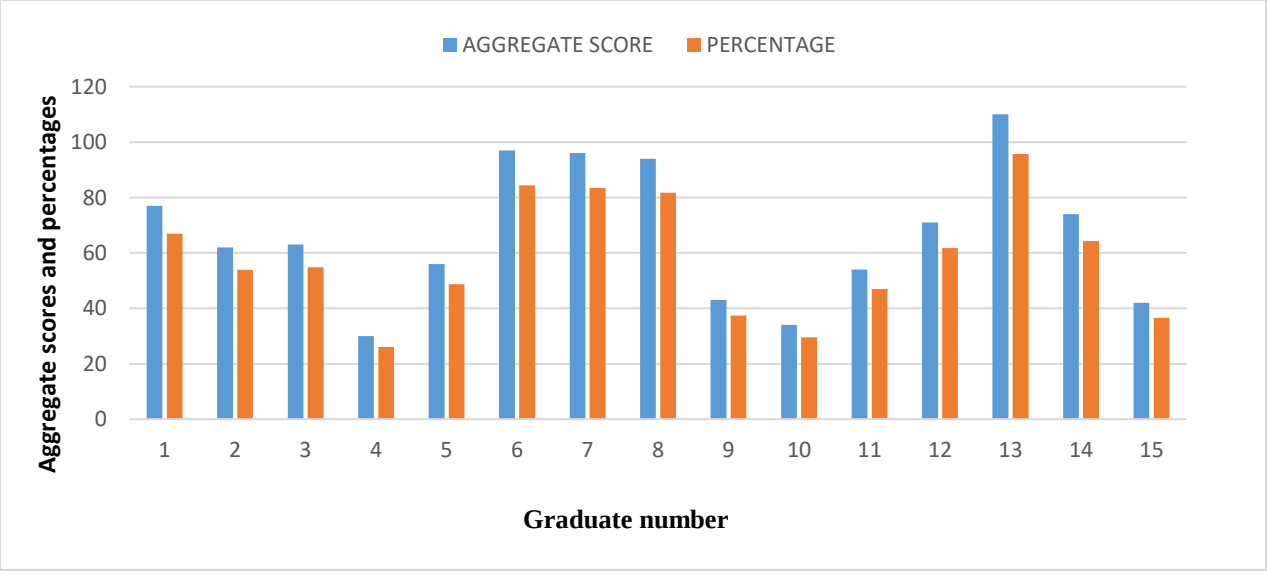


Figure 29: Aggregate scores of individual graduates

The number of competencies graded as “low” (i.e. with grade 1 or 2 level application), “medium” (i.e. with grade 3 level application) and “high” (i.e. with grade 4 and 5 level application) application of PAMCs for each of the interviewed graduates, according to the abovementioned convention is shown in *Figure 30*. Graduates [04], [09], [10], [11] and [15] scored predominantly “low” application grades, whereas graduates [01], [06], [07], [08] and [13] scored predominantly “high” application grades. Graduates [02, 03, 05, 12 and 14] scored predominantly “medium” application grades.

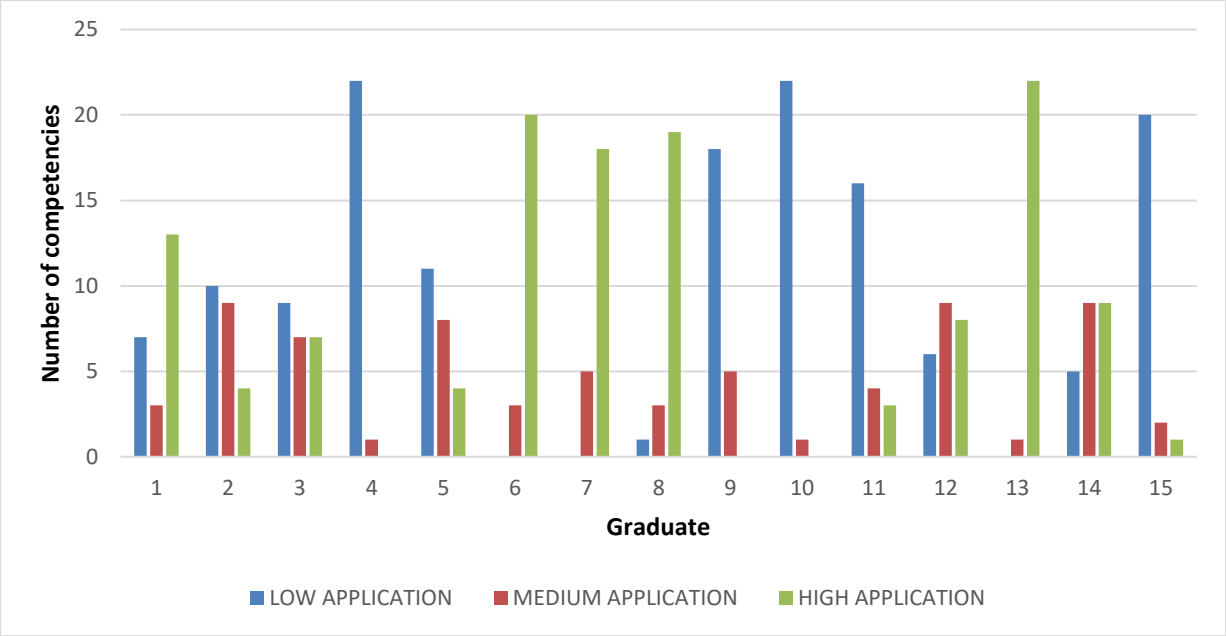


Figure 30: Level of application of competencies by graduates

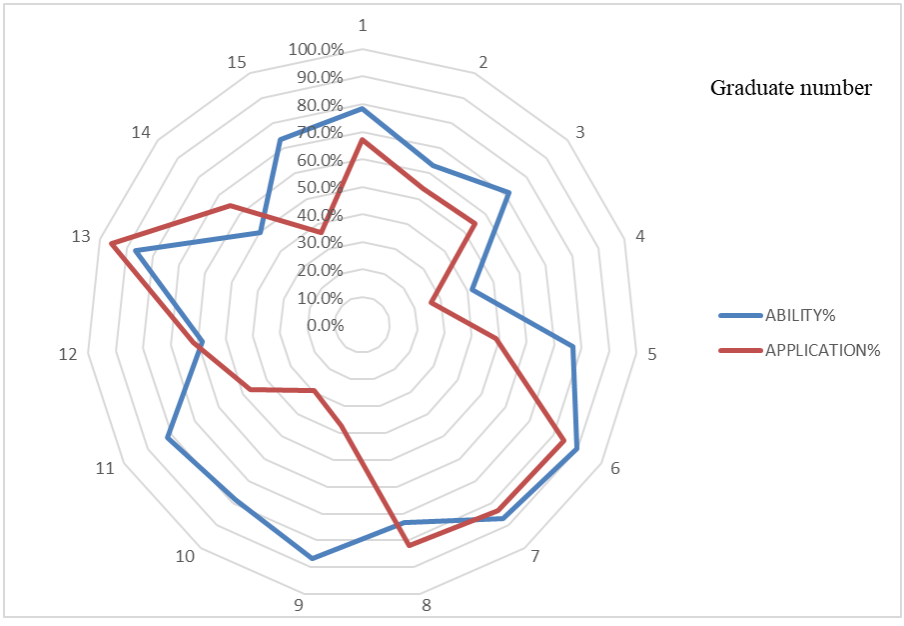
The five “low” appliers of the PgDCEH-acquired management competencies were typically in clinical roles, had lower positions in the organisational hierarchy and reported to other clinicians. Their self-reported ability to apply these competencies were on average lower (cumulative total 40.6) than that of the “high” applying graduates (cumulative total 50.0). There were two exceptions to this, presented in Vignette 2 in *Appendix R*. This succinctly illustrates the transitional nature of peoples’ engagement with the health system. At any different time-space coordinate in people’s careers, things may be different.

The five “medium” appliers of the PAMCs were typically in coordinator roles at the provincial level, had university qualifications and reported to director-level line managers. Two cases clearly illustrated some of the challenges faced by managers in health systems, presented in Vignette 3 (*Appendix R*).

The five "high" appliers of the PAMCs were typically in coordinator roles, with four of them working in projects, associated with NGOs. They were positioned relatively high in their organisational hierarchies and had four years of work after the PgDCEH training. Their self-reported ability to apply these competencies were on average higher (cumulative total 50.0) than that of both the "medium" (41.2) and "low" (40.6) applying graduates. Two examples of high appliers are presented in Vignette 4 (*Appendix R*, both attributing their promotion and improved abilities to the PgDCEH.

When the 23 "management" competencies application patterns were compared with "clinical" and "computer" tasks, there is a clear association between *low* management" application and *high* "clinical" application, and between *high* "management" application with *high* "computer" application. Of the five graduates [03, 04, 09, 10 and 15] who had predominantly high grades in clinical duties, four had predominantly *low* grades when relating to the "management" applications. Of the six graduates [02, 06, 07, 08, 12 and 13] had predominantly *high* grades in "computer" tasks, four predominantly high grades relating to "management" application.

When the graduate's self-reported abilities (through the survey questionnaire) were compared with the application of the PAMCs (as determined through the interviews and document reviews), 10 of the 15 graduates' subjective abilities were higher than their objectively graded application. This difference was most marked in graduates [10], [09], [11] and [15], see *Figure 31*. Interestingly, four of the five graduates with small differences between ability and application were high appliers.



To determine the level of self-reported abilities, each graduate's aggregate *abilities* score was calculated as a percentage of the maximum *abilities* score. To determine the level of objectively graded *application* of PAMCs, each graduate's aggregate *application* score was calculated as a percentage of the maximum *application* score.

Figure 31: Comparison of self-reported ability with actual application

6.3 Competency level application

The distribution of aggregate application scores on competency level was calculated as described in 6.1 Analytical procedures and is shown in *Figure 32*. The 23 "management" competencies accrued an average score of 43.6, representing 58.1%. The range is from 32 to 54 (42.7% - 72.0%). Highlights in *Table 31* show that most of the competencies (15 of 23) that were applied at low level by most graduates.

Table 31: Levels of application of management competencies: highlighted shows most graduates.

COMPETENCY	LOW APPLICATION	MODERATE APPLICATION	HIGH APPLICATION
Staff supervision	7	4	4
Report-writing and meetings	7	1	7
Managing assets	9	5	1
Finance administration	9	1	5
Service improvement	6	3	6
Quality and risk management	9	4	2
Organising eye care activities	5	5	5
Conflict and change management	6	5	4
Personal leadership	4	2	9
Presentations at conferences	10	1	4
Advocacy and fund-raising	5	3	7
Strategy planning and governance	6	2	7
Administration related to staff	7	2	6
Managing stakeholder relations	5	0	10
Communicating on senior level	4	2	9
Problem-solving and decision-making	6	4	5
Team building and teamwork	6	2	7
Health promotion management	5	5	5
Project management	7	3	5
Monitoring and evaluation	4	5	6
Budgeting and marketing	7	3	5
Planning for eye care	9	2	4
Human resource development	4	6	5

"Effectively managing stakeholder relations", "communicating about work to on senior/executive level" and "exhibiting personal leadership at work or in personal life" were the highest applied competencies. "Presenting work at conferences, national meetings, journals", "effectively manage assets including inventory, knowledge and information", "administering or managing finances of the programme were the lowest applied competencies.

The higher applied competencies seem to be those that related to relationships and personal communication, with non-specific outputs, whereas the lower applied competencies relate to activities which have more specific endpoints. For example, managing assets and risks require the development of tangible outputs (updated asset register or implemented risk management strategy), whereas managing stakeholder relations may not have such tangible targets set.

When the graduate-level application was compared with the competency-level application, it was clear that high applying graduates were associated with high application of the "computer use" competency and low application with "clinical tasks" competency. *Figure 32* illustrates this, using the schema below. The numbers in the top row indicate the graduate numbers.

	High applying graduates		Medium applying graduates		Low applying graduates
	High applied competencies		Medium applied competencies		Low applied competencies

GRADUATE	13	7	8	6	1	12	2	14	5	3	11	15	10	4	9
CLINICAL															
COMPUTER															

Figure 32: Graduate and competency level application compared with management functions

When the competencies were grouped according to the management functions as delivered in the PgDCEH curriculum, the highest applied functions were "organising & leading", "leading & planning" and "planning & organising" (*Figure 33*). "Planning & leading" was the lowest applied function pairing.

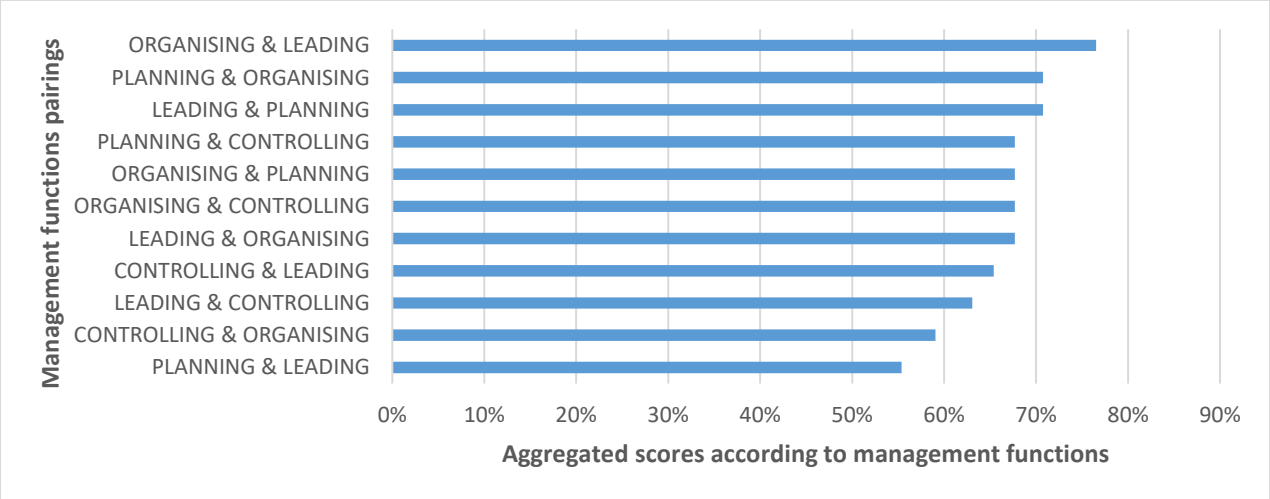


Figure 33: Competency scores according to management function pairings.

Although a distinct pattern of the application of management competencies according to the management function groupings is not clear, the "controlling" function is most lowly represented of the four. In particular the lack of "planning" and "controlling" were highest in the low applying graduates.

6.4 Programme performance as a result of PAMCs application

There have been few real programme successes, with the achievements mostly on an individual level. Reports of eye care programme successes or improvements were few and largely unsubstantiated. This was due to the lack of adequate monitoring systems and their application in most programmes. The graduates generally conveyed their beliefs or thoughts about how the programme performance changed over the post-graduation period, without producing relevant evidence. Their line managers were generally less convincing in this regard. Attributing their management competency to the PgDCEH was expected but could have been unrealistically amplified to please the researcher. Only one graduate (a high applier) [06] provided evidence that PAMCs application resulted in improved programme outcomes. The other four high appliers illustrated sustained programme / project performance, two in eye care and the others in other programmes. Most of the rest of the graduates reported reduced programme outcomes.

The responses to questions of programme effects contained hidden references to low performance and poor service quality, while the positive comments were very reserved, using labels such as "doing well", "some targets met" and "things are happening". Upon probing these responses, more direct reference was made, for example, "MoH no longer neglecting eye care", "Attractive for funders", "service improved" and "not better nor worse", "CSR did not increase", "stagnant" and "eye programme weak". A typical response was given as an example: *"Of course, we have seen improved utilization of services or rather increased demand for services, but there is still a lot required. We may not have evidence, but we know that the utilization is still very low." [2]*

The data from the three sources supports our conclusion that the eye care programmes still suffered shortages of funding, staff and infrastructure, causing them to fail to meet improved health outcome targets. The same challenges exist such as inadequate funding, a lower priority focus on eye care, shortages of human resources for health, health programmes dependent on NGO funding and a general lack of resourcefulness (see Vignette 10 in *Appendix R* for typical challenges experienced by graduates).

Most of the high appliers' achievements were on a personal or professional level, for example in terms of promotion, remuneration benefits and career achievements. On a programme level, no significant improvement in service delivery outcomes was noted. Many programmes continued underperforming (as evidenced by questionnaire reports) in the same way as before, while some even performed worse.

There is little evidence of improved eye programme performance: *"Compared to 2010 the eye service is performing not better nor worse. We are not doing so well. Because for example or cataract surgical rate had not increased much. It's like the output has not increased at all." [11]* One graduate recognised that the challenges of funding shortage, unavailability of adequate staff and low interest of senior management were the reasons for poor programme performance. According to another, *"There is nothing happening at the province everything happens where the people are. Our plan is dependent on what they want to bring." [5]* This reflected how the programme functioning was experienced as challenging. Either the same or non-improving performance or reduced effectiveness of the programme was admitted when prompted. These reports were similar to responses in the survey questionnaires, and further back to graduates' programme reports they generated during the PgDCEH coursework.

Reports of achievements and challenges ranged from personal difficulties to be acknowledged and optimally utilised to highly familiar programme and system issues (*Appendix L*). A small number of graduates achieved successes in eye care programme management, but most continued in their existing work roles, mostly having to deal with daunting challenges. The main achievements and challenges of the interviewed graduates appear in *Table 32*.

Table 32: Graduate achievements and challenges

Case	What are the main achievements?	What are the main challenges?
1	Developed best practices, advocacy	Not working in eye care programme
2	Increased interest in ophthalmic training	Low opportunity to apply in current post
3	Clinical status	Relationships, system issues
4	Own further education achievements	Partisan views on eye care, system issues
5	Stakeholder management selective	Relationships, system issues
6	Many personal achievements	System issues
7	Many personal achievements	Few system issues
8	Many personal achievements	System issues, no post in MoH
9	Immediate changes after PgDCEH	System issues
10	Own further education achievements	Few system issues
11	Spearheading training status of unit	System issues, personal
12	Various work-related achievements	Position, wrong station, understanding
13	Many personal achievements	System issues, political issues
14	In acting position as chief director	System issues, lack of support
15	Own further education achievements	System issues

A typical example is graduate [06], with management-type roles and responsibilities, doing well to lead a national eye care programme through its stages of programme evaluation, strategic planning and advocacy for improved eye care services. Here the aligned activities of a country-wide NGO-supported eye project provided the traction within which the graduate could apply her PAMCs and report improvement of service delivery outcomes, albeit with little if any line management support.

Some of the graduates excelled in new areas, outside eye care service delivery and management, including nurse teaching, conducting research, publishing papers and making conference presentations. Some were promoted to higher positions in their organisations directly because of their new qualification. One graduate, serving as an eye care coordinator, developed guidelines for selected eye care services in the ministry and became centrally involved in advocacy and fundraising. Two graduates pursued Masters' degrees programmes following their PgDCEH qualification.

Three graduates enjoyed the high recognition in their field of eye care, one even from high officials in the government: "*Even ministry of health if I ask them to meet with you, they would be very happy [8]* His early achievements are remarkable, such that of developing his country's first national strategic eye care plan while still in Cape Town doing the coursework. He went on to do malaria and trachoma mappings, primary eye care training and evaluation, before he was ousted and took refuge in project management positions in neighbouring countries.

The second, the ophthalmologist [10] achieved many things while working in a public health facility ophthalmology, including inspiring his team to work more efficiently and as teams. He established an eye department, developed human resources, set up mobile eye services, fundraised and set up direct screening and mobilization services. The challenges he faced included the difficulty to integrate eye care into the general hospital, with no post for an ophthalmic surgeon, in a very remote, unattractive rural province and far distances between service points. The lack of infrastructure and resources also limited his progress. What helped was that he was in a senior management position already, hence he had ample opportunity to apply management. He eventually gained popularity through the media, "*I went onto radio was given a free slot every week talking about eyes. I replaced the show of a traditional doctor who was taking all our patients. I became more of a public figure. People started looking at me as I became a household name. I became too popular I was on TV, they wanted me to become political [10]."*

The third, the graduate who excelled in nurses' training, did so because of her competencies in nurses' education (see Vignette 1 in *Appendix R*). The graduate, who was promoted to a higher position following the PgDCEH established best practise standards in her area of responsibility and was co-opted into the

district's executive management team, an accolade that her peers and line manager were proud of. *"And they have passed the audit with absolute flying colours, at almost 100%. [1S]"* In her workplace she faced the challenges characteristic of rural health districts in the Sub-Saharan African region, that is of low budgets for specialist services like eye care and a lack of adequate human resources and infrastructure.

Several graduates suffered low achievement, career stagnation and demotivation, resulting in the low application of PAMCs. One graduate, who occupied a senior management position, felt that she was still unable to solve problems and to support service delivery. Another graduate, who enrolled for the PgDCEH who was already in a senior position in the Health Ministry, was classed as a low applier, despite her achievement, "*I was acting up until February, I was chief director health programmes [14]."*

6.5 Summary

Both quantitative and qualitative analysis was conducted to determine how the PAMCs were applied, from a graduate-level and a competency-level perspective. About one-third of the interviewed graduates exhibited each of "low", "medium" and "high" management application in their work contexts. The high applying graduates scored high grades in all combinations of management function, with the "planning" group of functions best applied. The low applying graduates struggled to apply across all management function combinations, although the "leading" function is better applied than the others. The medium applying graduates exhibited variable levels of application, but the "organising" group was best applied.

Competencies like planning, organising, monitoring, supervising staff and budgeting were strongly associated with high performance and achievement. Some graduates struggled with programme challenges that existed from before their training and these were very likely out of their control. The problem in these situations was that the graduates had not devised innovative strategies to work around these challenges, regardless of whether there were in low or high tiers of management.

There is evidence of high management competency application in the graduates interviewed, in particular because so many of them obtained the level 5 grade "*evidence of major achievement according to multiple sources*" for so many competencies assessed objectively. However, there is little evidence that this has resulted in improved health outcomes in their eye care programmes. The next chapter elaborates on the challenges reported and explores the possible reasons for this.

Chapter 7: Factors influencing application

So far, the characteristics of the graduates and how they were applying the management competencies acquired through the PgDCEH were described. It was found that that the management application was equally split between "low", "medium" and "high" grades and that most of the graduates applied most competencies at a low grade. The "high" applying PgDCEH graduates were typically in coordinator roles, with four of them working in projects, whereas the "low" applying graduates were typically in clinician roles and had lower positions in the organizational hierarchy. The typical PgDCEH graduate (refer to the portrait in Chapter 5) might belong to the "medium" applying group, mainly because of the most common demographic and situational characteristics.

This chapter deals with the factors that determined whether the graduates applied their PAMCs or not. The discussion highlights the determinant factors on a personal, programme and health system level at each phase (input, process, output, outcome and impact) of the result chain, (*Table 33).*

Table 33: Aspects of the graduates' interface with the PgDCEH

	INPUT	PROCESS	OUTPUT	OUTCOME	IMPACT
Person	Training programme structure and function	Teaching and learning procedures	Assessment of learning	Acquisition of competencies	Graduate disposition
	Applicant demographics and selection	Students' experience of the training	Students' evaluation of training	Academic progression and qualification	Graduates' application of PAMCs
	Applicant motivations and expectations	Teachers' reflections of the training			Graduates' attitude and behaviour
Programme	Contextual environment	Contextual environment	Contextual environment	Management capacity increase	On programme achievements and challenges
System	Contextual environment	Contextual environment	Contextual environment	Health system strengthening	On health outcomes

The factors determining how graduates applied PAMCs stem from all the elements of the "system evaluation theory" paradigm, i.e. inputs, processes and outputs leading to specific outcomes and impacts in a health system context, as described in Chapter 3: Theoretical framework. The ensuing discussions are centered around how these relate to graduates' attributes, experiences and perceptions in influencing the application of PAMCs and eye care programme performance.

7.1 Input factors influencing application

The input factors that may influence application of the PgDCEH are situated in the graduate, programme and system domains of the system evaluation theory. The contextual environments (i.e. programme and system realms) from which the graduates originate were largely similar, hence the discussion is mainly about the graduates' attributes, experiences and perceptions and their engagement with the PgDCEH, the training programme. The impact of the PgDCEH as a health strengthening initiative was investigated, and not an evaluation of the PgDCEH as a programmatic initiative (i.e. profitability, sustainability and efficiency in relation to staffing, resources, infrastructure and organization). However, key attributes of the PgDCEH candidate at enrolment may be predictive of whether they would apply the PAMCs after graduation.

Because of the small sample, it is not possible to make any direct inference about whether the age, gender or country where the graduate worked had any influence in how they applied their PAMCs. The same can be said about the type of employment, the source of the funding for their studies and the contextual environment in which the graduates were embedded. There was also no differentiation between the graduates' time after graduation (range 3 to 5 years) and the levels of application.

Aspects of education, profession and work roles influenced the way graduates applied their competencies, but not in a predictable manner. While the application grades generally followed the pattern according to the "typical case" scenario, some atypical associations were observed, as summarised in *Table 34.*

Table 34: Variability of application related to education, profession and work roles

	HIGH APPLYING GRADUATES	NOT HIGH APPLYING GRADUATES
Education	Graduate [13] entered with Certificate level qualification.	Graduate [11] entered with medical specialist qualification.
Profession	Comprises of two non-clinical officers and three ophthalmic nurses / clinical officers	Includes a medical specialist, two optometrists and five ophthalmic nurses
Roles	All were in non-clinical, coordinator-type roles	Five medium-applying graduates were also in non-clinical, coordinator roles.

<u>Motivations for studying</u>

The graduates' motivations for study and expectations from the PgDCEH could be determining factors of how they applied PAMCs. Their motives for doing the course were mainly related to a) the desire to learn about management and b) to improve education, qualifications, skills or c) for job promotion or for other reasons. A few instances of "other reasons" were also reported.

The need to learn and fill the gaps in knowledge and skills in eye care programme management was a strong motivation, for example: "*When I came there, I knew the gaps, I needed to do some courses in eye health management, I was going to work with ophthalmologists, optometrists. If I was going to manage the programme I had to speak the same language. I have to plan and play a major role to lead the programme in the right direction, I needed up to date information and skills [13]",* as was the need to be equipped for the role of national eye care coordinator: "As *the national coordinator, I really wanted to be able to coordinate the programme at national level. Because it's one of the positions that really needs you to have adequate knowledge and skills. So, since I'm coordinating the programme , having ophthalmologists in the facilities, having all the (other eye care staff) like optometrist, and ophthalmic nurses, what I needed was to do the PgDCEH, so that I gain more knowledge and skills as the coordinator." [6]* These two graduates [06] and [13] were classified as high appliers according to the schema explained in Chapter 6.

For those with 5-years and more tertiary qualifications, the PgDCEH was a horizontal qualification. For others, especially those with 4-year degrees and diplomas or less, it was a step upwards in education. One graduate with a six-year Master degree made a distinction in value between the qualification and the competencies: *"It is more the skills than my qualifications that help me in my work." [14]* This one applied his PAMCs at a medium level. Even some with higher qualifications considered the course as a form of "specialization" at an esteemed African university, which made it very attractive.

One graduate felt he had to move ahead of the staff who report to him: *"I'm responsible for the three districts therefore I felt it's important that before we even send other students to go and do the very same course." [3]* Another graduate needed "*qualification to get back into academic*" [15], as he wanted to expand his career into teaching. Yet another wanted to be accepted and recognised, *"I want a title. I need to be accepted, to be better qualified with a title." [13]*

In addition to the abovementioned reasons for doing the PgDCEH, the opportunity to study, mostly with scholarship funding, in eye care programme management training programme, was a salient motivating factor. The notion that there was a course like this was clearly appreciated, as exemplified by the urgency with which the course was pursued by applicants, for example: "*I did not take time to apply because I felt the responsibility was mine." [13]*

All the graduates whose motives were to learn about management fell in the "high" applier group. The fact that they also improved their education, and advanced in their careers were secondary motives for

them. Those whose primary motives were to advance their careers did not necessarily obtain promotion or secure opportunity to apply their PAMCs.

Expectations from the training

The graduates' expectations aligned well with the course aims and their overall experience of the training was pleasant. The course provided an opportunity for students to learn and grow in their understanding of management in their settings.

The graduates' expectations were largely met, as they mostly expected to "learn about management" [1, 5, 6, 7, 8, 11 and 13] and their "…*intention was to learn about eye care and how to manage eye care programmes*" [13].Though not mentioned in the enrolment questionnaires, many came to obtain a qualification, in a way upgrading from a lesser qualification or educational institution. Some came to "learn about eye care" [2, 9, 12, 14], to be able to better deal with avoidable blindness. Although the latter was a central course aim, the few non-eye care trained graduates extracted some benefit from it. One graduate felt that the course was "*what I wanted because I needed to know more (about) the management of eye care. I felt strongly and intensely that is what I wanted to do-" [2]* The course was also *"timely, I must say it was timely, yes." [2]*

Graduates entering the training with expectations to learn the management of eye care programmes were also more inclined to be higher appliers than those who were unclear of the course outcomes and those who mistook the training for eye specialization training. One of the three graduates whose expectations were misdirected accumulated the lowest scores in the "application" rankings and was determined to have "adopted" none of the skills in her work application.

Several graduates courteously expressed gratitude towards the faculty (and convenor), both because of the training and the opportunity to undergo the training. One graduate was more expressive, "*I must say thank you very much for you. An absolutely new world opened up for me. I think it was one of the courses that was just for me a very great experience. Thanks a lot."[1]*

This graduate perspective provided insight into the suitability of the training. Combined with their evaluation of training and academic performance a strong case could be made for the overall suitability of the PgDCEH for developing management capacity in eye care programmes. Most of the graduates' experience of the training was pleasant. However, there is no clear relationship between the graduates' experience of the training and their application of PAMCs. The graduate [08] that reported some difficulty was one of the high appliers of PAMCs!

Two graduates determined that they enrolled for the wrong course, as they did not know that the course was about management, i.e. *"The course was more of administration, not operational, more management; it did not give me the clinical aspect [14]"* and "*Since I am in eye care, it would be better to learn (about community eye health). I didn't have an understanding that it was meant for programme managers." [4]* These graduates misunderstood the course aims, resulting in them entering the course for the wrong reason such that one reason that the graduates looked for clinical training, [14].

Table 35 is a summary of the main types of motives and expectations with their associated outcomes in relation to applying PAMCs. While the motives deal with the reasons for studying, the expectations deal with outcomes envisaged. In the case of the PgDCEH, the expectations were related to the degree of satisfaction a graduate may experience in relation to what the training programme is reported to provide. The motives and expectations have similar outcomes especially where they are matched with the core purpose of the PgDCEH. Those graduates whose motives and expectations were not matched to the PgDCEH did not exhibit high levels of application of PAMCs.

Table 35: Types of motives and expectations

MOTIVE	EXPECTATIONS	OUTCOME
Motive to learn about management	Expectation to learn about management	Management competencies obtained; Management competencies applied
Motive to improve education, qualifications, skills	Expectation to improve education, qualifications, skills	Qualification obtained; Management competencies may or may not be applied
Motive to advance in career, get promotion or financial benefits	Expectation to advance in career, get promotion or financial benefits	Not necessarily recognised for career advancement Management competencies unlikely to be applied
Other motives	Other expectations	Management competencies may or may not be applied

7.2 Process factors influencing application

The process factors that may influence application of the PgDCEH include the teaching and learning procedures, the students' experience of the training and the teachers' reflections on the training. The contextual environments have little relevance here. The main process factor which affected the application of the PAMCs, was the graduates' experience of the training. Most of the graduates' responses about the experience of the training indicated that the course was *"very useful and essential [13]"* and *"important*

for me." [8] The course design and delivery were regarded as highly suitable, relevant and useful in equipping the graduates with the required management skills.

The graduates' experience of the training was largely pleasant, and they were happy with what they learned so much that they thought that the course "*opened up my mind*" [7, 10] and was "*exactly what I needed. It was an absolutely wonderful learning opportunity for me." [1]* The course material was good, it was "*so neatly set out, that I could (always) get (back) into the material, it's almost like a resource document." [1]*

For some, the distance component was difficult, as related here: "… *the system of out of campus, the assignment was difficult, we struggled here. (Once), I had to (travel more than 1000km) to meet (my fellow student) to say there is no way we will solve this (by ourselves) [8]."* The struggles were eased through the assistance of their line managers: "*I used to work with (my line manager) on the assignment to know how to do it." [10]*

The availability of adequate educational resources applied effectively using appropriate teaching methods in a learning-enabling environment are key determinants of the success of training programmes like the PgDCEH. This study makes assumptions about the suitability of the training based on teacher reflections, student evaluations of training and the findings of a curriculum appraisal. Overall, the students' expectations at enrolment were mostly addressed, except the few who expected clinical training in ophthalmology. The graduates' excitement, happiness and satisfaction with the training experience far exceeded the researcher's expectations. As only a small number of graduates were able to apply the PAMCs and have achievements that could be attributed to the PgDCEH training, this may have been mainly a courtesy towards their teacher. The comparison between baseline expectations and actual experience is an aspect which was not fully explored in this study.

The students' evaluations of training provided some indication of the suitability and experience of the PgDCEH. These invariably returned positive results. This recurred over numerous renditions of the training and in part could have influenced the teaching and learning procedures over time. Also, some of the students' motives and expectations surfaced in the feedback provided. As these were anonymous exercises, no link between graduate application and students' evaluations could be determined.

7.3 Output factors influencing application

Outputs are the directly observed results obtained from an intervention. In the case of the graduates' engagement with the PgDCEH, these include their overall academic performance, their assignments

produced for formative and summative assessments, and the qualification obtained at graduation. All the graduates obtained the qualification, hence this aspect has merely to do with the institutional targets, i.e. number of scholarships and number of students graduated.

The coursework assessments to gauge the student's academic performance were mainly of the recall and comprehension type of tests, additional to a final examination of the same type. The students' final course marks ranged from 50% to 65% with only two outlying values. Additionally, students were required to complete a number of practical assignments.

These assignments were situated in the graduates' work settings and covered the topics as explained in Section 6.1, and illustrated in appendices A and J. Two of the students used the assignments to produce actual programme instruments (i.e. national eye care plans [06, 13] and programme evaluation strategy [06]. Both turned out to be high appliers. No discernable relationship was notable between the academic performance of the graduates and the way the PAMCs were applied.

7.4 Outcomes and impact factors influencing application

The outcomes and impact factors influencing the application of PAMCs relate to the effects of, or consequence of the PgDCEH on the individual graduate and programme and are discussed next. The individual graduate factors are those that manifest within the person and therefore are of a personal nature. Programme factors are those associated with the work environment in an eye care programme.

This section begins with discussion of the outcomes factors that relate to the graduates' acquisition of competencies, their academic progression and qualification with the PgDCEH. This extends to the resultant increase in qualitative and quantitative management capacity on programme level, and on system level. It concludes with the impact factors were those associated with graduates' improved knowledge, skills, understanding and their ability[21], the changes in their situation and in their attitudes and behaviours, in comparison with their situation before undergoing the training. Indicators of the graduates' application of PAMCs and their attitudes and behaviours also feature here. The graduates' achievements and challenges on programme level and their effect on the health system, especially with reference to improved eye health outcomes are discussed here.

[21] Note that the **ability to apply** the management competencies are implied here, not the application per se. Applying management competencies is discussed in the "Impact factors" section.

7.4.1 Graduate-level factors

Acquisition of competencies at graduate level and increase in qualitative and quantitative capacity at programme and system level are the key outcomes of the PgDCEH. Although two of the total student cohort needed supplementary examinations for progression, all students who enrolled in the 2009 to 2014 period graduated within the same academic cycle.

Increased knowledge and skills in management

The acquisition of competencies was considered an important value-add by most graduates and was confirmed by many of their line managers. Some learnt essential skills to apply in programme management ([06], [13]). One attributed her growth in knowledge to the PgDCEH in the following manner: *"I had just a bit of knowledge regarding finance administration, and preparing things like the Gantt's chart, knowing more about VISION 2020, even more about the health promotion. I've learnt so much from this, even (how) to develop the strategic plan. I really learned a lot from the (course)." [6]*

The course increased knowledge and the graduates learned much: "*It was really my foundation. But, (before the training), I was just practising (management) blindly. But, (after I came back), I was doing the right thing because I went through the training." [7]* This was confirmed by another: *"The course had good theoretical knowledge and skills." [12]* The course helped the non-clinically trained graduates to understand clinical processes, because "*the clinical part gave me the foundation." [13]* This one knew how to implement her knowledge of eye care programme management, "*The knowledge of how to run programmes, already I am implementing. Because of that knowledge, my bosses are confident in me, they trust me. Our account is checked by the auditors and they are happy." [8]*

Vignette 5 (in *Appendix R*) portrays the graduate's [13] exceptional degree of knowledge translation, which epitomises the application of competencies, brought on by the PgDCEH. Another line manager endorsed the graduate reporting to her as follows: "*There are many more people who can succeed her. At least four of them were trained by (the graduate) [12S]".*

Graduates who understood the context knew their limitations and had insight into how higher powers operated, scored higher ratings for application of PAMCs. Surprisingly, some PgDCEH graduates also confused management with organising, administration and office work. Some even seemed to dislike management, escaping from it to do clinical work. This is disconcerting, as the core aim of the PgDCEH was to provide competencies in management.

Some graduates did not apply the PAMCs because they felt incapable of performing the management tasks. After having attempted to do more management-type work, she realised that she did not have the insight and ability required to do that. "*We are a team, so I could not draw the whole plan without their help-" [4]* This was an example of poor knowledge translation, which may be due partially to her own lack of ability, or lack of confidence in her abilities and partially with their colleagues and context.

Some were not using the basic skills of planning, organising, controlling and leading, though they had the opportunity to do so. This includes misusing knowledge acquired through the training, as well as their own synthesis of new knowledge in relation to their work. There were also some instances where graduates applied their learning in inappropriate contexts or applied knowledge not acquired through the PgDCEH but thought to have been taught in the PgDCEH. While this was not actually restrictive to the application of PAMCs, it reflected on not applying PAMCs.

A few graduates disappointingly displayed serious ignorance about how their own health system worked. They cited "textbook" information, derived from PgDCEH course materials. This could mean that they prepared themselves for their interviews with the researcher or that they did not apply their knowledge to their own context. This explained the low level of knowledge translation in their work settings.
One graduate, operating at a low productivity level, thought that a second staff member would help to increase the coverage by doing more outreach. But the expectation was unrealistic because this resulted in further wastage of resources (staff and equipment). "*We can even increase the number of patients that we are seeing. We can even be able to do the outreach services so since I'm alone I can't do the outreach. [4]"* Misapplication of management principles was at play here.

Despite having performed above average in the PgDCEH, she was still very naïve about the health system she worked in. She thought that she would be able to use her diagnostics and therapeutic skills in an optometry post at the tertiary academic eye centre. She also thought that she could work in parallel with the current district eye care manager, as she believed there should be a coordinator representing optometrists too. This aligns poorly with a workable district eye health strategy. The PgDCEH is designed to prepare graduates to be dedicated district eye care managers in their own right, even though many districts do not have a post for one dedicated eye care manager, let alone two.

Another graduate, who was in a senior position in her department, had a view that problems related to the availability of supplies for cataract surgery could not be solved in her department, *"because most of the problems come from the ground, we cannot solve here." [14]* This was strange, because at her level and with her influence and responsibility, this is exactly where the problems should be solved.

One graduate thought that eye care staff at the facility level should initiate planning. He was clearly misunderstanding the role he should be playing and the strategy he should use to get buy-in from the facility staff: *"I asked the cadres who were there to send me their plan and the nurses and the doctors gave me a list, saying that is not their job." [5]* Another mistakenly used the PgDCEH material for the training of the undergraduate nurses: "*The community eye health formed the basis of my teaching." [12]*

More than one graduate likened the impact of their training on improvement in "community eye health". This tag, perhaps wrongly applied by the PgDCEH, alludes to the range of nursing specialities that proliferated in the aftermath of the Alma Ata declaration, with service delivery closer to the community. Hence, some health service providers underwent speciality training in delivering health services like mental, school and maternal and child health to people directly in their communities. To equip graduates with skills to deliver eye care services in the community was not the purpose of the PgDCEH, yet some graduates (and many applicants) had that misplaced understanding.

The main outcome of the PgDCEH was an increase in knowledge and skills in management in graduates, with graduates having a good understanding of the context more likely to apply the PAMCs. Inability to apply the competencies and poor knowledge translation was also found. Surprisingly, it was also found that few gradates misunderstand discipline called community eye health as being a clinical specialty training.

<u>Change in graduate position</u>

Graduates changed their position in organisational hierarchy, relationship dynamics and career prospects following the PgDCEH. For the latter, some used the qualification to get promoted ([01], [06]) and some for academic advancement ([07], [12], [15]).

Some were also enjoying more opportunities for promotion, career growth and further studies, for example: "*So when I came (back from the course) I just got promoted to be a national eye care coordinator. [7]",* and *"then also on that stage had the opportunity to apply for a senior position, and then only after I have done the course, I was accepted for the quality manager position." [1]* Another thought that "*the course opened a new world to me in terms of whether it's personally or work. Yes, I think I'm more, I would still like to do my Masters, so I think I will be able to do my Masters." [1]* There were some who were promoted directly as a result of the PgDCEH: *"When the promotion happened, I came here." [13] "The postgraduate diploma has moved me higher where I was; my salary has increased. [9]" and "I had a Level 8 position and jumped to a Level 10 position." [1]*

The financial benefits accrued directly from obtaining the PgDCEH were confirmed by some "*At the same time my financial situation also improved. [13]" and "Income growing ability increased." [13]*

Through the training some became able to "*speak to big people* [13]", and *"to speak the same language as the clinicians." [13]* And then, *"although I'm not involved in the eye, because I know what I do through the training I had, they listen when I do the advocacy for eye care." [1]*

The training did not necessarily bring positive changes to all graduates. Despair, stagnation, demotivation and isolation were amongst the most common dispositions of some graduates (see Vignette 6 in *Appendix R*). This group was generally less happy, confident and felt they were neglected, or their expertise overlooked. One graduate did not get a promotion after graduation*." It did not contribute anything there. I didn't even get a bonus." [3]*

A few even experienced expulsions from their posts, rejection by their colleagues and career prospects going backwards. While most of the negative effects cannot directly be attributed to the PgDCEH, the ones where the graduates lost their jobs because of "over-qualification" could have.

Career stagnation was expressed with despair and resignation by several graduates: "*I am still working here" [12], "Then I just find myself, I am there, and I have not been given an alternative" [2],* and *"Stagnation is there because I really wanted to do the masters. [12])* and despair because of the limitations: "(*My wings) are clipped, it's like I cannot fly." [4]* For another graduate, stagnation was inevitable, because of his position in the organisational hierarchy.

The career limitations experienced by these graduates were so severe that they expressed frustration and desperation. "*I expect to be higher but because of the promotions, the way they take so long for promotion. I have not been promoted, because there are so many who have stagnated in a job." [2]* Two of the graduates ([04], [09]) also felt that there were no career options for them.

In two instances the graduate felt blocked ([03] and [11]), where their line managers were seen to assume the management roles which were destined for them. In both instances, no real professional or financial demotion occurred, but the loss of power elicited defiant acceptance, resulting in low motivation and merely doing what was required of them.

Even though sometimes elevated to higher degrees of importance, some graduates were denied the commensurate recognition and remuneration: *"I am a necessary available resource (as a regional advisor for prevention of blindness) but it's not formalised, it is not on paper [11]",* and went on to pursue further studies, with variable success.

Poor leadership at the graduate level was also exhibited. Graduate [04] performed mostly clinical work, with low productivity, compared to standard expectations. She justified this as follows: *"We go there after every second month and … when I'm not here, then it affects-. (my performance). I checked my performance for this year, it's - lower because I'm not here most of the times or like when I go to attend the classes then there's no one to push to see the patients." [4]*

Some PgDCEH graduates experienced positive changes in their work situations, including career advancement, financial rewards (bonuses and increases) and greater influence in decision-making. Others stagnated in their jobs and were prevented from opportunities to apply. Some of this was due to lack of recognition of the qualification by their line managers, yet others' negative effects could be associated with poor leadership showed by themselves.

Change in graduate attitude and behaviours

Graduates reported and exhibited many of the benefits of studying for the PgDCEH. These include the PgDCEH curricular knowledge and skills and a high reputation qualification. More striking is the knowledge and skills gains in the eye care programme management which gave the graduates confidence and determination to apply them. This resulted in high motivation, achievement, happiness and pride.

Table 36 is a summary of the changes in attitude and behaviour in graduates during the period after completion of their studies, identified during this investigation. This was addition to the increased knowledge, skills and understanding of eye care programme management, which is the main aim of the training. The numbers in round bracket refer to the code in the compendium of quotes, *Appendix R*.

Table 36: Attitude and behaviour changes in graduates after returning to work

POSITIVE CHANGES	NEGATIVE CHANGES
Increased confidence	Despair, uncertainty, looking for ways out
Strategic insight and expertise	Misapplication of knowledge
Highly regarded, respected, trusted, valued	Disregarded, neglected, isolated
Opened minds, new thinking, ways of doing	Stagnation, nothing happening
Able to solve problems	Seemingly overwhelmed by challenges
Able to plan, organise, control, lead = manage!	No direct involvement in management
High motivation, happiness, personal achievements	Demotivation, unhappiness, despair
Promotion, financial benefits, career progression	Expulsion, rejection, career retrogression
Improved performance at work	Low productivity, overworked, under-utilized
Management regarded with higher importance	Low importance
Increase in power	Feelings of powerlessness

Most of these changes were triangulated through various means, including SKI verification and further probing during the interviews. The positive changes were broadly associated with higher management competency application whereas the negative changes were broadly associated with the lower application. These association could go both ways. When graduates were successful in applying PAMCs, they generally exhibited the positive attitudes and behaviours. Conversely, when the graduates were not able to apply the PAMCs, their demeanour changed to despair, demotivation, feelings of isolation, powerlessness and being "boxed in".

According to most of the graduates, the course greatly affected them in what and how things were done at work and in their personal lives. The knowledge and skills provided by the course, in turn, bestowed confidence on the graduates. One said, *"I'm happy with the knowledge, the skills that I acquired from this diploma in community health. I have all the confidence, even with the position that I'm holding, I'm really, really positive! [6]",* and another, "*The postgraduate changed me. I am self-confident. I can talk to big people." [8]* These graduates expressed confidence, were trusted more and had good work relationships. They felt strong as the course re-positioned them and took them "*to the next level." [5]*

Some felt that the course opened their minds and they became more inspired, even to explore and think about things differently: *"The post graduate diploma helped me to be able to even read more because I was limited (before). I heard and read more you see. [3]",* "*The way I thought about medicine afterwards was very different. I stopped thinking of people as diseases [10]"* and *"It has just, really, opened my mind because when I came back after I have graduated there most of the things which I have gone through I learned, I really implemented. Like, financing, management part of it. I can also decide I'm also planning. All those, most of the things, really, yes." [7]*

One high-applying graduate related that "*management had discovered my skills and get my input on how the district should be managed. I am the only one on this level that meet with (senior) management because of the training I had. And they told me that I am a positive return on investment." [1]*

The course pointed them in the right direction by *"telling … what is in the bush then you have to go [5]",* enabling them to solve problems and becoming multi-capacity: "*I have also learnt how to overcome challenges, about good planning and how you organize your work and how you should take guidance, and also all aspects of human resources (management) and finance which I then learned." [1]*

They could plan, manage difficult staff and knew how to manage. "*And I must say the course gave me an opportunity to manage with great confidence coming back to my workplace and to be assured of the fact that I believe I know how to manage any project. [1]"* and*, "I'm now managing properly, effectively*

within their big programme… as the programme coordinator. [7] I must say the course taught me to any person, after I have done the course, could I come out and I could apply and implement what I learned was there and with great confidence that I know what to do." [1]

Some graduates felt isolated, unhappy, demotivated, helpless and powerless about their work situation. There was too much work, things happened too slowly, they had limited resources available and the remuneration was mostly too low. Many sought ways out of the deadlock and further opportunity for study (as for the PgDCEH) was a good alternative. Graduates expressed frustration, unhappiness and despair, relating it to career stagnation, retrogression and isolation. Despair was perceived in many of the low and medium applying graduates, some pointing to the issues of control and power.

Having limited control over their work situation constrained the application of PAMCs in some graduates because "*when you are doing this, they will tell you do that. I don't have control over my own destiny, yes." [3]* Another graduate was tasked with secretarial duties for the same reason: "*I have to go to the counsel of governors to get the rubber stamp, so that can get access to the county. Doctor writes the letter. And I deliver it because he is the head." [2]* Indirectly, the lack of power caused despair, demotivation and lack of trust in the line management. *"I have the ability, but you know where I am placed because when it comes to promotion then I realise that he has no way of promoting. But I have no control, I don't think he has any control." [2]* Having "no power" was picked up from several of the low applying graduates.

Four graduates ([02], [04], [11], [12]) exhibited states of hopelessness, being disregarded without having any power, ability or influence to change things for the better. The same desperation seen in those who were blocked was observed but the focus was more on the futility to try to get rewarded for an excellent performance appraisal, to earn enough to afford a car, to gain recognition for an under-recognised profession or to try to find a place in an unaccommodating team. This powerlessness was further projected to the line management, underlining the futility.

The converse was also true. A high applying graduate who was politically well-connected came across as an influential person. His advanced ability to advocate, his good communication skills and knowledge about eye care and community matters made him a dynamic and positive person. He also applied his skills in church, where he plays a leadership role. Amongst their colleagues, many became highly regarded, trusted, valued and respected at work, as well as in their personal life spheres. Graduate [08] is one such example, (see Vignette 9 in *Appendix R*).

Graduates of the PgDCEH had undergone many changes in attitude and behaviour after qualification, mostly attributable to the PgDCEH. In addition to boosts in confidence, inspiration, recognition and respect, their improvement in management abilities was noticed and verified by the line managers. *Table 37* is a summary of the factors that influenced how graduate applied PAMCs. The graduates who were high appliers were well-connected, highly motivated, positive and forward-looking. They have progressed in their careers and were proud of their achievements. They also assimilated the programme and contextual knowledge well. However, graduates who were low applying were frustrated, demotivated and suffered career stagnation. Some felt isolated, especially because they felt their skills were unique and were not optimally utilized.

Table 37: Graduate level factors enabling and constraining application of PAMCs

Category	Enabling	Restricting
Knowledge and skills in management	Knowledge assimilation	Poor knowledge assimilation
		Misunderstanding community eye health
Graduate situation	Promotion and career growth	Career stagnation
	Personal achievements	Inability to apply
		Demoted or blocked
		Poor leadership at graduate level
Graduate attitude and behaviour	Happiness and being motivated	Despair, being demotivated
		Isolated, uniqueness of skills

The above table does not include an attribute observed in a graduate who moved from a district-level to a facility-level position [04] and seemed to have carefully manipulated her work placement for personal gain. This is one example of a form of extreme self-interest or self-orientation, which was also observed in other graduates. It is likely that this self-orientation could be due to poor personal leadership or low professional ethics and is illustrated in Vignette 8 (*Appendix R*).

7.4.2 Programme-level factors

The programme-level effect of the PgDCEH were those associated with the eye care programmes' achievements and challenges. As few improvements on programme level were reported, more programme challenges were encountered, many of which were mostly repetitions of experience before the PgDCEH. Hence these factors were mainly constraining application of PAMCs.

In some cases, there were reduction in management roles, with some experiencing retrogressive career growth and reduced roles and responsibilities at work. Three graduates who performed management functions before were now responsible for mostly clinical roles. This brought on severe limitations in their

scopes of practice. "*Like as I'm saying that I was managing in the district." [4] "My influence is a bit limited, as the practice is owned by somebody else [10]", "My official position denies me the credibility to influence or contribute to decisions." [11]*

There were some that believed that their superior knowledge and skills, thanks to their PgDCEH training, were unique, and were frequently ignored or under-utilised. While most graduates have been "empowered" to some extent by the PgDCEH, the feelings of despair in the low applying graduates were common and were associated with isolation, both because of the "uniqueness of their expertise" and their professional segregation. Boredom and frustration were expressed by some, hinting at a workload that was too low or that their work assignments left them unchallenged and demotivated. *"Okay sometimes it makes me feel, well it interferes with my motivation ability, and then I say, especially when I finish my target early and I still have to go to the office." [2]* This is also linked to under-utilization of the graduate as a management-trained resource, which in turn stems from poor line management.

It is conceivable that interest in and awareness of management[22] would increase the application of PAMCs in the programme environment. However, misapplication[23], disconnection from and disinterest in management were expressed commonly by the low and medium applying graduates and their line managers. Some of these directly affected how the graduates applied their PAMCs.

Firstly, some equated administration or office work and coordinating with managing, which is a common error in general clinical practice. Secondly, the archaic notion that management was something done by senior management was also noticeable. Thirdly, some line managers, those in charge of clinical units, had little real understanding of what "management" entails, as their "management" roles are mostly actualised by spending time in meetings and performing administrative tasks. Some regarded management as "easy" and could be done "anywhere" or "anytime." [2S]

One of the graduates' line managers, an expert advisor for Human Resources for Eye Health had this view about how to train management: *"I would say that one must have some basic orientation in eye care. Then it is good to look at people's personalities, which includes even people's initiative. Then it is good to equip them with some basic management skills, basic management skills. And from there, you watch how people move. Yes, it must be an ophthalmologist. I think it is necessary to look to the personality issues of a person, then some basic training and then some soft skill." [2S]* Another line manager complained

[22] Refers in this instance to management as executed by formally trained individuals such as PgDCEH graduates.
[23]Misapplying refers to reasoning, attitudes and actions that are contrary to how they should have been, according to management principles. Disconnection refers to line managers having views that are inconsistent with management practice in health programme environment. Misunderstanding relates to views that are based on incorrect interpretation of information.

because disease control targets were set at the National Health Department level, therefore *"we are struggling, unfortunately, we can't do anything. [3S]"*.

When misapplication came from the PgDCEH graduates, it showed the inability to apply the competencies in their settings and pointed to poor knowledge translation, which would result in the low application of PAMCs. When expressed by line managers, this could be because of the poor line of command or perhaps low management abilities. It was common practice in health programmes to have management-naïve medically trained professionals assume management positions.

This lack of interest in management may be due to the low number of management-trained eye care professionals in eye care programmes. While the PgDCEH increased the management capacity in individuals, the number of PgDCEH graduates produced over these five years represents only a small proportion of the programmatic need being met. Several graduates and line managers recognised that more people should be trained.

One graduate was of the view that one person with all the skills is not enough: *"I'm referring to the nursing service managers, the medical clinical managers and all those (who) must see all these things that are limiting us from doing our job. I think these people they must come into a bigger picture. I've got all the information, I can apply all the information and if they are included in this, we can make a difference but if only one person (applies) and they are not putting some effort in that, there's no way out." [3]* Although this reflects his belief that he possessed unique expertise which other managers in the systems were ignorant of, he summarises the issues of low concentration of eye-trained managers.

Another medium-applying graduate's line manager (wrongfully) attributed her achievements to the PgDCEH. This graduate [12] claimed to use her PgDCEH course materials to train her ophthalmic nursing students in "Community eye health": "*The community eye health formed the basis of my teaching." [12]* The PgDCEH is not clinical training, hence contains little material which could be relevant for nurses training. Two others regarded their PgDCEH qualification as a nursing speciality, like "Primary Health Care" or "Mental Health". This indicated a misunderstanding of the training outcomes. It was perhaps not surprising that these graduates did not exhibit high levels of the management application.

Another programme-level issue was the lack of supervision and line manager support. The type of support graduates received from line managers ranged from passive condoning of all actions and decisions of the graduate to active facilitation of development and growth of the individual in their work post or towards career-pathing. The passive form of line manager support was striking in many of the graduates' work settings, where it was exemplified by poor performance management, low regard for the subordinates'

needs for career growth and recognition and inability to manage low productivity and motivation (examples: [7], [8] and [1]).

The effect on the programme was illustrated by graduate [04]. She had low productivity, not necessarily due to her own doing, but a low desire to be productive, which she blamed on lack of supervision. *"From my experience I think it would make difference if there was a (non-medical) director who I can report to." [4]* This flowed from her belief that her current line manager was not accessible and supportive. It was likely to do more with a lack of supervision and performance management.

Although there were a few of the graduates who enjoyed excellent and constructive line management support, many graduates' line managers had low interest and involvement in the work of the graduate. Some line managers were there in an administrative capacity only or they were quite naïve about eye care issues. There were many references to "ignorance" about the programme.

Here, the line manager defended the working conditions of the employees with a disagreement: *"Staff ... are generally happy with their salaries and benefits. [12S]* The contrast in the incumbent's view was striking: "*I like my work although it is poor salary." [12]* This same graduate, being a long-serving, senior level health professional, did not own a car, reflective of her poor economic status.

Another graduate's line manager believed that she was best placed career-wise: "*A good career is right where she is. She already functioning at my level [12S]* and another thought that the graduate did well despite the strong male dominant society she worked in: "*Taking into account that we are still a small society where women are not that much energetic but she's, at the department, the main deliverer. It's good, she's doing it fine. Otherwise, she would not be so successful. Normally, if she still wants to pursue her PhD or not, I think the doors are open for her to climb [7S]".*

This graduate was a self-starter and the line manager provided adequate strategic leadership: *"I don't feel the need to (micromanage), I feel that if you know what to do, then you must fight for what you know to do, and I think they listen." [1]*

For some, very little changed: "*My role did not change as such because I was the programme officer, but I have added value because of the team element that we have in the office." [2]* Another graduate, working in a remote rural setting with an aspiration to become a regional coordinator did not realise the implications of health system design on personal aspirations.

The concept of "no change", signifying "slow" change is a recurring theme in the mindsets of negatively affected graduates. This was illustrated by the number of interviewed graduates who were in the same

posts (6 of 15), with the same employer (10 of 15 graduates), at the same level (7 of 15) and doing the same tasks (7 of 15) they were before the PgDCEH (see *Table 38*).

Table 38: Slow change in the workplace (√ indicates YES)

Same…	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
POST		√		√					√			√		√	√	6
EMPLOYER	√	√	√	√		√			√	√		√		√	√	10
LEVEL		√		√					√	√		√		√	√	7
TASKS		√	√	√					√			√		√	√	7
PROMOTION	√		√		√	√	√	√					√			7

Six graduates made complete changes related to post, employer, level and tasks and seven ([1], [3], [4], [5], [6], [8] and [13]) benefited from promotions, of which four directly attributed it to their obtaining the PgDCEH. Some reported supervising clinical staff and in return were reporting mostly to health professionals who were medical specialists in ophthalmology, public health or similar.

Of the 15 interviewed graduates, seven changed jobs after graduation, of which five moved upwards in the organisational hierarchy and two moved out of their organisation. One graduate was relieved of his post as he was now deemed too highly qualified for his old job and another's departure was personally driven. Of those who stayed in their jobs, five stayed at the same level, did not get any remunerative benefit and retained their scope of practice. The scopes of practice of two graduates were reduced to mainly clinical roles after active management roles in the first few years after graduation, with one of them practically being demoted. Although the numerical metric has low significance, the patterns illustrated how the expectations to apply their PAMCs may not have been completely realistic.

Even the challenges reported by respondents were not unlike the ones they reported before and during the training, as well as commonly known challenges in these settings, e.g. lack of funding, lack of manpower and low availability of supplies and equipment. They ascribed these to poor coordination, planning and budgeting in eye care. "Eye care is low priority", "line manager not interested in eye care" and "Ministry leave eye care for NGOs to fund" were also mentioned by some respondents. A few more intriguing challenges were also mentioned, including "qualification not recognized", "confusion with role assignments" and "expert skills not utilized".

The outcome and impact factors influencing application of PAMCs on a programme level include the changes in work roles related to management, with respect to the roles of PgDCEH graduates in eye care

programmes. Some graduates experienced rejection and exclusion because of their "unique" skill. Poor line manager support and supervision, low interest and knowledge about management and the slow rate of change in eye health programmes have significant effects on the application of the PAMCS.

So far, the factors influencing how graduates apply from the result chain perspective has been discussed. Some programme achievements and challenges and health systems outcomes as effects of and or despite the increase in management capacity were brought on by the PgDCEH. Most were unchanged from before the graduates' enrolment into their studies. (IAPB 2010 and2011) In the next section, the enabling factors that are associated with high application of PAMCs are discussed.

7.5 Enabling factors associated with high application of PAMCs

Several factors that significantly influenced how graduates applied their PAMCs were identified. *Table 39* (below) is a summary of selected enabling factors for interviewed graduates who have been classified as "high" appliers in the previous chapter. The situations of the graduates amidst their programme and health system context were derived from the analysis findings. "Yes" indicated the presence of the relevant characteristic, role or behaviour. Each graduates' findings are listed under the relevant graduate number ([13], [07], etc.) and are ordered from the high to the low number of YES's.

Table 39: High appliers' enabling factors

FACTORS	[13]	[07]	[08]	[06]	[01]	TOTAL
EXPECTATIONS TO IMPLEMENT	YES	YES	YES	YES	YES	5
MOTIVATED TO LEARN	YES	YES	YES	YES	YES	5
POSITIVE CHANGES IN GRADUATES	YES	YES	YES	YES	YES	5
PROFESSIONAL ACHIEVEMENTS	YES	YES	YES	YES	YES	5
OPPORTUNITY TO APPLY	YES	YES	YES	YES	YES	5
NON-CLINICAL ROLE	YES	YES	YES	YES	YES	5
PROJECT ENVIRONMENT	YES	YES	YES	YES	NO	4
SUPPORT FROM LINE MANAGER	YES	YES	YES	NO	YES	4
NGO COLLABORATION & FUNDING	YES	YES	YES	YES	NO	4
SUPERVISE TEAM MEMBERS	YES	YES	YES	YES	NO	4
TOTAL	10	10	10	9	7	

The five "high" applying graduates exhibited at least seven of the ten characteristics identified as factors influencing application. Three of them exhibited all ten characteristics. The "expectations" and "motivated" factors relate to the appropriateness of the candidacy, while "changes" and "achievements" relate to the positive impact of the PgDCEH on the graduate. "Opportunity" is facilitated through several means, including "non-clinical role", project environment" and support from line manager".

Figure 34 illustrates how the combination of these factors (and the presumed adequacy of the PgDCEH) lead to high application. The "candidacy selection" aspect was covered in section 7.1, and the "positive change in graduate" in section 7.4, hence only "suitability" and "opportunity" will be dealt with here.

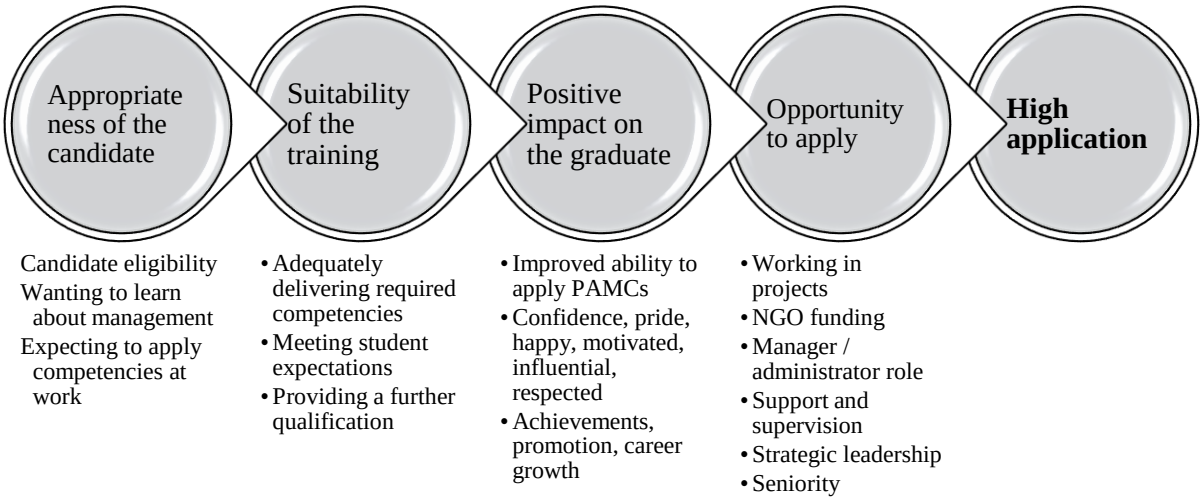


Figure 34: The main determinants of high application of PAMCs

Appropriateness of the candidate for the PgDCEH

Appropriateness of the candidate for the PgDCEH is one of the central factors that enabled the application of PAMCs. The high applying PgDCEH graduates were all in coordinator-type, non-clinician roles and demonstrated an ability to apply their PgDCEH-acquired knowledge, skills and understanding at work. The expectation to learn about management and intention to apply the PAMCs at work was characteristic of the high-applying graduates, in contrast with the misaligned intentions of the low appliers. No clear link between the level of education and high application was observed.

Suitability of the PgDCEH for the candidate

The PgDCEH suitability as an educational intervention is argued in Chapter 2 and the study's assumption about its adequacy in Chapter 4. Additionally, obtaining the PgDCEH as a postgraduate qualification was highly useful for the graduates, as summarised by respondent [13]: "*I had more confidence, my level was*

postgraduate". This graduate thought that the PgDCEH "…*was a good qualification and the training was also good [13]"* and gave him the qualification that allowed him to "*do all these things." [13]* The PgDCEH *"… has moved me higher where I was. When compared to the other qualifications, the level of the grade of payment of my salary has increased." [9]* Another graduate saw the PgDCEH as another "mid-level" qualification and "*would have liked to do whatever form of degree, like Masters." [2]*

Opportunity

Having the opportunity to apply was another central factor determining the application of PAMCs. Graduates working in projects (see Vignette 11 in *Appendix R*), had access to NGO funding, worked in coordinator-type roles and were adequately supported and supervised enjoyed greater opportunity to apply. Access to strategic leadership, whether inherent in the graduates or exhibited by the graduates' line management was also associated with the high application.

Project environment and eye care

Working in a project (as opposed to a programme) environment provided multiple opportunities to apply the PgDCEH-acquired management skills because projects challenged their teams to deliver results within a defined time, cost and quality framework. Even if success was not attained immediately, correction can occur more easily, as monitoring happens routinely. Conversely, the programme environment is structured for the meticulous following of procedures, which may not deliver quick results.

Although only a small number (n=3) of the 15 graduates worked in a separate project environment, it was striking that they all scored high applier grades for most of the competencies examined (examples: [13], [7], [8]). They also scored high on competencies such as finance and budgeting, monitoring and evaluation, supervising staff and quality and advocacy. These are the areas in which graduates in "programmes" really struggled with. The importance of project-focused management was also acknowledged by another graduate's line manager: "*I have noticed that she already had a good basis, but developed other skills, and it has especially had to do with how to manage projects. I have an idea that (the PgDCEH) delivered a contribution to her." [1S]*

The opportunities (for career advancement, and to apply PAMCs) were higher in NGO funded projects. The real and perceived issues ranged from beneficial to harmful, from the graduate's perspective. The issue of NGOs and the funding they provided was a major system factor, yet very contradictory, as this created the opportunities that were so dearly missed in the programmes. In some programmes the funding arrangements between NGOs and MoHs' seem to have influenced the decision-making processes.

In one government health programme, where service initiatives were packaged as projects, the performance and application of PAMCs improved. One graduate facilitated this through "*monthly meetings for all the projects, and the minister of health." [7S.* Another used the achievements of the projects for advocacy and to secure government resources. "*I'm really, really happy that at least there's something happening. Look at these, all these are sponsored by the ministry. But I'm no longer saying that we are neglected because it's now the ministry is seeing what is happening." [6]*

NGOs funding of eye health services

The positive dynamics of NGO involvement in government eye care programmes yielded opportunity, funding, skills and due diligence in terms of management, accountability and financial governance, which was surely deficient in these MoH entities. This was acknowledged by this graduate: "T*hese days I'm not no longer worried, because, I'm happy that partners are always helping you in the world. Because, through partnership they realize that it's very important". [7]*

Many graduates worked in programmes that were highly dependent on NGO funding because the "Ministry does not provide budget". This was cited as "government has low priority for eye care" by some respondents. Others suggest that MoH reduced funding of eye care initiatives because of the availability of NGO funding. Yet others were adamant that NGO's funding gave them leverage to determine service structure and priorities for implementation.

The effects of NGO's withdrawing from "sustainable" projects were disastrous in terms of lowering of programme outputs: "*Now that we do not have an NGO to provide the funding, we cannot afford this." [11]* Management activities like monitoring and evaluation and reporting became near obsolete in some programmes: "*Previously the NGO required us to submit regular reports. When we had the NGO there was a lot of monitoring, statistics, reporting, but now it is less." [11]* In this case, the extent of monitoring and reporting in programme context effectively dwindled down to this: *"At the end of the year I just send a report to the Senior Medical Superintendent." [11S]*

A MoH employed graduate, responsible for managing a partnership with an NGO that charges the Ministry fees for delivering services, did not think this was overly advantageous, "*You know staff and budget and all that for me they are secondary it's for the principles to know that eye care is part of the health system. Eye care is not that other programme whereby we have to pay the NGO. They are happy to come here and make money. We looked into it, but it is a process." [5]* Despite this, the partnership relationship still afforded the graduate opportunities to apply the PAMCs.

Another graduate had similar views, citing selfish aims "*because they don't give us their plans [7]"*, and the lamented leverage NGO's have because "*they have their funds." [7]* The latter sentiment was echoed by two more graduates [2, 5]. One of these graduates recounted the frustration of having to work with partners who do "*not understand the challenges in eye care and how what will help especially when it comes to barriers." [2]* These same NGO partners seemed to follow their own agenda, which may have been different to that of the ministry: "*In the Ministry of Health we have a plan of action, so we need all the stakeholders. We know who is contributing and when is it implementing his activity. So, they just come, like, ad hoc. It's like they are promoting their service because they like to bring free glasses. But, then the impact later, (of follow-ups) because it's just a chop-chop thing." [7]*

Criticisms of NGO partnerships came from both high and low appliers and included the ignorance that NGOs had about eye care, that partners had ulterior motives that guided decisions about what they do and fund, and that the partners' plans did not align with MoH plans. Positive comments included the availability of funding, which created opportunities and that they set high standards for monitoring and reporting. One graduate's line manager had low authority to make decisions to better her plight. This was evident through the long delay in the improvement of her working conditions and remuneration, despite her obtaining "exceed" performance appraisals for several years now.

For one graduate, having worked in projects for years before returning to a programme environment, the change was striking: complex and bureaucratic government systems and a decline in performance and management activity: "*These government things are a bit complex and slow. There was no way that we could do the same work. And to who would we be reporting? So, we just reduced down to what the hospital required. At the same time, it reduced (my) management activity, which is a major change. We are not pressured to perform monitoring tasks or reporting because there's no one." [11]*

The positive impact of the PgDCEH on the graduates, together with the appropriateness of the candidate, the suitability of the training and the opportunity to apply were the central factors that enabled application of PAMCs. All four these factors were illustrated in the graduates classified as high appliers of PAMCs. Next, the constraining factors associated with low application of PAMCs are discussed.

7.6 Constraining factors associated with low application of PAMCs

Table 40 contains a summary of selected constraining factors for interviewed graduates who have been classified as "low" appliers and derived as explained in section 6.2. At least four of the five "low" applying graduates registered "lack of opportunity", "clinical roles", "extreme self-orientation" and "low

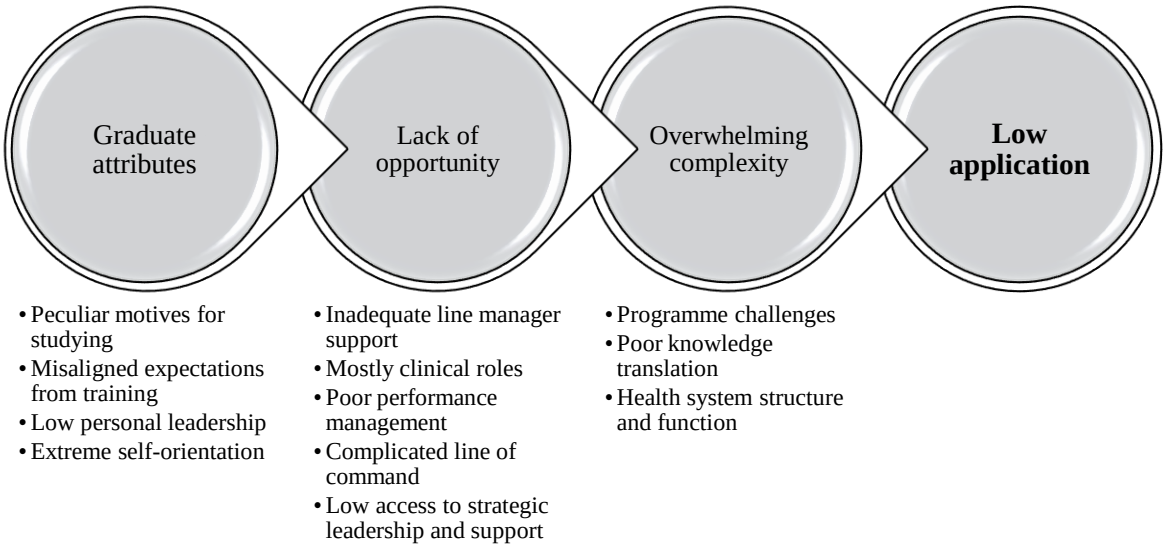
personal leadership" in their repertoire of characteristics. "Despair and lack of control" was a significant attribute exhibited by four of the five low applying graduates. These factors seem to be exactly the opposite of those enabling application of PAMCs. However, several other factors suggestive of challenges in the programme environments also feature prominently in many of low applying graduates.

Table 40: "Low" appliers' constraining factors

FACTORS	[04]	[10]	[15]	[09]	[11]	TOTAL
LACK OF OPPORTUNITY	YES	YES	YES	YES	YES	5
MOSTLY CLINICAL ROLES	YES	YES	YES	YES	YES	5
EXTREME SELF-ORIENTATION	YES	YES	YES	NO	YES	4
LOW PERSONAL LEADERSHIP	YES	YES	YES	YES	NO	4
DESPAIR, LACK OF CONTROL	YES	YES	NO	YES	YES	4
POOR PERFORMANCE MANAGEMENT	YES	YES	NO	NO	YES	3
LOW SUPPORT & SUPERVISION	YES	YES	YES	NO	NO	3
STAGNATION, DEMOTIVATION	YES	YES	NO	YES	NO	3
PROGRAMME ENVIRONMENT	YES	NO	NO	YES	YES	3
POOR KNOWLEDGE TRANSLATION	YES	NO	YES	NO	NO	2
TOTAL	10	8	6	6	6	

Figure 35 (below) illustrates how the combination of these factors leads to low application of PAMCs. Various largely negative graduate attributes contribute to the graduate being denied the opportunity to apply. The challenging work environments these graduates were embedded in make it difficult to ensure high application of PAMCs.

Figure 35: Factors constraining application of PAMCs



Lack of opportunity to apply

With the entry of new PgDCEH graduates and the resultant increase in management capacity in programmes, graduates expected to be taken up in new management roles. One graduate [04] moved from a "management" post to a "clinical" post before enrolling for the PgDCEH, a self-initiated transfer: "*I transferred to that post from (another province), yes. I was the assistant director. I was doing 80% management and 20% clinical." [4]* In the new position she had little opportunity to apply PAMCs. Another graduate' work role and location denied him the opportunity to apply, as illustrated in Vignette 14 (*Appendix R*).

Not given the opportunity to apply because of low support and supervision from line managers or low line management interest and involvement in the graduate's work can be another reason for the low application of PAMCs. This low interest and involvement also manifested in how performance management was conducted in the workplace. Performance appraisals are mostly done through self-reporting, *"Yes I fill in my own performance appraisals, in many areas above average." [11]*

Graduates (in manager positions) were not given an opportunity to participate in senior management meetings, because the line manager represents him: *"I'm usually the one who goes to the Non-Communicable Diseases meetings and present eye care. Those people don't always have the background and their understanding of what is happening (in eye care). So, the more information you give them, the more they understand what you are trying to achieve and the more they become sympathetic to your program." [5S]*

For one graduate [15], there was neither an opportunity nor an intention to apply his PgDCEH-acquired competencies in eye care programme management (Vignette 13 in *Appendix R*). Like the one seeking gratification from clinical work in the public sector, this one might have sought gratification from private sector success.

Extreme self-orientation

Overall, graduates exhibited reasonable protectiveness of self-interest in terms of benefits, workloads, remaining employed, staying in posts and fair personal benefits accruable. These subtle expressions manifested in their levels of motivation, interest and drive related to their work and their aspirations. The need to maintain autonomy, self-esteem, confidence and job satisfaction was evident through the expression in this investigation as well as through the multiple ways in which many of them sought to improve their career status in the post-graduation period.

Extreme self-orientation was observed in graduates who pursued paths that favoured their own interests at the expense of work or programme interests. In high-applying graduates, protecting their self-interest was balanced with a desire to perform well at programme level. However, some of those who were not high performing tended to look after their own interest primarily as a reaction to their own state of demotivation, despair and stagnation (See Vignette 12 in *Appendix R*). These issues speak to their personal well-being as opposed to how they are equipped for their work roles, and thus invariably impeded their application of PAMCs. Many blamed general health programme challenges for their inability to perform well at work, in spite of having completed the PgDCEH-training, which was aimed at equipping graduates with knowledge and skills to deal with these challenges.

Varying degrees of self-orientation were identified, which directly affected how low PAMCs were applied. For example, one graduate [3] was very personally affected by the measures introduced to lower spending, through a limitation on the reimbursement claims he could make for using his car for work transport. His response was defiance towards his line management and reducing the intensity of his workload. In a different show of self-interest, the graduate performed mainly clinical tasks, while his job description required of him to do mainly management tasks. His justification for this shift was levelled at the need of the people to access health care services, as he "*felt sorry for the patients*". He may have only really satisfied his own need to be comfortable in his work and be respected by the patients, who see him as a doctor. According to him, being a nurse, "*nurses are meant to care*", hence he preferred to work with patients. But he had personal concerns about money and how he was limited by cost curtailment. He preferred to work with patients as opposed to do management tasks, which was required from him by his line management. He found comfort in clinical work, almost to the extent that it provided an escape from the tedious "admin" work.

Another graduate [08] wanted to go back to clinical work, despite being in a project management post. This same graduate was ousted from a government post due to a higher qualification. After a failed attempt to do a masters studies, another [04] enrolled for clinic training course, which she was in the process of completing. She was eager to start with the next course, also clinical, which was conflicting with her despair of not being able to apply her management skills. Another [12] pushed on to study further at her own expense.

Some degree of self-orientation seemed necessary for graduate and programme achievement, however. One graduate [13] emphasised how he wanted a title, "*to be accepted, to be better qualified with a title." [13]* indicating the need for acceptance and affirmation. This is his justification: "*I gained a lot but still I want to further my education. I want to go back to (my country) to bring change. I wanted to work with government [13]" We want to be a model for (our region); I want to make change. [13]"*

The need to build a good career took much consideration by high and low applying graduates alike, but those who were low applying sought opportunities away from eye care programme management, for example: *"I first did the nursing diploma then the Bachelor of Nursing then the Master of Business Administration. But then decided I liked nursing better. I was doing too much finance and admin and decided to go back to clinical." [14]*

One graduate [04] was "*tired of clinical work",* although she still "*registered (to study for) an MBA."* After failing to progress, she went on to enrol for certificate training in optometric diagnostics. This was possibly a case of uninvolved line management with low expectations of productivity. This could also have been high self-orientation and boredom. She uses her further studies as justification for her low productivity while not really doing anything constructive to improve her work situation.

Another graduate, [3], felt locked in by the changes meant to limit excessive expenditure on transport. He used this to justify his low motivation and low productivity. As this was primarily a concern rooted in self-interest, he exhibited a perspective that did not align with the teachings of the PgDCEH. He was primarily interested in securing the best situation for himself; programme benefits seemed secondary.

Clinician roles

Graduates who, by the post classification are administrators tend to be mostly high appliers. The predominantly administration workers are predicated to higher applying, because their task ranges were in the realms of coordination, administration, mostly utilizing knowledge and skills required to manage.

Two exceptions were found, both with relatively high education. The first exception relates to an administrator who initially was a high applier. However, halfway through the post-training period, the graduate became a low applier, because the work scope centred on clinical tasks. The management tasks were very low compared to the erstwhile proportion. The second exception involved an administrator who enrolled for the wrong course. This resulted in a lower application. This does not necessarily mean that the incumbent did not apply "management" skills, which she did because of her senior position in the hierarchy but refers to achievements attributable to application of PAMCs. This distinction was important because the PgDCEH competencies come complete with knowledge and skills specific to managing eye care in a health district, something not demonstrated by this graduate.

These two examples illustrate the workings of diffusion theory applied to adoption of an innovation. The innovation in this case is the PAMCs, with the first example representing the early adopter and the second example the late (or no) adopter. The reasons for early or no adoption include opportunity, suitability and the health system structure.

Lack of line manager support

Several graduates' application of PAMCs were low because of inadequate line manager support. One of them expressed the lack of line manager support as a key personal challenge. *"Currently the manager is merely a place holder. My main challenge is to do with my lack of senior support [14]"* Another graduate who works mostly unsupervised and unsupported said: *"Very, very seldom (is when I meet my line manager). She knows me. I report even the reviews I do with her. Only for when I go on leave, leave forms that only when (the ophthalmologist) signs and (my line manager) will then approve." [4]*

This graduate applied some skills but under the supervision of his line manager, an ophthalmologist: *"I do coordination, supervise staff, writing memos, community mobilisation. I use the opportunity but indirectly through the ophthalmologist", [11]* despite his line manager acknowledging "*he is in space where he is not getting much opportunity to manage' [11S]* and *"if I was a in a coordinator post I would be allowed to participate. Unfortunately, I am not given the access to that organ of the hospital." [11]* Another graduate (in coordinator position) was not given opportunity to participate in senior management meetings, because the line manager represents him.

Vignette 7 (in *Appendix R*) sheds light on the calibre of leadership available to the graduate. Not able to recognise the graduates' stagnation and demotivation as direct effects of these limitations is the result of poor leadership.

Line managers who actively support their subordinates make every effort to understand the work they do, encourage their efforts to develop themselves further and see the link between the graduate's work outputs the broader strategic goals of the organisation. It also helps if the line manager has clear strategic intent which includes the graduate's work. The graduate-line manager relationships are characteristically stronger, more personal and more direct. Graduates who work with line managers whose leadership philosophy was inclusive and aligned with the eye strategy.

Perhaps because a line manager understanding of the reality of the challenges and the positive attitude towards tackling those challenges: "*It's a challenge needing funding, because without the funding, you cannot implement, and you cannot realize the ministerial objective. That's one, but the beauty is through whatsoever challenge there is also means of overcoming it. We are here to try our level best to overcome the situation, and not to get frustrated. And, even if you are in a heavily resourced area, there will also be challenges. So, the issue here is that how best can we do with the little that we have. And, we are kind of trying to absorb various shocks, so that we deliver the best services, with the limited resources we have to the community." [7S]*

Poor performance management

Graduates who were poorly supported and supervised were also not adequately performance managed. This graduate was left alone, lost and in despair, partly because of poor performance management: *"As for managing myself because of the workload in the office, I try to meet the targets and since we have to achieve at the end of the – every year or government year we have targets every three months, I have to see that whatever targets I have for the year I am following up and I have to evaluate myself every three months what I have achieved to move to the next and if I have not, and if I feel I am not going to achieve I talk with my boss and there is no wrong or right. Initially I thought you know one has to be right all the time, but now I realise no, when I have to, when I failed to achieve it is not a crime, I have reasons of why I have not achieved, and I am able to put them on the table." [2]*

Health system structure and function

The health system was experienced as a very complex place, with many graduates and line managers alike, struggling to engage constructively with it. Even this graduate in a senior position was incapable of solving problems: "*Because most of the problems come from the ground, we cannot solve here." [14]* Two South African provincial programmes' health management information system were so corrupted that patients took their files home so as not to lose them. *"The filing and records system - here is none. There are no resources, there is no budget." [14]* This can be likened to the health system failure.

Another province has been struggling with political and financial issues for several years now. The focus on bigger issues was not there, because the representation in higher management was very low. There was a sense of resignation (despair, hopelessness) in both the line manager and the graduate. The priority for them was to have a budget for their posts and some allocation for transport to conduct monitoring visits. Developing and implementing a provincial eye care plan was a distant ambition.

Another graduate works in a health system which was poor and highly under-resourced, although there were adequate numbers of doctors and nurses to provide a reasonable degree of service delivery in the urban centres. They were exclusively dependent on NGO funding for supplies and equipment, but they were well supported by CBM and Sightsavers[24] through multiple project funding.

Graduates experienced many system issues that posed difficult challenges, some for which they are powerless to overcome. These included decentralized authority, extreme bureaucracy, poorly resourced programmes in terms of staff and facilities and eye care's relatively lowly place in the health system

[24]CBM and Sightsavers (International) are international NGOs working in eye care in the region.

pecking order. In many programmes, eye care was observed as largely stagnant, undynamic and the focus on programme development was nearly non-existent with no vision, strategy or plan. This bred complacency as things go slowly on a programme level.

Ineffective line of command and organisation structure was another challenge. Graduates worked in complicated programme structures, *"There is no real line management, we just work together" [12]* or complicated structure: "*I'm the national health coordinator but I'm under the Department of Public Health and the Department of Clinical Services, and the facilities under that, they are the ones which are supposed to give the authority on whatever." [6] Also, "I'm reporting to the Ministry Health and the Director of Preventive Health, there's an eye care component, but I'm also reporting to the NGO funder's country office in the capital" [7].* These two managed to apply their PAMCs.

For some, there was ongoing restructuring of organisation taking place: *"This is an interim organogram it became too much. There is a new organogram currently being developed since 2014" [14]*, sometimes because of attrition of senior leadership, "*We don't have a proper organogram it is in developing for a number of years and every time when we request information or when we request the organogramme then we hear no they start all over again." [5]*

What was striking about the health systems was that the challenges graduates faced were the same as the challenges before their training. Even though people change and move in and out and around within the system, they change their perceptions, motives and interactions with others in the health system.

The impact changes related to desired health outcomes were not observed in any of the settings studied. As the PgDCEH facilitated the strengthening of one of the six health system building blocks, namely "human resources", some effects should have been discernible in some of the other blocks. Disease control monitoring operates in relatively short cycles, yet no significant improvements in eye programme performance have been identified. An explanation for this may be that changes in the health system usually take time as it involves policy, organisational behaviour and technological modification, hence it was likely that it may be too early to see any significant impact.

Many personal, programme and health system factors contributed to the low applying graduates' failure to apply the PAMCs. While the constraining factors were mostly the inadequacy of aspects that facilitated PAMCs application in high appliers, extreme self-orientation and programme and health system challenges significantly contributed to low application of PAMCs.

7.7 Constraining factors associated with medium application of PAMCs

The "medium" level appliers' constraining factors are similar as for the "low" appliers. *Table 43* contains a summary of selected constraining factors and the presentation of factors associated with medium applying of PAMCs. "Programme", "Overwhelmed" and "Unique" were commonly associated with medium application of PAMCs. Although most of them progressed well, career-wise and are positioned in the higher tiers of seniority, few are involved in supervising team members. These graduates had all the opportunity to apply but were hindered to do so mainly because of their challenging programme contexts.

Table 41: "Medium" appliers' constraining factors

FACTORS	[02]	[14]	[03]	[05]	[12]	TOTAL
PROGRAMME ENVIRONMENT	YES	YES	YES	YES	YES	5
OPPORTUNITY TO APPLY	YES	YES	YES	YES	YES	5
OVERWHELMED BY CHALLENGES	YES	YES	YES	YES	NO	4
NON-CLINICIAN ROLE	YES	YES	YES	YES	NO	4
UNIQUE EXPERTISE / ISOLATION	YES	NO	YES	YES	YES	4
PROFESSIONAL ACHIEVEMENTS	NO	NO	YES	YES	YES	3
POOR KNOWLEDGE TRANSLATION	NO	YES	NO	NO	YES	2
EXTREME SELF-ORIENTATION	NO	YES	YES	NO	NO	2
LOW SUPPORT & SUPERVISION	YES	YES	NO	NO	NO	2
SUPERVISE TEAM MEMBERS	NO	YES	YES	NO	NO	2
TOTAL	7	7	7	6	5	

Graduates succumbing to the challenges of health systems were constrained from applying PAMCs, mainly because of the challenges they were unable to overcome, despite their PgDCEH training. Understanding their health systems was a critical factor determining how graduates conceptualize the opportunities and challenges they encounter in their workplace. Those making efforts to learn about their health systems' internal and external environment have greater grasps of what is needed to make the most of the opportunities and overcome challenges.

Graduates who understand their health systems know what strategies are likely to yield positive outcomes and what should be aborted, if they are against public health policy. In some graduates, insufficient knowledge, skill and understanding of management to apply the PgDCEH competencies was demonstrated. This could mean the course outcomes had not been met in some areas.

The PgDCEH provides an opportunity for graduates to look at their health systems in a critical way. Going back into the work cycle and becoming updated about the opportunities and challenges was

something the higher appliers seem to be doing better than the lower appliers. The former group did not merely accept the pre-training notions of their health systems but accepted that the challenges are out there and to be overcome. They devised innovative ways to engage with the health system in a practical and productive manner.

7.8 Findings in relation to researcher expectations

The researcher's expectations prior to data collection and analysis are discussed in Chapter 4 Section 2. All the researcher's expectations of factors that would enable graduates to apply their competencies were supported by the research data. All the researchers' expectations of factors that would constrain graduates from applying their competencies were supported by the research data. These expectations presented major source of researcher bias. The steps taken to counter this are discussed in section 8.7.

The main expectations of the researcher were that the graduates' self-reporting would be mostly positive, that many would be in better positions, vocationally and economically and that their improved skills would have warranted them higher status or more important roles. The researcher expected to find a variation of career trajectories, including stagnation, promotion and people leaving the eye services. However, these were just predictable ideas as it would happen the same way in the general population as well. Some had expectations that the PgDCEH qualification would significantly increase their professional status.

It was expected that graduates would generally feel good about the PgDCEH, and that their expectations had largely been met in terms of skills acquired and qualifications. The opportunities for applying these skills may prove to be too few, particularly for those in mostly clinical roles. What was expected in terms of application was not concretely formulated during the conception of the study. In terms of achievements and programme performance, the expectation was that the impact would be less pronounced.

Overall, the researcher expected that graduates who are currently involved in management functions as part of their work would be more likely to apply than those who are not. He did not expect graduates who were in mainly clinical positions to have been able to apply their competencies, mainly because their challenging work environments would limit the opportunities for application of management skills.

It was expected that the programme and system-level factors would be restrictive to applying PAMCs. The severity of the restrictions, however, was not expected. For graduates who worked in programmes, their process-focus, long-term timeline and integrated monitoring posed more challenges than opportunities for achievement.

7.9 Summary

The main factors enabling graduates to apply PAMCs are the suitability of the training and having opportunities to apply the competencies gained. Being in an administrator position, having line manager support and working in projects, in collaboration with NGOs that provide funding afforded these graduates the opportunity to apply PAMCs. Having their expectations from the PgDCEH matched in terms of learning about management because they are in aspirant management positions which are further enabling factors. The main factors constraining graduates to apply PAMCs included extreme self-orientation, a lack of opportunity and being overwhelmed by the challenges of the health system. Being demotivated and isolated, working in programme environment, lack of support and supervision, unresponsive line management and harsh health system challenges were underlying reasons for this.

Some factors were indeterminate, showing no enabling or constraining effect of management application. Seniority or organisational hierarchy was one of the factors that surprisingly did not help to determine how graduates applied their PAMCs. It was likely that this was because the lower appliers are either positioned too lowly in the organisational hierarchy or that their higher seniority did not necessarily translate into higher decision-making powers. For higher appliers, the level of seniority seemed to be of no consequence.

Despite the eye care situation at programme level, graduates who were in coordinator role, worked in projects or for NGOs, and were motivated, confident, respected and influential in their work roles, were high appliers of PAMCs. Graduates who were mainly in clinical roles, worked in programmes, were demotivated, unhappy and hopeless were low appliers of PAMCs. Some graduates who were in coordinator roles and had the opportunity to apply PAMCs did so only moderately, mainly because of the intense challenges posed by their complicated environment.

High appliers typically performed well and some achieved successes on personal and programme level, whereas low and medium appliers generally stagnated, were demotivated and exhibited more extreme self-orientation than their counterparts. No significant improvement in health outcomes were reported.

Chapter 8: Discussion of findings

In this chapter, the findings in relation to the research objectives are discussed and related to what was known about the topic before the start of the study. It is also considered how the findings might be affected by the assumptions made and the limitations in the research methodology. The new insights uncovered by the study are highlighted and the impact and implications of the findings are explored. In conclusion, recommendations for improvement of the PgDCEH, are posed, based on the findings. The findings in relation to the system evaluation framework are summarised in *Table 42.*

Table 42: Summary of findings

a)	Graduates entered the PgDCEH with various expectations, motivations, motives and aspirations. These expectations have been largely met.
b)	After completion of the training, graduates performed various roles, engaged in different line manager relationships, were presented with different opportunities and many projected changes in ability and attitudes with regards to management practices.
c)	Graduates generally struggled to negotiate the programme and system challenges, which were largely the same as before their training, although some successes were achieved.
d)	Graduates applied the PgDCEH acquired competencies with varying effectiveness, categorised as high, medium or low applying, according to a competency application rubric.
e)	Organising and leading- type competencies were more readily applied by high appliers and planning-and-controlling-type were least readily applied by low appliers.
f)	High applying graduates mostly found the PgDCEH to be highly suitable, worked in project environments, with NGO collaboration and had line manger support and supervision.
g)	Low applying graduates struggled to thrive in challenging environments, had low opportunity to apply, exhibited extreme self-orientation and were frustrated, demotivated and were stagnating.
h)	While no remarkable programme achievements were registered by the graduates, some personal achievements and successes on project level were identified.

The findings support most of the research propositions (see section 4.3.1), i.e. those related to management roles and career achievements, but the proposition regarding organisational hierarchy is not supported (i.e. that graduates who are operative in higher levels of the organisational hierarchy may be more inclined to positively influence programme outcomes than those in lower levels).

The study uncovered the intricate relationship dynamics between people within the health system, and how this affected application of PAMCs. Next, these relationships and effects on application of PAMCs are discussed.

8.1 The graduates and their health systems

The typical PgDCEH students passed from enrolment through the training process and returned to their work environments, which had remained mostly unchanged. For most, the environment seemed unaccommodating of their new skills, while some found ways to put their new skills to work.

There are personal, programme and system factors determining the graduates' application of PAMCs. *Table 43* summarises the factors that enabled or constrained graduates to apply PAMCs, grouped into person, programme and system-level factors. Person-level factors are those factors derived from the knowledge, attitudes and behaviours of individuals, while programme factors refer to the work activities, processes and structures. System factors relate to the relationships between the various elements interacting to produce the desired health outcomes.

Table 43: Summary of factors enabling and constraining application of PAMCs

	PERSON	PROGRAMME	SYSTEM
Enabling	Motives for studying Expectations from training Suitability of the trainee Experience of the training Opportunity to apply Personal leadership Non-clinician role Professional achievements	Training suitability Current work role Support from line manager Graduate in supervisory role Motivation	Working in projects NGO collaboration and funding Support & supervision Strategic leadership Seniority (power / position)
Constraining	Motives for studying Expectations from training Low personal leadership Extreme self-interest Mostly clinical roles Extreme self-orientation Demotivation and stagnation Poor knowledge translation	Work role changes Not performance managed Complicated reporting Low strategic leadership Unique expertise / isolation Lack of opportunity Low leadership capacity Low support & supervision	Programme challenges Poor knowledge translation Health system complexity Challenging environment Poor performance management
No effect	Demographic aspects Cadre, education	Type of employer Type of funding for studies	

The graduate, infused with PgDCEH-acquired management competencies, intends to apply these competencies towards meeting the programme targets. However, the factors constraining application mostly outweighed the factors enabling application on a person, programme and system level. This was a key finding of the study. Some factors, like "motive", "opportunity" and "leadership" had enabling effects when they were expressed in positive range, and constraining effects when expressed in negative range. For example, "wanting to learn about management" as a motive was predictive of high application of PAMCs but "attending the wrong course" suggested the opposite. General demographic aspects and duration of employment after graduation did not seem to influence the graduates' application of PAMCs.

The theoretical framework illustrates how the PgDCEH (as one of several possible health systems strengthening interventions) should ultimately result in improved eye health outcomes. However, graduates had difficulty applying PAMCs for improved eye care programme performance. The findings showed that inputs, processes and outputs of the intervention (the PgDCEH) have not necessarily produced the outcomes and impact expected. The PgDCEH graduates did not elicit the anticipated health system response of a significant improvement in eye care programme performance. Instead, a less linear interrelationship between the graduate, the programme and the health system is suggested (*Figure 36*).

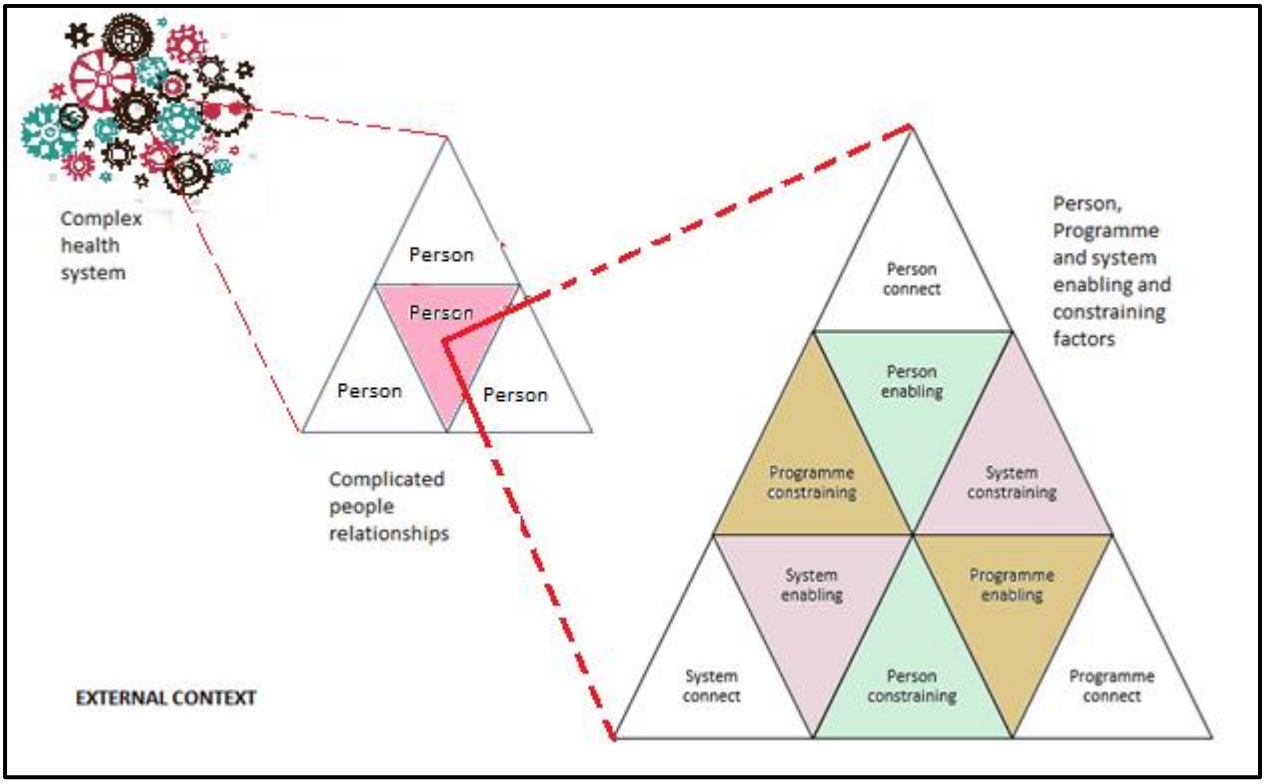


Figure 36: Interconnectedness of graduates' engagement with health system (Author construct with incorporated image obtained from https://www.shutterstock.com/image-vector/complicated-intricate-clock-mechanism-different-shape-7498743580)

The above is an illustration of the interconnectedness of one individual (the PgDCEH graduate). Each graduate connects with other individuals in their programme (and other programmes) in multiple ways. Programmes in turn interact with each other, within (and outside) the health system. There are multiple and multi-directional interactions with other individuals and eye programme elements for the purpose of meeting the desired health system outcomes, yet without high achievement. This is mostly because of severe challenges and constraining factors on personal, programme and system levels.

The system evaluation framework fails to explain why graduates who were "high" appliers still failed to demonstrate achievements at the programme level, how "medium" applying graduates were mostly in positions with the opportunity to apply but did not, and how "low" applying graduates seemed completely overwhelmed by the challenges of the health system. A greater understanding of the patterns of behaviours amongst these elements is required. (Kwamie, Van Dijk & Agyepong, 2014)

Some health system response was anticipated. According to the system evaluation framework, appropriate inputs, processes and outputs should be delivering some improved service outcomes, advances in human or infrastructural resource development or improved advocacy and coordination of eye care services at the programme level. However, this was not demonstrated, not even by the high applying graduates.

This was a reasonable expectation, as improved health outcomes following increase in management capacity have been demonstrated in various LMIC settings, including Ethiopia (Hartwig et al., 2008), South Africa (Mutyabule et al., 2017), Mozambique (Perry, 2008), Kenya (Seims et al., 2012), Zambia (Mutale et al., 2017) and after a coaching and mentoring initiative in five African countries. (Manzi et al., 2017)

The improved health outcomes due to the increased management capacity occur usually in confined, facility-based settings (Bradley, 2015), in project settings (Manzi et al., 2017 and MSH, 2017b) or after extended periods. For example, the National Malaria Control programme project (MSH, 2017b) reported significant improvements only after four years. These are relatively small and do not meet Adam's (2012) expectation that a health system strengthening intervention should have "large" system-wide effects. This would imply that small and localised interventions cannot be regarded as health system strengthening. The intervention (PgDCEH) was indeed health-system strengthening as human resource capacity building is part of health systems strengthening (Yeager, 2015), even though there was no direct, measurable response.

Many outcomes and impact findings are based on subjective responses from participants. Examples include Pillay's (2010) competency measurements, 360-degree perceptions of Mutyabule et al.'s (2017),

perspectives of Mutale et al. (2017) and impact of coaching and mentoring of Manzi et al. (2017) Makhubela et al. (2013) found through subjective reportage, weaknesses in competencies related to finances, people management and achievement of project goals, amongst others, in senior managers of the South African Public Service.

The study in Kenya (Seims, 2012) and one in Mexico, Colombia and El Salvador (Diaz-Monsalve, 2004), used observation of managers' practices in combination with questionnaires, interviews document reviews to determine the impact of management training. While management practices of the graduates were not observed in the Mexican study, the findings were triangulated with line manager's views, the perusal of management outputs and observation of graduate structural and functioning position in their workplace. Programme indicators were also examined to verify the subjective views of respondents.

Demonstrating success beyond the project level may be difficult. (Dorros, 2006) Often, successful implementation does not happen ((HST, c2009a) despite policies, procedures and systems being in place. Translating knowledge into practice is difficult to demonstrate. (Amde, Sanders and Lehmann, 2014) The PgDCEH study went beyond an assessment of knowledge translation but assessed the application of PAMCs, using more objective assessment of competency application and achievement.

Although the PgDCEH produced positive effects in the graduates, especially in their ability to perform management tasks and the level of confidence they have in their abilities, the effect on their programme performance was negligible. The expected effects on eye health system outcomes were not demonstrated, neither in the whole nor in any of the constituent elements. The findings suggest that the interplay of various individual, programme, system and other factors may provide explanations for this.

8.2 Factors influencing application of PAMCs

The factors influencing application of PAMCs will be discussed in three broad aspects: individual or person-level, programme level and system-level, in relation to the origin of the factor. However, some of these factors could be originating and determinant in any of the levels. For example, in *Table 43*, the seniority factor is positioned in the "system" box, it can easily originate in the individual (power and position) or programme (line management) realms.

8.2.1 Person-level factors

The main person-level factors that influenced graduates' application of PAMCs were the graduates' expectations, motives and motivations for study, the graduates' personal motivation and the issues of power, position and professions.

Motives and motivations for study

The findings show that graduates entered the PgDCEH with various expectations, motivations, motives and aspirations. The expectations have largely been met. The individual motives for studying the PgDCEH varied from an earnest desire to learn about management, to improve qualifications and to gain the experience of studying at the University of Cape Town.

The main motives of students at the entry of the PgDCEH might be confounded by the opportunity to study at a prestigious university through fully funded scholarships. The PgDCEH is a reputable, postgraduate qualification from one of the highest-ranked universities in Africa. Because of eligibility through recognition of prior learning (RPL), many graduates enrolled for the programme with 3-4-year diplomas obtained from much lower-ranked institutions in their countries. Obtaining the PgDCEH ensures that the graduate emerges with a higher and more prestigious qualification. This has significant implications for personal and career advancement. It also means that the expectation and motive for studying for the PgDCEH could be unrelated to the programme expectation that management competencies should be applied for improved eye health outcomes.

If graduates enrolled for studies to learn about management, they would be more likely to apply PAMCs than if they studied to obtain the qualification or the experience of studying at a university. If graduates enrolled for studies because of opportunity or to the wrong course or whilst occupying the wrong post, it may be unreasonable for them to be expected to apply the competencies. However, those graduates who came with the intention to become eye care programme managers or who were in programme manager roles already should have been high appliers with their improved competencies. Some might have entered the PgDCEH with mismatched expectations, making this a significant issue to address in future designs of the programme, as well as marketing and selection procedures.

The real motives for studying are not always readily accessible or easy to determine. This was a very individualistic parameter and makes candidate selection for maximum application of competencies difficult to control. Academic programmes are limited by educational criteria to make these selections. By the same token, the actual achievements and challenges of graduates are dependent on what respondents are willing to disclose. Hence, failure to apply the competencies should be expected from some management-trained individuals.

Personal motivation at work

Following enrolment, the motive-driven thread was continued as they progressed from student to graduate to the potential manager. The critical importance of motivation of graduates at work was another key

factor determining whether they would apply PAMCs. The findings show motivation expressed along a wide spectrum and are related to career development, remuneration, work performance and job demands and supervisor support and feedback. Graduates with high personal motivation pressed on to "have a title" [13], "possess the skills" [6] and "have higher qualification" [7], whereas those with low personal motivation focused on clinical work [3], engaged in career-shifting studies [4] and maintained low work productivity [2]. The latter group were low on applying PAMCs.

Many graduates reported that they were performing well against their work objectives. For some, this was confirmed by their line managers [1, 6, 7, 13]. These were the same graduates who expressed positive feelings about their work situations (which included excitement, pride and happiness). Their satisfactory performance was underlined by their personal achievements.

Graduates with achievements at work were more motivated, hence, more likely to perform their work with confidence. This could lead to further achievements, engendering more confidence and respect from their peers and line management. Furthermore, people are motivated by the rewards and awards they receive in recognition for the work they do, hence, this would lead to higher application of PAMCs.

Some graduates believed that the PgDCEH gave them unique expertise [2, 5], resulting in pride and a sense of gratification. Others were frustrated because they felt their unique expertise was not fully utilized [4, 8] and appreciated. All people have motivations that inspire their personal and work lives. Personal motivation is a central driving force in economics (Barbalet, 2012) and benefits accrued to self or own interest are commonly sought, whether directly or indirectly. The personal motivation notion may be explained by any of the several motivation theories (Chand, 2018 and Pardee, 1990) and leadership and management studies are typified by Maslow's (1953) hierarchy of needs. (Fallatah and Syed, 2018)

The persistent programme and system challenges can limit the achievements and lead to frustration and demotivation in some graduates. This can be further complicated by a lack of support from peers and line managers. These scenarios can heighten the graduates' need for reward or restitution, which can lead to them turning towards themselves and become more conscious of their unfulfilled needs. They can become only partially engaged in their work, with meeting their work targets becoming a priority secondary to addressing their personal needs. The contribution of the low-applying graduate to meeting programme targets may be less appreciated than that of the high applying graduate, which may be more aligned with line management expectations, and therefore, greater contribution to their work objectives. It is, therefore, important that as management graduates, the issues of personal motive and motivation is understood and

appropriately managed by themselves. Consequently, it is required that line managers understand and fully support the staff who report to them.

The notion of personal motivation is also about self-preservation and the identity of a person. (Epner & Baile, 2011) Being able to do and having everything to perform a task may not be enough. It may also be necessary to protect, honour and serve their personal interests. Personal motivation may be important for security, autonomy, respect and self-esteem.

In work environments, the hierarchy is structured along the lines of education and qualification, particularly in health professions. Obtaining a (further or higher) qualification may be addressing the issues of security, power and self-worth. It may be that the level of qualification is too low to exact the requisite respect and recognition from colleagues in the health system.

If excessive self-preservation is a primary concern, the management application may be less important for the individual. This is because management as a work responsibility is about "others": getting "others" to do what must be done, for "others", refer to Chapter 2, section 1.1. The primary "others" are the people that report to the manager and must meet their key performance targets. The secondary "others" are the manager's own collection of people to whom he or she is accountable. In other words, management works with an outward demeanour, instead of an inward one which is a concern about others more than about self. To manage effectively, the focus must turn to others.

If the manager's interest is mainly inward, due to being demotivated about the work situation, lack of promotion or low salary, it is difficult to keep management issues in primary focus. Excessive protection of self may direct the attention inward, to the self, causing neglect of the management tasks and responsibilities in the programme. This can be because of a perceived threat to the person, i.e. lack of respect from peers and line managers, failure to grow and perform well, or even financial loss. For PAMCs to be applied, the non-self needs to be at the forefront. If the individual is not thinking of others first, having all the resources, opportunities and equipment will not guarantee a successful application of management skills. This may work both ways: the disgruntled one will lower application/performance, whereas the satisfied one will work towards achievements, like qualifications and success at work.

It is normal human nature to want to be successful. To be successful, individuals need an enabling environment, sufficient resources, a collection of positive attributes (including healthy mind and body), and appropriate personal competencies. These include aspects such as the ability of self-expression and

self-knowledge. Personal motivation plays a key role in the determination of success: positive motivation enables, and negative motivation constrains the application of PAMCs.

Power, position and professions

Another key factor determining the application of PAMCs from an individual perspective is the interrelated issues of power, position and professionalism. The findings show a strong relationship between clinical/administrative roles and whether they apply PAMCs or not. Clinical responsibilities reduce the opportunity to apply PAMCs, mostly because the clinical duties occupy the graduate, leaving less of an opportunity to perform management tasks. Those in administrative positions had more opportunity to apply management skills. However, the application of competencies may be more related to the issue of "agency" or the role a person plays, than who the person is. People change their roles constantly throughout a typical day. At work, specific roles are required to be filled.

There are imbalances in the health workforce (WHO, 2006) on many levels including professional, geographic, gender and economic. In LMICs, where the health care workforce is limited, clinicians are usually in superior positions in their units. Superiority is associated with more power and involvement in decision-making. There is a strict hierarchy between the professional classes, especially between the medically qualified and those who are not. Medically qualified cadres are assigned labels of "senior", "leader" (NHS, 2009), more readily than others, with implicit respect and decision-making powers.

Doctors' professional jurisdiction give them more power (Gabel, 2012) as their ideas are more readily accepted than others' (Spehar, Frich & Kjelhus, 2014). Evaluators at the Institute of Medicine (2013) observed exclusion, usurpation and power-play as vestiges of professional boundaries in nurses. Even from the administrators' perspectives, doctors are "powerful experts" (Von Knorring, De Rijk & Alexanderson, 2010), even though they have "low knowledge of how things work". On the other hand, doctors may be reluctant to fully embrace the leadership/management role and abandon the area of their primary expertise (Kyratsis et al., 2016), namely medical care. They may also be untrained in management, and poorly prepared and incentivized. (Doherty, 2015)

The advantage that medical doctors have over others was highlighted by Gabel (2012), who emphasized the importance of recognising and exercising the right type of power to achieve success and Spehar (2014) marking the differentiation as a determinant of success. This is exemplified by one PgDCEH graduate providing secretarial assistance "because he is the doctor" [2], another's work not being recognised "by the doctors" [5] and another excluded from management meetings "because it is for doctors" [11].

This may be because of the phenomenon referred to as "tribalism" of professions by Frenk (2010), professional boundaries that restrict inter-professional interaction. In eye health services, ophthalmologists and optometrists practise in their recognised professions in the same broad health programme. Still, there is little interaction beyond one or two shared work objectives. The volatile tension that exists between ophthalmologists and optometrists related to their professional scopes of practice is vividly illustrated by a survey respondent's comment (see *Appendix L*, #12)

Management is not seen as a "profession", the same way that medicine, optometry and nursing are seen as professions in health. Managers, therefore, do not gain comfort from a profession that protects and supports them. (Abbot, 1988) They do not enjoy the benefits of camaraderie and exclusivity afforded by professions. (Dahl, 2015) Instead, the unique skills of management are considered alien or non-core and therefore non-essential by the "true" professionals.

According to the Theory of Professions (Dahl, 2015), professionals have "higher education", participate in formal associations, bear protective titles, adhere to ethics codes and subscribe to journals. These and other factors separate clinicians from managers. This paradigm of professions is present in other sectors as well, such as in law. (Lester, 2015) Health programme managers are largely excluded from this definition. This can be because management work is less visible to end users. There are not as many quick wins, compared to the gratefulness of a patient successfully treated by a clinician, for example. The closer the health professional works with patients the further this may take him or her from management. This is aptly demonstrated by the graduate who preferred to do clinical work because "*who will look after these people?*" and "*they call me doctor*". The inter-related importance of motivation and motives for study, personal motivation at work and power in determining management effectiveness has not previously been demonstrated in eye care programmes and is a significant new insight uncovered by the study.

8.2.2 Programme-level factors

The main programme factors that influenced graduates' application of PAMCs, namely the support and supervision the graduates enjoyed or did not enjoy, line management leadership and performance management are discussed next.

Support and supervision

The findings show that high applying graduates were supported and supervised by line managers who were interested in and knowledgeable about their work (see section 7.5). Conversely, graduates who were low applying enjoyed less constructive support and formative supervision (see section 7.6). These line managers showed little intention or ability to make important decisions, e.g. about rewards and

promotions. Their supervisory roles may be limited to administrative control (i.e. attendance, punctuality and employee wellness) and may not involve monitoring the employee's day-to-day performance of tasks linked to the achievement of organisational strategic goals. This takes away the leverage a line manager should have for negotiation of performance targets with their subordinates.

Supervision plays a key role in performance and motivation. (Bradley, 2013) Supervision frequently occurs according to line of command. Good supervision requires line managers to know what their subordinates should be doing, i.e. applying PAMCs in the case of PgDCEH graduates. Effective supervision, (not only occasional inspection and monitoring), affects motivation for better performance, achievement and career development. (Bradley, 2013)

Support, which encompasses proper supervision, performance monitoring and feedback is necessary for management effectiveness. (Bradley, 2015) Positive feedback affects the way a manager develops (Baloch, 2016) because it builds confidence and aids in matching expectations.

The lack of supervision and line management support was a major source of dissent, demotivation and discouragement, according to the interview responses [2, 4, 10, 14]. Also, the graduates' supervisors' relative ignorance and disconnectedness in relation to management views, understanding and its application in the eye care context [2, 3, 6] limits their use as advocates and facilitators for eye care issues. These same line managers even motivated for the graduates to go for the training in the first place.

Those graduates who were confident because they had opportunities to apply the competencies were supported by an involved and interested supervisor, and were excited about their achievements, albeit mostly in meeting project targets. This group of graduates exhibited more contentment because their personal interest was addressed, therefore they could identify better with the bigger picture, the organisational strategic goals. This attention to personal motivation recognises that organisational wins are also personal wins.

Graduates who had the responsibility to supervise staff [6, 7, 8, 13, 15] had more opportunity for the PAMCs application. The supervision role allows the application of a vast array of management-related knowledge and skills, effectively keeping the supervisor management-proficient.

Line management leadership

The central role line managers play in whether a graduate applied their PAMCs or not, was one of the main findings of the study, which was unexpected. Good line management is attained by a carefully executed line of command, clear links between the graduates' job description and the organisation's

strategic goals and professionally respectful relationships. Many of the graduates' line managers were overloaded with multiple engagements and responsibilities. Others struggled to make inappropriate or dysfunctional lines of command work, frequently without possessing the relevant skills.

The difference between leadership and management is explained by theories and principles which put these two concepts into context. Leadership is about vision and strategy and if the line manager does not have strong strategic leadership, the interest in the subordinate can be very low. Ideally, management-trained line managers are needed to make this work. Line managers should have management training so that they can appreciate and understand the work the graduates are supposed to do.

Some graduates in senior management positions need to contend with low levels of authority and inadequate delegation, a typical pattern. (WHO, 2002) "Defective budgeting processes", "staffing issues", including "vacancies in key managerial positions" and "ineffective use or lack of management information systems" are further challenges in district health managers' work environments.

Several of this study's graduates [1, 3, 5, 13] suggest that their line managers should be equipped with the appropriate management skills. Leadership training is a popular means of human resource development for higher professions or senior members in the organisational hierarchy. Yet, management is central to organisational goals being achieved, through implementation and monitoring of core activities. Leadership, by definition, does not involve dealing with these "hands-on" deliverables.

The line managers' lack of involvement in the work and performance of their subordinates may have a direct effect on the extent and manner that graduates applied the PAMCs. This is regardless of whether it is because of general disinterest in their work, general ignorance about the work or general inability to provide the requisite support. Where the line managers were disinterested in the work of their subordinates, the PgDCEH graduates, it left them without somebody to consult for guidance, assistance and direction. This may have resulted in the subordinate failing to perform at an optimal level. Graduates who had line managers such as these were demotivated, directionless and struggled to find an opportunity to apply their skills.

Performance management

Performance management practices in eye care programmes were found not to be conducive to a high individual or programme performance. This includes self-appraisal [4], formality appraisals [11, 15] and appraisals that had no intention to lead to a promotion or constructive feedback [2, 6]. This can be because the line manager is ignorant or disinterested about the graduate's work or has low expectations of the graduate or that the performance management process is a mere formality.

Poor performance management makes for poor alignment of the employee's performance targets with the strategic targets of the unit or organisation and leads to poor optimization of skills (management included), resulting in low productivity and achievement. (Bradley, 2013) Graduates and their peers failed to get the appropriate recognition for their achievements or general support and encouragement for their efforts, amidst the reigning system challenges. Instead, some line managers sought self-aggrandisement [1, 3], seeking credit for gains that should accrue to the graduate.

Performance management through self-appraisal is a widely accepted practice in many government health departments and many countries. Subordinates present self-administered performance reviews to their line managers which are invariably endorsed by them. While this serves the purpose of adherence to labour policy, it does not help to align the employee's work outputs with the requisite benefits, e.g. remuneration and promotion, not only an end/means transactional relationship as understood by Ohemeng (2009).

The three concepts: performance management, performance evaluation and performance measurement are different entities relating to the continuous, periodic and cross-sectional natures of interactions between the supervisor and the incumbent, according to Mosoge (2014). These should be further distinguished by their relations to the organisation's strategy, objectives and activities respectively. Employees need proper performance management, not only periodic inspection and monitoring. (Bradley, 2013) Supervision, support and feedback are necessary for optimal performance and further development (Baloch, 2016) of individuals and teams.

In organisational theory, there is a psychological contract between the worker and the line manager. (Rousseau, 2004) This ensures that the line manager has some leverage to hold the worker to the contract terms, especially relating to the performance of tasks that produce results against objectives. Managing contracts is a largely administrative process, often overseen and organised by human resource departments. This weakens the leverage afforded by the normal transactional relationships (Antonakis and House, 2014) in performance contracts, from a line manager perspective.

The findings suggest that proper performance management can be effectively used to moderate the productivity of an employee because of the contractual/transactional relationship implicit in it. In the absence of proper performance management, there is the likelihood of reduction to low productivity, low motivation, low creativity and innovation, all leading to a low opportunity to apply PAMCs.

8.2.3 System-level factors

The main system factors that influenced graduates' application of PAMCs were the challenges of eye care programmes, the opportunities embedded in the design and the health system in which application of the PAMCs was to take place.

Eye health programme challenges

Graduates experienced several challenges that related specifically to the structure and function of the eye care programmes they worked in. "Lack of adequate resources", "insufficient human resource development" and "no dedicated eye care budget" are the most common challenges reported.

Challenges experienced by PgDCEH graduates in their eye care programmes are mostly no different from the challenges reported before they enrolled for the PgDCEH. Most of these challenges stemmed from the chronic shortage of resources. Some programmes are allocated less staff than other programmes and others worked in poorly resourced workstations and multiple supply chain problems. The long-term exposure to these challenges may lead to demotivation and despair, leading to low application of PAMCs.

In the programme environment, graduates are exposed to conditions of high routine [4], narrow scopes of practice [2, 11] and complicated reporting lines [2, 6]. These are some of the reasons why graduates struggle to apply their PAMCs. The high routines of work roles in programmes imply that tasks come with pre-defined procedures, leaving little room for innovation or creativity. The priority to follow the procedures and even fill the day doing this, is greater than trying to reach a clearly defined result, complete the task and go on to start and finish a new task.

Also, in programmes, a manager's range of tasks may be very limited, being responsible only for a proportion of the task. For example, in procurement, one staff member may fill out a requisition, another may be responsible to check the stock, yet another signs authorization and the issuing of the item done by a fourth. In this way, one individual rarely sees a procedure through from start to finish. Excessive task sharing across several units, staff and departments may lead to the fragmented completion of big tasks, such as preparing budgets. In such big organisations, there are varying degrees of ability, productivity, motivation, hence getting to a level of proficiency and efficiency at work may take a long time.

Furthermore, programme lines of command can be very complicated, with some employees reporting to officers outside their strategic unit or even in different departments. Some attributes of human resource establishments such as rigid post / role designations, central human resource management (Conn, 1996), complex organograms and the slowness of the rate of change can work against the easy application of

PAMCs. In programmes, complicated organograms are common, and many organograms are constantly under construction or are not aligned with guidelines, strategy or policy.

Work in programmes work may lead to stagnation [2, 4, 9], being blocked [5, 11] and being powerless [2, 5, 11]. The sense is that these situations have been characteristic of the incumbent even before studying for the PgDCEH, although this cannot be stated conclusively. It is not clear whether the low application causes stagnation with little chance of promotion, which leads to demotivation or whether the low motivation leads to low application.

One of the implications of this is that eye care programmes have difficulty to engage optimally within the health system. Eye care is a relatively small health programme, and when having to compete with the big programmes (TB, HIV and malaria), falls far short. It is very difficult for eye care to earn its fair share of resources to facilitate the meeting of programme outcomes. To this end, eye care in LMICs often develops initiatives that are "project"-based and attract external resources such as funding from NGOs.

Project designs as opportunities for application

Reports of achievements amongst the high applying graduates were mostly in activities related to NGO-funded projects [6, 7, 8, 13] and were centred on individuals in small teams. Although these may be isolated achievements, they provide direct reward and gratification because of the greater requirement for results-based monitoring and reporting, the reciprocal reward system and the Ministries of Health adopting these projects as part of their national strategies. These projects, with relatively short time horizons, provide ample opportunity for managers to apply a wide range of management competencies, from planning to organising, controlling and leading.

There is a modern trend in organisations to execute their strategies in the form of projects. (Van Der Waldt, 2016) Alignment of the project aims with organisational strategies helps to ensure organisational success. (Stanleigh, 2016) According to the Project Management Institute, "management by projects" is used to achieve organisational goals. (White, 2002) This means that all organisational activities are subject to project management principles. The central purpose of project management is to achieve results in a singular initiative, of tactical design and with clearly defined limits in scope. (Crawford, Simpson & Koll, 1999) "Management by Projects" is the organisation-wide, strategic roll-out of multiple projects in an operating environment. (Boznak, 1991)

According to the USAID (2004) monitoring guide, programme/project centred management approaches are most widely used in primary health care. Projects are more focused and allow for more precise

control. Few projects end up in absolute success (Stanleigh 2016) because projects do not properly align with organisational strategies and they tend to work against integration. The way projects are designed allows a more interactive line of command and therefore better execution of supervisory roles. The way programmes are designed affords employees the security they need for career development, stability and the protection against changing policies, which may be characteristic of projects.

The programme environment is known to be more accommodative of process-type activities, whereas the project environment is more focused on results. (Boznak, 1991) This can be an explanation as to why eye care initiatives thrive in vertical project environments and struggle in programme environments. In the programme setting, there is a rigid adherence to how things are done, a heavy and dense senior management structure, slow evolution of change and defined hierarchies of roles, especially where doctors and nurses work together in teams.

The graduates working in project environments applied their PAMCs more readily than those who did not. This may be because of the greater opportunity, the availability of dedicated funding, the use of the project management approach (White & Patton, 2002), the focus on monitoring and evaluation and the clear line management structures within which they work.
It seems that eye care, being a surgically based discipline, fares better when using this "project" style of service delivery, like outreach camps. Even the clinical outcomes are easier to measure than in other programmes and have relatively quick turn-around times. These targeted activities make for positive achievements reported through focused monitoring procedures compared to a slow generation of results in a largely routine programme environment.

The suggested benefits of the project approach for eye care (Blanchet, 2012) are evident from the findings. But, is it possible that the eye health workers were pre-conditioned to work in projects because of the nature of operations for eye care? The reasons why the project approach seems more appropriate for eye care should be explored with further research.

Project design seems to be more impactful than programme design when applied to eye projects. This could be because when eye services are subsumed into programmes, eye care becomes neglected and fails to secure resources, attention and interest required for performance, compared to larger programmes such as chronic diseases. The benefits of the project design allowed for easier expression and implementation of eye care initiatives. The greater effectiveness of the project design has not previously been demonstrated in eye care programmes and was a significant new insight uncovered by the study.

NGO collaboration as opportunities for application

Much of the high applying graduates' achievements were in association with NGOs' involvement, usually in a funding arrangement. This was likely because the NGO funding created an opportunity for eye care programme management activities. Many NGO funding arrangements are ongoing in the region with NGOs operating eye care initiatives partially embedded in government programmes. Graduates who work in this environment glean benefit from project activities that are highly focused on meeting targets, deadlines and milestones. In exchange for having mostly superior remuneration and benefits, staff members are required to perform ranges of duties that are much broader than those in government programmes.

In many countries in Sub-Saharan Africa, the funding of eye care activities by the Ministries of Health is largely insufficient. Over the years, NGOs have increasingly helped to fill this gap, resulting in many eye care activities being implemented as standalone, vertical interventions, with little integration into the broader health system. In addition to providing funding, NGO's play strong, facilitative roles in developing and supporting eye care programmes. Through designing, financing and monitoring projects that a) align to their own strategic aims, and b) meet some defined needs in eye care programmes, NGOs provide an opportunity for applying PAMCs across all four functions of management.

The NGO-association with eye care is not entirely positive [2, 5, 7, 11, 14]. In LMICs, there is always the danger of dependency on NGO funding. As businesses, NGOs are intent on the pursuit of their own strategic objectives, which may include providing funding for initiatives not prioritised by the government. The presence of strong NGO support can confuse the power dynamics in the health system. It is as if the NGO has the power to decide what to do or what to prioritise, because they pay for that part of the programme. NGOs seem to determine some priorities in the system to the extent of taking over the role of the government [2, 6]. This could extend to NGOs seemingly wanting to take total control of an eye care initiative, leaving little room for the Ministries of Health to take ownership. Alternatively, Ministries of Health can see NGO funded programmes or projects as "taken care of", hence, neglect to allocate appropriate resources to them. This was also noted in some of the other graduates' perspectives.

The vertical nature of NGO-funded projects makes it problematic to integrate eye care into health systems. Integration has not been conclusively shown to be effective in eye care. Integration, when it means sharing resources and cooperating across the six elements of the health system (service delivery, human resources, finance, information systems, supplies and leadership and governance), can be useful to align project-based and NGO-funded initiatives with long-term strategies of the Ministries of Health.

This is particularly true in eye care, as NGO funding is a welcome supplement to limited government budgets for health programmes. Blanchet's (2012) suggestion that managers regard projects funded by international organisations as the responsibilities of those entities was not observed in this study. Instead, it was found that NGOs regarded their projects as the best solution to health problems. The opportunities for applying PAMCs provided through NGOs collaboration with eye programmes were not previously demonstrated as strongly as in this study. It was a significant finding and it has many implications for programme design, teaching and research.

Health system complexity

In describing the health systems of the graduates through which eye care services are delivered, the researcher did not expect anything different from what was found. Amongst the graduates' countries, there were broad similarities in health systems structure and function with differences mainly noticeable in geographical and demographic realms. The programme challenges graduates faced were the same as they had been before their training. The health system is dense, slow to change and largely an unaccommodating place for new management graduates trying to apply management competencies in eye care, a relatively lowly prioritised health discipline. This may be the reason why eye care in LMICs seems to thrive in slightly disconnected formats from the general health system. (Blanchet, 2010)

The orderly flow of people and processes between the health and education realms of systems (Frenk et al., 2010), generating a constant supply of workforce for the health system paints an idealistic picture of how things can be. In this study, it was found to be much more unpredictable, chaotic and complex. The PgDCEH puts the graduate through many paces: enrolling, studying, doing assignments, then expecting them to apply their PAMCs. The PgDCEH graduates are not alone in their struggles to overcome complexity. The South African Health Report of 2012-13 reports complex reporting lines, myriad responsibilities, intricate stakeholder and resource management algorithms as common sources of complexity and likens it to "calculated chaos".

In many health systems, managers are not equipped to deal with the complexity of systems (Frenk et al., 2010), as there are too many "system" problems to deal with. It may be that these managers think in mostly linear ways. Gharajedaghi (2011) suggests that the reason things seem chaotic and complex is because managers do not understand them. Hence synthetic thinking (Harrison and Bramson, 2000 and Patton, 2016) is needed to understand complex systems, as opposed to analytical thinking. This is because the essential properties of the parts of a system get lost if analysed separately from the whole. (Morgan, 2005)

Systems come in many forms including natural systems, technical and human systems and functions through interactions of the constituent elements. (Gharajedaghi, 2011) These systems are, in turn, are comprised of infinite numbers of sub-systems. The management training through the PgDCEH is such a subsystem interacting with other subsystems. The PgDCEH graduates negotiate this complex environment, sometimes in teams, sometimes isolation. Other professionals can form communities of practice, but managers usually negotiate this alone. Several graduates allude to isolations, "unique expertise" and "not being understood". This isolation can contribute to making the PgDCEH graduates' interactions with the health system very difficult.

Providing management training to a small number of individuals working in eye care programmes, as the PgDCEH does, is a very small intervention in a very complex, multi-layered health system. Graduates at their positions in the organisational organograms are relatively small cogs in the big machinery of health systems. In relation to management, they are relatively isolated and sparsely distributed. Creating a "receptive context for change" (Plsek, 2003), through optimisation of personal relationships, communication and teamwork may improve this in organisations. This same complex health system environment in which eye care and other programmes are embedded is the vehicle for the generally slow rate of the adoption of the innovation which in this case is the new knowledge and skills provided by the PgDCEH. As in the principle of diffusion theory, the key in fast diffusion is in early adoption. This requires a potential innovator (e.g. the PgDCEH graduate, with new ideas, energy and motivation) to be an early adopter.

In the context of overwhelming health system challenges, like those experienced by the PgDCEH graduates, change happens slowly (see section 7.4.2 and *Table 38*). Homeostasis, self-regulation and equilibrium (Mele et al., 2010) and resilience (Barasa et al., 2018) are preserving attributes of complex adaptive systems, which can contribute to improved performance of the health system. (Plsek, 2001) In favourable times, change happens faster as less sturdiness or tenacity is required than in difficult times. In difficult times, adaptability is needed to be able to overcome challenges in a complex system.. The internal and external resources required by individuals (PgDCEH graduates in this case) to overcome the challenges (complex relationships, policies and procedures, etc.) may be insufficient despite their training.

Change is necessary, continuous and takes time Sherman (2001), as it can lead to the extinction of the former state (Sartori, 2018), to increase or decrease in status or to the modification of form, according to Hewson (1992). In health programmes, implementing interventions for improved outcomes are catalysts of "change" reactions. For example, the goal in eye care is "to eliminate avoidable blindness". To achieve this, certain conditions (objectives) must be met, each of these fitting under the relevant result chain (or

Theory of Change) indicators. Each of these objectives may require another set of sub-objectives that have to be achieved for the overall objective to be achieved. This can be broken down to the smallest possible activity, with various inter-linkages, within and across programmes, implemented by a variety of different health workers. Making a success of this requires intricate and meticulous planning, organising, controlling and leading, in other words, management.

The PgDCEH contributes mainly to the expression of so-called soft skills, which ensures that technical skills are used effectively and efficiently. (Joshi, 2017) "Hard" and "soft" factors are thought to significantly influence the structure and function of the health system. (Van der Waldt, 2016) Loosely put, "hard" factors include processes and systems involving technology and "soft" factors include those involving people and culture in organisations. (Lazarus, 20130) Soft skills include personality development, communication skills, relationship, time management, leadership, team building, managing stress, problem-solving, thinking skills, decision-making, and workplace etiquette. (Heckman and Kautz, 2012)

8.2.4 Summary

Applying the PAMCs is dependent on a variety of factors, at a personal, programme and system level. Senior managers of health programmes should be alerted to the realisation that applicants' personal motives for enrolling for training and their level of motivation at work may influence how the graduates apply PAMCs in their programmes. This may be further affected by graduates' level of authority, roles and qualifications in relation to other staff. Close monitoring of graduates' performance and general situation is necessary, along with measures to ensure selection of the appropriate candidate for training. The PgDCEH graduates presented scenarios where many of the conditions for effective management (WHO, 2007b) were not met and were therefore restrictive to graduates' application of PAMCs. Those graduates who overcame the challenges encountered in the eye care programmes are the ones who applied the PAMCs. Although having opportunities alone does not necessarily mean that graduates would be applying PAMCs, having adequate equipment or tools to perform a task is a well-known enabler of implementation. (Filerman, 2003)

Many of the senior managers were not providing adequate support and supervision, leadership and performance management due to ongoing challenges experienced at eye care programme level. Like most health care programmes, eye care struggles to meet its health system outcomes due to the complexity of the health system. Considerations to apply the project- design and inviting NGO collaboration should be made when developing eye health interventions on a programme level.

8.3 New insights uncovered by the study

The findings did not fit the systems evaluation framework. Based on the assumption that the curriculum designed and delivered was deemed adequate, acquisition of the competencies should lead to their application if the opportunity was presented. Applying the competencies effectively, appropriately and consistently and ultimately improving health outcomes was not a linear equation as proposed by the systems evaluation framework. Intermediate steps may be required to ensure the achievement of health system outcomes, including addressing the effects of people's personal motivation in a complex health system environment and structuring programme designs around the project management approach. (White and Patton, 2002)

The systems evaluation framework was embedded in a rich, complicated context which was so overwhelming that graduates had difficulty applying their PAMCs and individual, programme and system factors constrained them to apply PAMCs in interrelated ways. These inter-dependencies and inter-relationships between the graduates and their programme, embedded in their respective health systems led to several new insights about the complex, sometimes chaotic nature of health systems in LMICs.

The nature and dynamics of the health system (of which eye care services form part) were understood to be conceptually made up of six building blocks, interlinked and working in a synchronised manner to produce the desired health outcomes. (WHO, 2007c) Now, having realised the overwhelming challenges faced by graduates intending to apply the PAMCs, it is conceived that:

1. Health care workers' personal motives and motivations are important drivers of personal achievement and success on programme level, hence they require support, supervision and proper performance management.
2. The constituent elements of the health system are not inanimate objects, structures or systems, but people, who are connected in intimate, complex and multi-dimensional ways through communication, relationships and team dynamics;
3. The health system is constantly in motion, along a space and a time trajectory which presents challenges or opportunities to negotiate a change in complex environments;
4. The project design of health service initiative may be favourable for eye care within the programme environment;
5. The spaces between the health system elements (people!) are the places where maintenance should take place: this is the place of management, and these spaces need to be properly managed; and
6. There is a need for increased management capacity in the leadership echelon of health programmes.

8.3.1 Personal motivation determines programme achievements

Health workers in their professional capacity, whilst in the quest of improving health outcomes, also have their own motives and motivations. Apart from performing their health-directed tasks, the health workers also need jobs to earn money for their own and family sustenance. The individual's personal and professional best interests are of critical importance when they have to consider what, when, where and why they do it. This may be true for both graduates and their line managers and may come at the expense of programme and system performance. From their entry into the training programme, where their motives may be career aspirations, family considerations to their return to programme activities (with the motive of promotion and remuneration, seeking recognition and attention, or defending their interest, the key concern may be to look out for themselves. Most of these considerations may be realistic and positively competitive, but there are some that can be considered negative and abusive to the system.

People's multi-faceted engagement with each other and the world around them influence how they think about their life and work which, in turn, drives them towards specific actions. These actions lead to results such as success in meeting targets, achievements and applying certain PAMCs. This means that the management of staff members' personal motivation has a direct effect on how individuals perform management tasks. Individuals need more than just adequate skills and appropriate equipment to perform tasks at work. A much stronger focus should be in the development of the internal capacity of individuals, that is, their personality, life skills and attitudes. Doing this would enable them to utilize the skills they acquire to do professional tasks more effectively.

Extremely personal motivation may have the effect of drawing resources away from programme activities. It is conceivable that a significant proportion of a health workers' "work" time is spent on non-work (i.e. not directly leading to health outputs) activities. If health workers, therefore, do not spend their whole workday on their key performance indicators, it means that less capacity is available for producing health outcomes that are suggested by the numbers. It is, therefore, important that health workforce planners take cognizance of the staff ratios. To provide adequate resources for the delivery of health services, thinking is about the whole (100%) person's time, not necessarily the proportion of the person's time that is available to perform the task. This may entail the re-calculation of ratios for staff needs, considering the actual amount of staff member's time available for the tasks.

People's personal motivations for work or study may cover a wide spectrum, from high motivation to low motivation. Their interest may also range from mostly self-deterministic to altruistic. Management is needed to harness individuals' high motivation and uplift others' low motivation for producing improved health outcomes, a critical competency for managers. Strong leadership is needed to help individuals

balance their interests to have their own needs met, with that of others, another key requirement for management application.

8.3.2 Health systems are comprised of people

The WHO Global Strategy for Human Resources for Health emphasizes that "health systems can only function with health workers" (WHO, 2006). Achieving health outcomes is dependent on availability, accessibility and acceptability of the human resources to deliver the service, but also on the utilization of the service. Obtaining the desired health outcomes is centrally dependent on people. (Gilson, 2011) This study's findings propose that people are not merely **central** to the health system, **they are** the health system. Though this may be a simplistic observation, it is a crucial one, because this distinction has not been emphasised strongly enough in the health system strengthening debates.

People are inter-connected through communication, relationships and pursuit of team and strategic objectives. The communication and relationships are transactional but can also be spontaneous or erratic. People need support and enablement, which requires more investment to fill gaps in the system. People must be understood differently than inanimate objects because they have feelings, beliefs, thoughts and most importantly, memory. (Harris, 2011) People and their combinations interlink with others in different programmes and sectors, always moving and changing through space and time. This can be a very complicated and complex arrangement and needs direction, maintenance and resources.

People use communication, relationships and team dynamics to engage and produce the outcomes sought in systems like health programmes. Within organisational units, people need supervision and support and must be managed (monitored, optimised and maintained, i.e. controlled organised, led and planned for) to achieve the desired results. While much capacity-building occurs to equip people with skills to produce these outcomes, not enough is done to develop and support the person.

The people-centred approach (WHO, 2016b) calls for greater attention to the software of the health system, which means the people and their relationships. Lazarus (2013) suggested the restructuring of the health system model. These arguments still consider people as operators of the "elements" of the health system. This research led us to pose a view that the whole health system is comprised of people. The inanimate components are instruments with which people are enabled to meet health outcomes but essentially, health systems are people. A revised health system framework should improve on Lazarus's model to make people the building blocks of the health system, interconnected with many others. Firstly, this should be through interrelationships, communication and teamwork and secondly supported by the various structural backbones (policies, procedures and frameworks), centrally intersected by management.

Health systems are structured and functioning as units of organisation (e.g. health programmes) through which health outcomes are delivered and health care staff are accommodated. These organisational entities need to be suitably resourced to participate competitively in the broader contextual environment. Having a strategic impulse to remain viable to survive is critical for organisations to meet their strategic goals. Similarly, the health system's overall impulse is to "survive" and so for the health system to survive it must ensure that the people in it thrive and survive too.

The health system through this research is seen as a living, dynamic and extremely complex arrangement of people, interacting in multiple directions, across several domains (time, space and rank). This is a departure from the rigid compartmentalised version previously popularised. The implication of this is not only that the health systems paradigm can now be applied to people in their complex relationships, but also that the importance of people management is more strongly emphasised.

8.3.3 Change affects people's lives and work

The decline in management activity observed in two of the graduates (after high performance and achievement) typified the effect of the change on peoples' lives and similarly over health systems. When changes in their work contexts occurred, these two became effectively low applying. The changes involved new roles, new workstations and acquiring new leadership. In others, the changes in the personal situation and new opportunities also demonstrated this change dynamic.

Management training may only become useful much later in an individual's career or work life. It is difficult to operationalise management training in the same space-time dynamic as would be appropriate for technical training. For example, one can learn a technical skill today and utilise it tomorrow, but management skills may only be optimally utilised weeks, months or years after the training. This is because of the practical experience of performing the responsibilities of managers helps to consolidate the learning from the training.

When graduates return to their programmes in possession of new PAMCs, expecting to be applying them in the old role, they may not find the situation quite so welcoming. They might not get their old job back, because they are too highly qualified, or they are allocated roles and responsibilities that do not provide an opportunity to apply their PAMCs. Hence, there is no application of PAMCs and the expected improvement in eye care performance.

Even if the time is right, it is difficult to broker change in programmes. Change requires the "diffusion of innovation" (Rogers, 2003 and Sahin, 2006), in other words, a mechanism for knowledge or ways of doing to spread throughout a work community. The PgDCEH graduates' new competencies represent this change that must be adopted by their colleagues and line manager. Sahin (2006) described this as the process of diffusion, starting with the acquisition of knowledge (for example the competencies of the PgDCEH), which must pass through several stages to confirmed innovation. Amde, Sanders & Lehmann (2014) also reported difficulties in translating learning into practice. The process of knowledge translation can be halted at the stage of persuasion already if the innovator is expected to overcome the myriad of challenges in the health system discussed earlier. The lack of opportunity, low compatibility of the innovation with the system and complexity of the system that needs to change are some of the factors that may influence the rate of adoption of innovation.

8.3.4 Project designs favour eye programmes

Another new understanding is that "management by projects" is more conducive to the meeting of targets, and that management training should focus more strongly on project management. Eye care initiatives seem to perform well in vertical, NGO funded environments. The VISION 2020 strategy typically embedded a "district eye care plan" in "project" style within a "national eye care programme". Projects are more accommodative to management application than programmes. Even in programmes, the "management by projects" paradigm should be followed. The benefits of adopting the project approach include the central responsibility and accountability by a project manager, ease of monitoring and more effective and efficient problem-solving capacities. Conceivably, many health programme targets can be met by applying the project management approach. (Boznak, 1991)

The restrictive programme attributes are the "long-timeframe", "functional organogramme" and "process-oriented performance metrics". These can be replaced with projects' "shorter, limited time-frames", matrix organogramme" and "result-oriented performance metrics". The programme approach is standard in health systems because health strategies are long-term, outcomes are diverse, and the resources and systems are interconnected and integrated. These same strategies and outcomes may also cut across other systems and are dependent on the external environment.

The same advantages of projects could also be disadvantageous because of a lesser alignment of the project aims with organisational strategy. Furthermore, the limitations of the project design may curtail the advances that can possibly be made in programmes. Embedding the project approach within the overall programme structure could ensure that the advantages of the programme design are not be lost.

It may be that for eye care to attain meaningful results, it must operate on a project basis because the programme environment is much too challenging and the resources available are rarely adequate. Eye care needs to be operating in project mode to survive in the health system. The importance of utilizing the project approach in programmes may be a far-reaching assertion which warrants further research. For instance, would other similarly low priority health programmes also achieve better results if structured along with the project management principles? This can have a tremendous effect on how health programmes can be redesigned for greater effectiveness and efficiency in the future.

8.3.5 Health systems need maintenance

Through this study, we uncovered a new understanding of the importance of keeping the health system structure and function in good working order, in other words, health system maintenance. The maintenance procedure for the health system is poorly defined. It sits somewhere in the spaces between the health system elements. This "maintenance" is likened to "management", which is absent in the health systems strengthening framework. Health systems require constant and sustained maintenance, in other words, management.

That management is given such a low profile in the WHO's health system framework could be the main reason why the system is struggling to overcome the challenges. For this reason, it can be considered that the framework has reduced relevance as it does not account adequately for the workings and requirements of complex adaptive systems (Ellis, B. 2011), hence, may need more critical review.

The idea of a management-centred health system where maintenance is the central axis should be explored. An analogy could be drawn to a machine with working parts that require a lubricant to ensure smooth movement. People are the moving parts, interconnected like gears, and the oil is the maintenance or people management where they are supported, motivated, encouraged, performance managed and developed. People are connected in multiple ways and are all involved in managing each other with the manager not necessarily the most senior person.

Management is not a prominent health system element according to the health system strengthening framework. (WHO, 2007b, 2009, 2010a & 2010b) "Management" is neither a health system element nor a health system principle. (Bradley, Taylor & Cuellar, 2015) In fact, it does not feature prominently in the health systems strengthening paradigm, unless it is meant to be a subtle sub-component of "leadership and governance". Management is vested in human resource development where managers are the purveyors of management. In fact, everybody partakes in management, at least some of the time.

In none of the health system framework building blocks are explicit management functions indicated. This, despite the WHO's highly constructive guidelines on how to structure the management of health programmes. De Savigny's (2009) recognition that "… health systems lack the capacity to measure or understand their own weakness and constraints", leaves out consideration of their strengths and assets, but more importantly, the need for management of the health system. The health system framework's leadership and governance building block talks about ensuring that protocols are developed and adhered to, that oversight occurs in terms of medical, financial and labour matters (WHO, 2006), whereas stewardship talks about "the careful and responsible management of the well-being of the population" (WHO, 2002). Neither stewardship nor leadership and governance is management, which is more at a ground-level, making things work as they should for better outcomes.

While some of the WHO's guidelines and frameworks have been internally critiqued for quality and relevance (Norris and Ford, 2017), there have been a few ventures away from the sturdiness of the health systems strengthening framework so far. Perhaps the tight linkage to the theory of change (Mayne, 2015) paradigm makes it useful to monitor and evaluate results against targets, particularly in developmentally-focused initiatives in LMICs. Ideas of people-centred health systems (WHO, 2016b) and resilient health systems (Barasa et al., 2018 and Gilson, 2018) have been offered, but may merely be contributing to the complexity and chaos. (Norman, 2011, Plsek and Wilson, 2001 and Bragg, 2013) The Integrated Management Cascade (De Savigny and Binka, 2004) is a welcomed effort to instil management culture (through supervision of community health workers) by district management teams. This is, however, too peripheral and disconnected. It is necessary to make sense of this by engaging with all the parties that make up the health system.

Over the last two decades, many World Health Assembly resolutions and guidelines on leadership and management have been tabled and many countries have implemented these resolutions. This research took place years after health system strengthening and other health system support initiatives have been implemented. Yet, there has been low returns on improved health outcomes. It seems that this is a continuous difficulty that has been going on for decades without being addressed. The challenges may have sounded good on funding proposals and the overcoming of them seemed to be good "development" strategies. Take the global performance of eye health, for example (Ackland, 2016): it took 15 years for 64 (out of 200 countries = 32%) to have a National Blindness Prevention Committee, 29% of countries to have a National Eye Care Strategy and still the average cataract surgical rate in Sub-Saharan Africa is 500 (global average 1500, the target was 2000). In other words, the delivery of the desired eye health outcomes is slow. This could be a system-wide pattern and could be because of failure to do routine maintenance and repair of the health system elements, i.e. management.

It is difficult to see where "management" is positioned in the health system strengthening debate. It also enjoys very little practical application in health systems policy research. (Gilson, 2012) It was shown that after acquiring management competencies, graduates of the PgDCEH are still struggling to overcome the programme and health system challenges. Even their line managers also struggle. It may be that managers in general struggle in the health system and that, despite management training and support systems, such as WHO policies, in-service training, and workshops, etc., managers in health systems are generally struggling because of poor health system maintenance.

8.3.6 Need for increased management capacity in leadership

According to the WHO (2007c), improved health services outcomes can be obtained through strengthening leadership and management. The conditions for strengthening leadership and management are adequate numbers of managers, appropriate competencies, functional support systems and enabling work environments.

This study highlighted the issue of "numbers of managers" as critical in relation to the concentration of managers, rather than the distribution of managers. The low number of managers was insufficient to drive adoption of innovation, in sometimes unfriendly, professionally exclusive and isolated environments. Gilson and Daire (2011) recorded that people at every level of management felt that they were isolated and suffer many challenges. Relating "alone"-ness and "unique"-ness to leadership as a team-based system process versus individual activity was significant as "few people (sharing unique expertise) can do little". Faster, more intense and more widely accessible management training is required.

Although the concept of communities of practice (Wenger, 2009) relates mostly to learning, it can also be thought of more broadly as translation or application of learning. Students, whilst learning in a collective can instigate organisational learning according to the community of practice principle. After graduation, the benefits of communities of practice are largely unavailable for management trainees due to the low concentration of managers in any given work setting. It may be that the area of study or in this case the domain of interest, "management" may be too isolated (or specialist) and should target involvement in continuous professional development, alumni associations and relationships outside their departments.

The quality of the training, the candidates and the knowledge translation, may not be the only consideration for management training. Quantity is also important, in that the low concentration of management-trained clinicians makes the conversion of their competencies into positive change largely insufficient. For significant improvement in eye care programme performance, greater numbers, or a critical mass of trained managers is needed in a health programme.

The PgDCEH is delivering too few trained managers to significantly increase management capacity. From a quantitative perspective the programme delivers 6-8 graduates per year, which does not significantly increase the pool of competent managers in eye care programmes in Sub-Saharan Africa. The PgDCEH-trained managers are too sparsely distributed. Hence, the expectation to have dedicated eye care managers in all health districts may be unreasonable. It would be better to aspire to have "eye-informed" or "eye-concerned" managers in greater concentration than is currently the case. This means that more "general" health managers should be exposed to eye care issues and strategies. This will generate better support for management-trained eye professionals.

Most health departments invest largely in developing leadership within their ranks of senior management. This is a good practice as strategic leadership is necessary to be able to devise effective and efficient interventions in a high disease magnitude and low resource setting. Medically trained seniors might not have management training but maybe the leaders in a health programme. Leadership is central to improving the quality of health services. (Hartley 2008) Non-clinical management-trained individuals may have moved up the ranks through laborious processes of promotion. At their highest position of management, they report to a clinical manager who does not have the appropriate knowledge, skills and understanding of management but superior expertise in leadership. This can be one of the reasons why line managers are unable to properly supervise and support their subordinates. It should be considered that leadership training should include management training or that only management-trained individuals should be considered for management positions.

The lack of "functional support systems" as a condition for effective management (WHO, 2007a) was clearly illustrated in this study's findings, through the lack of line manager. It is further suggested that even the line managers face the same challenges of lack of support and this could possibly extend to the next level as well.

The condition of "appropriate competencies" may be too difficult to fulfil in one training programme like the PgDCEH. Although the competencies taught in the PgDCEH may be "appropriate" and necessary to perform the management tasks required in eye care programmes, they may not be sufficient. Addressing personal leadership may be necessary to better equip graduates for health programme management. These competencies may fall outside the scope of some training programmes.

The condition "enabling working environment" is also difficult to fulfil, especially in poor countries. Staff who completed their training frequently return to work environments that are not conducive to applying their training. (Bradley, 2013) Managers are the agents responsible for creating enabling environments for

their subordinates. Senior managers should be creating suitable environments for junior managers, but senior managers are also "managers." The challenge of limited resources in LMICs may make this an unachievable condition. Health leadership should recognise these difficulties when they design their organograms, as the lines of command are derived from them.

8.4 Research impact and implications

The findings show that the PgDCEH is not adequately addressing the needs for management capacity development. The aim should be to transfer relevant competencies to individuals that enable them to successfully negotiate and combat the challenges of complex health systems. This should be addressed through improvements in selection of candidates, and the programmes they work in, content and methods of teaching and learning and in post-training support.

Although the PgDCEH was designed and delivered to give graduates the PAMCs to improve eye health outcomes, this does not happen at the programme level because of a lack of opportunity in health systems. These are comprised of people engaged in complicated and complex relationships with each other with varying degrees of personal motivations.

It was found that the complexity of the health system was so substantial that graduates of the PgDCEH found it extremely difficult to apply their management competencies to achieve improved eye health outcomes in their programmes in the absence of other interventions. This study helped to explain how a health system strengthening intervention like the PgDCEH in isolation failed to generate the anticipated responses of improved eye care programme performance.

The personal motivation in some individuals, the challenges facing eye programmes and the lack of support and supervision from a line management perspective rendered the achievement of improved eye health programme performance extremely difficult, despite an improvement in a management capacity.

The study exposed the challenges posed to human endeavour in complex health systems. The WHO Health System Strengthening Framework (WHO, 2007c) positions humans centrally relative to the six building blocks. It is, however, not about **where** humans are positioned, it is **that** humans are essentially the building blocks of health systems. All six elements, as illustrated, are directed and operated by humans. So, in a health system, the architecture made up of organograms, the rules and regulations, the interpersonal linkages, the issues around labour, legal and regulation are all operated by humans.

The programme environment may possess intrinsic qualities of complexity. Projects are the means of simplification. Projects are simplified, "cut to manageable size" parts of programmes and the adage of the

African proverb of “eating an elephant bit by bit” is relevant here. Using the project approach, many of the programmes’ challenges can be overcome through targeted, results-focused strategies being systematically measured according to the theory of change or result chain principles.

NGO collaboration with Ministries of Health is a key enabler of project (and by implication) programme development. NGO support in LMICs’ eye health programmes has consistently provided the impetus and momentum for the achievement of programme objectives, through project design, implementing and monitoring, usually through external funding. Due consideration of the complexities relating to power dynamics, contracts and strategy (as discussed in section 8.2) is necessary.

8.4.1 Implications for research in management application

The low impact of the PgDCEH on eye care programme outcomes has implications for research, eye care programme design and management education for health programmes. The findings showed that about one-third of the graduates went on to apply the PAMCs in their eye care programmes, another third applied some competencies with much lower intensities and the final third not at all, within the time frame of the study.

The criteria of selection into the programme are influenced by other factors (availability of funding, strategic and personal motives). This may allow the entry of lesser preferred candidates into the training. This 33% success rate may be benchmarked against another non-professional training programme like management training to help programme designers evaluate the effectiveness of their training programmes.

The expectation that graduates must make an immediate, far-reaching impact on their eye programme performance may be too ambitious, as it is known that management training has a longer return on investment cycle than most types of technical training. So, even expecting them to apply their competencies may be unrealistic as the opportunities to apply may be too few in a short space of time.

Now that the question of whether and how graduates applied their PAMCs has been answered, the next exploration should be to determine how the training should be structured to enable the graduates to broker change in person (self), programme and system, for improving health outcomes. This should shed light on a different purpose of education than just imparting knowledge and skills but stimulating change agency. In other words, the training should enable the graduate to engineer change, to become influential, innovative and instrumental in creating the change that is needed for improvement. Further research is needed to investigate how change management skills can be internalised, sharpened and measured. (Hall

and Hord, 2015, Lobe, 2005 and Sartori et al., 2018) Perhaps the notion of "applying" should be expanded to mean "successfully adopting" or further clarified as meaning "applying with measurable success" when looking at the methodology of such studies.

"Good management practice" could be established as a measure of adherence or application in the same way *"good laboratory practice", "good clinical practice" and "good accounting practice"* are set up for standardization and quality assurance of laboratory science, clinical research and accounting respectively. This would pave the way for measuring management application for more standardized monitoring and evaluation, and extend further to moderate standards for management education.

Management incumbents could benefit from continuous management development in the vein of "continuous professional development", which is used to maintain competency relevance within professions. (Dahl, 2015 and Lester, 2015) A module of "management practice" could be included to train managers how to implement good management practices in the same way that medical doctors are trained on how to set up medical practices.

8.4.2 Implications for eye care programme performance

The lack of adequate management capacity is a major reason for poor eye care programme performance. Most PgDCEH graduates, possessing the appropriate management competencies (according to the study's assumption) did not succeed to improve eye care programme performance. There is a necessity to create a critical mass (Guwatudde et al., 2013) of management-trained health professionals in these eye care programmes. The more of these operating in the health system, the faster diffusion of innovation will take place and the sooner the health outcomes will improve.

One small-output management training programme (the PgDCEH) cannot deliver the numbers of trained health managers that is required to fill the gap. Suitable training strategies should be structured to drastically increase accessibility to greater numbers of trainees, for example, through the establishment of learning networks across various infrastructural platforms. These improvements will lead to an increase of trained managers, more effective application and more influence to broker positive change.

Management training could be restructured to become personal training, training to develop the individual into a wholesome, well-grounded, well-informed and well-connected relationship manager, using personal leadership to set and aim to meet the eye programme targets. If more of these individuals co-operate in the health system, this can become an integrated network of managers that could push on to deliver their desired health outcomes. Research on the usefulness and application of programme evaluation

frameworks such as the WHO's Eye Care Service Assessment Tool (WHO, 2015) may also add important data to support theories about management effectiveness in eye care programmes.

For this study, the VISION 2020 indicators and targets were used to gauge programme performance. It may be specifically useful to establish indicators and targets as benchmarks for eye care programme performance, and include indicators and targets relating to programme management, beyond a timed strategy like VISION 2020. Standardising the use of the abovementioned evaluation tool may be a necessary next step.

Health programme leadership should consider integrating real-time coaching and mentoring supervised and self-directed learning in authentic tasks with real-time mentors. Doherty's (2015) "workplace-based learning" could be attained through this. In-programme learning and support in the PgDCEH through the practical assignment component while supervised by course faculty is an approximation of this. Similarly, post-training coaching (Lefebvre, 2003) and mentoring (Lee, Dennis & Campbell, 2007) programmes could be developed to support and monitor graduates' application of PAMCs, using previous PgDCEH graduates.

Teaching people the skills to perform tasks that deliver health services (clinical, consultancy, administration) and people are not necessarily (wholly) developed through these skills acquisition alone. Given the critical importance of personal motivation in every health professional's life, there is a much more need to build capacity in people than just giving them skills and tools to do their jobs. This capacity should be in self-management, personal leadership and relationship management. People working in health programmes are likely to have a much bigger personal agenda than to perform the health programme related tasks. Hence, much greater investment is needed in human resource management in eye care programme, with work packages structured according to the project design, if possible.

8.4.3 Implications for management education

The new understanding of the application and effect of PgDCEH-acquired management competencies may inform education leaders to consider the issues of candidacy, the competencies covered in the curriculum and training programme design. The findings showed that some competencies are more useful than others, like planning, project management, advocacy and monitoring and evaluation. Some others were difficult to apply, like change management, conflict management and financial administration. It should be considered to locate more of the training in "project" (as opposed to "programme") management in health programmes and to strengthen the focus on person-related competencies like communication, team-building and personal leadership.

Candidates for management training should be selected on merit or high potential for a positive return on investment. As shown, there is a shortage of clinically practising eye professionals in LMICs. Drawing some away for management training may be counter-productive. It may be better that people with an inclination to follow administrator / manager careers are trained to ensure adequate utilization of scarce resources, which include ophthalmic clinicians.

Apart from all the reasons cited so far, the important business aspect of "return on investment" should be considered too. Especially in the case of the PgDCEH, where most of the trainees are being sponsored by NGO-provided scholarships and government bursaries, there could be a reasonable expectation that there should be some value returned on this investment. Giving an employee a leave of absence to pursue their studies also carries a significant opportunity cost.

Students may decide to either "**go** for training" or to "go for **training",** in other words, a choice between the training as travelling event and the training as an educational event**.** There are multiple incentives for such incumbents, including a break away from work, a chance to travel, monetary gain through per diems and a further qualification or certification. If the training has promotional potential, further career benefits can be expected.

The balance between individual and institutional gain (or loss) should be carefully considered. Management training, like most other forms of formal training, can catapult an employee out of the employment which sponsored their training, soon after completion. This was seen in at least two of the graduates. Line managers and funders should put measures in place to manage this risk.

Based on the findings, the eligibility criteria for the education programme need to be reviewed. Consideration should be made about the dependency on scholarship funding and its role on applicants' motive and motivations for study.

The trainees should also be receptive of the training. In the Sub-Saharan African context, human resource development is a high focus area for governments and NGOs, who frequently assign significant budget amounts to programmes for training, in the form of scholarships and bursaries. This provides the opportunity to train health workers who would otherwise not have been able to afford the training.

Because of the complexity of contexts students in the region are derived from (Amde, Sanders & Lehmann, 2014), it is important for curriculum designers and teachers to know a) these contexts in their students are required to apply their skills and b) how students learn and how to optimize their learning. There is also a need for greater mentorship availability since not all competencies can be taught without

interaction with peers. These critical attributes of teachers put a premium on their own experience, qualifications and skills as teachers. complexity of contexts

To this end, training programme directors should set up effective systems to monitor the progress of their programmes. This includes defining indicators for inputs, processes, outputs and outcomes of the training. An "indicator", the specific measurable characteristic of an aspect that requires measuring should be defined for each item to be monitored. Additionally, comparison of student evaluation of training responses over time and between students and teachers can be used to for further improvement of the training programme. (Plaza, 2007)

From the perspective of the PgDCEH curriculum, greater focus should be on personal leadership, relationship management and complexity management. These would strengthen future PgDCEH graduates' ability to negotiate the challenges introduced by change, multidirectional people relationships and the complexity of health systems.

8.5 Limitations of the study

The main limitation of the study is that the study focused only on one eye care programme management training intervention, of which only a portion of the graduate cohort was investigated at a specific time in their engagement with the PgDCEH and their health systems. A different sample might have produced different results. Considering this study's high survey response rate, and an interview sample comprising almost half of the study cohort, this might be contested, unless taken over a more extended study period.

However, a theoretical generalisation of the findings was possible as the PgDCEH is the only training intervention of its kind in the Sub-Saharan African region. It would be useful to explore the impact of similar interventions in different settings, like the management training programmes conducted by the Lions Aravind International Centre for Ophthalmology[25]and their impact on eye care programmes in the South East Asia Region.

The study's pre-conceived limitations included the following:

- Potential bias may have been caused by the closeness between the researcher and the participant. The researcher could be seen to influence participants, drawing insights which may have skewed the data. This aspect is further elaborated in sections 4.2 and 8.6.

[25] Lions Aravind International Centre for Ophthalmology (LAICO) delivers a suite of vocational eye care management training programmes, with participants sourced from all over the world, but the majority coming from the South East Asia Region.

- There was no baseline data about the graduates' previous management training and experience. The effects elicited by the graduates may not be wholly attributable to the PgDCEH.
- Graduates had different "exposure" times to apply their management competencies following PgDCEH training. It is not known if duration of exposure could influence the application of PAMCs in eye care programmes. Because of the small sample the effect of this cannot be reliably calculated.
- No interview data was obtained from key demographic, geographical and culture-linguistic settings like Nigeria, Madagascar and Malawi. The researcher depended on the questionnaire and supplementary data and garnered perceptions, experiences and outcomes perspectives from these.
- Not all the programmes were equally resourced to ensure application of PAMCs, hence the effect of variable resourcefulness on the application of PAMCs could not be controlled for.
- Only graduates of the 2009 to 2013 academic years were considered for the in-depth interviews, to allow for at least two years of opportunity to apply the competencies;
- None of the 2009 class of the PgDCEH was included in the interview phase, because the programme delivery structure was different to that of the ensuing years. It was felt that selection, enrolment, motivation for training and the student experience might yield incomparable results.
- There are no standard methods of determining the application of PAMCs; and
- Improvement in eye care programme performance could only be accurately measured if baseline performance was known.

Thomas and Harden's (2008) twelve criteria for the quality of studies and Erlandson's (1993) techniques as described by Savenye and Robinson (2005) for ensuring the quality of a study were used to ensure sturdiness. Despite these and other measures, some aspects of the study's quality could be compromised. The expectation of improved eye care programme performance was not dependent only on the graduate's PAMCs. Other interventions could also contribute to improved eye programme performance, according to the theoretical framework. These other interventions are neither specified nor considered in this analysis.

Another issue may be the targets proposed by VISION 2020, which may be unrealistic. While these targets were based on projections done at country level at the launch of VISION 2020 in 1999, there have been very few countries meeting these targets over the last 15 years or so. On a programme level, selected successes have been achieved.

The respondent truth factor can be a significant limiting factor. (Lincoln and Guba,1994) Johnson (2005) suggests that the behaviour of others is largely determined by our behaviour towards them. The responses made by the graduates may have been confounded through exaggeration, modesty and misunderstanding of what was asked of them. This was further verified for those who participated in the interview stage.

For example, one graduate rated some of her skills as excellent, whereas, upon triangulation, the skills were less excellent. This could have reflected her need to impress her teacher which highlighted the issue of reliability and truth of people's responses.

Self-reporting and observer reports can be significantly different. (Solansky, 2010) For example, many graduates' excitement, happiness and satisfaction with the training experience did not match their personal and professional situations. The researcher observed many incidences of frustrations, desperation and stagnation in their work settings, as well as mediocrity in performance. The positive expression may have been mainly a courtesy towards their teacher. These subjectivities were mitigated by triangulation of the data.

According to Reichenbach (2012), a statement is true when it corresponds with reality and false if it merely represents someone's beliefs. In conversation with graduates and their secondary key informants, several responses mainly represented their beliefs. These are frequently unfounded and likely to be partial truths. (Wilder, 2009) This is because perception creates reality and is a "product of our inner self". Watson (2014) further refers to "multiplicity of interacting processes and systems."

Communication and relationship dynamics are some of the most important elements that facilitate management application, but were not fully assessed during the study. Communication occurs in forms that lead to direct health outcome generation, marketing and information-sharing as well as stakeholder engagements. Relationships can be formal or informal, within and between networks. The new insight that the interconnections of people are critical for health system structure and function makes this an important gap in the findings.

Other aspects which were not assessed included language and culture, multi-directional relationships, personality and emotional disposition and personal socioeconomic status of the graduates. Some of these may be deeply personal attributes, which would have been difficult to validate. It also involved exploration in psychology, which is beyond the scope of the study. Although the personal and personality issues have not been explored in this study, these are deep-set motives which can have far-reaching effects in e.g. career aspirations, work performance and professional achievements as well. It could also present important conflicts which directly relate to the application of PAMCs. The findings highlighted this as an important area for further research.

There is insufficient data to determine why some competencies (i.e. those belonging to the organising function) were more commonly applied than others (i.e. those belong to the planning function). It is an important gap in our understanding, which should be explored through further research.

The anticipated health system effect was not noticed in this study, possibly because it was too weak or too early to detect. Training in management is likely to show effects over extended periods of time. (Bradley, 2015) There should be a discussion of when research into management training impact should be undertaken. The time after graduation ranged from 3 – 5 years and it was our assumption that this was enough time to show effects of application of PAMCs. This is because the PgDCEH contains a component which tests the graduates' application of PAMCs in their work environments, in the form of practical assignments, which forms part of summative assessment for academic progression.

Management capacity building is a long-term strategy, with performance improvements likely to be only observable years after the training. (Bradley 2015) Also, given the difficulty to construct accurate information about the graduate, their programmes and their health system at baseline (entry into the training) and the intricate nature of timing and graduate mobility, full impact measures cannot be derived from the available data. However, some early effects of the training have been identified and are described as achievements in the text.

8.6 Assumptions of PgDCEH adequacy

There may be concerns that the graduates' failure to apply PAMCs could be because of the failure of the PgDCEH to transfer the competencies to graduates. This might have been because of ineffective teaching and learning methods or the selection of unsuitable candidates. Ultimately, the concern might be that the PgDCEH may not have provided the graduates with the competencies as indicated. For management competency application to lead to programme achievement, graduates should be in possession of the relevant management competencies. This was one of the key assumptions of the thesis, which warrants some justification.

It should be emphasized that the assumption of PgDCEH adequacy was necessary to assess the outcomes and impact of the PgDCEH as an "as is" intervention as the study did not empirically investigate the educational adequacy of the PgDCEH. This is a core issue and the assumption needs to be made that the PgDCEH was adequate otherwise there could be no proposition that the graduates would apply the PAMCs with commensurate achievements. What follows is a justification of this assumption.

The PgDCEH was designed and delivered to develop PAMCs for improvement of eye care programme performance. It was presumed that the graduates would have emerged from the training in possession of appropriate knowledge and skills to manage district eye care programmes in a low-income country setting. This presumption was partly based on the appraisal of the curriculum as published on two

occasions (du Toit, 2010a, du Toit, 2010b) in peer-reviewed journals. The appraisal of the curriculum was conducted by experts in instructional design, education, public health and ophthalmology. The researcher was a co-author of the publication. This may have affected the objectivity of the appraisal.

The assumption was further supported by input from stakeholders who attended the curriculum development workshop, which was held as a consultative initiative before finalising the curriculum. The regional stakeholders in eye health have vested interests in eye care programme management. However, their advice may not have been based on sound knowledge and understanding of the issues in eye health systems and the appropriate educational responses to them.

Favourable experiences of the course were reported by most graduates. Most graduates' expectations have been met, although there had been some misunderstandings of the course aims and purpose. It was realised that candidates could enrol for the wrong reasons, although sometimes with naivety or under false pretences and that the course marketing could be improved to avoid these types of misunderstandings.

Students' in-course evaluations were a valuable source of feedback about the effectiveness, relevance and suitability of the PgDCEH. Despite knowing that student evaluations are usually unreliable (Hornstein, 2017 & Uttl, B., White, C.A. & Gonzalez, D.W, 2017), the generally high overall ratings carried some significance. In the 2013 academic year, for example, the analysis of these evaluations returned 100% "strongly agree" responses to six out of the ten questions posed for several of the course sub-modules and more than 80% "strongly agree" responses for most of the sub-modules, see *Appendix O*.

There was always a suspicion that high evaluation scores of students might be false, as is the case in routine evaluations. To avoid the low validity of student evaluations due to dishonesty, automatic and patterned responses, evaluations were administered anonymously, conducted after the final course assessments and students were encouraged to provide further comments. We expected that gaps in the training and the curriculum would be identified and would mainly point to the theory-denseness of the training and that the time was too short. The researcher also expected parts of the course to be deemed irrelevant and of little use. Lastly, it was expected that there would be a reasonable variation between the academic performance of the graduates and their professional achievements at work.

For the PgDCEH, students must complete a portfolio of assignments which provide an opportunity to practice the application of the competencies taught during the course. This is an integral part of the training and involves coaching, mentoring and support from the faculty. The submitted assignments are

used for formative and summative assessment and serve as proxies for the transference of competencies, as these are to be applied in programme settings.
The assumption that the intervention (the PgDCEH) "works" may raise concerns about the validity of the findings of the study. However, unlike experimental studies where interventions can be tested for effectiveness in closed, controlled environments, this is a phenomenon occurring in the natural world, with many complex interactions, making it difficult to do the same as in efficacy studies, for example.

It is therefore posited that the assumption is a reasonable one to base the study on since the findings related to the experiences and perceptions of individuals who received an intervention (the PgDCEH) The PgDCEH delivered its educational mandate to train and ensure the graduation of health workers in eye care programme management, according to the curriculum and meeting the prescribed educational standards of the university.

Despite this, we considered the PgDCEH graduates not to be adequately prepared for maximum benefit to themselves, the programme or the health system. This is firstly in the context of time, since if the graduates spend too much time pursuing their own interests, it draws effort away from focusing on programme interests. Secondly, in the context of space, because the health management organogram does not have a place (physical as well as financial) for an eye health manager, as the more critical need is in general health management. Thirdly, it is likely that a "postgraduate diploma" presents too low a qualification to wield the requisite professional or academic power for graduates to use as leverage in highly competitive work environments. It may be necessary to restructure the PgDCEH as a higher level qualification. This may just have the effect of more targeted selection and more appropriate deployment of the graduates.

8.7 Reflections on the research process

Before the start of the data collection, the researcher reflected, as suggested by the academic supervisors, on his expectations of the level of participation from the graduates, the data collection process and the findings. The expectations and findings against the expectations are dealt with in the Methodology chapter (section 4.2) and in Chapter 7 (section 7.8). Some of these expectations may have influenced the research process. This section deals with these reflections and will be related in the first person.

During the data collection, I was embedded centrally within the graduates' experiences. I used what was known about the graduates (their assignments, performance, evaluations) to form the entry point for

learning from them. I learned about their work before graduation, their job descriptions and resumés to determine their current and past levels of competency and how they applied PAMCs. This is a source of pre-conception which could instil a heightened sense of familiarity and was potentially a source of social desirability bias. (Garton and Copland, 2010) The positive rapport and eagerness to share their experiences with me were spontaneous and generous, to the extent that graduates (and some of their secondary key informants) were thought to have "performed" for the interview, as if unnatural or transformed. (Hazel, 2005) This animated behaviour could have reflected my demeanour. (Johnson, 2005)

There were many subjective engagements with the graduates (Saldana, 2009) which could have influenced the findings, analysis and interpretation in several ways. (Stock, 2015) These were familiarity, graduate perceptions, my pre-conceptions and the staging of the interview events. My role as programme convenor and teacher of the PgDCEH allowed for close relationships with all the graduates (Seidman, 2006), from handling enquiries about the training, through to the application, enrolment, allocation of scholarships (for most), administering student finances, teaching and assessment to mentoring. The students may have harboured gratitude or respect for me which may have influenced the way they responded to questions. In addition, the graduates' perceptions of me were as their teacher and mentor for whom they may have had high regard, coming from the University of Cape Town, a highly ranked, prestigious academic institution, based in South Africa. Attempts to project success and achievement may have moved them to present more favourable insights into their experiences.

The graduates made special arrangements to meet me and to introduce me to their line managers. The animation was noticeable in the conduct of the graduate, both in how they spoke and what they were talking about. The manner of speaking was reminiscent of somebody putting their best foot forward to impress somebody they respected. In some cases, the talking content included direct quotations from the course materials, possibly to impress their former teacher.

Although likely to introduce reflexivity or social desirability bias, this can also be a genuine desire of the graduate to be recognised, heard and approved as professionals, a need that seems to be neglected professionally in several cases. This interview with me presented a real opportunity to talk about their work and situation to somebody external as they may not be adequately performance managed, supported and or supervised with the resultant implications of low motivation and productivity. On the other hand, those with real excitement about their work and achievements would be happy to tell somebody about it, especially someone who they think maybe particularly happy to hear about it (their former teacher): "And, at least you'll be able to see how I'm progressing, being a product of Cape Town"[7], and "I am very grateful for your training, especially management." [13]

I also projected my own perceptions and expectations onto the graduates during data collection. Following data collection and review, I extracted answers to the interview questions from the data and posed them against relevant aspects of the research question. The methods I used include self-talk (voice recording which was later transcribed), presentation (on flip-charts which were later captured into the database) and discussion with my supervisor team. These were incorporated into the data corpus, and subsequently considered during data analysis and interpretation.

This, the researchers voice (Patton, 2002) is sounded through continued reflections on the research phenomenon, data and the interpretation thereof. (Saldana, 2009) Though not captured as data in the same way as the graduates' responses were, the researchers' views are data, which contribute a significant, inseparable contribution to the data. These sources of researcher bias are significant threats to high-quality research using qualitative designs. We followed the procedures to minimise researcher bias (Yin, 2011) in data collection, management and analysis as described in the Methodology chapter. To strengthen confirmability, dependability and creditability, the responses were triangulated through verification against other sources of data, e.g. the line managers or supporting documents produced by the respondents. Additionally, the researcher constantly reflected on the data presented with the aim of making sense of it.

Two techniques of strengthening trustworthiness were not employed in this study. First, due to prolonged engagement with the study participants, it was impossible to put aside the researchers own knowledge, beliefs, values and experiences, known as bracketing. (Chan, 2013) The second one is member checking where participants are provided with transcripts of their data and asked to verify it. This was not done, as the expectation of feedback would present logistical difficulties. There is, however, an intention to provide participants with a summary of the findings as an acknowledgement of their contribution at the reporting stage of the study, after the submission of the thesis.

Following data collection and review, I extracted answers to the interview questions from the data and posed them against relevant aspects of the research question. The methods I used include self-talk (voice recording which was later transcribed), presentation (on flip-charts which were later captured into the database) and discussion with my supervisor team. These were incorporated into the data corpus, and subsequently considered during data analysis and interpretation.

These reflections helped to strengthen my efforts to minimize bias and to acknowledge when it happened. Despite all the influences (from myself, and the graduates) which could contribute to bias, I was still able to identify significant aspects of the reality these graduates experienced in attempts to apply the PAMCs.

The graduates' and their secondary key informants' views may still have leaned towards more favourable or less severe views than reality.

Similarly, in analysis, I might have highlighted or ignored some responses that were agreeable or not agreeable with my expectations and what was deemed important to answer the research question. My clear separation of knowledge of the programme and system challenges obtained from previous development work in these same countries and programmes and the findings of this study was always of critical importance throughout the analysis and interpretation phases of the study.

Personally, my view of health programme dynamics also broadened. I started off with a mostly linear, cause-and-effect conception of how results could be achieved through carefully planned and directed activities, subject to the assumptions that underlie them. Gradually, I became more capable to recognise and understand the dynamics of complex adaptive systems and the strategies required to make such systems work.

My stance on the importance of personal motive and motivation arose after I was struck by the crude manifestation of personal motivation in determining the attitudes, perceptions and work performance of graduates. At least three of the graduates' motives to do the training stemmed from their power to make the decision to come for the training. At the time of enrolment, it seemed the right thing to do, but after the training they were not applying the competencies. I could not identify any significant change in the way they worked, despite having ample opportunity to do so. The eye care programmes they were responsible for were in worse states than before, i.e. more poorly resourced and low performance. Their states of demotivation led them to seek out the benefits only for themselves. Two were involved in clinical duties where they could earn gratification from having treated patients and three others continued with further studies that would not likely be of any use in their current career path.

I struggled to understand why they did not apply their learning whilst having the opportunity to do so. I was intrigued, shocked and almost disturbed by it. It was in my own interest that they should apply their skills, be successful so that it could be proven that the PgDCEH was effective. This sensitised me to the issue of personal motivation and I looked for this is in all the interviews with the graduates subsequently. I then found that positively motivated graduates, while still looking out for themselves, managed to score some achievements. At least three graduates enrolled for the PgDCEH knowing it would lead to their promotion. One left the department that sponsored her for the training and the other two went into provincial and national coordinator positions directly after graduation.

I have become sensitive to the strength of people's motivation for survival, self-preservation and growth and the transactional nature of relationships between people, everywhere, in the workplace and in private life. My experiences during this study support this. As PgDCEH candidates and then as students, they shared with me their deepest personal aspirations. Frequently, their motivations for studying or applying for the study were secondary to their own personal objectives of what they really wanted for themselves and their careers. Combined with my experience as an eye care programme development consultant, this gave me an outsider view of what was really going on in some eye care programmes.

My situation may have influenced the data collected by the questions I asked, what I did not ask, the views I was interested in or not and what I regarded as important. The information given or extracted could have been inflated, filtered or subdued. The graduates' achievements, challenges, how they applied, which factors constrained or enabled their application and how their eye programmes performed, the views of the graduates' line managers could have all been influenced by this. As most of these findings were based on multiple data sources, hence, I thought they were thoroughly triangulated. Still, most of the graduates' views about the suitability of the PgDCEH could be distorted because of their need to be polite to their teacher. These views were taken with a reserve and were not used in isolation.

It is likely that anybody else who did the data collection and analysis, especially the interviews, might have come up with different data sets and different interpretations of the data. However, despite these inevitable threats to validity, I was still able to see beyond some of the animated, nuanced responses to the questions, because I was keen to discover new insights from the data, including my own reflections.

8.8 Summary

The PgDCEH graduates interacted on multiple and multi-directional levels with other individuals and elements of the health system, most struggling to apply the PAMCs. Some were able to secure some individual achievements, but no significant programme improvements were achieved.

The system evaluation framework of the study does not account for the severe challenges PgDCEH graduates and their line managers have to overcome on personal, programme and system levels in order to meet their health service targets. On personal level, low and medium applying graduates were constrained due to lowly positions, lack of power because of wrong profession, extreme self-orientation and mis-aligned motives. The lack of support and supervision, poor line management leadership, inadequate performance management and general eye care challenges amidst the overwhelming complexity of health systems were constraining factors for application of PAMCs in low and medium applying graduates.

Working in a programme setting was a common limiting factor, associated with low opportunity, complex operations, complicated organisation charts and a lack of adequate monitoring of staff performance and service outputs. Graduates with excessive personal motivation, in pursuit of activities and opportunities that mostly benefit themselves, also belong to this group. This seems to apply to their line management as well.

Graduates who exhibited a high level of application lauded the suitability of the PgDCEH as they enrolled for the PgDCEH with the intention of acquiring management skills to apply in their eye care programmes. They acknowledged that they gained qualification or skills and much confidence and were highly motivated. They also worked in partnerships with NGOs who provided resources or in project environments. Their line managers spoke highly of their performance and were supportive and knowledgeable of the work they do.

The main limitation of the study included its lack of baseline data, the relatively small sample of PgDCEH graduates investigated within a particular time and place context and the close relationship the graduates had with the researcher. Furthermore, the assumption that the PgDCEH as an educational intervention was adequate to deliver the competencies designed to improve management capacity might also have detracted from the sturdiness of the findings. However, the research methodology incorporated several measures to strengthen trustworthiness and overall validity of the findings.

The importance of personal motivation, the dynamics of change and the interpersonal nature of health systems were vividly illustrated through this study. New insights into the suitability of the project design of management for eye care and the need for health system maintenance to further strengthen health systems were uncovered. Additionally, the need for even further increased management capacity, especially in health service leadership was emphasized. Some key implications for research, eye care programme design and management education were highlighted. Recommendations pertaining to these are posed in the conclusion.

Chapter 9: Conclusion

The research was conducted to determine how PgDCEH graduates applied the management competencies acquired through the training, to investigate the factors that enabled or constrained their application of these competencies and to determine how this impacted on the performance of the eye care programmes in which they worked.

In constructing the conceptual framework of analysis, a novel method of inquiry was developed that may be useful in other settings, namely the development of assessment rubrics for management application to grade the levels of management competency application. Very few other studies in management competencies application have used objective observations as source data for their analysis.

Data obtained from a questionnaire survey, in-depth interviews with graduates and their secondary key informants and document reviews were used to determine the level of application of PAMCs, and the factors influencing them. In addition to qualitative analytical procedures, a custom-designed competency application rubric was used to make quantitative measurements of levels of application of PAMCs for identification of factors conducive to high, medium and low levels of PAMCs application. The study focused on the objective measurement of management competency application in a real-life setting, an area rarely receiving adequate attention in public health research.

Although the study focused mainly on the outcomes and impact phases of the result chain, some elements of the input, process and output areas were also indicated in influencing the application of PAMCs. These include the selection of candidates for the training, the teaching methods and the educational resources available for the students. At enrolment, PgDCEH graduates had various expectations, motivations and motives. These expectations have largely been met, with the reports of benefits accrued because of the training, especially related to acquisition of management competencies, being mostly positive. As some of these attributes relate to graduates' roles and location in their work settings which hardly changed from enrolment to graduation, there is a strong association with the suitability of the PgDCEH as a capacity development mechanism. This may support the assumption that the PgDCEH was successful in delivering its learning outcomes.

After completion of the training, graduates performed various roles in eye care programmes, were situated at different levels of programme hierarchy and reported variable abilities to perform key management tasks. They were also presented with different opportunities and challenges in the workplace. Most of the programme and system challenges were found to be largely the same as before their training.

It was anticipated that the improvement in the management capacity in eye care programmes would have resulted in improvement of eye care programme performance. This expectation was based on the system evaluation framework and the PgDCEH theory of change (*Figures 13 and 14*). The advantages of this construct lie in the practical way in which the status (of a system) can be perceived and the result endpoints (outputs, outcomes and impact) can be made sense of. The difficulty lies in the uncertainty as to where exactly two theories intersect. For instance, systems theory explains some of the complexity and its manifestations (more challenges), but cannot relate to any specific "output", "outcome" or "impact". The complex nature of systems makes it virtually incompatible with a linear theory of change.

Systems theorists may test how system elements behave within the appropriate contextual environment to determine which interventions might work then make predictions of adaptability or suitability in other contexts. This is vastly different from change theorists who build feasible and measurable predictions into their result chains. The fusion of these two makes for the examination of the phenomenon in a dynamic time-space continuum. Health system activities do not occur in static or in a predetermined order, they are critically intertwined in space and time dimensions. Application (and by extension, performance) changes because of changes in the interest and position of the individual over time. This was illustrated by several of the PgDCEH graduates, but none so striking as the one who changed position from programme-focused provincial manager to patient-focused private practitioner. Nonetheless, the theoretical framework did not account for the challenging environments in which graduates were embedded and were expected to work towards improvement of eye health outcomes.

PgDCEH graduates apply their management competencies with difficulty in a highly challenged, poorly facilitated and under-resourced, complex health system, although management in projects is easier. When properly supported, supervised and performance managed, PgDCEH graduates who are motivated, happy and proud, can attain significant individual achievements. Although these can translate into programme achievements, this does not happen easily because of the challenges of eye care programmes and the complicated relationships between people, interacting in complex health system environments.

It was concerning that these are management-trained graduates, who received training to deal with these challenges. This means that obtaining the PgDCEH has had a limited or negligible impact on graduates' eye care programme performance. The theoretical framework makes provision for other interventions that could also have contributed to improved eye programme performance (apart from the graduates' application of PAMCs) including other training and education, removal of some constraining elements and re-definition of performance targets. Not considering these "other" initiatives in health system strengthening towards eye care service improvements may be the critical shortcoming here.

Opportunity to apply was the central axis around which application of PAMCs revolved and cut across individual, programme and system levels. Being in an administrator role, performing mainly management tasks, being enabled by a supportive and supervising line manager, having access to funding and working a project environment presented; these presented high opportunity. Where the opportunity was diminished, the application and individual achievements were low.

This research provided new knowledge about the effect of the PgDCEH training on the graduates and how this impacted on the performance of eye care programmes in which they work. This led to better understanding of how management training for eye health services should be designed and delivered, and how eye health services should be designed for greater effectiveness. Critical lessons about the effects of change, personal motivation and the structure and function of health systems were also learned.

Personal motivation was identified as a crucial element determining whether a graduate would be a high, medium or low applier of PAMCs. This notion, like opportunity, also cut across individual, programme and system levels. When relating this to the graduate, the motivation for applying for the scholarship, undergoing the training and obtaining the qualification may all be largely self-serving. Even when contemplating application, i.e. the work roles they will assume, the work targets they will meet, and the achievements they will cherish, may all be mainly for their own best interests. There may be collateral benefits to the system (i.e. programme targets met, health outcomes improved), which are considered secondary to the individual's primary benefits of personal gain or achievements.

Another new insight was that applying the project management principles of managing discrete, time-bound, results-focused and routinely monitored objectives to ensure that desired outcomes are most effectively and efficiently achieved in eye care, especially with associated NGO collaboration. Projects seem to be more accommodative to management application than programmes. The findings suggest that eye care needs to operate in project mode in order to thrive in the health system as is. Even in programmes, the "management by projects" paradigm could be followed. Conceivably, many health programme targets can be met by applying the project management approach.

The intricate workings of health system do not always favour eye care, a relatively minor surgical discipline. NGO collaboration (through funding support and project management) is a very workable alternative to competing with larger disciplines in programme environments. The graduates' real and perceived issues regarding NGO partnerships range from beneficial to harmful, but the overall finding is that these partnerships provide the opportunity to apply PAMCs and to have personal and programme achievements. This is another key finding, as NGOs generally management deliverables through projects.

The severity of the health system challenges to the application of PAMCs was illustrated through several means. Firstly, through the low level of leadership and management competencies in line managers of the graduates. Secondly, the poor practices in performance management observed throughout the study cohort and thirdly, the professionally differentiated clinical/administrative work roles assumed by some extremely over-worked individuals. Lastly, the changes in the interest and position of health care professionals over time also played a significant role.

The complexity of the health system requires the PgDCEH graduate, who is mostly poorly resourced, unsupported and unsupervised to find opportunity, negotiate the challenges and produce a change in an intensely challenging programme environment. The idea of an isolated intervention that will return a favourable response through normal system theory is incompatible with the findings. The study exposed the personal challenges people face in health systems. People are in essence the building blocks of health systems. The PgDCEH graduate, manager or health worker in general can be pictured as a central cog in his or her subset of the health system, each connecting with several similarly structured subsets in multiple and multi-directional ways. This makes the health system a living, dynamic and extremely complex arrangement of people, interacting across several domains (time, space and roles). This was a departure from the seemingly inanimate, rigid, stationary and compartmentalised view currently held.

The implication of this is not only that this study's health systems paradigm can now be applied to people in their complex relationships but also that the importance of people management was more strongly emphasised. Developing more effective support and supervision structures in health programmes and instituting routine maintenance of the health system may work towards improved health outcomes. This "maintenance" is likened to "management", which is remarkably absent from the health systems strengthening framework. Management is the critical component of the health system which has been neglected in the health system strengthening debate to date. The routine maintenance of the components (the people), their connections and the spaces in-between are required to have a well-performing health system, capable and motivated to produce the desired health outcomes. Effective management of people and relationships is required to ensure that health systems function continuously and optimally through purpose-driven performance management systems. (DPSA, 2007)

The significance of these findings should inspire a call for more empirical research to study management practices more objectively and for deeper exploration of the effects of opportunity and personal motivation in the delivery of health service outcomes. In management education, closer attention should be given to personal leadership development and relationship management. In practice, management-by-projects and supervision and support for incumbent managers should be strengthened.

The thesis inspired ways of improving not only the PgDCEH, but also the structure and functioning of management training in the greater the health system, including the following recommendations:

- Change advertisement, selection and enrolment to attract candidates with greater likelihood to pursue career in health programme management;
- Market management training for all health services managers as an essential capacity development intervention to enable them to better manage their staff's personal motivations and aspirations
- Integrate management training into health professional education, with credits for Continuous Professional Development, or similar;
- Strengthen the leadership development component of the curriculum to ensure greater emphasis on personal and strategic leadership;
- Intensify study of the contextual environment and its effects on programme achievements and challenges as well as personal and relationship dynamics;
- Include "management by project" as a foundational component and use the practical assignments to coach and mentor students through the project stages;
- Involve the greater eye care team in management capacity building, perhaps by making online courses / quizzes available to all; and
- Incorporate formal feedback mechanisms to monitor and support graduates' encounters with challenges and encourage celebration of their achievements.

The constituent elements of the health system are not inanimate objects, as commonly portrayed, but people, who are connected in intimate, complex and multi-dimensional ways through communication, relationships and team dynamics to deliver health outcomes. This research broadened understanding of how PgDCEH graduates interact with their work environment and uncovered ways to improve the design and delivery of management training for eye health workers in the future. Revision of the criteria for selection, strengthening focus on leadership, project and relationship management topics, and integrating management training into health professions' education programmes may substantially improve the impact of health management education. Making a greater effort in education and management to address people's individual personal motivations may help to ensure that health system strengthening is indeed: everyONE's business!

REFERENCES

Abbott, A. 1988. The system of professions: An essay on the division of expert labor, Chicago, IL, US: University of Chicago Press.

Ackland, P. 2012. The accomplishments of the global initiative VISION 2020: The Right to Sight and the focus for the next 8 years of the campaign. Indian J Ophthalmol, 60, 380-6.

Ackland, P. 2016. The IAPB Vision Atlas presentation at the International Agency for the Prevention of Blindness. 10th General Assembly. Durban, South Africa.

Adam, T. & De Savigny, D. 2012. Systems thinking for strengthening health systems in LMICs: need for a paradigm shift. Health Policy Plan, 27 Suppl 4, iv1-3.

Adam, T. 2014. Advancing the application of systems thinking in health. Health Res Policy Sys 12, 50 (2014). https://doi.org/10.1186/1478-4505-12-50.

Adams, J. S. & Freedman, S. 1976. Equity Theory Revisited: Comments and Annotated Bibliography. In: Berkowitz, L. & Walster, E. (eds.) Advances in Experimental Social Psychology. Cambridge MA: Academic Press.

Adu, P. 2013. Qualitative analysis coding and categorizing. Presentation: 22 November. Retrieved from http://www.slideshare.net/kontorphilip/qualitative-analysis-coding-and-categorizing. [Accessed October 2017].

Akerlind, G., McKenzie, J., & Lupto, M. 2010. A threshold concepts focus to curriculum design: supporting student learning through application of variation theory. University of Technology Sydney.

Alasuutari, P., Bickman, L., Brannen, J. 2012. Introduction: Social research in changing social conditions. In: The SAGE Handbook of Social Research Methods. London: SAGE. ISBN: 9781848608429.

Alderfer, C. P. 1972. Existence, relatedness, and growth: human needs in organizational settings. New York: Free Press.

Amde, W. K., Sanders, D. & Lehmann, U. 2014. Building capacity to develop an African teaching platform on health workforce development: a collaborative initiative of universities from four sub Saharan countries. Hum Resour Health, 12, 31.

American College of Healthcare Executives (ACHE) 2018. Competencies assessment tool. Healthcare Leadership Alliance and the American College of Healthcare Executives. Available from: https://www.ache.org/-/media/ache/career-resource-center/competencies_booklet.pdf.

Anderson, D & Anderson, LA. 2001. Beyond change management: Advanced Strategies for Today's Transformational leaders. San Francisco: Jossey-Bass/ Pfeiffer.

Anderson, L.W. (Ed.), Krathwohl, D.R. (Ed.), Airasian, P.W., Cruikshank, K.A., Mayer, R.E., Pintrich, P.R., Raths, J., & Wittrock, M.C. (2001). A taxonomy for learning, teaching, and assessing: A revision of Bloom's Taxonomy of Educational Objectives (Complete edition). New York: Longman.

Antonakis, J. & House, R. J. 2014. Instrumental leadership: Measurement and extension of transformational–transactional leadership theory. The Leadership Quarterly, 25, 746-771.

Ashby, W. R. 1958. Requisite variety and its implications for the control of complex systems. Cybernetica 1:2, p. 83-99.

Bacon, F. 1902. Title: Novum Organum Or True Suggestions for the Interpretation of Nature. Project Gutenberg.

Baloch, M., Faiza, M. 2016. Impact of 360 Feedbacks on Management Skills and Development. Imperial Journal of Interdisciplinary Research (IJIR), 2 (1) , 2016. ISSN : 2454-1362, www.onlinejournal.in.

Bandura, A. 1969. Social learning theory of Identification processes. Chicago, IL: Rand McNally & Company.

Barasa, E. W., Molyneux, S., English, M. & Cleary, S. 2015. Setting healthcare priorities in hospitals: a review of empirical studies. Health Policy Plan, 30, 386-96.

Barasa, E. W., Molyneux, S., English, M. & Cleary, S. 2017. Hospitals as complex adaptive systems: A case study of factors influencing priority setting practices at the hospital level in Kenya. Soc Sci Med, 174, 104-112.

Barasa, E., Mbau, R. & Gilson, L. 2018. What Is Resilience and How Can It Be Nurtured? A Systematic Review of Empirical Literature on Organizational Resilience. Int J Health Policy Manag, 7, 491-503.

Barbalet, J. 2012. Self-interest and the theory of action. Br J Sociol, 63, 412-29.

Bartlett, G. 2001. Systemic Thinking: a simple thinking technique for gaining systemic (situation-wide) focus. The International Conference on Thinking "Breakthroughs 2001". Auckland, New Zealand: Prodsol International.

Baxter, P., Jack, S. 2008. Qualitative case study methodology: Study design and implementation for novice researchers. The Qualitative Report 13 (4) , 544-559 http://www.nova.edu/ssss/QR/QR13-4/baxter.pdf.

Belanger, P. 2011. Theories in Adult Learning and Education. Study guides in Adult Education. Barbara Budrich. Opladen & Farmington Hills, USA.

Blanchet, K., Gilbert, C. & De Savigny, D. 2014. Rethinking eye health systems to achieve universal coverage: the role of research. Br J Ophthalmol, 98, 1325-8.

Blanchet, K., Lindfield, R. . 2010. Health Systems & Eye Care: the way forward. International Centre for Eye Health, London School of Hygiene & Tropical Medicine. www.iceh.org.uk

Blanchet, K., Patel, D. 2012. Applying principles of health system strengthening to eye care. Indian J Ophthalmol, 60, 470-4.

Bloom, B. S. 1956. Cognitive Domain. Taxonomy of Educational Objectives. New York: McKay.

Boisot, M., McKelvey, B. 2011. Complexity and Organization - Environment relations: Revisiting Ashby's Law of Requisite variety. In: Allen, P., Maguire, S., McKelvey, B. (ed.) The SAGE Handbook of Complexity and Management. SAGE.

Booth, S. 2008. Researching Learning in Networked Learning – Phenomenography and Variation theory as empirical and theoretical approaches. Proceedings of the 6th International Conference on Networked Learning. 5-6 May, Halkidiki, Greece.

Bourne, R. R. A., Flaxman, S. R., Braithwaite, T., Cicinelli, M. V., Das, A., Jonas, J. B., Keeffe, J., Kempen, J. H., Lwasher, J., Limburg, H., Naidoo, K., Pesudovs, K., Resnikoff, S., Silvester, A., Stevens, G. A., Tahhan, N., Wong, T. Y., Taylor, H. R. & Vision Loss Expert Group. 2017. Magnitude, temporal trends, and projections of the global prevalence of blindness and distance and near vision impairment: a systematic review and meta-analysis. Lancet Glob Health, 5, e888-e897.

Boyce, C., Neale, Palena. 2006. Conducting in-depth interviews: a guide for designing and conducting in-depth interviews for evaluation input. Pathfinder International.

Boznak, R. G. 1991. Project management: the bridge to excellence. PM Network, 5(5), 6–7.

Bradley, E. H., Taylor, L. A. & Cuellar, C. J. 2015. Management Matters: A Leverage Point for Health Systems Strengthening in Global Health. Int J Health Policy Manag, 4, 411-5.

Bradley, S., Kamwendo, F., Masanja, H., De Pinho, H., Waxman, R., Boostrom, C. & McAuliffe, E. 2013. District health managers' perceptions of supervision in Malawi and Tanzania. Hum Resour Health, 11, 43.

Bragg, M. 2013. Complexity. Panel discussions on the British Broadcasting Corporation Radio programme, In Our Time Podcast. BBC. London, UK.

Branch, R. M. 2009. Instructional Design: the ADDIE approach, Springer US.

Brannen, J. 2005. Mixed Methods Research: a discussion paper. ESRC National Center for Research methods. Available from: http://eprints.ncrm.ac.uk/89/1/MethodsReviewPaperNCRM-005.pdf.

Braun, V. & Clarke, V. 2006. Using thematic analysis in psychology. Qualitative Research in Psychology, 3, 77-101.

Brouselle, A. & Champagne, F. 2011. Program theory evaluation: Logic analysis. Eval Program Plann, 34, 69-78.

Buch, K. 2002. Learning style and training delivery mode preference. Journal of Workplace Learning, 14, 5-10.

Buchanan, D. A., Denyer, D., Jaina, J., Kelliher, C., Moore, C., Parry, E. & Pilbeam, C. 2013. How do they manage? A qualitative study of the realities of middle and front-line management work in health care. Health Serv Deliv Res 2013;1(4). Southampton (UK).

Campbell, S. 2009. Systems Thinking for health systems strengthening. Alliance for Health Policy and Systems Research. World Health Organization (WHO). Geneva, Switzerland.

Cancedda, C., Farmer, P. E., Kerry, V., Nuthulaganti, T., Scott, K. W., Goosby, E. & Binaghawo, A. 2015. Maximizing the Impact of Training Initiatives for Health Professionals in Low-Income Countries: Frameworks, Challenges, and Best Practices. PLOS Medicine, 12, e1001840.

Chan, V. F., Naidoo, J., Chinanayi, F. S. & Naidoo, K. S. 2017. Near vision correction and quality of life among textile factory workers in Durban. African Vision and Eye Health, 76.

Chan, Z. C. Y., Fung, Y. L., & Chien, W. T. 2013. Bracketing in phenomenology: only undertaken in the data collection and analysis process? The Qualitative Report, 18(59), 1-9. Retrieved from http://www.nova.edu/ssss/QR/QR18/chan59.pdf

Chand, S. 2018. Motivation Theories: Top 8 Theories of Motivation - Explained! http://www.yourarticlelibrary.com/motivation/motivation-theories-top-8-theories-of-motivation-explained/35377. [Accessed June 2018].

Chen, D. & Stroup, W. 1993. General Systems Theory: Toward a conceptual framework for science and technology education for all. Journal of Science Education and Technology, 2, 447-459.

Chen, H. T. 2012. Theory-driven evaluation: Conceptual framework, application and advancement. In: Strobl, R., Lobermeier, O. & Heitmeyer, W. (eds.) Evaluation von Programmen und Projekten für eine demokratische Kultur. Wiesbaden: Springer Fachmedien Wiesbaden.

Chiang-Hanisko, L., Newman, D., Dyes, S., Piyakong, D. & Liehr, P. 2016. Guidance for using mixed methods design in nursing practice research. Appl Nurs Res, 31, 1-5.

Chinitz, D. P. & Rodwin, V. G. 2014. On Health Policy and Management (HPAM): mind the theory-policy-practice gap. Int J Health Policy Manag, 3, 361-3.

Chmiliar, L. 2010. Multiple Case study designs. In: Mills, A.J., Durepos, G. & Wiebe, E. (ed.) Encyclopedia of Case Study Research. Thousand Oaks: SAGE Publications.

Chonko, L. 2018. Ethical theories. Direct Selling Foundation. University of Texas at Arlington.

Collins, A. M., Brown, J. S., & Newman, S. 1989. Cognitive Apprenticeship: Teaching the Craft of Reading, Writing, and Mathematics. In: Resnick, L. B., Erlbaum, L. (ed.) Knowing, Learning and Instruction: Essays in Honor of Robert Glaser. Hillsdale, NJ.

Conn, C. P., Jenkins, P. & Touray, S. O. 1996. Strengthening health management: experience of district teams in The Gambia. Health Policy and Planning, 11, 64-71.

Cook, C. 2007. The economic burden of blindness, the cost of Vision 2020 and the cost benefit of Vision 2020 in Southern Africa. East African Journal of Ophthalmology. May 2008.

Crawford, L.H., Simpson, S. and Koll, W. 1999. Managing by Projects: A Public Sector Approach. In: Artto, K.A., Kahkonen, K. and Koskinen, K., (Eds.) Proceedings for NORDNET'99: Managing Business by Projects, pp. 608-626. Helsinki, Finland: Project Management Association, Finland and NORDNET

Creswell, John W, 2007. Qualitative enquiry and research design: Choosing among 5 approaches. Sage Publishers, New York.

Creswell, John W, 2008. Mixed Methods Research: Design and Procedures. Presentation University of Pretoria, October 21, 2008.

Crowe, M., Sheppard, L. 2010. Qualitative and quantitative research designs are more similar than different [Invited Editorial]. Internet Journal of Allied Health Sciences and Practice, 4 (8), 2010

Dahl, T. A. 2015. Theory of professions. Hogskolen Oslo. Presentation 13 January. De Akerhuis.

De Savigny, D. & Adam, T. (Eds). 2009. Systems thinking for health systems strengthening. Alliance for Health Policy and Systems Research, WHO, 2009.

De Savigny, D. & Binka, F. 2004. Monitoring future impact on malaria burden in sub-Saharan Africa. Am J Trop Med Hyg, 71, 224-31.

De Savigny, D., Webster, J., Agyepong, I. A., Mwita, A., Bart-Plange, C., Baffoe-Wilmot, A., Koenker, H., Kramer, K., Brown, N. & Lengeler, C. 2012. Introducing vouchers for malaria prevention in Ghana and Tanzania: context and adoption of innovation in health systems. Health Policy Plan, 27 Suppl 4, iv32-43.

Department of Public Service Administration (DPSA) 2007. Employee Performance Management and Development System. Developed by the Department of Public Service and Administration as a framework for voluntary use by departments. http://www.dpsa.gov.za/dpsa2g/documents/ep/2007/EPMDS.pdf. [Accessed August 2018].

Department of Public Service Administration (DPSA) 2008. Competency framework for SMS members. Presentation HR Steering committee. Department of Public Service Administration, South Africa. http://www.dpsa.gov.za/dpsa2g/documents/networks/hr_forum_01_2008/6.pdf. [Accessed August 2018].

Diaz-Monsalve, S. J. 2004. The impact of health-management training programs in Latin America on job performance. Cad Saude Publica, 20, 1110-20.

Dirkx, J. M. 1998. Transformative Learning Theory in the Practice of Adult Education: An Overview PAACE Journal of Lifelong Learning, Vol. 7, 1998, 1-14.

Doherty, J. & Gilson, L. 2011. South African Health managers speak out. Lessons for innovative health management in the public sector. Oliver Tambo fellowship programme. Conference proceedings: Celebrating Innovative Health Management. Cape Town, 20-30 June 2011.

Doherty, J. & Gilson, L. 2015. Workplace-based learning for health system leaders: practical strategies for training institutions and governments. Technical Report. RESYST, London School of Hygiene & Tropical Medicine.

Dorros, G. L. 2006. Building management capacity to rapidly scale up health services and health outcomes. Geneva, Switzerland: World Health Organization.

Downes, A. 2016a. Kaufman's Five Levels of Evaluation. Learning Evaluation Theory: [Online]. https://www.watershedlrs.com/blog/learning-evaluation/kaufman-levels-of-learning-evaluation. [Accessed May 2018].

Downes, A. 2016b. Kirkpatrick Model. Learning Evaluation Theory: [Online]. https://www.watershedlrs.com/blog/learning-evaluation/kirkpatrick-training-evaluation-model. [Accessed May 2018].

Downes, A. 2016c. Brinkerhoff Model. Learning Evaluation Theory: [Online]. https://www.watershedlrs.com/blog/learning-evaluation/brinkerhoff-method. [Accessed May 2018].

Draganidis, F. & Mentzas, G. 2006. Competency based management: a review of systems and approaches. Information Management & Computer Security, 14, 51-64.

Dreyfus, S. E. & Dreyfus, H.L. 1980. A five-stage model of the mental activities involved in direct skill acquisition. Operations Research Center.

Du Toit, R., Cook, C., Minnies, D. & Brian, G. 2010a. Developing a competency-based curriculum for eye care managers in sub-Saharan Africa. Rural and Remote Health, 10.

Du Toit, R., Cook, C., Minnies, D. & Brian, G. 2010b. Competency development for an eye care programme managers' course. South African Association of Health Educators Conference. Johannesburg, South Africa.

Ellis, B. 2011. Complex adaptive systems: a tool for interpreting responses and behaviours. Inform Prim Care, 19, 99-104.

Epner, D. E. & Baile, W. F. 2011. Wooden's pyramid: building a hierarchy of skills for successful communication. Med Teach, 33, 39-43.

European Commission. 2006. Final Report of the Expert Group on Management capacity building. Enterprise and Industry. Available from: https://ec.europa.eu/downloads/mcb_en_3473.pdf.

Facione, P.A. 2016. Cultivating A Positive Critical Thinking Mindset. Measured Reasons LLC. Based in part on material from chapter 2 of Think Critically, Facione and Gittens, 2016, Pearson Education

Fallatah, R. H. M. & Syed, J. 2018. A Critical Review of Maslow's Hierarchy of Needs. Employee Motivation in Saudi Arabia. http://www.springer.com/978-3-319-67740-8.

Feistauer, D. & Richter, T. 2017. How reliable are students' evaluations of teaching quality? A variance components approach. Assessment & Evaluation in Higher Education, 42, 1263-1279.

Filerman, G. 2003. Closing the management competence gap. Human Resources for Health, 1.7

Finch, B. 2001. How to write a business plan. 3rd Edition. Sunday Times. Kogan page. London.

Flick, U. 2009. An introduction to qualitative research, 4th ed, Thousand Oaks, CA, Sage Publications Ltd.

Flick, U. 2018. An Introduction to Qualitative Research. Freie Universtität Berlin, Germany.

Forbes. 2017. Leadership and management [Online]. Available: https://www.forbes.com/sites/kevinkruse/2012/10/16/quotes-on-leadership/#6934167e2feb [Accessed September 2019].

Foster, A. 2001. Cataract and "Vision 2020—the right to sight" initiative. British Journal of Ophthalmology 2001;85:635-637.

Foster, A. 2003. Vision 2020 – the Right to Sight. *Tropical Doctor*, *33*(4), 193-194. https://doi.org/10.1177/004947550303300401.

Fraser, N. 2001. Social Justice in the Knowledge Society: Redistribution, Recognition, and Participation. Beitrag zum Kongress "Gut zu Wissen", Heinrich-Böll-Stiftung, 5/2001. 2001.

Freire, P. 2005. Pedagogy of the oppressed. 30th Anniversary Edition. Translated by Myra Bergman Ramos. A Continuum. New York.

Frenk, J., Chen, L., Bhutta, Z. A., Cohen, J., Crisp, N., Evans, T., Fineberg, H., Garcia, P., Ke, Y., Kelley, P., Kistnasamy, B., Meleis, A., Naylor, D., Pablos-Mendez, A., Reddy, S., Scrimshaw, S., Sepulveda, J., Serwadda, D. & Zurayk, H. 2010. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. The Lancet, 376, 1923-1958.

Fricke, T. R., Tahhan, N., Resnikoff, S., Papas, E., Burnett, A., Ho, S. M., Naduvilath, T. & Naidoo, K. S. 2018. Global Prevalence of Presbyopia and Vision Impairment from Uncorrected Presbyopia: Systematic Review, Meta-analysis, and Modelling. Ophthalmology, 125, 1492-1499.

Gabel, S. 2012. Power, leadership and transformation: the doctor's potential for influence. Med Educ, 46, 1152-60.

Gadotti, M. & Torres, C.A. 2009. Paulo Freire: Education for development. Published on behalf of the Institute of Social Studies, The Hague.

Gagne, R. M. 1966. Elementary science: a new scheme of instruction. Science, 151, 49-53.

Galer, J. B., Vriesendorp, S. & Ellis, A. 2005. Managers who lead: A handbook for improving health services, Cambridge, Management Sciences for Health.

Garton, S. & Copland, F. 2010. 'I like this interview; I get cakes and cats!': the effect of prior relationships on interview talk. Qualitative Research, 10, 533-551.

Geneau, R., Massae, P., Courtright, P. & Lewallen, S. 2008. Using qualitative methods to understand the determinants of patients' willingness to pay for cataract surgery: A study in Tanzania. Soc Sci Med, 2, 558-568.

Gentry, J. 1990. Guide to Business Gaming and Experiential Learning. Nichols/GP. 1990. University of Michigan. ISBN 0893973696.

Gharajedaghi, J. 2011. Systems thinking: managing chaos and complexity, A platform for designing business architecture, Third edition, Elsevier.

Gilson, L. & Agyepong, I. A. 2018. Strengthening health system leadership for better governance: what does it take? Health Policy Plan, 33, ii1-ii4.

Gilson, L. & Daire, J 2011. Leadership and Governance within the South African Health System. South African Health Report.

Gilson, L. 2012. Health policy and systems research: a methodology reader. . Alliance for Health policy and systems research.

Gilson, L. 2018. RESYST meeting about Resilient health systems.08 February. University of Cape Town. Cape Town, South Africa.

Glaser, J. L. & Grit 2013. Life With and Without Coding: Two Methods for Early-Stage Data Analysis in Qualitative Research Aiming at Causal Explanations [96 paragraphs]. Forum Qualitative Sozialforschung / Forum: Qualitative Social Research, 14(2), Art. 5, http://nbn-resolving.de/urn:nbn:de:0114-fqs130254.

Goodell, L. S., Stage, V. C. & Cooke, N. K. 2016. Practical Qualitative Research Strategies: Training Interviewers and Coders. J Nutr Educ Behav, 48, 578-585 e1.

Gowen, C.R. 2006. On the centrality of strategic human resource management for healthcare quality results and competitive advantage. Journal of Management Development, 25, 806-826.

Graham, R. 2012. Human resources for Health and the Global Health Workforce Alliance. IAPB 9th General Assembly. Durban: International Agency for the Prevention of Blindness.

Green, H., E. 2014. Use of theoretical and conceptual frameworks in qualitative research. Nurse Researcher. 21, 6, 34-38.

Greene, J. C., DeStefano, L., Burgon, H. & Hall, J. 2006. An educative, values-engaged approach to evaluating STEM educational programs. New Directions for Evaluation, 2006, 53-71.

Guwatudde, D., Bwanga, F., Dudley, L., Chola, L., Leyna, G.H., Mmbaga, E.J., Kumwenda, N., Protsiv, M., Atkins, S., Zwarenstein, M., Obua, C. & Tumwine, J.K. 2013. Training for health services and systems research in Sub-Saharan Africa--a case study at four East and Southern African universities. Hum Resour Health, 11, 68.

Gwatkin, D.R., Bhuiya, A. & Victoria, C.G. 2004. Making health systems more equitable. The Lancet, 364, 1273-1280.

Hall, G., & Hord, S. 2015. Implementing change: Patterns, principles, and potholes. (4th ed.). Boston, MA: Pearson Education.

Handler, A., Issel, M. & Turnock, B. 2001. A conceptual framework to measure performance of the public health system. Am J Public Health, 91, 1235-9.

Harden, R. M. 2001. AMEE Guide No. 21: Curriculum mapping: a tool for transparent and authentic teaching and learning. Med Teach, 23, 123-137.

Harris, L. R. 2011. Phenomenographic perspectives on the structure of conceptions: The origins, purposes, strengths, and limitations of the what/how and referential/structural frameworks. Educational Research Review, 6, 109-124.

Harrison, A., F.& Bramson, Robert, M. 2002. The Art of Thinking: the classic guide to increasing brain power, Berkley.

Harrison, J. P. 2010. Chapter 5: Strategic Planning and SWOT analysis. Essentials of Strategic planning in Healthcare. Health Administration Press.

Hartley, J., Martin, J. & Benington, J. 2008. Leadership in Healthcare: A review of the literature for health care professionals, managers and researchers. National Institute for Health Research.

Hartwig, K., Pashman, J., Cherlin, E., Dale, M., Callaway, M., Czaplinski, C., Wood, W. E., Abebe, Y., Dentry, T. & Bradley, E. H. 2008. Hospital management in the context of health sector reform: a planning model in Ethiopia. Int J Health Plann Manage, 23, 203-18.

Hazel, S. 2015. The paradox from within: research participants doing-being-observed. Qualitative Research, 16, 446-467.

He, M. 2016. Cataract Surgical Rate and Socioeconomics: A Global Perspective. Presentation, 14 October. 10th General Assembly. International Agency for the Prevention of Blindness (IAPB).

Health Systems Trust (HST). 2009a. District Management Study, A National Summary Report: A review of structures, competencies and training interventions to strengthen district management in the national health system of South Africa.

Health Systems Trust (HST). 2009b. National Service Delivery Agreement. 2010-2014 for Outcome 2: A Long and Healthy Life for All South Africans.

Health Systems Trust (HST). 2013. Gray A, Vawda Y, Jack C. Health Policy and Legislation. In: Padarath A, English R, editors. South African Health Review 2012/13. Durban: Health Systems Trust; 2013. URL: http://www.hst.org.za/publications/south-african-health-review-2012/13.

Health Systems Trust (HST). 2014. Gray A, Vawda Y. Health Policy and Legislation. 2014. In: Padarath A, English R, editors. South African Health Review 2013/14. Durban: Health Systems Trust; 2014. URL: http://www.hst.org.za/publications/south-african-health-review-2013/14.

Fry, H., Ketteridge, S. & Marshall, S. (eds.) 2009. A Handbook for Teaching and Learning in Higher Education Enhancing Academic Practice. Third edition. Routledge, London.

Heckman, J. J. & Kautz, T. 2012. Hard evidence on soft skills. Labour Econ, 19, 451-464.

Hewson, P. W. 1992. Conceptual change in Science Teaching and Teachers Education. "Research and Curriculum Development in Science Teaching,". National Center for Educational Research, Documentation, and Assessment, Madrid, Spain.

Hofmeyer, A. & Marck, P. B. 2008. Building social capital in healthcare organizations: thinking ecologically for safer care. Nurs Outlook, 56, 145-151 e2.

Hornstein, H. A. 2017. Student evaluations of teaching are an inadequate assessment tool for evaluating faculty performance. Cogent Education, 4, 1304016.

Institute of Medicine. 2013. Evaluating Obesity Prevention Efforts: A Plan for Measuring Progress, Washington, DC, The National Academies Press.

InstructionalDesign. 2017. Instructional Design Models [Online]. Available: https://www.instructionaldesign.org/models/ [Accessed May 2017].

International Agency for the Prevention of Blindness (IAPB). 2010. IAPB Vision 2020 Workshop report. 11-12 May 2010. Durban, South Africa. IAPB.

International Agency for the Prevention of Blindness (IAPB). 2011. IAPB Vision 2020 Workshop report. Johannesburg, South Africa. IAPB.

International Agency for the Prevention of Blindness (IAPB). 2013 IAPB Africa Human Resources for Eye Health Strategic Plan 2014-2023. Vision for Africa. [Online] www.iapb.org. [Accessed June 2017].

International Agency for the Prevention of Blindness (IAPB). 2014. The crisis in the eye health workforce in Africa. [Online] www.iapb.org. [Accessed June 2017].

International Agency for the Prevention of Blindness (IAPB). 2016. IAPB 10th General Assembly Programme. [Online] www.iapb.org. [Accessed April 2016].

International Agency for the Prevention of Blindness (IAPB). 2017, IAPB Vision Atlas First Edition, ISBN 978-1-9999112-0-1.

International Agency for the Prevention of Blindness (IAPB). 2019. Vision Atlas [Online]. Available: http://atlas.iapb.org/ [Accessed 2019].

International Centre for Eye Health 2010. Final Narrative Report. Training Centres in Community Eye Health for Vision 2020. Nuffield Foundation.

Jabareen, Y. 2009. Building a Conceptual framework: Philosophy, Definitions and Procedure. International Journal of Qualitative Methods, 8.

Jasson, C. C. & Govender, C. 2017. Measuring return on investment and risk in training – A business training evaluation model for managers and leaders. Acta Commercii, 17.

Johns Hopkins University School of Public Health (JHUSoPH) 2000. Training in Qualitative Research Methods for PVOs & NGOs (and counterparts) Adapted from: Gittelsohn, J. 1996-98. Qualitative Research Methods. The Johns Hopkins University School of Public Health. (Course notes).

Johns, G. 2001. In Praise of Context. Journal of Organizational Behavior, 22, 31-42.

Johnson, B. & Geal, M. 2005. Behavioural analysis in training. Train the trainer. Issue 23. Fenman Limited.

Johnson, R. B., Onwuegbuzie, A. J. & Turner, L. A. 2007. Toward a Definition of Mixed Methods Research. Journal of Mixed Methods Research, 1, 112-133.

Joshi, M. 2017. Soft skills. First edition. Bookboon.

Kaufman, R. & Keller, J. M. 1994. Levels of evaluation: Beyond Kirkpatrick. Human Resource Development Quarterly, 5, 371-380.

Kebede, S. Y. A., Wolde, M., Bekel, B., Mantopoulos, J. & Bradley, E. H. 2010. Educating leaders in hospital management: a new model in Sub-Saharan Africa. International Journal for Quality in Health Care, 22, 39–43.

Keller, J. 2000. How to integrate learner motivation planning into lesson planning: The ARCS model approach. VII Semanario, Santiago, Cuba, 20 February 2000. Florida State University.

Kerrigan, J.E. & Luke, J. S. 1989. Public Administration Education and Training in the Third World: Problems and Opportunities. https://doi.org/10.1111/j.1541-1338.1989.tb01010.x.

Kessy, J. & Lewallen, S. 2007. Poverty as a barrier to accessing cataract surgery: a study from Tanzania. . Br J Ophthalmol \ 91, 1114-1116.

Keynan, A., Ben-Zvi Assaraf, O. & Goldman, D. 2014. The repertory grid as a tool for evaluating the development of students' ecological system thinking abilities. Studies in Educational Evaluation, 41, 90-105.

Kim, D. & Downey, S. 2016. Examining the Use of the ASSURE Model by K–12 Teachers. Computers in the Schools, 33, 153-168.

Kohlbacher, F. 2005. The Use of Qualitative Content Analysis in Case Study Research [89 paragraphs]. Forum Qualitative Sozialforschung / Forum: Qualitative Social Research, 7(1), Art. 21, http://nbn-resolving.de/urn:nbn:de:0114-fqs0601211.

Konak, A., Clark, T. K. & Nasereddin, M. 2014. Using Kolb's Experiential Learning Cycle to improve student learning in virtual computer laboratories. Computers & Education, 72, 11-22.

Kruk, M. E. & Freedman, L.P. 2008. Assessing health system performance in developing countries: A review of the literature. Health Policy, 85, 263-276.

Kwamie, A., Van Dijk, H. & Agyepong, I. A. 2014. Advancing the application of systems thinking in health: realist evaluation of the Leadership Development Programme for district manager decision-making in Ghana. Health Res Policy Syst, 12, 29.

Kyratsis, Y., Armit, K., Zyada, A. & Lees, P. 2016. Medical leadership and management in the United Kingdom. Australas Psychiatry, 24, 240-2.

LaFond, A. K., Brown, L. & MacIntyre, K. 2002. Mapping capacity in the health sector: a conceptual framework. Int J Health Plann Mgmt, 17, 3-22.

Lazarus, A. 2013. Soften up: the importance of soft skills for job success. Physician Exec, 39, 40-5.

Lecuona, K. & Cook, C. 2011. South Africa's cataract surgical rates - why are we not meeting our targets? SAMJ, S.Afr.med.j.101 (8). Issues in public health.

Lecuona, K. 2007. Analysis of eye care services in South Africa's public sector. . Community Eye Health, 20(64).

Lee, A., Dennis, C. & Campbell, P. 2007. Nature’s guide for mentors Nature, 447.

Lefebvre, P. 2003. Coaching Practices for Managers. The National Managers’ Community. Canada. Available at www.managers-gestionnaires.gc.ca.

Leithwood, K., Louis, K.S., Anderson, S. & Wahlstrom, K. 2004. How leadership influences student learning. Learning from Leadership. Commissioned by The Wallace Foundation

Lembani, M., De Pinho, H., Delobelle, P., Zarowsky, C., Mathole, T. & Ager, A. 2018. Understanding key drivers of performance in the provision of maternal health services in Eastern Cape, South Africa: a systems analysis using group model building. BMC Health Serv Res, 18, 912.

Leppink, J. 2017. Revisiting the quantitative–qualitative-mixed methods labels: Research questions, developments, and the need for replication. Journal of Taibah University Medical Sciences, 12, 97-101.

Lester, S. 2015. On professions and being professional. Stan Lester Developments, Taunton, UK. devmts.org.uk. Version of September 2015.

Lewallen S. & Kello, A.B. 2009. The need for management capacity to achieve Vision 2020 in Sub-Saharan Africa. PLoS Med. December 2009. Volume 6. Issue 12. e1000184

Lewis, S. E. 1898. AIDA sales funnel [Online]. Available: https://www.provenmodels.com/547/aida-sales-funnel/elias-st.-elmo-lewis [Accessed December 2017].

Lichtman, M. 2013. Qualitative Research in Education: A user's guide. Third Edition. Sage, Los Angeles.

Lincoln, Y. S. & Guba, E.G. 1985. Naturalistic Inquiry., Newbury Park, CA, Sage Publications.

Lobe, D. 2005. Change management: A strategic component for Business success, Zytek Publishing.

Longest, B. B. 2015. Management Certainly Matters, and There Are Multiple Ways to Conceptualize the Process; Comment on “Management Matters: A Leverage Point for Health Systems Strengthening in Global Health”. International Journal of Health Policy and Management, 4, 777-780.

Longest, B. B., Darr, K. 2014b. The practice of health service organizations and health systems. Managing Health Service Organizations and systems.

Longo, N. V. 2013. "Deliberative Pedagogy in the Community: Connecting Deliberative Dialogue, Community Engagement, and Democratic Education," Journal of Public Deliberation: Vol. 9: Iss. 2, Article 16.

Lopes, M. A., Almeida, A. S. & Almada-Lobo, B. 2015. Handling healthcare workforce planning with care: where do we stand? Hum Resour Health, 13, 38.

Luo, H. 2011. Qualitative Research on Educational Technology: Philosophies, Methods and Challenges. International Journal of Education, 3.

Makhubela, R. 2013. Competency based assessments for senior management service members in the South African Public Services (presentation). 37th International Congress on Assessment Centre Methods together with the 33rd Annual ACSG Conference March 2013 Stellenbosch, South Africa.

Management Sciences for Health (MSH). 2017a. Leadership and management [Online]. Management Sciences for Health. Available: https://www.msh.org/resources/leadership-and-management-to-empower-the-health-workforce [Accessed November 2017].

Management Sciences for Health (MSH). 2017b. National Malaria Control Program: Capacity Building project, Final Report. Leadership, Management and Governance. USAID.

Manzi, A., Hirschhorn, L. R., Sherr, K., Chirwa, C., Baynes, C., Awoonor-Williams, J. K. & the AHI PHIT Partnership Collaborative. 2017. Mentorship and coaching to support strengthening healthcare systems: lessons learned across the five Population Health Implementation and Training partnership projects in sub-Saharan Africa. BMC Health Serv Res, 17, 831.

Marton, F., Runesson, U. & Tsui, A.B.M. 2004. The Space of Learning. In: Ehrlbaum, L. (ed.) Classroom Discourse and the Space of Learning. New Jersey: Mahwah.

Mason, M. 2010. Sample Size and Saturation in PhD Studies Using Qualitative Interviews [63 paragraphs]. Forum Qualitative Sozialforschung / Forum: Qualitative Social Research, 11(3), Art. 8, http://nbn-resolving.de/urn:nbn:de:0114-fqs100387.

Matovu, J. K., Wanyenze, R. K., Mawemuko, S., Wamuyu-Maina, G., Bazeyo, W., Olico, O. & Serwadda, D. 2011. Building capacity for HIV/AIDS program leadership and management in Uganda through mentored Fellowships. Glob Health Action, 4, 5815.

Maxwell, J. A. 2005. Conceptual framework: What do you think is going on? Qualitative research design. Thousand Oaks, CA: SAGE.

Mayne, J. 2015. Useful Theory of Change Models. Canadian Journal of Program Evaluation 30.2 (Fall / automne), 119–142.

McClelland, D. C. 1985. Human Motivation. Glenview, IL: Scott, Foresman, 1985.

McGregor, D. 1985. The Human Side of Enterprise: 25th Anniversary Printing. Foreword by Warren Bennis. New York: McGraw-Hill.

McLeod, S. A. 2014. Lev Vygotsky. Retrieved from www.simplypsychology.org/vygotsky.htm [Online]. [Accessed August 2018].

Mele, C., Pels, J. & Polese, F. 2010. A Brief Review of Systems Theories and Their Managerial Applications. Service Science, 2, 126-135.

Mennin, S. 2010. Self-organization, integration and curriculum in the complex world of medical education. Med Educ, 44, 20-30.

Mezirow, J. 1997. Transformative Learning: Theory to Practice. New Directions for Adult and Continuing Education. San Francisco: Jossey-Bass Publishers.

Mindtools. 2017. Cause and Effect Analysis: Identifying the Likely Causes of Problems. https://www.mindtools.com/pages/article/newTMC_03.htm [Accessed 2017].

Mindtools. 2017. The Planning Cycle: A Planning Process for Medium-Sized Projects [Online]. Available: https://www.mindtools.com/pages/article/newPPM_05.htm [Accessed 2017].

Miner, J. B. 2005. Organizational behavior I. Essential theories of motivation and leadership. New York: M.E. Sharpe.

Minnies, D. 2016. The Pono Letlotlo project: evaluation report. Community Eye Health Institute University of Cape Town, South Africa.

Mintzberg, H. 1990. Management: Inside our strange world of organizations. New York: The Free Press.

Moore, R. 2013. Social Realism and the problem of the problem of knowledge in the sociology of education. British Journal of Sociology of Education, 34, 333-353.

Morgan, P. 2005. The idea and practice of Systems Thinking and their relevance for Capacity Development. Maastricht: European Centre for Development Policy Management.

Mosoge, M. J. & Pilane, M.W. 2014. Performance management: the neglected imperative of accountability systems in education. South African Journal of Education; 2014; 34(1) Art. # 834, 18 pages, http://www.sajournalofeducation.co.za.

Murphy, E. & Dingwall, R. 2007. Informed consent, anticipatory regulation and ethnographic practice. Social Science & Medicine, 65, 2223-2234.

Murray, C. J. L. & Frenk, J. 2000. A framework for assessing the performance of health systems. Bulletin of the World Health Organization, 78.

Mutale, W., Vardoy-Mutale, A.-T., Kachemba, A., Mukndi, R., Clarke, K. & Mulenga, D. 2017. Leadership and management training as a catalyst to health system strengthening in low-income settings: Evidence from implementation of the Zambia Management and Leadership course for district health managers in Zambia. PloS One, 12, e0174536-e0174536.

Mutyabule, J., Senkubuge, F., Cameron, D., Pillay, V. & Petrucka, P. 2017. Perceptions of the impact of an advanced training programme on the management skills of health professionals in Gauteng, South Africa. African Journal of Health Professions Education, 9, 133.

Nagda, B., Gurin, P. & Lopez, G.E. 2003. Transformative Pedagogy for Democracy and Social Justice. Race Ethnicity and Education, 6 (2).

Naidoo, K. 2007. Poverty and blindness in Africa. . Clin Exp Optom, 90, 415-421.

National Health System (NHS) 2009. Medical Leadership Competency Framework. Available from: https://www.leadershipacademy.nhs.uk/wp-content/uploads/2012/11/NHSLeadership-Leadership-Framework-Medical-Leadership-Competency-Framework-3rd-ed.pdf.

Neave, H. R. 1987. Deming's 14 Points for Management: Framework for Success. Journal of the Royal Statistical Society. Series D (The Statistician), Vol. 36, No. 5, Special Issue: Industry, Quality and Statistics (1987), pp. 561-570. Published by: Blackwell Publishing for the Royal Statistical Society. Stable URL: http://www.jstor.org/stable/2348667. [Accessed January 2019].

Necochea, E., Badlani, M. & Bossemeyer, D. 2013. Systemic management of Human Resource for Health: An Introduction for Health Managers. Jphiego Corporation.

Nguyen, P. 2011. On Henry Mintzberg's Model of Managing. Working paper. Centre Franco-Vietnamien de formation à la Gestion (CFVG), Vietnam.

Norman, G. 2011. Chaos, complexity and complicatedness: lessons from rocket science. Med Educ, 45, 549-59.

Norris, S. L. & Ford, N. 2017. Improving the quality of WHO guidelines over the last decade: progress and challenges. The Lancet Global Health, 5, e855-e856.

Ohemeng, F. L. K. 2009. Constraints in the Implementation of Performance Management Systems in Developing Countries: The Ghanaian Case. International Journal of Cross-Cultural Management, 9(1), 109–132. https://doi.org/10.1177/1470595808101158.

Olum, Yasin. 2004. Modern management theories and practices. 15th East African Central Banking course. Kenya School of Monetary Studies.

O'Neill, M. 2013. Leadership and management to empower the health workforce. In: DeLuca, M. (ed.) Transforming the Global Health Workforce. New York University.

Opdenakker, R. 2006. Advantages and Disadvantages of Four Interview Techniques in Qualitative Research [44 paragraphs]. Forum Qualitative Sozialforschung / Forum: Qualitative Social Research, 7(4), Art. 11, http://nbn-resolving.de/urn:nbn:de:0114-fqs0604118.

Ord, J. 2012. John Dewey and experiential learning: Developing the theory of youth work. Youth and Policy, No 108, March 2012..

Organisation for Economic Co-operation and Development (OECD) 2017. Working with change. Systems approaches to public sector interventions. OECD Observatory of Public Sector Innovation An initiative of the OECD's Public Governance and Territorial Development Directorate. Available from: https://www.oecd.org/media/oecdorg/satellitesites/opsi/contents/images/h2020_systemsthinking-fin.pdf.

Pardee, R., L. 1990. Motivation Theories of Maslow, Herzberg, McGregor & McClelland. A Literature Review of Selected Theories Dealing with Job Satisfaction and Motivation.

Patel, D., Hampejskova, L., Parsley, S., Leck, A., Ntodie, M., Molao, C., GichangiI,M. & Debrah, O. 2016. Strengthening eye care service provision through online education: Case studies. International Agency for the Prevention of Blindness 10th General Assembly.

Patterson, T. E. & Champion, H 2016. Addressing leadership gap in healthcare. Center for Creative Leadership.

Patton, M.Q. 2002. Qualitative research and evaluation methods. 3rd Edition. Sage Publications, New York.

Patton, M. Q. 2003. Utilization-Focused Evaluation. In: Kellaghan, T. & Stufflebeam, D. L. (eds.) International Handbook of Educational Evaluation. Dordrecht: Springer Netherlands.

Patton, M.Q. 2016. Developmental Evaluation. Systems thinking and complexity science. Presentation Minnesota Evaluation Studies Institute (MESI 2016). The American Evaluation Association.

Paul, R. & Elder, L. 2006. The Miniature Guide to Critical thinking Concepts and Tools, Foundation for Critical Thinking. Available from: https://www.criticalthinking.org/.

Perry, C. 2008. Empowering primary care workers to improve health services: results from Mozambique's leadership and management development program. Hum Resour Health, 6, 14.

Persson, H. I. 2016. What is the function of a figurine? Can the repertory grid technique tell? Int J Technol Des Educ: 26, 541-565 (2016).

Pfeffer, J. 2015. Leadership BS: Fixing workplaces and careers one truth at a time (lecture). Stanford webinar. www.youtube.com /watch/ [Accessed October 2018].

Pillay, R. 2010. The skills gap in nursing management in South Africa: a sectoral analysis: a research paper. Journal of Nursing Management 18, 134–144.

Pillay, Rubin 2008. Defining competencies for hospital management: A comparative analysis of the public and private sectors. Leadership in Health Services, 21(2), 99 - 110.

Plaza, C.M., Draugalis, J.R., Slack, M.K., Skrepnek, G.H. & Sauer, K.A. 2007. Curriculum Mapping in Program Assessment and Evaluation. American Journal of Pharmaceutical Education 71 (2) Article 20.

Plsek PE. 2001. Redesigning health care with insights from the science of complex adaptive systems. In: IOM Committee on Quality of Health Care in America. Crossing the Quality Chasm: A New Health System for the 21st Century. Washington: National Academy Press.

Plsek, P. E. & Wilson, T. 2001. Complexity, leadership, and management in healthcare organisations. BMJ, 323, 746-9.

Potter, C. & Brough, R. 2004. Systemic Capacity Building: A Hierarchy of Needs. Health Policy and Planning, 19, 336-45.

Prozesky D., R. 2000. Factors influencing output due to training: a case study of an international course for trainers of health workers. Thesis. University of Liverpool.

Pryor, M. & Taneja, S. 2010. Henri Fayol, practitioner and theoretician – revered and reviled. Journal of Management History, 16, 489-503.

Purcell, J., Kinnie, N., Swart, J., Rayton, B. & Hutchinson, S. 2009. People Management and Performance. New York: Routledge.

Purnell, L.D. 1999. Health Care Managers' and Administrators' Roles, Functions, and Responsibilities. Nursing Administration Quarterly, 23, 26-37.

RAAB (Rapid Assessment of Avoidable Blindness) Repository [Online]. Available: http://raabdata.info/ [Accessed October 2019]

Ravilla, T. & Joseph, S. 2011. How Can Hospital Programs be Strengthened to Enhance Achievement of Vision 2020 Objectives? Middle East Afr J Ophthalmol, 18, 102-8.

Regoniel, P. A. 2015. Conceptual Framework: A Step by Step Guide on How to Make One. In Simply Educate Me. Retrieved from http://simplyeducate.me/2015/01/05/conceptual-framework-guide/.

Reichenbach, B. 2012. Epistemic Obligations: Truth, Individualism, and the Limits of Belief. Waco, Texas: Baylor University Press.

Reid, S. & Mash, B. 2014. African Primary Care Research: Qualitative interviewing in primary care. Afr J Prm Health Care Fam Med. 2014;6(1), Art. #632, 6 pages.

Reid, S. 2014. Health Professional Education for the National Health Insurance. SAAHE Plenary Speech, Cape Town: 27 June 2014.

Reinholz, D. L. & Andrews, T. C. 2020. Change theory and theory of change: what's the difference anyway? International Journal of STEM Education, 7, 2.

Renger, R. 2015. System evaluation theory (SET): A practical framework for evaluators to meet the challenges of system evaluation. Evaluation Journal of Australasia, 15, 16-28.

Resnikoff, S., Felch, W., Gauthier, T.M. & Spivey, B. 2012. The number of ophthalmologists in practice and training worldwide: a growing gap despite more than 200,000 practitioners. . Br J Ophthalmol, 96, 783-787.

Richardson, J. E. 1999. The Concepts and methods of Phenomenographic Research. Review of Education Research, 69, 53-88.

Rogers, E. 2003. Diffusion of Innovations. . New York: Free Press, 2003.

Roncarolo, F., Boivin, A., Denis, J. L., Hebert, R. & Lehoux, P. 2017. What do we know about the needs and challenges of health systems? A scoping review of the international literature. BMC Health Serv Res, 17, 636.

Rossouw, A. 2004. An assessment of the required competencies for the senior management service in the South African Public Service. http://dx.doi.org/10.4102/ [Accessed October 2018]

Rousseau, D. 2004. Psychological Contracts in the Workplace: Understanding the Ties That Motivate. Academy of Management Executive, 18, 120-127.

Rowe, A. K., D Savigny, D., Lanata, C. F. & Victora, C. G. 2005. How can we achieve and maintain high-quality performance of health workers in low-resource settings? Lancet, 366, 1026-35.

Sahin, I. 2006. Detailed review of Roger's Diffusion Theory and Educational Technology-related studies based on Roger's Theory. The Turkish Online Journal of Educational Technology.

Saldana, J. 2009. The coding manual for Qualitative Researchers. [London]: Sage Publications Ltd.

Sartori, R., Costantini, A., Ceschi, A. & Tommasi, F. 2018. How Do You Manage Change in Organizations? Training, Development, Innovation, and Their Relationships. Front Psychol, 9, 313.

Savenye, W. C. & Robinson, R. S. 2005. Using qualitative research methods in higher education. Journal of Computing in Higher Education, 16, 65-95.

Savenye, W. C., & Robinson, R.S. 2004. Qualitative research issues and methods: An introduction for educational technologists. In: Jonassen, D. H. (ed.) Handbook of Research on Educational Communications and Technology (pp.1045-1072). Mahwah, NJ: Erlbaum.

Schneider, B. & Alderfer, C. P. 1973. Three Studies of Measures of Need Satisfaction in Organizations. Administrative Science Quarterly, 18, 489-505.

Schutte, S., Acevedo, P. N. M. & Flahault, A. 2018. Health systems around the world - a comparison of existing health system rankings. Journal of Global Health, 8, 010407-010407.

Schwandt, T. A., Lincoln, Y. S. & Guba, E. G. 2007. Judging interpretations: But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. New Directions for Evaluation, 2007, 11-25.

Seidman, I. 2006. Interviewing as qualitative research: A guide for Researchers in Education and the Social Sciences. 3rd edition. [New York]: Teachers College Press.

Seims, L. R. K., Alegre, J. C., Murei, L., Bragar, J., Thatte, N., Kibunga, P. & Cheburet, S. 2012. Strengthening management and leadership practices to increase health-service delivery in Kenya: an evidence-based approach. Human Resources for Health, 10, 25-25.

Sherman, R.T.J., Dobbins, D. & Weidler, D. 2001. Management Competencies and Sample Indicators for the Improvement of Adult Education Programs. Washington, DC: Pelavin Research Inst..

Sherman, R. T.J., Dobbins, D. & Weidler, D. 2002. Management Competencies Assessment Instrument. PRO-NET 2000. Building Professional Development Partnerships for Adult Educators Project. Available from: https://www.calpro-online.org/pubs/99.pdf.

Simundic, A.M. 2013. Bias in research. Biochemia medica, 23, 12-15.

Smith, M. K. 2003. 'Communities of practice', the encyclopedia of informal education. www.infed.org/biblio/communities_of_practice.htm. Last updated: June 21 2006.

Solansky, S. T. 2010. The evaluation of two key leadership development program components: Leadership skills assessment and leadership mentoring. The Leadership Quarterly, 21, 675-681.

Spehar, I., Frich, J. C. & Kjelhus, L. E. 2014. Clinicians in management: a qualitative study of managers' use of influence strategies in hospitals. BMC Health Services Research 14:251.

Stanford Encyclopaedia of Philosophy. 2000. Aristotle's Logic [Online]. Available: https://plato.stanford.edu/entries/aristotle-logic/#AriLogWorOrg [Accessed March 2018].

Stanleigh, M. 2016. How to Undertake a Project Quality Review [Online]. https://www.projectmanagement.com/articles/315499/How-to-Undertake-a-Project-Quality-Review. [Accessed June 2018].

Stefl, M. E. 2008. Common Competencies for All Healthcare Managers: The Healthcare Leadership Alliance Model Journal of Healthcare Management 53:6 November/December 2008.

Stevens, G. A., White, R. A., Flaxman, S. R., Price, H., Jonas, J. B., Keeffe, J., Leasher, J., Naidoo, K., Pesudovs, K., Resnikoff, S., Taylor, H., Bourne, R. R. A. & Vision Loss Expert Group. 2013. Global prevalence of vision impairment and blindness: magnitude and temporal trends, 1990-2010. Ophthalmology, 120, 2377-2384.

Stevens-Fulbrook, P. 2019. 15 Learning Theories in Education (A Complete Summary). Available: https://teacherofsci.com/learning-theories-in-education/ [Accessed June 2019].

Stock, T. 2015. Intro to research methods. Parsons School of Design Summer Intensive seminar. www.newschool.edu.

Stroh, D. P. 2006. Conducting effective systems analysis. Applied Systems Thinking Article 3.

Stufflebeam, D. L. 2003. The CIPP Model for Evaluation. In: Kellaghan, T. & Stufflebeam, D. L. (eds.) International Handbook of Educational Evaluation. Dordrecht: Springer Netherlands.

Sweet, L. & Palazzi, D. 2015. Application of Kern's Six-step approach to curriculum development by global health residents. Education for Health, 28, 138-141.

Tan, K. 2009. Variation theory and the different ways of experiencing educational policy. Educational Research for Policy and Practice, 8, 95-109.

Tayla, S. 1999. Analyzing Qualitative Interview Data: The Discourse Analytic Method. Library & Information Science Research, Volume 21, Number 4, pages 459–477.

Taylor, E. W. 2008. Transformative learning theory. New Directions for Adult and Continuing Education, 2008, 5-15.

Taylor-Powell, E. & Henert, E. 2008. Developing a logic model: Teaching and training guide. University of Wisconsin-Extension.

The Health Leadership Alliance. 2010. Overview of the HLA Competency Directory. http://www.healthcareleadershipalliance.org/directory.htm. [Accessed December 2017].

The South African Qualifications Authority (SAQA). 2012. Level Descriptors for the South African National Qualifications Framework.

Thomas, J. & Harden, A. 2008. Methods for the thematic synthesis of qualitative research in systematic reviews. BMC Med Res Methodol, 8, 45.

Tjitra, H. 2011. Doing qualitative interviewing: An introduction. Presentation January 2011. Zhejiang University. Hangzhou, China.

Torres, C. A. 1996. Adult education and instrumental rationality: a critique. Int. J. Educational Development, 16, 195-206.

Udo, N. K., S. 2004. What are the core competencies of a successful project manager? Paper presented at PMI Global Congress 2004—EMEA, Prague, Czech Republic. Newtown Square, PA: Project Management Institute.

United States Agency for International Development (USAID) 2004. Performance monitoring and improvement: A manual and trainer's guide. Alliance Africa.

University of South Africa (UNISA). 2016. Research design and methodology [Online]. http://uir.unisa.ac.za/bitstream/handle/10500/1935/06chapter6.pdf. [Accessed April 2017].

University of Warwick. 2015. Leadership Development Programme [Online]. https://warwick.ac.uk/services/od/leadership/programmes/ [Accessed May 2018].

Uttl, B., White, C. A. & Gonzalez, D. W. 2017. Meta-analysis of faculty's teaching effectiveness: Student evaluation of teaching ratings and student learning are not related. Studies in Educational Evaluation, 54, 22-42.

Valenzuela, D. & Shrivastava, P. 2006. Interview as a method for qualitative research. Presentation.

Van Der Waldt, G. 2016. Probing strategy-project alignment: The case of the South African Social Security Agency. The Journal for Transdisciplinary Research in Southern Africa, 12.

Vaughan, R. 2008. Conceptual framework. Presentation. 19 May 2008. Bournemouth University. www.bournemouth.ac.uk.

Von Knorring, M., De Rijk, A. & Alexanderson, K. 2010. Managers' perceptions of the manager role in relation to physicians: a qualitative interview study of the top managers in Swedish healthcare. BMC Health Serv Res, 10, 271.

Vygotsky, L. 1930. Mind and Society. Published by: Cambridge, MA: Harvard University Press.

Vygotsky, L. 1962. Zone of proximal development. http://www.learning-theories.com/vygotskys-social-learningtheory.html. [Accessed June 2016].

Vygotsky, L. 1978. Mind in Society: the development of higher psychological processes. Cambridge. MA: Harvard University Press.

Wagner, K. D., Davidson, P. J., Pollini, R. A., Strathdee, S. A., Washburn, R. & Palinkas, L. A. 2012. Reconciling incongruous qualitative and quantitative findings in mixed methods research: exemplars from research with drug using populations. Int J Drug Policy, 23, 54-61.

Watson, A. 2014. Who Am I? The Self/Subject According to Psychoanalytic Theory. SAGE Open, 4, 2158244014545971.

Wenger, E. 1998. Communities of Practice: Learning, Meaning and Identity. New York. Cambridge University Press.

Wenger, E. 2009. Communities of practice and social learning systems: the career of a concept. Learning capability in social systems. EQUAL Final Report.

West, M., Armit, K., Loewenthal, L., Eckert, R., West, T. and Lee, A. (2015) Leadership and Leadership Development in Healthcare: The Evidence Base. London, Faculty of Medical Leadership and Management. Faculty of Medical leadership.

White, D. E. & Patton, J. R. 2002. Managing-by-projects: closing the gap requires more. Paper presented at PMI Research Conference 2002: Frontiers of Project Management Research and Applications, Seattle, Washington. Newtown Square, PA: Project Management Institute.

Wiggins, G. & McTighe, J. 2006. Chapter 1: What is backward design? Understanding by Design 2nd ed. ed. Alexandria, VA: Association for Supervision and Curriculum Development.

Wilder, R. 2009. Programme theory and logic [Online]. Wilder Foundation. https://www.wilder.org/sites/default/files/imports/LogicModels_2-10.pdf [Accessed August 2018].

Wilson, J. 2013. Essentials of Business Research. A guide to do your research project. 2nd Edition. Sage. Los Angeles.

Wisdom, J. & Creswell, J.W. 2013. Mixed methods: Integrating Quantitative and Qualitative Data Collection and Analysis While Studying Patient-Centered Medical Home Models. Agency for Healthcare Research and Quality. Advancing Excellence in Health Care. Available from: www.ahrq.gov.

Wood, J. C. & Wood, M.C. 2002. Henri Fayol: Critical evaluations in Business and Management. Fayol and the principles of organisation. London, Routledge.

World Health Organization. (WHO) 2015. Eye care service assessment tool. World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2000. Determining skill mix in the health workforce: guidelines for managers and health professionals. Authors: Buchan, J. Ball, J. & O'May, F. Queen Margaret University College Edinburgh. Evidence and Information for Policy. Department of Organization of Health Services Delivery. World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2002. Technical consultation on Imbalances in the health workforce. Evidence and Information for Policy Department of Health Service Provision World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2005. Strengthening management in low income countries. Making health systems work: Working paper no 1. Department of Health System Policies and Operations. Evidence and Information for Policy, World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2006. The World Health Report 2006: Working together for health. World Health Report. World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2007a. Towards better leadership and management in health. Making health systems work: working paper No. 10. Report on an international consultation. World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2007b. Everybody business: strengthening health systems to improve health outcomes : WHO's framework for action. World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2007b. Towards better leadership and management in health. Framework brochure. World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2008. Operations manual for delivery of HIV prevention, care and treatment at primary health centres in high-prevalence, resource-constrained settings: edition 1 for field testing and country adaptation. ISBN 97892 41597432. World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2009. Country cooperation strategy Malawi. World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2009. Systems thinking for health systems strengthening. Alliance for Health Policy and Systems Research. Don de Savigny and Taghreed Adam (Eds). World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2010a. Monitoring the building blocks of health systems: A handbook of indicators and their measurement strategies. World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2010b. Monitoring and evaluation of health systems strengthening: An operational framework. World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2011. Global status report on Non-communicable diseases 2010. World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2013a. Draft action plan for the prevention of avoidable blindness and visual impairment 2014–2019: Towards Universal Eye Health a Global Action Plan 2014-2019. World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2013b. The world health report 2013: research for universal health coverage. World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2014. World Health Statistics 2014. World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2016a. Global strategy on human resources for health: workforce 2030. DRAFT 1.0 submitted to the Executive Board (138th Session). World Health Organization. Geneva, Switzerland.

World Health Organization (WHO). 2016b. Framework on integrated, people-centred health services. Sixty-ninth World Health Assembly A69/39 Provisional agenda item 16.1 15 April 2016. Report by the Secretariat. World Health Organization. Geneva, Switzerland.

Wunsch, J., S. Why has decentralization failed Africa? Assessing the lessons of self-organized, local governance initiatives. Workshop on Political Theory and Policy Analysis. Indiana University-Bloomington, 2008.

Yamey, G. 2012. What are the barriers to scaling up health interventions in low- and middle- income countries? A qualitative study of academic leaders in implementation science. Global Health, 8, 11.

Yeager, V. A. & Bertrand, J. 2015. Putting Management Capacity Building at the Forefront of Health Systems Strengthening: Comment on "Management Matters: A Leverage Point for Health Systems Strengthening in Global Health". Int J Health Policy Manag, 5, 129-31.

Yin, R. K. 2004. Case study methods Revised draft. Complementary methods for Research in Education, 3rd edition. Cosmos Corporation.

Yin, R.K. 2009. Case Study Research Design and Methods. 4th Edition. Applied Social Research Series. Volume 5. Sage. Los Angeles.

Yin, R.K. 2011. Qualitative research from start to finish, London, The Guilford Press.

Yorston, D. 1999. The global initiative Vision 2020: the right to sight. Community Eye Health, 12, 44-5.

Zucker, D.M. 2009. "How to Do Case Study Research". School of Nursing Faculty Publication Series. Paper 2. Available from: http://scholarworks.umass.edu/nursing_faculty_pubs/2.

Zwanikken, P. 2014. Outcome and impact of Master of Public Health programs across six countries: education for change. Human Resources for Health, 12.

APPENDICES

A. THE POSTGRADUATE DIPLOMA IN COMMUNITY EYE HEALTH c

The University of Cape Town's Community Eye Health Institute provides support to VISION 2020 programmes, focusing mainly on programme management, advocacy and monitoring and evaluation. From our vantage point, management is the collective activities of getting things done through others and includes the act of leading. The Management Essentials for Success paradigm is applied in all the programme management training offerings of the unit.

To effectively manage eye care programmes, it is essential:

a) That we know our own abilities, shortcomings and aspirations - Personal leadership
b) That we know the abilities, shortcomings and objectives of our teams - Teamwork
c) That we know the essentials for success is in VISION 2020 - Introduction to VISION 2020
d) That we know how to plan for success in VISION 2020 - Project management
e) That we know how to work according to the plans for success
f) That we know how to measure our success
g) That we know what to do when our success is delayed or achieved
h) That we are able to apply all this consistently and routinely

This is also the basis of the Postgraduate Diploma in Community eye Health (PgDCEH), a one-year, mixed mode, postgraduate programme, aimed at providing training in eye care programme management.

The course is intended for people working in eye care or prevention of blindness programmes in sub-Saharan Africa. These may include national eye care coordinators, district, provincial or national eye care programme managers, and clinical professionals working in eye care programmes (ophthalmologists, ophthalmic medical officers, ophthalmic clinical officers, optometrists, ophthalmic medical assistants, and ophthalmic nurses). It is primarily for (aspirant) programme managers, with the intention that the participants would be able to plan and manage a district VISION 2020 programme. The course is in English and is therefore most suitable for people with good English speaking and writing abilities.

<u>Entry requirements</u>

The main entry requirements of the course are:

- An undergraduate degree in health sciences, social sciences, or business management, or an equivalent university qualification, or recognition of prior learning. Candidates may be required to complete a Portfolio of evidence (a structured knowledge, skills and activities summary) to support their applications, should some of the eligibility criteria not be fully met. A minimum of two years of work experience in eye care, with an interest in the management of VISION 2020 programmes.
- Fluency in English, as demonstrated by a Grade 12 (school-leaving certificate) or equivalent pass in English
- Further to the main eligibility criteria, computer literacy and numeracy are recommended as well as a written undertaking from the employer that adequate support will be provided for the incumbent to pursue roles in eye care programme management after graduation

Course curriculum

The PgDCEH curriculum was developed in consultation with stakeholders of eye care in the sub-Saharan African region. These included national eye care coordinators, NGOs doing work in eye care, educators, funders, practicing clinicians and service providers in eye care at district, national and regional level.

The PgDCEH was to provide training in eye care programme management. This meant that there was a requirement for a strong knowledge foundation in community eye health and management. Firstly, the course should give an epidemiological foundation to planning community eye health services. Secondly, there was a need to refresh familiarity around contextual health issues. Hence, health promotion, human resource development and health professional education formed the basis of the second course. Thirdly, a thorough grounding in management principles were critical. The course curriculum covered the four main activities of management as proposed by Fayol in 1909, namely planning, organising, controlling and leading. These were structured as learning outcomes and delivered through a variety of teaching methods as part of course 3. Course four was the practical application of the contact coursework, where students were required to continue further study and complete assignments, specific to their work environment during a 24-week distant learning period. During this period the students were supported, assisted and supervised by faculty of the course.

Course delivery

The course is held at the University of Cape Town's Community Eye Health Institute at Groote Schuur Hospital, University of Cape Town, South Africa. It is run by the Division of Ophthalmology of the Faculty of Health Sciences of the University of Cape Town. The course faculty is made up of a combination of South African and international educators, ophthalmologists and management and public health specialists practicing in the sub-Saharan African region.

The teaching methods include interactive, didactic lectures, individual exercises, group work and reflective practice. The assessment methods include modular formative and summative assessments in the form of tests and assignments as well as a course examination.

Course structure

The courses are based on planning, implementing, and managing a VISION 2020 programme for a one million population (0,5 million – 2 million) "service unit" (district, region, province) specific to the student's own country. Course 1 through 3 are contact courses, offered over a 10-week period in Cape Town. Course 1 covers *Community Eye Health: the magnitude of blindness and Principles of planning eye services.* Course 2 covers *Advocacy, Health promotion and Human Resource Development* and Course 3 covers Programme Management in 4 submodules, namely: *Management and Strategic Leadership, Project Management, Programme Implementation and Development and Programme Administration and Management*. During this period, the students develop strategies for human resource development, infrastructure development, and disease control. In course 4 during the intermediate 24-week period, the students return to their health districts, where they implement, administer, manage, and monitor a VISION 2020 programme. This period is one of "reflective practice", during which students have opportunity to apply the knowledge and skills acquired during the initial period.

B. WHO ARE THE GRADUATES?

From the start of the PgDCEH in 2009 until the end of 2015, there were 42 students enrolled, of which 40 graduated. 23 (57.5%) of the graduates were males and 17 (42.5%) were females. The age range of the graduates during their year of study was 30-56, with an average of 42.7 years and a median of 42 years.

A total of 28 (70%) of the graduates came from the Southern Africa region, 4 (10%) from West Africa, 5 (12.5%) from East Africa and 3 (7.5%) from outside Africa, of which 11 (27.5%) came from South Africa. The proportion of non-South African applicants to the PgDCEH averaged over 95% over the 5-year period from 2011 to 2015.

Education

A total of 22 (55%) graduates had a University qualification upon entry to the programme, 16 (40%) a college education and 2 (5%) "other" education. A total of 6 (15%) graduates had at least 7 years' tertiary qualification involving specializations in ophthalmology, public health, business administration and optometry. A total of 16 (40%) graduates had 3 or less years of tertiary education upon entry, hence requiring recognition of prior learning to be accepted on the course. A total of 30 (75%) graduates had either a 3-year diploma or a 4-year Bachelor degree. A further 7 (17.5%) graduates had masters or doctorate degrees.

Cadre

A total of 23 (55.25%) graduates were qualified as ophthalmic nurses or ophthalmic clinical officers, 7 (17.5%) as optometrists and 5 (12.5%) as medical officers, of which 2 (5%) were ophthalmologists. Three (7.5%) graduates were non-clinically trained and worked as administrators or managers in their programmes.

Employment

A total of 6 (15%) graduates worked in eye health programmes, while 11 (27.5%) worked at health facility level, 11 (27.5%) at district, and 12(30%) at provincial or national level. A total of 30 (75%) were employed by Ministries of Health, 5 (12.5%) by NGOs, 3 (7.5%) in the private sector and 2 (5%) in education institutions.

Funding

A total of 13 (32.5%) graduates were funded through scholarships obtained by UCT-CEHI, 9 (22.5%) by MoHs, 12 (30%) by NGOs and 6 (15%) were self-funded.

Academic performance

The graduates' final examination marks ranged from 41 – 73%, with an average of 61.175% and a median of 61%. The Spearman correlation coefficient between Exam marks and Years of tertiary study was 0.114, indicating low correlation between education level and course performance.

Although looking cross-sectionally at the cohort of graduates of the PgDCEH from 2009 and 2014, the research methodology also makes accommodation for capturing the changes in personal, programme and system context between the time of training and the time of investigation.

C. INFORMATION AND QUESTIONS FOR DATA COLLECTION

Title: "The graduates of the Postgraduate Diploma in Community Eye Health: how do they manage?"

INFORMATION AND QUESTIONS FOR DATA COLLECTION

There are inadequate numbers of suitably trained and competent eye care programme managers available to support the delivery of effective and efficient eye care services in sub-Saharan Africa. This lack of sufficient management capacity in eye care programmes is a significant weakness, contributing to the problem of high occurrence of needless blindness and visual impairment in the region. Management training is an essential intervention needed to scale up health service outcomes.

The Postgraduate Diploma in Community Eye Health (PgDCEH) has been offered at the University of Cape Town, South Africa, since 2009 to develop management capacity in eye care programmes in sub-Saharan Africa. The PgDCEH has to date yielded a total of 35 graduates, mostly eye care practitioners working in public eye care programmes in the region.

We intend to investigate the factors that enabled or constrained the ability of graduates to apply the management competencies acquired through the Postgraduate Diploma in Community Eye Health, and determine how these affected the performance of the eye care programmes in which they are working or had worked. We will do this by exploring the effects of the training on the perceptions, experiences and achievements of these graduates, from an eye care management perspective.

We will use an embedded multiple case study design, performing qualitative methods of data collection and analysis involving the students who completed the PgDCEH course between 2009 and 2013, inclusive. We will conduct interviews with the PgDCEH graduates to identify their perceptions, activities and achievements in relation to eye care programme management in their local settings. We will also interview selected secondary informants for the purpose of triangulation and further data construction. Through analysis of the PgDCEH curriculum and the data collected from participants, we will explore the relationships between the PgDCEH graduates and the eye care programmes in which they are working or had worked.

This research will provide new knowledge about the effect of the PgDCEH training on the graduates and the performance of eye care programmes in which they work, something that has not been done in this field. We may learn about the graduates' management capabilities at the time of the inquiry and what they were accomplishing, leading us to better understand how to design and deliver management training for health management in the future.

This purpose of this document is to obtain baseline information about the study participants' conceptions, activities and achievements in relation to eye care programme management following the obtaining of the Postgraduate Diploma in Community Eye Health.

D. GRADUATE SURVEY QUESTIONNAIRE

Number	

PgDCEH GRADUATE QUESTIONNAIRE

A. Graduate particulars

Name of graduate		**Year of graduation**	

B. Job details

Your official designation			
Duration of employment (this position)		**Previous position**	

LINE FUNCTION	**Official designations of people (give title only)**
Who do you report to?	
Who report to you?	

YOUR ROLES		**Percentage of time**
What proportion of your work time do you currently spend on:	**Managing staff?**	
	Managing equipment?	
	Managing supplies?	
	Managing finance?	
	Managing stakeholder relations?	
	Monitoring and evaluation activities?	

Country	
District / Region / County / Province served by your programme	

1. PROGRAMME CONTEXT

	COUNTRY	DISTRICT
Year of latest census / mid-term estimate		
Total population of area / country/ according census		

2. SERVICE DELIVERY (Numbers previous year)

	COUNTRY	DISTRICT	TARGETS MET? YES / NO
Total number of primary eye care treatments provided			
Total number of cataract surgeries performed			
Total number of refractive error corrections provided			

3. HUMAN RESOURCES FOR EYE CARE PREVIOUS YEAR

	COUNTRY	DISTRICT	ADEQUATE? YES / NO
Total number of ophthalmologists / ophthalmic surgeons			
Total number of optometrists			
Total number of ophthalmic / eye trained nurses			

4. FUNDING AND INTEGRATION (Answer Yes, No or Don't know)

	COUNTRY	DISTRICT	ADEQUATE? YES / NO
Is there funding provision in the MoH for eye care services?			
Is there good integration of eye care in the general health system?			
Are there any formal partnerships with NGOs / businesses in place?			

5. INFRASTRUCTURE FOR EYE CARE (Answer Yes, No or Don't know)

	YES	NO	DON'T KNOW
Do you have at least one VISION 2020 surgical centre in your health district?			
Do you have dedicated eye care teams in all these centres?			
Do you have adequate theatre time and clinic facilities in your district?			

6. YOUR SKILLS GENERALLY EMPLOYED AT WORK

	IN YOUR OPINION: How would you rate your ability to	VERY POOR	POOR	AVERAGE	GOOD	EXCELLENT
i	Perform clinical work in relation to eye care?					
ii	Perform computer tasks such as creating documents, email and internet?					
iii	Perform monitoring tasks such as collecting statistics and controlling stocks?					
iv	Perform administrative tasks when dealing with the Finance and HR departments?					
v	Use technology such as electronic equipment to simplify your work?					
vi	Collect, analyse and interpret information for action in your work?					
vii	Supervise staff, including being responsible for their performance at work?					
viii	Deal with stakeholders for the maximum benefit of your eye care programme?					
ix	Write reports, proposals and minutes of meetings for presentation to others?					
x	Communicate your programme's needs to senior management of the region?					
xi	Draw up a budget and administer the finances of your programme?					
xii	Develop a plan for an eye care project to be approved by senior management?					
xiii	Control the performance of your programme in relation to quality, cost and time?					
xiv	Build and work with your team to meet your annual performance targets?					
xv	Identify problems in the workplace and implement suitable solutions in time?					

7. PROGRAMME CONTEXT

	FROM YOUR OWN UNDERSTANDING:	VERY POOR	POOR	AVERAGE	GOOD	EXCELLENT
i	How would you rate the strength of the health system you are currently working in?					
ii	How would you rate the strength of the eye care programme you work in?					
iii	How would you rate the degree to which your eye care programme is integrated within the overall health system?					
iv	How well are you doing in your job, currently?					
v	How well is your eye care programme doing, currently?					

8. Explain the major frustration / challenge you have experienced at work following the completion of the PgDCEH training.

END OF QUESTIONNAIRE

E. IN-DEPTH INTERVIEW GUIDE

IN-DEPTH INTERVIEW GUIDE

This interview guide is aimed at guiding the data collection procedures through interviews for the purpose of meeting the aims of the above study.

The guide will be followed closely to ensure the following:

- That all the critical details of the study are shared with the interviewee;
- That the interviewee is given opportunity to raise concerns or asks questions;
- That the researcher adequately addresses the issues of informed consent, privacy and confidentiality, and that
- The researcher is reminded to obtain answers to the key questions of the study

BEFORE THE INTERVIEW

The researcher will introduce himself, handing out contact details and references, then ask the interviewee to do the same. The researcher will then tell the interviewee about the aims and purpose of the research project and explain the reason for his visit, namely to conduct an interview with the participant (and selected key secondary informants). For example:

"We are in the process of conducting research to investigate the factors that enabled or constrained the ability of graduates to apply the management competencies acquired through the Postgraduate Diploma in Community Eye Health, and how these affected the performance of the eye care programmes in which they are working or had worked. Please help us by answering the following questions. Your comments, opinions and observations are extremely important to us."

The aim is to have the interviewee reflect on their experiences in relation to eye care management, and then speak to the researcher of those experiences in such a way that the two come to a mutual understanding of the meaning of those experiences. The researcher will then explain that the interview should take about 40 – 50 minutes and would be led by the researcher asking a number of questions. The interviewee will be invited to answer the questions, ask for clarifications, if necessary, and give further information, if prompted to do so by the researcher.

The researcher will briefly talk about the study sampling method and how the interviewee was selected, how he will ensure quality of data collection and analysis, and that the interview proceedings will be recorded for accurate transcription.

DURING THE INTERVIEW

Once the preparatory discussions have been completed, the researcher will commence with the interview questioning. After posing each question, the interviewee will be given opportunity to answer, ask for clarifications or repeat, and probed for further elucidation of a topic (as suggested), where required. While the questions will be asked in the sequence listed, a question may be omitted or re-ordered, if the questioning sequence requires it.

After the questioning has been completed, the interviewees will be thanked for their participation and told the following:

- That the interviews will be transcribed by a professional transcription service;
- That the transcribed interview will be analysed as part of a multiple case study;
- That a summary of the of the case report will be sent to the interviewees;
- That interviewees will be invited to give comments for feedback to the researcher;
- That following successful transcription, the audio files will be destroyed; and
- That the interviewee can contact the researcher any time for further questions.

The researcher will give the interviewee an opportunity for further comments and or questions, then close the session. The audio-recording session will be stopped.

AFTER THE INTERVIEW

The researcher will ask the interviewee to view for specific documents or records, related to information shared during the interviews. This may occur either immediately after the interview or may be set up for later collection.
It may also be necessary to ask for observation of key activities or events referred to either during the interviews or via the questionnaire survey. The permission to obtain this and related logistics would have been arranged prior to the visit.

F. INTERVIEW QUESTIONS

	QUESTIONS FOR GRADUATES	PROBE FOR
1	*Before you started the course what were your expectations? How have your expectations been met / not met?*	Specific personal, career opportunities or challenges at the time. Possible reasons why the expectations may have been / not have been met.
2	*What parts of the PgDCEH have you been able to apply, adopt or incorporate in your daily work / life?*	Lessons, topics, tools, skills, experiences, knowledge, understanding, networks established? Refer CV and job description.
3	*Considering where you are today, what you know and what you do: how was the PgDCEH course, what did you like or did not like?*	Curriculum contents, design, delivery, the faculty, the teaching methods, the logistics of the training, the assignments, the assessments, the class composition, the influence of the other students
4	*How has the PgDCEH influenced the way you are managing people and resources at work?*	Changes in attitudes and behaviours associated with specific insights obtained from the training.
5	*How has the PgDCEH influenced the performance and achievements of the programme you work in?*	Changes in your role and responsibility, particularly following your completion of the PgDCEH
6	*What were the challenges you have experienced in applying the management competencies acquired through the PgDCEH?*	Possible reasons why these challenges occurred and ask for examples.
		Also, how can these challenges be overcome, in your opinion?

	QUESTIONS FOR SECONDARY KEY INFORMANTS	PROBE FOR
1	*Please describe your (eye care) programme in terms of location, target population, service delivery, human resources and infrastructural facilities available.*	Achievements against known performance indicators. NB: research this first so that actual reference can be made regarding responses of over- and under-achievement.
2	*Please describe the relationship you have had with the PgDCEH graduate over the last three years, referring to an organogram.*	Changes in roles and responsibilities, and attitudes and behaviours of the PgDCEH graduate following completion of the course.
3	*What would you regard as your (eye care) programme's most significant successes or achievements these past three years or so?*	Possible reasons for these successes and achievements.
		Also, the role the PgDCEH graduate played in this.
4	*What would you regard as the most serious challenges your eye care programme have been facing these past three years or so?*	Possible reasons why your programme has or has not overcome these challenges. The role of the PgDCEH graduate in this?
5	*In your opinion, what should eye care programme managers know and be able to do?*	The interviewee's own beliefs about the need for management capacity development for eye care? Also, whether the interviewee believes that the PgDCEH graduate has acquired these competencies?
6	*Given what you know of the PgDCEH, do you think it was useful and relevant for the graduate at the time?*	DO NOT PROVIDE FURTHER INFORMATION ABOUT THE PgDCEH!

G. ADDITIONAL QUESTIONS AFTER THE FIRST ROUND OF INTERVIEWS

	REVISED QUESTIONS FOR GRADUATES AFTER FIRST ROUND OF INTERVIEWS	USE IN
1	*Tell me about how the idea came about to do the PgDCEH, where were you what were you doing and what happened since.*	Who are they? Timeline.
2	*Tell me about your current job, how you got into it, what are you doing and how are you experiencing it so far.*	Where are they, location, career, relative to then.
3	*Talk to me about the survey questionnaire: your current work profile, your competencies, your programme performance and your challenges.*	How are they applying?
4	*Are the following issues also relevant for you? How do you experience this?*	
5	*What have been the most important changes in your professional life after completing the PgDCEH?*	
6	*Any questions for me?*	

H. CONSENT FORM FOR GRADUATES

"The graduates of the Postgraduate Diploma in Community Eye Health: how do they manage?"

Study aim: To investigate the factors that enabled or constrained the ability of graduates to apply the management competencies acquired through the Postgraduate Diploma in Community Eye Health, and how these affected the performance of the eye care programmes in which they are working or had worked.

1. You have been asked to participate in a study conducted by researchers at the University of Cape Town (UCT), South Africa to investigate the factors that enabled or constrained the ability of graduates to apply the management competencies acquired through the Postgraduate Diploma in Community Eye Health, and how these affected the performance of the eye care programmes in which they are working or had worked.
2. The study is recruiting past graduates of the Postgraduate Diploma in Community Eye Health working in health programmes in sub-Saharan African countries.
3. We are interested to learn how the Postgraduate Diploma in Community Eye Health, which you have obtained at the University of Cape Town, have influenced you and the work that you are doing, especially in eye care programmes in your health district.
4. With this knowledge, we will be able to better structure the way the Postgraduate Diploma in Community Eye Health is designed and delivered for the benefit of future students and eye health care in general.
5. You may not directly benefit from the research, and we do not foresee that there will be any unfavourable consequences of your participation in the research, because of the following:
   a. We will collect information from you about your perceptions, experiences and achievements through verbal conversation and written correspondence (in person or via tele-communication)
   b. We will not subject you to any physiological or psychological tests or challenges
   c. When we analyse the information obtained from you, we will anonymise the findings so that your confidentiality will be protected
6. If you agree to participate, these are the activities that you will be involved in:
   a. To give consent, by reading the attached study outline and signing this consent form.
   b. To complete the "Phase 1" questionnaire survey to obtain high-level information about your eye care programme, your work and your performance at work.
   c. To participate in a face to face or skype interview with the researcher, which will be audio-recorded and transcribed for analysis.
   d. To give comments about the researchers' primary analysis of your information
   e. To give further information when required (including current CV and job description)
   f. To identify colleagues and line managers who can give feedback about your role in the (eye) health care programme
7. The study will take place from 2014 to 2016, and your direct participation is estimated to be approximately 4 hours of contact time with the researcher, not including travel time. As far as possible, the researcher will travel to meet you.
8. You will receive a small gift as a token of appreciation for your contribution.
9. Your participation is voluntary. If at any time you wish to withdraw your participation, you are free to do so without prejudice.
10. If you have any questions about your participation prior to the research, please feel free to contact the researchers.

CONSENT AND AUTHORIZATION: *(Delete if not applicable, and write initials alongside)*

- I agree to participate in the following activities of the study:
  - The questionnaire survey
  - Personal Interviews
  - Recording of interviews
  - Review of the written work produced during the course of the study year
  - Identification of secondary key informants who can give feedback about your work

AUTHORIZATION:

- I have read the above and understand the nature of the study.
- I understand that by agreeing to participate I do not waive any legal or human right and that I may contact Mr Deon Minnies of UCT (the principal investigator) at +27-21-4066039 or +27-82-8598627 or at d.minnies@uct.ac.za at any time to discuss my participation.
- I agree to participate in the study. I understand that I can withdraw at any time from the study.
- If I have any concerns about how this study is conducted, or how I have been treated, I can contact the chairman of the UCT Faculty of Health Sciences' Human Research Ethics Committee, Professor Mark Blockman at Marc.Blockman@uct.ac.za or +27-214066496.

Participant's signature: _____ Date:_____
Researcher's signature: _____ Date:_____

I. CONSENT FORM FOR SECONDARY KEY INFORMANTS

"The graduates of the Postgraduate Diploma in Community Eye Health: how do they manage?"

Study aim: To investigate the factors that enabled or constrained the ability of graduates to apply the management competencies acquired through the Postgraduate Diploma in Community Eye Health, and how these affected the performance of the eye care programmes in which they are working or had worked.

1. You have been asked to participate in a study conducted by researchers at the University of Cape Town (UCT), South Africa to investigate the factors that enabled or constrained the ability of graduates to apply the management competencies acquired through the Postgraduate Diploma in Community Eye Health, and how these affected the performance of the eye care programmes in which they are working or had worked.
2. The study is recruiting the line managers of past graduates of the Postgraduate Diploma in Community Eye Health working in health programmes in sub-Saharan African countries.
3. We are interested to learn how the Postgraduate Diploma in Community Eye Health, which the graduate has obtained at the University of Cape Town, have influenced him / her and the work that he / she is doing, especially in eye care programmes in your health district.
4. With this knowledge, we will be able to better structure the way the Postgraduate Diploma in Community Eye Health is designed and delivered for the benefit of future students and eye health care in general.
5. You may not directly benefit from the research, and we do not foresee that there will be any unfavourable consequences of your participation in the research, because of the following:
   a. We will collect information from you about your (eye) health care programme, the work relationship between you and the graduate and the challenges and achievements of your (eye) health care programme through verbal conversation and written correspondence (in person or via tele-communication)
   b. We will not subject you to any physiological or psychological tests or challenges
   c. When we analyse the information obtained from you, we will anonymise the findings so that your confidentiality will be protected
6. If you agree to participate, these are the activities that you will be involved in:
   a. To give consent, by reading the attached study outline and signing this consent form;
   b. To participate in a face to face or skype interview with the researcher, which will be audio-recorded and transcribed for analysis;
   c. To give comments about the researchers' primary analysis of your information; and
   d. To give further information when required.
7. The study will take place from 2014 to 2016, and your direct participation is estimated to be approximately 2 hours of contact time with the researcher, not including travel time. As far as possible, the researcher will travel to meet you.
8. You may receive a small gift as a token of appreciation for your contribution.
9. Your participation is voluntary. If at any time you wish to withdraw your participation, you are free to do so without prejudice.
10. If you have any questions about your participation prior to the research, please feel free to contact the researchers.

CONSENT AND AUTHORIZATION: *(Delete if not applicable, and write initials alongside)*

- I agree to participate in the following activities of the study:
  - Personal Interviews; and
  - Recording of interviews.

AUTHORIZATION:

- I have read the above and understand the nature of the study.
- I understand that by agreeing to participate I do not waive any legal or human right and the I may contact Mr Deon Minnies of UCT (the principal investigator) at +27-21-4066039 or +27-82-8598627 or at d.minnies@uct.ac.za at any time to discuss my participation.
- I agree to participate in the study. I understand that I can withdraw at any time from the study.
- If I have any concerns about how this study is conducted, or how I have been treated, I can contact the chairman of the UCT Faculty of Health Sciences' Human Research Ethics Committee, Professor Mark Blockman at Marc.Blockman@uct.ac.za or +27-214066496.

Participant's signature: _____ Date:_____

Researcher's signature: _____ Date:_____

J. VISION 2020 REPORT CARD

VISION 2020 REPORT CARD QUESTIONNAIRE

DATE	

NAME OF MANAGEMENT UNIT (DISTRICT / COUNTY / REGION / COUNTRY)			
NAME AND DESIGNATION OF RESPONDENT			

	DISTRICT	**COUNTRY**	
POPULATION (SOURCE:)			

INDICATORS

	A. DISEASE CONTROL	**DISTRICT** (YES, NO, or NOT SURE)	**COUNTRY**	
1	In the previous financial year, did you meet the CSR target?			
2	Is cataract surgical case finding part of the government's programme?			
3	Is there adequate spectacles provision as part of a government programme?			
4	Is there adequate numbers of glaucoma treatments as part of a government programme?			
5	Are there adequate numbers of diabetic retinopathy treatments as part of a government programme?			
6	Is there reasonable access to low vision services?			
7	Is there reasonable access to tertiary child eye health services?			
8	Is Primary Eye Care used as a strategy to deal with minor eye conditions and screening?			

	B. HUMAN RESOURCE DEVELOPMENT	**DISTRICT** (YES, NO, or NOT SURE)	**COUNTRY**	
1	Do you have adequate numbers of ophthalmologists / ophthalmic surgeons?			
2	Do you have adequate numbers of optometrists?			
3	Do you have adequate numbers of ophthalmic nurses?			
4	Do you have a dedicated manager / coordinator for eye care?			
5	Do you have access to at least one instrument technician?			
6	Are the tasks of the ophthalmologists optimally matched with their skills?			
7	Are the tasks of the ophthalmic nurses optimally matched with their skills?			
8	Are the tasks of the optometrists optimally matched with their skills?			
9	Are the tasks of the managers / coordinators optimally matched with his / her skills?			

(YES, NO, or NOT SURE)

	C. INFRASTRUCTURE DEVELOPMENT	DISTRICT	COUNTRY	
1	Do you have at least one VISION 2020 surgical centre per health district?			
2	Do you have dedicated eye care teams in all these centres?			
3	Do you have adequate theatre time, overnight beds and clinic facilities in all these centres?			
4	Is there adequate access to training or skills development for eye care personnel?			
5	Is there adequate access to transport available to do clinical outreach?			
6	If money was not an issue, can you sure that good quality equipment is available to procure?			
7	If money was not an issue, can you be sure that good quality consumables is available to procure?			
8	In general, do staff have access to technology to assist the doing their work (e.g. computers)?			

(YES, NO, or NOT SURE)

	D. OTHER HEALTH SYSTEM ELEMENTS	DISTRICT	COUNTRY	
1	Is there adequate budget provision for eye care services?			
2	Is there a reasonably active eye care committee?			
3	Is there an eye care plan that is current, approved and being implemented?			
4	Is there a reasonably active community participation?			
5	Is there a health management information system that adequately addresses eye care issues?			
6	Is there adequate intersectoral collaboration to facilitate coordination and integration?			
7	Are there any formal partnership collaborations with NGOs / corporates for sharing of resources?			
8	Is monitoring of eye care activities occurring routinely?			
9	Is eye care service delivery driven by good and effective leadership?			

COMMENTS:

K. PILOT STUDY REPORT

A graduate was selected who was within easy access, time and distance-wise. Before the interview, the graduate was contacted and informed that she was selected for the pilot interview. The procedures were explained to her and she was asked to arrange for her line manager to be interviewed as well. The study information and consent forms were sent to them by email.

The following checklist was used to ensure collection of good quality data:

• Listen more, talk less	Needed for improvement
• Ask questions that are not: leading or closed	Needed for improvement
• Do not interrupt	Needed for improvement
• Ask what happened	Needed for improvement
• Keep participants focused, ask for details	Acceptable
• Identify personality / mood issues (on both)	Not sure
• Limit over-zealous interaction	Needed for improvement
• Use a simple interview guide	Yes
• Harvest the wealth in silence, body language, other observations	Yes
• Address inconsistencies, gaps in understanding	Needed improvement
• Clarify language, conversational uncertainties peculiarities	Needed improvement

Another important thing to remember was the cost (time and money) and the opportunity of the interviews. This one was relatively low, and it was felt that the return (useable data) was relatively low too. There will be more expensive, time-consuming and once-off opportunities from which the data return should be much more in keeping with the investment. Therefore, careful planning and preparation for interview quirks were necessary. Training in interviewing skills, on-the-spot analysis, note-keeping and synthesis was necessary, as well as the need of at least one very good secondary key informant, against whom to confirm some of the responses from the graduates. This would strengthen the validity of the findings through triangulation. Additionally, access to secondary but objective information about the graduates, their activities and their settings would also be useful. A protocol amendment may be necessary to allow for that. A third area to sharpen up is to hear their thoughts about the reasons why they are doing so well or so badly.

We synthesized some ideas for implementation in the proper data collection stages:

- Prepared a file which contained relevant background information about the graduate's eye care programme and the external context of the graduate's district, province, region or country.
- Planned to arrive at least 10 minutes before the scheduled interview time to set up the interviewing area: seating, recording equipment. It was also useful to make observations about the graduate's workspace, the way of organising work and the facilities and equipment available to the graduate.
- Considered a small gift as a token of appreciation for the graduate and line manager. A factual book that intended to match the participants' interest or a station in life is a good choice, as it required thought and consideration. These gifts were mostly books about management or related topics but headphones, laptop bags and pen sets were also given at times.
- Spent a few minutes building rapport, perhaps by having a brief conversation about topical or actual issues that are relevant at the time.

- Developed an interview guide, which was basically a script that guides the researcher as to what exactly to say and write a brief algorithm to guide the interviewer through the potential traps of digression from the topic, not answering the question or not giving clear answers.
- Made brief notes of examples given to support answers given by the graduates and ask secondary key informants for verification.
- Made notes of key body language expressions that accompany simple responses like agreement, disagreement, uncertainty or strong emotion and ask for elaboration.
- Asked about negative, disagreeable or unfavourable aspects of the phenomenon of mostly positive, agreeable or favourable aspects are mentioned and vice versa.
- Made special recordings of any promises made by the participants or the researcher and made sure to keep them.
- Reviewed the interview notes, together with the transcripts of the recorded interviews as soon as possible after the interview and made corrections where necessary. Where possible, we asked for clarification from the participants.
- Made a list of all the errors and set out strategies to correct them in future interviews.

The trip was planned to be in time for the interviews, and provision was made for a small gift.

Because of our familiarity, we spent a few minutes exchanging courtesies. This would be replaced with a brief rapport establishment conversation with the line managers who were not already in the researcher's correspondence network. For the graduate session, this brief segment was used to test our sound recording system, which worked well. At this stage an interview guide was not used yet.

The interview followed, which was recorded and checked for audio quality. The templates prepared were also tested and notes about improvements were recorded. The interview commenced, during which the graduate talked with excitement about her work and how she applied her trainings in her work. This did not necessarily yield balanced views as it was difficult to draw from her any negative or neutral thing about the training. The interview lasted about 30 minutes, which provided a rough standard for planning and scheduling purposes.

The meeting with the supervisor was started with a rapport-building conversation and took much longer than that with the graduate. This was because the supervisor was more than happy to tell his life story. He independently confirmed her claims to her achievements, her abilities, with some very good examples. He spent some time describing his own achievements, experience and qualifications. This was thought to be an important factor to consider later in the study.

He also talked about his extensive knowledge and skills of leadership, and how he ensures that this rubs off on his staff. When asking about his programme performance, a difficulty was presented, in that only excellence was reported. This is a good lesson, because people will not easily talk badly about their programme performance to outsiders, especially if they are responsible for the programme. This means that care must be taken to ask for results against relevant indicators. With some mild prompting, some challenges were eventually mentioned.

Through analysis of the interview transcripts, it would be possible to identify the errors and plan for corrective strategy. Logistically, however, everything went well.

L. SURVEY RESPONDENTS' CHALLENGES & FRUSTRATIONS

	GRADUATE COMMENTS (sic)
1	The main challenges I had faced was when the MOH of [my country] assigned NCD director who has no hint of what VISION 2020 is and the national strategic plan for blindness prevention. His poor leadership qualities were obstacle to my determination and commitment in combating the causes of avoidable visual impairment and blindness. That resulted to my resignation from the programme and decision to leave the country and work in neighbouring countries. Fortunately, I am able to use my profound knowledge and skills that was gained from PgDip course and took part in the Global Trachoma Mapping Project to coordinate the mapping exercise in [another country].
2	Poor rating of eye care in the top management priorities of the ministry cause lack of manpower in eye care services, Poor funding for training eye personnel and to buy proper equipment's and materials for eye care services and for planning eye care activities, inadequate outreach programmes, improper eye care activities planning, lack of proper facilities and materials. This also a result of denying opportunities to advocate eye care services. It is very bad to work with a population of almost a quarter of a million people in the region without an ophthalmologist and optometrist. Working in a tiny small consultation eye clinic room is also one of the challenges I have experienced. Lack of exposed to workshops, in-service training and symposiums in ophthalmology is also one of the frustrations I have experienced.
3	Not been recognised as specialised person in VISION 2020 Management. The system of VISION 2020 structure was not in place in the MOH.
4	There is a problem of creating post of ophthalmic unit in [the country] to foresee the implementation of strategic plan in eye care in my region. Am still talking to health minister, chief health officer, and the directors to start one with help of national coordinator.
5	Management competition from eye care in-charge. Not knowing his clear job descriptions as he wants the overall staff managements and everything. He also doesn't know his boundaries. He doesn't have management skills/training
6	No comments but concerns about job security.
7	Non- recognition of my post by the government
8	The government is not engaging in programmes to tackle eye care in [the country] despite the need.
9	The programme I established is still being well run by my ophthalmic nurse. Please if you will be coming, I would be excited and love to meet you. You and [your colleagues] were just fantastic and you have left long impressions on my mind. In case you intend to visit [the programme] I can even escort you there.
	Lack of financial support- no designated budget for eye care programmes. Eye care not just considered a health priority and not fully integrated into primary health care activities. Inadequate eye care personnel – eye care managers, eye surgeons, ophthalmic nurses, clinical officers. Lack of designated eye care infrastructure – no eye theatres, no eye wards, in most health facilities no reserved spaces for eye care services. Inadequate eye

	drugs, equipment and supplies – No refraction kits, no supply of readymade spectacles and other than tetracycline eye ointment all eye antibiotics can hardly be found in our dispensaries. Lack of eye care partner organisations – local/international organisations. Most programme donors / funders not interested in eye care. Lack of career progression for eye care workers resulting into staff exodus. Most eye care workers have joined other well-funded health programmes. Eye care qualifications not well recognised and do not attract pay rise nor change of salary scale. This does not attract health personnel to joining eye care teams. Lack of transport to undertake outreach programmes. No motorbikes and no motor vehicles, hence most of the planned outreach activities remain on paper. Lack of trained community eye care volunteers. Lack of referral system for eye patients. Lack of eye care managers.
10	Lack of sponsorship of the eye programme after withdrawal of NGO sponsorship. Most consumables are not available locally in [my country].
11	The major frustration is that there is no post establishment for my new position in the public health sector which means I cannot fully practise the new skills I have just acquired. I am still working as a general ophthalmic nurse when I have vast knowledge to contribute to the betterment of our eye care programme.
12	Needless health care politics in [my country] eye care sector is killing eye care in the country. Unhealthy rivalry between ophthalmologists in (my country) and other eye care workers especially optometrists because ophthalmologists don't want optometrists to be utilized adequately. They use all their power to frustrate them leaving the patients to suffer and making attainment of target hard to meet. Refusal to allow other eyecare workers have input. Ophthalmologists are not adequately positioned, they cluster in an area making it difficult for patients to have access to them from certain areas. They also waste so much time and energy doing primary eye care such as refraction, simple eye examination and treatment of conjunctivitis in a bid to frustrate other eyecare workers especially optometrists who unfortunately ophthalmologists in my country see as enemies instead of partners. The result is that they don't have time for adequate surgeries leading to huge back logs. They (ophthalmologists) say they are trained to do all things. To make it worse, ophthalmologists try to go into administration as the head of the state ministry of health where they believe they will make more money and also have power to frustrate other eye care personnel. Presently, the most experienced ophthalmologist left clinical services and is now in full administration in ministry of health. She recently stopped the optometrists' allowance. This is causing serious disharmony in the eye care team. The real problem to our health system and eye care programme is politics here. Recently other health workers went on two months strike because of this needless health politics. Medical doctors also went on two months strike earlier because they want to determine other health workers salaries, training and promotion.
13	I have not given up, I am still advocating at all levels. Shortage of manpower in my programme at national level has also frustrated me badly. I work more than an extra mile to achieve my programme's targets because I have passion for my work as well as excellent leadership & management skills.
14	I have been busy since I came back from my annual leave. I understand that you are one of the RAAB experts. [Our country] RAAB report is completed, our trainer was [your colleague]. Currently, we are busy preparing for the development of the strategic plan for 2016-2020. There is a lot that my programme has achieved since I completed my PgDCEH.

15	I have weakness in the budget such as costing the programme, my assignment marks on budgeting was the lowest mark that I got during my training. I want to enrol for Master of Public Health. Please acknowledge the receipt of this mail and advice I still need to come for short courses. Eye health is not a priority in my ministry, there are many competing programs, no matter how hard you work and advocate for improvement of eye services in the country. The decision makers are putting more effort on communicable diseases to prevent mortality and on the non-communicable diseases such as diabetes, cancers, and hypertension.
16	I am struggling with page 2 of your questionnaire because information required is not at my fingertips. How should I fill pg2? Do I have to contact [the district coordinator] for district information? Please clarify. Ok. It looks like an assignment. Maybe I should log on to Vula, the student resource platform of the University of Cape Town.
17	Poor coordination from the district. No district meetings. Shortage of equipment/infrastructure. No computer and printer for (several months). Business plan and working procedures are not developed. Finance administrators. I attempted to establish Primary Eye Care but no support from primary health care coordinators.
18	General perception of eye care is lowly rated and pushed to NGOs. Competing priorities leaves eye care programme with no funding allocation in the district. Implementation plans despite presenting activities and Budgets.
19	No recognition of the PgDCEH, no promotion following completion of the course. Resistance to change some of what used to be routine and accommodate new knowledge i.e. running hypertensive & diabetic clinics. Lack of equipment to run the programme i.e. tonometers, fundus camera, slit lump, auto refractors, spectacles to enable rolling out of screening programmes. Inadequate human resources i.e. optometrists, ophthalmic nurses and cataract surgeons. Phasing out of NGO which used to support eye care in the region.
16	Advocating for the eye care programme to be afforded the same recognition as other health programmes by high authority. The integration of the eye care programme in the health system. The most challenging was to get the personnel in the programme to plan and cost their annual activities. Reporting is also a challenge within our system. Staff establishment is a major challenge in all categories of ophthalmic services. Budget determinations for programmes is not clearly set.
17	Procurement of modern equipment, supplies and portable equipment that could enable surgeries on outreach or out of the base clinics. Acute shortage of human resources/ ophthalmic staff; limited funding for human resources development where most meaningful training can only be attained out of the district/country/abroad; Funding to replace obsolete equipment. Funding to develop infrastructure of building to adequately contain the rapidly increasing patient turn out. Transportation (vehicles) and catering for community eye clinics to the suburbs and communities. Lack of Funding and sponsorship for continuing education and seminars/workshops (external).
18	The major frustration is that no RAAB no exist in [my country], so we don't have the up to date number of cataract cases (we work with WHO estimates). The crisis political in [my country]. 1. Small budget for eye care services: 2% of budget for MOH. 80% of ophthalmologist and cataract surgeon, low accessibility of PEC clinics in community. Challenge: PgDCEH training helped me to improve management of eye care programme.

	An example is the Refractive Error Project which was successful to provide Refractive Error Services in a Community: before the project, 10 000 people received refractive error services in the community, and now, because of the project 24 100 = increase of 140%!
19	Lack of interest on side of health workers to do eye care. Overworked and poor remuneration.
20	Financial support is very poor because of cost curtailment, things have changed because of cost curtailment which affect everyone in this department
21	Major challenge would be that I honestly feel I am being under-utilized; What I learnt from this course is really difficult to put into life because of the limits. I know I can offer more.
22	Convincing the Ophthalmologists to demonstrate the leadership elements in their areas as team leaders. They do not take initiative easily. Getting support from partners to support hard to reach areas in [my country].
23	Not being able to attend meetings at higher levels, for example the National Blindness Prevention Committee meetings in the capital city.
24	I have not managed to have an opportunity to go and actually work permanently for the project. However, since I am working at a training institution I was able to teach others, over 14 students by end of 2014 to go and implement the VISION 2020 programme in their districts so basically, I can say through that in all districts with a trained eye nurses eye care programmes have been put in place some have now been given supervisors. In [my country] eye care service delivery is the responsibility of the Ministry of Health so structures have been put in place, Personally I cannot have much power over them now. Eye care services in [my country] have greatly improved and will continue to improve.
25	Eye care is currently not the top priority programme in the Department of Health. It is integrated in the Chronic Disease programme. Prevention of blindness gets zero attention, mainly focus on the curative part and a small focus on cataract removal. So staff for eye care services is limited. Though I have the training in Community Eye Health, I am not directly involved in the team, but I do speak up for the eye care program, from a quality assurance perspective and I advocate for top management to budget for the programme.
26	Ophthalmic nurses rather opt to work in district hospitals where they benefit because of the occupational specialization dispensation. My province's eye care plan expired in 2015. We are awaiting approval of national eye care strategic plan, before we will work on our next provincial eye care plan.

M. PgDCEH TEACHING FRAMEWORK

	TOPIC	BASIC CONCEPTS AND APPLICATIONS TAUGHT	ADDITIONAL RESOURCES PROVIDED FOR FURTHER STUDY	ACTIVITIES FOR LEARNING CONSOLIDATION	FORMATIVE AND SUMMATIVE ASSESSMENTS	ASSIGNMENTS FOR FOLLOW-UP AND SUPPORT	COACHING & MENTORING PROVIDED AS NEEDED
1	Perform clinical eye care to patients on a daily basis						
2	Create documents on computer, use email and internet for work						
3	Plan and implement monitoring & evaluation planning activities						
4	Perform administrative tasks involving human resources & finance						
5	Draw up a budget and prepare tools for marketing						
6	Effectively manage assets including inventory, knowledge and information						
7	Supervise staff for optimal performance						
8	Effectively manage stakeholder relations						
9	Write reports, attend senior meetings and give feedback to team						
10	Communicate about work to on senior / executive level						
11	Administer or manage finances of the programme						
12	Develop a eye care plan for programme implementation						
13	Problem solving and decision-making at work						
14	Build and work with teams to meet performance targets						
15	Develop human resources of programme e.g. training						
16	Manage conflict and change at work or in personal life						
17	Exhibit personal leadership at work or in personal life						
18	Manage health promotion and service marketing plans						
19	Improve service delivery structure and administration						
20	Effectively manage programme quality and risk						
21	Perform project management activities, e.g. planning, controlling						
22	Conduct advocacy and resource mobilization activities						
23	Organise activities for improved eye care programme outcomes						
24	Present work at conferences, national meetings, journals						
25	Participate in institutional strategic planning & governance						

N. CHALLENGES REPORTED BY NATIONAL EYE CARE COORDINATORS

Excerpt from the IAPB VISION 2020 Workshop report:
Workshop to develop strategies to meet HRD needs
For implementing Vision2020 eye care programmes in Southern Africa
11th-12th May 2010, Durban, South Africa

This presentation was centred on the topic of the day as outlined in the theme- HRD for V2020

Key topics addressed in this presentation were well presented in the handbook that every participant received at the workshop. These included topics such as HRD for V2020, Recruitment and deployment, staff development and retention, regulatory and legal aspects, Optimizing HR for V2020. References and resource list were provided.

Human Resource Challenges
Country participants were briefed on how to complete a situational analysis of the Human Resources. This was followed by a practical session. A feedback session elicited the following human resource challenges, grouped as follows:

1. Insufficient numbers of staff:
   - Too few posts available to cater for the need.
   - Suitably qualified and skilled staff not available to fill many vacant posts.
2. Inappropriate utilisation
   - Government ophthalmologists performing part-time work in private practice
   - Cadres with relevant skills and qualifications are not recognised
   - Some cadres are deployed to other health sectors that are not eye related
3. Inappropriate distribution
   - Staff mainly in the urban areas
4. Poor management
   - Uneven / inequitable distribution of human resources, even when in adequate numbers
   - Cadres with relevant skills and qualifications not recognised
   - Some cadres are deployed to other health sectors that are not eye related
   - Insufficient co-operation with private sector
   - Health systems needing accelerated strengthening
   - Certain cadres like optometrists and managers do not even exist in certain countries
   - Services (and human resources) are too centralised
   - Difficulty to approach, engage and commit senior government decision-makers
   - Low staff retention, low staff motivation
   - Overall low staff productivity
   - Lack of cooperation with Human Resource Development departments
   - Many countries do not have national coordinators with appropriate mandates and support
   - Lack of suitable training programmes for ophthalmic nurses, optometrists, etc.
5. Lack of motivation and recognition
   - Low staff retention, low staff motivation
   - Overall low staff productivity
6. Inappropriate training programmes
   - Training through-put too slow (more cadres need to be trained in shorter time periods)
   - Training programmes inadequate to meet emerging training needs (Integrated PHC, etc.)
7. Unavailability of funding for training
   - Government's training budgets not available for specific eye care training needs
   - Insufficient infrastructure (equipment and consumables) to support in-service training
   - Other strong (vertical) programmes cause dilution of resources available for eye care programmes
   - Trainees not able to sustain themselves during training
   - Institutions not able to retain trainers and professionals who completed training

O. PgDCEH STUDENT EVALUATIONS: EXAMPLE

The figure below is a summary of a typical training evaluation for one of the submodules of one of the courses of the PgDCEH. In addition to the standard questions, students were also asked open questions which encouraged them to give their comments, criticisms and suggestions in free text.

CEH Diploma & Short Course Student Evaluations - 2010

Week Eight Project Management for Vision 2020	**1**					**2**					**3**					**4**					**5**				
Statement	Strongly agree	Agree	Not so sure	Disagree	Strongly disagree	Strongly agree	Agree	Not so sure	Disagree	Strongly disagree	Strongly agree	Agree	Not so sure	Disagree	Strongly disagree	Strongly agree	Agree	Not so sure	Disagree	Strongly disagree	Strongly agree	Agree	Not so sure	Disagree	Strongly disagree
The knowledge and skills obtained during the course will be very useful in my day-to-day work.	✓					✓						✓					✓				✓				
The course was worth the time and money spent.	✓					✓						✓					✓								
Overall, the course was well presented.		✓				✓										✓					✓				
The faculty interacted comfortably with all the participants.	✓					✓					✓					✓					✓				
I am now much more confident about my abilities to work in an eye care programme as a manager	✓					✓						✓					✓				✓				
The material presented is of good quality.	✓					✓					✓					✓					✓				
The manner in which the lessons were offered was interesting and helped me to understand better.		✓				✓						✓					✓								
I am happy with the key lessons I have learnt.		✓				✓						✓					✓					✓			
During the course I was able to constantly relate to practices and situations in my own work environment.	✓					✓						✓					✓					✓			
I will be able to implement some of the things I have learnt in my work immediately.	✓					✓						✓					✓					✓			

The figure below is a summary of the analysis of all the sub-modules of all the courses at the end of the academic year. The colour codes highlight the analysis outcomes for further action: yellow = 100%, no issues, pink: less than 75% of responses strongly agreed to positive statement, for investigation.

PGDCEH13 / CERTCEH13	**STRONGLY AGREED BY WEEK**										
Statement	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6 A	Week 6 H	Week 7	Week 8	Week 9	Week 10
1. The knowledge and skills obtained during the course will be very useful in my day-to-day work.	100.00%	71.43%	85.71%	87.50%	87.50%	75.00%	100.00%	87.50%	87.50%	87.50%	75.00%
2. The course was worth the time and money spent.	75.00%	85.71%	42.86%	87.50%	87.50%	87.50%	100.00%	87.50%	62.50%	62.50%	75.00%
3.Overall, the course was well presented.	75.00%	85.71%	57.14%	87.50%	100.00%	87.50%	100.00%	75.00%	87.50%	75.00%	75.00%
4. The faculty interacted comfortably with all the participants.	100.00%	85.71%	57.14%	87.50%	100.00%	87.50%	100.00%	87.50%	87.50%	75.00%	62.50%
5. I am now much more confident about my abilities to work in an eye care programme as a	100.00%	42.86%	42.86%	75.00%	87.50%	75.00%	87.50%	75.00%	100.00%	75.00%	87.50%
6. The material presented is of good quality.	100.00%	85.71%	28.57%	100.00%	87.50%	87.50%	100.00%	87.50%	87.50%	75.00%	87.50%
7. The manner in which the lessons were offered was interesting and helped me to understand	100.00%	85.71%	57.14%	62.50%	100.00%	87.50%	100.00%	87.50%	87.50%	75.00%	87.50%
8. I am happy with the key lessons I have learnt.	75.00%	100.00%	57.14%	75.00%	75.00%	87.50%	100.00%	62.50%	100.00%	75.00%	87.50%
9. During the course I was able to constantly relate to practices and situations in my own work	50.00%	85.71%	14.29%	75.00%	87.50%	87.50%	87.50%	87.50%	75.00%	87.50%	75.00%
10. I will be able to implement some of the things I have learnt in my work immediately.	100.00%	71.43%	28.57%	100.00%	75.00%	87.50%	87.50%	87.50%	87.50%	75.00%	75.00%
	875.00%	800.00%	471.43%	837.50%	887.50%	850.00%	962.50%	825.00%	862.50%	762.50%	787.50%
	87.50%	80.00%	47.14%	83.75%	88.75%	85.00%	96.25%	82.50%	86.25%	76.25%	78.75%
		100% - brilliant!									
		Less than 75% - investigate!									

P. COMPENDIUM OF THEMES

NUMBER	THEME	ILLUSTRATIVE QUOTE
1	Graduate happy to apply the knowledge she gained	*"I am happy and the course has helped me to come this far and I used the knowledge and the material in developing IEC materials which I circulate in the community. [2]"*
2		*"Personally of course, I am in a position that I have knowledge, I can apply that knowledge for different things in a project. [8]"*
3	Graduate clear about her leadership role	*"We are working as a team. It's myself and though I'm the coordinator. I'm coming up with this but I'm always the initiator. The driver of the work.[6]"*
4	Graduate had ownership of her work	*"We are really doing a very good job because I don't want my programme to remain behind. I'm always telling her to say no, we are pushing. We are going to, we'll get there. [6]"*
5	Graduate enjoys her work	*"I enjoy my work [14]"*
6		*"And, now, I'm enjoying it my work. I can just tell you my line manager, I do this and that, I think that I can just shift this. [7]"*
7	Graduate's love for her work	*"I really like my job. It's because of passion. I have that passion towards eye health. Even when I'm at home I just dream of all that I'm going to do in the office, where I going to start because I'm always making sure that I have things to do for the whole week. [6]"*
8	Graduate happy and proud of achievement	*"I'm so proud, and I'm so happy, because what if it wouldn't have, from this training I wouldn't have achieved this ... so I'm happy, and I've achieved what, really I in my work. [7]"*
9		*"I'm really feeling so confident and they know me very well that I am the national eye health coordinator. [6]"*
10	Graduate looking to pass benefits to those in need	*"He wants to make sure that the support that comes benefits the community [13S]"*
11	Graduate's understanding of how a manager should function	*"I think I understand with my training and the systems that are in place, how a manager should function. I think the training I had, then it seems to me that I can manage any situation, whether it is work, personal life, or is it a programme or a project. Because the principles remain the same, you know, it's just the context that differs. [1]"*
12	Training impact on graduate	*"It is a personal achievement in my way of looking at things and handling people and understanding people. It is personal but it adds value because I cannot separate myself from the professional way and the personal way of being and how I look at people in general. [2]"*
13		*"It was a seed which need to be nourished, something like that so I had to water that well, put some manure and all that so that's why I feel I'm now a man, a rock. [3]"*

14	Graduate stuck with poor salary	*"I like my work although it is poor salary [12]"*
15	Graduate's feeling of limitation	*"It is important that well, in life when you must be given a space to do your job so sometimes you are being limited that well you are not supposed to do this, you are not supposed to do, so it is important that, that's why I believe that well, you know to lead you cannot lead from the table here. You have to climb the mountain and lead there. [3]"*
16		*"It's very, very limited definitely, it's very limited. You can't do anything with that. The stations allow-. you cannot go out so frequently. [3]"*
17		*"The patients are the ones who are suffering too much like when I'm supposed to go out to the clinic to go and screen my patient, only to find out I'm being limited on the kilometres so therefore I cannot go (to do the screening). I'm not going to go when I'm supposed to attend the meeting when my kilometres are already exhausted because they've cut the kilometres. [3]"*
18	Graduate felt that his appointment should have been announced	*"I should say the first thing that is challenging is that I was never introduced to the people so I had to find my way through to the people. [5]"*
19	Unsupportive line manager	*"If it was a continuous service. Why it is not continuous is there is a shortage of ophthalmologist, skills, and people in the facility. [6]"*
20	Graduate's despair, stagnation, going nowhere	*"I have the ability but you know where I am placed because when it comes to promotion then I realise that he has no way of promoting. But I have no control, I don't think it has any control. [2]"*
21		*Then I just find myself, I am there and I have not been given an alternative. [2]"*
22	Remorse	*Under remunerated for many years [11]*
23	Health facility managers do not understand eye care	*"Sometimes you feel you are speaking a foreign language and you want those people to understand you. And sometimes I feel maybe if I could develop a language which is understandable to them because sometimes you feel after you have spoken these people they don't understand. [5]"*
24		*"This one who came to us did not know about eye care [13]"*
25		*"I don't think she understands the programme [14]"*
26	Over-worked	*Too much pressure [12]*
27	System issues	*Because sometimes the internet breaks down [13]*
28	Lowly remuneration	*We can walk home, I don't have a car [12]*
29	The desperation is raw in this	*Then I just find myself, I am here and I have not been given an alternative. [2]*

30	Aspirations of a better career	*"I want a better career and to see progress in terms of ophthalmic nursing. I want to do a PhD. They are talking about started a degree in ophthalmic nursing. I want to be part of that [12]",*
31		*"I feel like, you know I need to find something else to do. And probably other things have come and I able to pull out and do them. [2]" and*
32		*"I want to be a clinical officer first, because that is what I qualified for that time. Then I said management will be my second or office work, will be my second. Then third would be teaching. [2]"*
33	Comfortable	*"Well, I'm very much comfortable but my bosses. They don't want me to do this see. I like to intermingle with the patient. [3]"*
34	Need to return to clinical work	*"I am not fully happy, because I need to go back into the system. I want to go work, like if I want to go to the district level, I have to see hospital work. [8]"*
35	wanted to study further	*"I'm looking for my professional career toward the PhD. But, now, they won't allow it because otherwise they don't have somebody else to get over, yet. [7]"*
36	Desire to return to MoH	*"Yes (the salary) that will be low. I don't mind and I will be getting part-time. I want to go back, but some people have different issues. Now they said the documents were sent to (the capital) and they were waiting for (approval). It is now two years already. [8]"*
37	Need of higher qualification to teach	*"That is why I said I wanted to go further just to move to the Masters. We have got universities here, they teach different courses and I would like to join them to teach public health and to include eye care, it is just a matter of talking to the Director of the university and to propose. [8]"*
38	Need to be educated	*because "people do not take you seriously (if you are not). [8]"*
39	The effects of monitoring of finances on graduate personally	*"I think they must relax that cost curtailment, it's like a blanket one to everybody so of which there those who are supposed to be monitored, but if you are working inside this, it's not a problem. They can monitor it as they want but as long as you are being given a chance to go and you are doing this for the patient outside that so the patient then said they won't worry feeling the heat. We don't have a problem so even they cut all these, we'll come and sit in the office the whole day, it's not a problem. We can come and sit here and go back home but the problem now is the patient themselves are going to suffer because of this cost curtailment. [3]"*
40	Limited by cost curtailment	*"It is already limited so if you are being limited on the budget so therefore even if you are, what's that, you are immediate managers, you can't blame them even if they tell you that well, you must do like this, you have to abide because you, they know that well, it's another way of controlling or directing something like that but now if you are going to be given enough finance that will also open your mind. You will be free to do what you want to do because you are, you know that well, you'll go beyond call of duty but in this case where you are been given*
41		

		limited funds it actually closes your movement. There's no way out even if you want to, not necessarily about money. Money is just opening everything. Once you have got money so you can be able to talk so if you don't have it also closes other doors. [3]"
42	Justification for low productivity / poor performance	*"This year I checked my performance for this year, it's - lower because I'm not here most of the times or like when I go to attend the classes then there's no one to push to see the patients so -It's not like I'm away just for being away. I'm doing something. [4]"*
43	Line manager takes the credit	*"The reason why I also can say that I got a bonus every year for exceptional service and for that reason I say now it is as a team. I cannot, if one person or individual takes the honour for it, and it is for that reason that someone like (the graduate) course's value which she recorded with her training played ' a large role in that it is also a very good course, exceptional service is what she, since she was appointed. She is the leader in terms of the programme and linking what she does with the programme manager of the entire province. Yes, so she is the interested party in what is concerned. Because of her high-quality services and that she also has developed so fast under my heading, there is a new quality manager appointed last year in (a neighbouring district) and who was then asked to help her? (the graduate!) [1S]"*
44	Graduate establishing control	*He used to, but now I'm managing and slowly he's now, I control him. Yes, you mix the skills. [7]"*
45	Aware of under-utilization of human resources but having no power to address it.	*"There are five at (one secondary hospital). Yes, but they are not doing a lot. Because you'll find that maybe within a week they do about roughly twenty (cataract operations). [6]"*
46	Limited influence of graduate	*"I keep repeating my influence is limited by my position. For sure when they are doing the strategic plan for the hospital I am excluded. Because of my status as a cataract surgeon I do not participate in those activities [11]"*
47	Line manager knows little about eye care – lack of power	*"I don't know where the money is going to I'm not part of that decision-making, but I know that the money that we requested was not that much and with the little that we requested, we could have done quite a lot things. [5]"*
48		*"It depends also according to me on your supervisor if you are prepared to let your subordinates grow so his got the knowledge of his subject. His got it much better than me and they tell him point blank you are the specialist in this area and not me. He doesn't have anybody who is his subordinate so I don't know how he will handle… [5S]"*
49	Line manager misunderstood the motives behind health seeking behaviour	*"If they say there will be eye care (outreach with spectacles provision) you know, people will come just because there is eye care. You see, the reason why I'm saying that people are hungry for it, is that people would rather not eat but just to queue for and (wait) for the eye care. The others they may leave you know the other resources like all the services, even the other departments but eye care will remain and which means that it keeps them going and really it is something, I'll say it is doing well. [3]"*

50	Line manager's misunderstanding about the eye care	*"I'm saying it's so difficult to compare them because with eye care it's not always there. Mental health it's also not a good one but it is available there almost every time but eye care, you go into all these clinics. You won't get the real eye care services until you get the team doing the outreach for eye care. [3S]"*
51	Line manager has a singular expectation	*"I was thinking if he could still be part of us, because we are doing community work also. We go for outreaches and we need a lot of advocacy to make progress. No one is advising them what to do to move forward, so we need locals who know the reality and who have the capacity to do the advocacy with the decision-makers. So, if the graduate could still work with me and continue doing that advocacy work on the side lines, it would be wonderful. Our voices would be heard better, if both of us speak together. [8S]"*
52	Slight positive change happening in government health services	*"I think there is will energy, not acceptance for the poor situation. Even in hospital management everyone recognises that there is more we can do [11]"*
53	Awareness of professional limitations	*"Some of the things are outside my scope of practice [12]"*
54	Graduate's deep understanding of the need to be understood	*"It was a challenge, if somebody cannot understand you it is a barrier [13]"*
55	Graduate not understanding complexity of health system issues	*"If I was in the chief director post, I would make sure that the eye issues get attention [14]"*
56	Graduate's view that senior meetings for managers is a flaw of the system	*"Just because that is the flaw of the system, because these meetings are for managers [11]"*
57	Graduate recognised that more people should be trained	*"Maybe what I wanted to say, we just need to do this training in Cape Town again. It is just a matter of maybe when you are going to talk to (my supervisor) just to emphasize more on that. We need to have more peopled trained on that. It is very valuable and if we have more people trained on that, it would help a lot. [9]"*
58	Graduate did not feel restricted by ophthalmologist but also not enabled by her	*"The ophthalmologist is not restricting me from anything as far as I know [11]"*
59	This line manager had unrealistic perception of how	*"It's not actually ophthalmologists who do the cataracts operations. The cataract is already an outpatient issue, and it depends on the skill, you know. The nurse could have done it. [6]"*

60	and eye programme can work best:	*"Well, comparatively it might be okay, but … I wouldn't say that we need so many people for next year. It is scattered but still … being scattered you can reach in the one day, you can cover, there are many of the distances. Yes. It could be done. What is important is a mobile unit, for example, could be organized. [6]"*
61	Line manager recognising graduate's understanding of how things work	*"He is also understanding as the data must come from the field [13S]"*
62		*"If we fail he also fails do he wants to make sure we succeed [13S"]*
63	Line manager misinterpreting health service user uptake behaviour	*"In the eyes of I think they are hungry for the service because whenever there is a gathering they would just come just because there is eye care. People would rather not eat but just to queue for the eye care. [3]"*
64	Line manager explaining the effect of attrition on programme performance	*"We are very small and some of those who are trained, then they are no longer doing what they were trained for. Some of them have been given promotion then just maybe leave because people want greener pastures. [3]"*
65	Graduate view of the importance of government to fund services	*"What we need, we don't need any financial from the NGO's, but from the government itself. Okay they pay the salaries of staff, but we also need equipment, drugs, and other specific services like the service for the rehabilitation services, because they are not in place, it will come later. [8]"*
66	Graduate now possessed expert knowledge that can be used for positive change	*"I went to talk to the director. It is not about the money, but I want to help, I want to use the knowledge that I am willing to share and to influence the country to change. But I am happy doing something that is being appreciated. [8]"*
67	Graduate reasoning how programme performance can be improved	*"We are slowly gradually working on that to say, we should use them when we need them we should not be dependent on them. (If) we can have nurses and optometrists in other areas then it is going to reduce a lot of dependency on the NGOs [5]"*
68	Line manager has partisan views about management candidature	*"Okay. I would say that, one must have some basic orientation in eye care. Then it is good to look at people's personalities, which includes even people's initiatives. Then it is good equip them with some basic management skills, basic management skills. And from there, you watch how people move. Yes and give this one – so it is not, must be an ophthalmologist. But it is a multiple partner, I think it is some look into the personality issues of a person, then some basic training and then some soft skill. [2S]"*
69	Misapplication of performance appraisal	*"It is difficult when you are asked to blow your own trumpet [11]"*
70	Graduate misapplying knowledge	*"We failed as optometry because we had few meetings as optometrists and that's how we feel we are being neglected. We need an optometrist at district office, even at provincial. [4]"*

71	Graduate not able to complete a key management activity like budgeting	*"Yes, so then I got stuck so it's still incomplete. I did what I did on the template and gave it to them, to (the ophthalmologist) and the nurse so we never finalised it. Yes, there were no inputs. I couldn't finalise it because I needed their inputs. He has his plan. He knows what should be in the plan. [4]"*
72	Partners lack understanding about eye care:	*"It is lack of understanding because I realized that partners have money but may not have skills in eye care. [2]"*
73		*"Some of the challenges I encountered what to do with you know when you understand how things should run, and you are working with a team who does not understand the challenges in eye care and how what will help especially when it comes to barriers [2]"*
74	Colleagues and superiors are ignorant of management	*"He doesn't have any experience of managing, he doesn't know. He's like, you know, he doesn't have confidence, something that anytime I can just be moved away. [7]"* *Graduate's frustration that health facility managers do not understand eye care*
75	Performance management is difficult:	*"So, if they need to commence probably the performance appraisal does not reach the level, where I can be promoted. [2]"*
76	Line management lacking continuity and interest	*"I do have a comprehensive package which I presented to my director and she lost it. [5]"*
77	Lack of infrastructure	*"That's why sometimes it takes long for me to reply. [10]"*
78	Complicated reporting structure:	*"There are some of the things that are not implemented because of ... these two departments. [6]"*
79	Acceptance of slow turnaround in government departments:	*"The government will say, we will do anything. We will wait, even if it means for 20 years. Our economy has not been well for a long time [12]"*
80	Management application low in other areas too:	*"There are many nurses not having registration. Their managers are not monitoring this [14]"*
81	The challenge of transport	*"My assistant directors do not have transport to do their monitoring [14]"*
82	Graduate's superior expertise	*"No, you cannot (change it). (The facility managers) do the things differently. [5]"*
83	Challenges are overwhelming:	*"There are a lot of problems we cannot deal with [14]"*
84	Health system failure	*"The filing and records system -here is none. There are no resources, there is no budget [14]"*
85	Graduate in senior position being incapable of solving problems	*"Because most of the problems come from the ground, we cannot solve here [14]"*

86	Management happens up there / graduate, even though in high position, powerless:	*"They say there is no money to employ the optometrist or increase the salary. They say its national responsibility [14]"*
87	Opportunity	*"I should say the first thing that is challenging is that I won't call it being that bad but I was never introduced to the people so I had to find my way through to the people.[5]"*
88	Low-influence line manager representing graduate in senior meetings	*"I'm usually the one who is going to their meetings and present whatever in non-communicable diseases and I have done exactly that with eye care as well because those people don't always have the background and their understanding of what is happening so the more information you give them, the more you understand what you are trying to achieve and the more they become sympathetic to your program. [5]"*
89	Line manager assigns graduate menial tasks	*"Partly, partly because when it comes to scanning or when it comes to – if he is not in the office, then he requests me to make sure that (it gets done) [2]"*
90	Line manager confidence on graduate's abilities to get things done	*"With (the graduate) there I do not have to be to be involved, she will do anything very well she is well read. She is exposed to so many things. When you want to assign something, she will get out done [12S]"*
91	Recognition, enable, know strengths, feedback	*"Thankfully she recognised the areas that I am good at and she allows me (to do that). Sometimes she does consult with me before she goes to those meetings [11]"*
92		*"I don't think she had ever done anything deliberate to undermine me. She is not so aggressive, not at a stage where she is more dynamic [11]"*
93		*"(The graduate) is a hard worker and self-started. She sometimes gives me feedback, perhaps asks permission [12]"*
94		*"The prospect for her is to go to the university and offer BSc in community nursing [12]*
95		*Among my tutors she is the most assertive [12]"*
96	Ignorance about graduate's work, merely a placeholder, poor strategy	*"I was not getting the chance to lead with (my previous line manager) My new boss lacked the knowledge but he did not want to show it [13]"*
97		*"That they are, they have all this on the line, this will not limit her from moving along the organogram. Yes, of course this one is much higher than all of them. This is one is probably the same as one of them, but okay technically she is very high, because she is an ophthalmologist. She is youngest, very new, she has been here for a few months. It is okay, I think I will defend her. [2S]"*

98	Lack of leadership	*"I also blame on how people are deployed because some people they go there without a background of what they have to do. [5]"*
99	Short-sighted leadership	*"I'm not very happy every year always with the way we are rendering services because we promise the people a good service and we are not of the standards always to be very honest with you. Because every time service delivery is going with budget and the budget is very small or the budget that we get at the end is very small so we can do only a bit of what we have planned for the year as well. [5]"*
100		*"We don't have a lot of services that we would like to render, our main thing as far as on the provincial level is we are going to two, three meetings at national and then our support visits, support visits is vital to us. But, this year we haven't had any support visits because the submissions were not approved. [5]*
101	Ignorance about work of graduate	*"I think it was more than a thousand. Yes, he will have the… [5]"*
102	Not acknowledging graduate's achievements	*"But it's, nothing … … is being done yet, so, we shouldn't be best in, when you say community eye health. [6S]"*
103	Showing no energy, will-power, ability to support graduate	*"She had brought some of the issues, you know, for additional staff. This means, you know, once you fail this is not important. Unless, and otherwise, she knows somebody there, who sees that the issue that she's raising is important to …… somebody else. There's no one here in this ministry. [6S]"*
104	Supportive and enabling	*"She plans her own thing, we are not doing micromanaging. We are doing the principle that these are the interventions that we need to do and we follow suite, we discuss, we exchange ideas, and we support her when it comes to middle-level management related to policy, related to operational where she plans, we see where we can fit in and then they do the necessary. [7S]"*
105	Acknowledges graduate's achievements	*"And, at a scale of five she's among the best five who are doing best in terms of programme management. The best part, she's delivered. But, I think she's a strong one, taking into account where she comes from. She climbed through the ladder, she did not over-jump the ladder. She went through all the ranks of the ladder and she has proved herself to be a strong deliverer. So, it's also a matter of the exposure. [7S]"*
106	Hinting at role modelling / mentoring	*"It depends on the … how do you call it … I am learning from somebody. So … I forgot the word, it's your mirror image, who you would like to be. The role model and …So, the role model is the one who is determining your path, plus or minus. [7S]"*
107	Individual mind-set is also important	*"I think I have, but it's not only that training. You can go to the best school … But, if your composition as an individual is not right, then you go with the wrong expectations, you will go with at the wrong time. That's where people fail. [7S]"*

108	Supportive reporting framework	*"(We have) monthly meetings for all the projects, and the minister of health. [7S]"*
109	Role in performance management	*"I evaluate the appraisal (for the graduate), and she has to do it. That's how we do it. Not fully, because I'm also right here, but when I evaluate her I, well, the supervision I do have because …yes, and there's enough because we have (another one) [6S]"*
110	Boasts about own skills and qualifications	*"I can do just about everything because of my generic skills. Yes, qualifications, you name it, I'm an army officer, a senior officer, doctor, I have two Masters degrees, I am also a teacher actually trained, Yes, so I'm also very knowledgeable with regard to the management of work's policy also, Yes, and set up six different values against each other and cultures that are different and all that. Okay well. Yes, I can generally say that of our Director's side, and she has a lot of input. I now most heard from several people that (the graduate) improved since she did the course with you, I think it was a year course or something? [1S]"*
111	Revel in managing the one who first managed her	*"I find him in the profession, he was the one senior to me in eye care. He came here, when he applied for this post he was the, you know we were in the same rank he came for this post or the post. When I came there, then I was under him and now he left, he's here. Now I have to be grooming him, you know there's no attitude, the reason why I'm saying his attitude is good is that he, even the very same post of a director, he went to also for an interview. He doesn't have that attitude of I there, he regards me as his boss. [3S]"*
112	Taking credit for graduate's development	*"He's getting there. Very, very flexible so I mean we have got such a nice, so with (the graduate), believe me, he's getting there. I am pushing, I am. The fact that he's drivable, I think I'm going to have a best manager out of him, more than the others. He's also going to grow. I can see the difference. [3S]"*
113	View on application of new competencies	*"You need to be able to practice what you learnt so that you know there need to be a difference when you get an extra qualification. Or you must change your job. [4S]"*
114	Seeking budget only to fund for monitoring costs un-resourcefulness of management	*"We don't have a lot of services that we would like to render, our main thing as far as on the provincial level is we are going to two, three meetings at national and then our support visits, support visits is vital to us. But, this year we haven't had any support visits because the submissions were not approved. [5S]"*
115	Enabling viewpoint:	*"I believe that they should be exposed to other environments as well so that they become familiar with those environments and then also, I can feel relaxed when they are in those situations. [5S]"*
116	Cognizant of graduate's challenge, but doing nothing about it:	*"All the resources that we have, they are the only two who run up and down, and that is one issue. The second issue is the division is more of, the programme is more of a vehicle issue in a sense, you know. It should have been I would say, well attached to one. [6S]"*

117	High account of graduate	*"(The graduate) is hard working, all-rounder [12S]"*
118	Agreeable relationship with graduate	*"If I asked her I am sure she will be agreeable [11]"*
119		*"I do not want to undermine my line manager [11]"*
121	Uninvolved with work of low performing graduate	*"Something, it's like support from the management. You know, since I came here, I don't remember like Allied I explained to for the meeting. Okay eye care meeting the district even as Allied but I never had like, we never have meetings for Allied so I don't know maybe the gap is because we don't have an Allied manager or who's been looking or managing Allied Health Services so we're being managed by clinical and clinical is like the more concerned of the doctors and nurses so the support is, it's just not good. [4]"*
122	Need for supportive reporting structure	*"My main challenge is not having somebody to report to. [14]"*
123		*"Currently the manager is merely a place holder. My main challenge is to do with my lack of senior support [14]"*
124		*"Something, it's like support from the management. You know, since I came here, I don't remember Allied ever had a meeting. We had eye care meetings in the district even as Allied but I never had like, we never had meetings for Allied so I don't know maybe the gap is because we don't have an Allied manager or who's been looking or managing Allied Health Services so we're being managed by clinical and clinical is like the more concerned of the doctors and nurses so the support is, it's just not good. [4]"*
125	Blinkered to functional and structural limitation of graduate.	*"It is not anything that really disturbs me so much, probably because we discussed it a bit more times and seeing that sometimes it is not easy to change a number of things but then we, in the meeting we had today, one of the discussions was space. This is our thing on space and we will get it. I don't view it a magnitude, because you are still able to work, I can sometimes. Or her performance. I cannot see that, I can just see that it's – on the one side it provides great closeness of the team. What do you mean space? [2]"*
126		*"She sits, she sits here with this one. This one use to sit here. But now this one seems to have first an issue, this one has decided to join them, this one sits with this one. And these are with him, also who is part of that. This one sits nowhere. Or, everywhere rather than nowhere. [2S]"*
127	Support and encouragement from peers	*"I worked alone for a period of eight months before (the graduate) joined me. And then from there, you know what, I was just working hard, hard alone, to an extent that even the permanent secretary was in a meeting and said, you know what, you are doing a good job, as if you are twenty. Even when she came they told her that, Ma, here you've come to the programme where there's hard work. She knows. Wherever I saw that she, maybe she's trying to go around I'd say, no, it's this way not that way. [6S]"*

128	Works mostly un-supervised and un-supported	*"Very, very seldom (is when I meet my line manager). She knows me. I report even the reviews I do with them, I mean with her rather. Like only for when I go on leave, leave forms that only when (the ophthalmologist) signs and (my line manager) will then approve. [4]"*
129	Applying some skills but under supervision	*"I do coordination, supervise staff, writing memos, community mobilisation. I use the opportunity but indirectly through the ophthalmologist [11]"*
130	Limited opportunity for graduate to apply	*"(The graduate) is in space where he is not getting much opportunity to manage [11S]"*
131	Clinical post restricted from applying management"	*"If I was a in a coordinator post I would be allowed to participate. Unfortunately, I am not given the access to that organ of the hospital [11]"*
132	Taking credit for graduate's work	*"Yes, of course when she does that I am at rest – I mean I am able to do other things. But I am still am still accountable and I take responsibility. [2S]"*
133	No formal structure	*"There is no real line management, we just work together [12]"*
134	Complicated reporting structure:	*"And, besides that, I also … evaluate the prevention of blindness … since it plays part of non-communicable diseases. And the one evaluating on appraisals. They fall directly under disease control but disease control has TB, Malaria. [6]"*
135		*"I'm the national health coordinator but I'm under the Department of Public Health and the Department of Clinical Services, and the facilities under that are supposed to give the authority on whatever. [6]"*
136		*"I don't report exactly to him because he has got his own programme. I'm having the chief there, there is this division. And, under this, is the Disease Control Division. [6]"*
137		*"I'm reporting to Ministry Health and the Director of Preventive, there's an eye care component, but I'm also reporting to the NGO funder's country office in the capital [7]"*
138	Ongoing restructuring taking place:	*"And, one time we'll get – it's just that, you know, we are now in the process of the ministry's restructuring. They are saying they are going to give the district management teams more power. But, it's only us, where are two but we are pushing so much. [6]"*
139		*"We don't have a proper organogram it is in developing for a number of years and every time when we request information or when we request the organogram then we hear no they start all over again. [5]"*
140		*"This is an interim it became too much There is a new organogram currently being developed since 2014 [14]"*
141	Attrition & loss of leadership:	*"We don't have a director he resigned [14]"*

142	Side-lined because of new qualification:	*"I don't remember the exact year when we went, but unfortunately after finishing his course, he could not re-join us because of some bureaucratic problems with the Minister of Health. He had to repositioned back to us, but that process had been delayed for no reason, but he always comes here in between whenever he gets time to support us in the area of training. [8S]"*
143	Central human resource department	*"If he wants to join us, he has to join us in the same post. So now he has upgraded, he should get an upgraded post also and that is with the human resource department to agree on such post. I don't have that kind of influence. [8S]"*
144	Cadres not properly recognised	*"The ministry of health does not recognise my position as cataract surgeon [11]"*
145	Ophthalmologist favoured by line manager:	*"That they are, they have all this on the line, this will not limit her from moving along the organogram. Of course this one is much higher than all of them. This is one is probably the same as one of them, but okay technically she is very high, because she is an ophthalmologist. She is youngest, very new, she has been here for a few months. It is okay, I think I will defend her. [2S]"* *This line manager complains that targets are set at national health department level, and "we are struggling, unfortunately, we can't do anything. [3S]"*
146	Too much work	*"The work is too much, if there was an assistant director for eye care it would help [14]"*
147	Low capacity / too much work	*"Yes, that's what we are still working on, but the capacity on the national level is very low. We are really -. … we are covering everything. We are looking at the (two) eye staff as the programme. But, it's just that we are planning and at the same time we have to ensure that there is an implementation. Like what we're saying, that we are now planning for community eye-screening in one of the villages, so that we give the glasses that have been donated, the reading glasses. But we do plan and at the same time we are expected to (implement) – because there are those people that we are working with, but they are not that, you know, active. [6]"*
148	Manager post without administrative support	*"I don't have the administration (support). Because, I've been really, really advocating, asking, requesting for more staff, at least two or even one. Even with the data it is a problem because they are sending data here from the facilities, but to analyse that data it's a … we cannot. We have been asking at least to have data checked to help us with the analysis, at least to compile. Even what was that we are analysing because that one is for monitoring for somebody. But at least to compile the data. We are really, really having a problem. I'm having a lot of work. [6]"*

149	Eye care programme allocated less staff	*"Bearing in mind that some of these things like going to fax and then going to photocopy can be done. But you know what, we have long talked to them and they said, no we are giving you enough, but other programmes have about twenty people, while we are two. [6]"*
150	High attrition	*We are very small and challenges again, you find that some of those who are trained, then they are no longer doing what they were trained for. Some of them have been given, okay it's promotion then a person just maybe leaves because people want greener pastures. [3S]*
151	Eye care regarded as super specialty	*"It was a shock for us to see that the people don't know eye care. They don't know what kind of services there are for eye care and now we are talking about nursing staff we are not talking of staff outside these few here in the health. That is required to be rendered at least they know of the services they are rendering now, but not they require. [5]"*
152	Poorly resourced workstation	*"Mainly this is what I'm doing. You know I'm working under difficult circumstances. As you can see this is my office and this is all what I have.[4]"*
153	Poor contract management	*"The challenge is we have some contract here which I don't know how we came to sign them, we have a contract, whereby people who will be giving refractive services they don't give reports, they don't even have the mechanism to see if these people are achieving. [5]"*
154	Supply chain problems	*"We struggle to get hold of IOLs and some medicines. We cannot get through the hospital it is impossible. Every time we want to do surgeries we have to scrape together consumables. We have staff, equipment and even patients, but this is the limiting factor. [11]*
155		*None of them including the district manager have budgeted for eye health. the mines will contribute money to eye health so why should we budget for it. [5]"*
156	Eye care committee not active	*"I'm not happy because even the previous committee it wasn't as good as it's supposed to be. The only problem is that after the meeting, you know, we'll discuss even it's – the programme that comes up, we come up with the agenda, then we send the agenda a week before and ask them to comment or maybe to make an input. They never even bother to do that. We are really, really having a problem with the committee, it's not that active. It is what we discussed even with the planning, you see. [6]"*
157	Eye care meetings never happen	*"Our eye care meetings, you know you'll keep on following people but how are working with that meeting just once a month and then sometimes you push and then you end up in it and then you'll draw up a plan to say we'll meet, how often and-. but this never happened and oh my goodness. Changing? I'm not so sure because that's how I found it to be and I tried to intervene. [4]"*

158	No budget for NECC meetings	*"We don't have meeting, because to be an advisor at a regional level, it is something which has been proposed to be official by the Minister of Health, that no job description was done officially, even to propose a budget like I should go to see what is going on in (another province), I can't do that. Yes it includes the planning, so also, we were supposed to have twice per year meeting national VISION 2020 meeting and of course, it hasn't happened this year. We were supposed to have an ophthalmology congress, so we postponed. Anytime we can have that one. [8]"*
159	Dependent on NGO funding	*"We are depending on NGOS, but we do not have NGO', they are on HIV-Aids & STDs. [14]"*
160	Eye care budget allocation insufficient	*"I think in a way it is because we are – dependent. We are dependent of equitable shares the money and not like HIV, TB where they have got their specific…And unfortunately, the accruals they are so much then when we start a new year that is actually what happened this year we are already in the red. [5]"*
161	Delays in funds availability	*"Sometimes, it can pass a year without getting the funds from the ministry. Yes. Or, yes, it was just limited funds, you know. They are looking for the priority. If they see our project is getting funds from an NGO, then we will have to look at those ones that don't have donors. [7]"*
162	The importance of money	*"Even if we say don't concentrate on the money thing but concentrate on other things but still money will be needed in order to open your mind so that you can for example, we need ophthalmic nurses. That's the reason why I'm working alone here. We need, there's no transport. Those who are supposed to go and do what I'm doing now but because of the transport there you've got that problem of they don't have the vehicle and the government vehicle they don't have. Then at least I'm better off from here because I've got that, my own car then I claim. [3]"*
163	Little evidence of improved eye programme performance	*"Compared to 2010 the eye service is performing not better nor worse. Wish wise, where we wish we can be, we are not doing so well. Because for example or cataract surgical rate had not increased much. It's like the output has not increased at all. [11]"*
164	Mostly done through self-reporting	*"Yes, I fill in my own performance appraisals, in many areas above average [11]*
165		*"As for managing myself because of the workload in the office, I try to meet the targets and since we have to achieve at the end of the – every year or government year we have targets every three months, I have to see that whatever targets I have for the year I am following up and I have to evaluate myself every three months what I have achieved to move to the next and if I have not, and if I feel I am not going to achieve I talk with my boss and there is no wrong or right. I initially thought you know one has to be right all the time, but now I realise no, when*

		I have to, when I failed to achieve it is not a crime, I have reasons of why I have not achieved and I am able to put them on the table. [2]"
166	Serving own interests"	*"Yes, I fill in my own performance appraisals, in many areas above average [11]"*
167	Different promotion procedures in higher echelons:	*"Somebody must promote me or say I work hard because from (chief director position) (promotion) is political [14]"*
168	Ignorance about graduate's work	*"I evaluate the appraisal (for the graduate), and she has to do it. That's how we do it. Yes, because – not fully, because I'm also right here, but when I evaluate her I, well, the supervision I do have because and there's enough because we have (another one) [6S]"*
169		*"I think we have got about two if I'm not mistaken and we have got also problems with the ophthalmologist and also the challenges that we are facing is in terms of the theatre times especially the resources when it comes to theatre times and in some cases the issues of consumables so in doing well [3S]"*
170	Not leading to promotion:	*"So, if they need to commence probably the performance appraisal does not reach the level, where I can be promoted. [2]"*
171	Low expectations for performance	*"And for us there are only – we don't have a lot of services that we would like to render, our main thing as far as on the provincial level is we are going to two, three meetings at national and then our support visits, support visits are vital to us. But, this year we haven't had any support visits because the submissions were not approved. [5S]"*
172	Proud of her teaching	*"When they come, the nurses, they don't know anything. But by the time they wrote they are so good, like doctors [12]*

Q. INTERVIEW PHASE CASE SUMMARIES

Case	1	2	3	4	5
Who is the graduate?	Female, social sciences graduate	Female, ophthalmic nurse	Male, ophthalmic nurse	Female, optometrist	Male, ophthalmic nurse
What is s/he doing?	Coordinating district health support programme (not eye)	Coordinating national health promotion services	Coordinating provincial eye care programme	Providing clinical optometry services at a primary care facility	Coordinating provincial eye care programme
Where is the graduate?	Dynamic role, growing, respected, performing well	Low intensity role, stagnant, demotivated, neglected demeanour	Prefers clinical work, neglects admin, frustrated, self-interest	Does mostly clinical eye care, low productivity, bored, self-interested	Tries to organise provincial level service delivery, frustrated but motivated
How is the graduate applying?	High applier of some competencies	Low applier of most competencies	Low applier of most competencies	Low applier of most competencies	Moderate applier of most competencies
Why is s/he or is she not applying?	High position, good relationship with senior management	Leadership, position, system challenges	Self-interest, relationships, system challenges	Self-interest, wrong post, wrong course	Position, system challenges, no support
What are the main challenges?	Low opportunity to apply finance, human resource management	Low opportunity to apply in current post	Relationships, system issues	Biased views on eye care, system issues	Relationships, system issues
What have been the main achievements?	Developed best practices, mentoring, advocacy	Increased interest in ophthalmic training	Clinical status	Own further education achievements	Stakeholder management selective
Has the programme performance improved?	No, but she does not work in eye care	No, but she is promoter of the national strategic eye care plan	No, it may have decreased.	No, it may have decreased.	Perhaps

Case	6	7	8	9	10
Who is the graduate?	Female, ophthalmic nurse	Female, Ophthalmic clinical officer	Male, Ophthalmic clinical officer	Male, Ophthalmic clinical officer	Male, Ophthalmologist
What is s/he doing?	Coordinating national eye care programme	Coordinating regional eye care programme	Coordinating national non-eye care project	Providing clinical eye services at primary care level	Providing general medical care in private practice
Where is the graduate?	Does well in organising eye care services, motivated but over-worked	Does well in organising eye care services, motivated, well supported	Does well in official role, respected for regional eye advisory role	Does mostly clinical eye care, coordinator aspirations	Does mostly clinical care, highly successful, happy
How is the graduate applying?	High applier of most competencies	High applier of most competencies	High applier of most competencies	Low applier of most competencies	Low applier, but was early adopter in former role

Why is s/he or is she not applying?	Project & programme, motivation, position	Project, motivation, support, position, personal	Project, programme, motivation, position	Too remote, wrong station, wrong post	Self-interest, wrong post
What are the main challenges?	System issues	Few system issues	System issues, no post in MoH	System issues	Few system issues
What have been the main achievements?	Many personal achievements and commendations	Many personal achievements & commendations	Many personal achievements & commendations	Immediate changes after PgDCEH	Own further education achievements
Has the programme performance improved?	Yes, it has been doing better, thanks to projects	Yes, it has been doing better, thanks to projects	Not sure as he does not work in eye care	Not likely	No, it deteriorated after his departure.

Case	11	12	13	14	15
Who is the graduate?	Male, Ophthalmic clinical officer	Female, Ophthalmic nurse	Male, Health technician	Female, Clinical nurse practitioner	Male, Optometrist
What is s/he doing?	Providing clinical eye care services at a district health facility	Teaching ophthalmic nursing at nursing college	Coordinating national non-eye care project	Coordinating provincial health primary care directorate	Providing clinical services in private practice setting
Where is the graduate?	Does mostly clinical eye care, with some coordinator roles	Does mostly eye nurses' teaching, practicals, studying	Does extremely well in extremely difficult circumstances	In highly senior position overseeing eye care since before PgDCEH	Does mostly clinical eye care, highly successful, self-interested
How is the graduate applying?	Low applier but was high applier in former role	Moderate applier of some key competencies	High applier of most competencies	Low applier of most competencies	Low applier of most competencies
Why is s/he or is she not applying?	Programme, position, system issues	System issues, personal issues	Project, motivation, position, support	Programme, position, system, self-interest	Wrong post, outside public health
What are the main challenges?	System issues, personal	Position, wrong station, understanding	System issues, political issues	System issues, support,	Partisan views on eye care, system issues
What have been the main achievements?	Spearheading training status of unit	Various work-related achievements	Many personal achievements	Acting as chief director	Own further education achievements
Has the programme performance improved?	No, it had declined	Not likely	Yes, highly likely	No, the programme performance declined	No, it may have decreased.

R. VIGNETTES OF INTERVIEWED GRADUATES

Vignette 1: Achievements

Interviewee [12], an ophthalmic nurse with nurses' education qualification, was accepted into the PgDCEH via RPL. Now, after 5 years, still a "junior" tutor at the same institution, responsible for coordinating the training of ophthalmic nurses. She is directly involved in the training and the practical supervision, which involves organising hospital placements of her students. She also organises outreach camps, using these same nurses to do screening and referral for treatment. Her work performance is highly appraised, but mainly related to her teaching roles. She does some planning, but not project management style, more like ward matron style, without much regard for targets and success monitoring. She is organising well, though not controlling as well as she should. Her leading is reasonably effective, it shows in the design of the nursing training curriculum, development of guidelines, involvement in Nursing council, selection committee for the nurse trainees and participation in the National prevention of blindness committee. She enjoins good support from her line manager and even further up in the organogramme.

Vignette 2: Changes in roles

Interviewee [11], a clinical ophthalmic officer, was in project coordinator position upon entry to the PgDCEH, but following withdrawal of the NGO partner, the graduate lost many of his key roles in planning, coordinating and organising eye activities. He returned to clinical duties in the hospital, reporting to the ophthalmologist, the head of the eye clinic. Project monitoring stopped, and reporting became redundant. His own advocacy to secure the appointment of an ophthalmologist resulted in the ophthalmologist taking over his coordinating roles, leaving him with mostly clinical work. The ophthalmologist, his line manager is partisan to his plight and delegates some management responsibilities to him, including periodic staff supervision. However, the relevant management functions are applied with low intensity.

Interviewee [10] was medical superintendent and provincial ophthalmologist at a rural provincial hospital at the time of starting with the PgDCEH. After the PgDCEH, he went on to complete an MSc in Community Eye Health. For a few years he exhibited high application of PAMCs, with great achievements, but was removed from his post, for unknown reasons. At the time of the interview, he was a general practitioner in the national capital city, rarely applying any of the PAMCs beyond patient management. For the future he sees himself as playing a role in the national programme, as the eye care fraternity is very supportive. This private practice work is only interim, and he believes it helps him to exercise many of his clinical skills.

Vignette 3: Health programme challenges

Interviewee [05] had an ophthalmic nurse qualification when he entered the PgDCEH. He came into a vacant provincial coordinator post following his graduation with the PgDCEH. He receives good support from his line manager, who herself seems to lack effective management ability. Between the

two of them, the focus is on securing budget to attend meetings and travel costs for monitoring. The broader need to develop the eye programme for the province is not a main priority for them. No provincial eye care plan has been developed, hence the programmatic application and activity is very low. Providing irregular, NGO funded outreach services is the modus operandi. This, "project" work makes for positive reporting in a largely passive programme environment.

Interviewee [14], a nurse by profession, works in the provincial health department as a deputy director with eye care being one of several sub-directorates in her portfolio. She has been at this senior management level from before the PgDCEH and has also acted on behalf of the director of public health in the past. Her main reason for doing the PgDCEH was to learn more about eye care as she had been "away from the clinical side for too long". The management functions of planning and organising are executed as administrative formalities and controlling merely as high-level monitoring. She reckons that the funding shortage, unavailability of adequate staff and low interest of senior management are challenges she cannot overcome but does not realise that she herself can be regarded as senior management! She expresses the lack of line manager support as a key personal challenge.

Vignette 4: Impact on career development

Interviewee [01] entered with 4-year Bachelors' degree, non-eye related, worked in rural health district as health promotion officer before enrolling for the PgDCEH. Immediately after completion of the PgDCEH, the graduate was promoted to the Quality manager position in the same health district. Her roles and responsibilities are largely coordinating, administration and management-focused, though not in eye care. She applies many of the PAMCs and identifies project management and advocacy as the most useful. Even after 5 years in the management position, she has little opportunity to apply financial and human resource management skills, mainly because budgeting is occurring one level above hers, and she does not have anyone reporting to her.

Interviewee [06], an ophthalmic nurse by qualification, was appointed as national coordinator right after completion of the PgDCEH. This position gave her opportunities to apply all the PAMCs. Her achievements include organising a Rapid Assessment of Avoidable Blindness survey, an eye care situational analysis and evaluation of the National Eye Health Programme. She is directly involved in planning and organising many activities that contribute to meeting eye health programme performance. Through this, she has set up collaborative partnerships with international NGOs, resulting in many project-based eye services being rendered in her country. One of her challenges is that the eye care programme sits in the public health as opposed to chronic diseases department. She does not enjoy much support from her line manager, who is uninvolved and disinterested. She attributes much of her success to the PgDCEH.

Vignette 5: Suitability

Interviewee [13] was accepted on the course with RPL as he only had two one-year certificate courses listed as tertiary education on his CV. However, as he was the project coordinator for his country's

National Eye Care Programme, he had much opportunity to apply PAMCs. At the time of the interview, he was working as project manager for an international eye care programme in a neighbouring country. He applied all four management functions with high effectiveness, albeit under difficult circumstances: a country struggling with war, political conflict, people displacement and famine. He is respected by his project partners (*"I have seen good support from him to make sure that the finance on the project is good, He knows what he is doing he is very good. [13S]")*, his NGO line management and the Ministry of Health, and attributed most of his achievements to the PgDCEH. Arguably, he is also a great advertisement for the course, having taken up the learnings with exemplary diligence. We thought that the course was meant exactly for somebody like him.

Vignette 6: Demotivation, despair and demotivation

Interviewee [02]'s highest qualification before the PgDCEH was a Diploma in Ophthalmic nursing, a two-year post-basic nursing qualification obtained at the national medical training centre. She is employed at National level in the Ministry of Health, and reports to the Head of the Ophthalmic Services unit, an ophthalmologist. She sits in a flat organogram, flanked by staff responsible for support of clinical ophthalmology services in the country. She basically fulfils supporting roles for the implementation of the National Strategic Eye care plan, which includes organising health promotion and staff development events. She applies most of the PAMCs in a low intensity manner, mainly because her duties require little management type decision-making. Personally, she stagnates as a professional and has become used to low performance intensity. Improving the outcomes of the eye care programme she works in is not in her immediate interest, as it could be, as she is part of the national eye care team. In her work she is under-utilized as a resource. Physically, she occupies a small desk with a computer, swamped by boxes of health education and awareness materials and the encroachment of her team members.

Interviewee [04] had a Bachelor of Optometry degree at entry to the PgDCEH and was one of the top performers in the course, academically. She came into this (100% clinical) post from a district coordinator post (up to 50% coordination). She now realises that she is "sick of doing clinical" and "doing what a newly graduated optometrist should be doing". There is little opportunity to do management work, although unsuccessful attempts had been made to initiate planning and organising functions. Her work involves mainly clinical practice management, but she is not performing simple management tasks such as monitoring, organising her services to improve eye services for the population she serves.

Vignette 7: Poor line manager leadership

Graduate [02] encountered situations of poor job allocation, possibly due to lack of utilizing or recognition of her qualification or skills. According to her line manager, *"When I want (secretarial) things done, I give to her not only ophthalmic." [2S]* This role is fulfilled with the requisite courtesy, and perhaps resignation: *"Because when it comes to scanning or when it comes to – if he is not in the office, then he requests me to make sure that (it gets done)." [2]* And, *"Doctor writes the letter and I deliver it*

because he is the head [2]." Her workstation setup is very cramped, and not conducive to expansion and growth.

Her line manager describes her position in the organogram as follows: *"She sits, she sits here with this one. This one use to sit here. But now this one seems to have first an issue, this one has decided to join them, this one sits with this one. And these are with him, also who is part of that. This one sits nowhere. Or, everywhere rather than nowhere-" [2S]* This limited structural and functional space affected her scope of practice, her role in the unit and her motivation. It was like a ceiling, nowhere to move up to, but deemed unfair compared to the ease with which medical staff can move up in the ranks, with relatively unclear functions.

The line manager's views on the graduate's situation are: "*I don't view it a burden, because you are still able to work, I can sometimes. Or her performance. I cannot see that, I can just see that it's – on the one side it provides great closeness of the team. What do you mean space? [2S]"*

Vignette 8: Extreme self-orientation

Interviewee [03], a celebrated ophthalmic nurse who won many accolades in his professional career, had several nursing qualifications to his name before starting the PgDCEH. Despite his earlier discipleship of commercial leadership gurus, he shows little application of it, particularly when considering that he is in the post of provincial eye care manager. He is not applying his PgDCEH acquired knowledge and skills in his specific context despite having all the opportunity. He prefers to do clinical work, because "who else will look out for the plight of the poor patients?" His application of planning and organising is sometimes elevated to programme level, but he exhibits low controlling and leading functionality. There is lack of proper performance management, and only had a small role in supervision.

The graduate holds a management position in a provincial eye care programme, preferring to do clinical work, despite ample opportunity to apply PAMCs. His line manager insists that he manages his portfolio, which includes the provincial eye care programme, and three district coordinators. He justified his focus on clinical work as follows:

"*They want me to do administration, that's all and manage the three eye care coordinators in the three districts in the province. I'm supposed to be responsible for them, listen to their problems and all that, doing the administration but you know I believe that well I'm hands on. I want to even in theatre I was working in theatre. When we do the cataract operations I'm the runner. I'm actually not staying back and looking at the, say what how many operations did we do? No, I go to theatre, I assist the ophthalmologists-" [3]* This graduate found comfort in clinical work, almost to the extent that it provides escape from the tedious "admin" work. The clinical work relates to the core purpose for studying nursing: to provide clinical care, but also provides quick rewards for himself. This is extreme self-orientation, pursuing targets for own gain, while not applying PAMCs to meet programme targets.

Vignette 9: Highly valued, trusted and respected

Interviewee [08], a high applying graduate in project manager role. An ophthalmic technician by training, came to the PgDCEH via RPL. He was then doing cataract surgery and eye disease treatments. He is now a project manager, working in a project focusing on leprosy. He is in a highly respected, but informal, appointment as regional advisor to the national coordinator for eye care. These positions are filled by ophthalmologists in other regions. His PgDCEH qualification made him over-qualified for his former post in the Ministry of Health. He is anxiously pining to return to working in eye care, as do his erstwhile line manager and colleagues. In his new role, he has staff that report to him and he reports to the organisational NGO that funds the project that he manages. He has a lot of autonomy in this role, applying most of the management skills. He is well connected with the eye department and is voluntarily involved in training and advocacy for eye care at provincial level. His line manager is very supportive and appreciative of the value he adds to eye care in the region and respects him very much. *"He helps us in training and in making draft plans for national health. He contributed a lot and I think this most probably because of this training. That is what I can make out. He is more inspired now he knows what he is talking about. [08S]"* This applies to other areas of his life as well: "*I am a respected person from the church on the component of planning, just using the same knowledge, so my life now, it is almost governed by almost most of the knowledge that I got from the postgraduate [08]".* Like his line manager, he attributes his success to the PgDCEH. "*Yes, because in that (PgDCEH) we learned how to run the project and how to run the programme, the indicators, all the issues, because you know (I manage) the financials here. The money is given (by the NGO), not the Government. I am the one who manages things, human resource, money, how much do we send to the Government, to this organization, how do we monitor and how do we achieve what we need to achieve. [08]"*

Vignette 10: Common programme challenges

A questionnaire survey respondent who established a district eye care service in one province and then proceeded to facilitate the establishment of another in a different province itemised the challenges he faced as follows:

- *Lack of financial support- no designated budget for eye care programmes.*
- *Eye care not considered a health priority and not fully integrated into PHC activities.*
- *Inadequate eye care personnel – eye surgeons, ophthalmic nurses, clinical officers.*
- *Lack of designated eye care infrastructure – no eye theatres, no eye wards, in most health facilities no reserved spaces for eye care services.*
- *Inadequate eye drugs, equipment and supplies – No refraction kits, no supply of readymade spectacles and other than tetracycline eye ointment all eye antibiotics can hardly be found in our dispensaries.*
- *Lack of eye care partner organisations – local/international organisations. Most programme donors / funders not interested in eye care.*
- *Lack of career progression for eye care workers resulting into staff exodus. Most eye care workers have joined other well-funded health programmes.*

- *Eye care qualifications not well recognised and do not attract pay rise nor change of salary scale. This does not attract health personnel to joining eye care teams.*
- *Lack of transport to undertake outreach programmes. No motorbikes and no motor vehicles, hence most of the planned outreach activities remain on paper.*
- *Lack of trained community eye care volunteers.*
- *Lack of referral system for eye patients.*
- *Lack of eye care managers."*

Vignette 11: Working in projects with line manager support

Interviewee [07] had acquired a Masters degree on top of her PgDCEH, after having entered with a cataract surgeon qualification, and through RPL. She is a high applier, applying the PgDCEH acquired competencies in her daily work. She is in a very happy demeanour: successful, having received awards, achievements, improved her education and proud that she has moved up the ranks. Over the years, thanks to the skills of the PgDCEH she has learned to deal with difficult situations. She now feels triumphant over earlier issues and thriving in a context where she is in control of her establishment, which includes men, which is unusual in her cultural context. Her line manager is very knowledgeable about her work, recognises her achievements, and encourages her. He is knowledgeable about PgDCEH training. Her line manager is very knowledgeable about her work, recognises her achievements, and encourages her. He is knowledgeable about PgDCEH training.

The graduate was highly commended by her line manager: "The graduate is a central player. She plans – before going to the (project) she used to be the head of the primary eye care unit. She has been doing both, she has been doing as a managerial-level programme manager for primary eye care and at the same time she has been doing some clinical services: primary diagnosis, putting on people's specs, and then planning for cataract correction, or something of that nature. [7S]"
As she was seconded from the ministry to coordinate the eye project, she claimed independence in managing the NGO funding, as it is allocated to the government project under her control. 'They (the ministry) are getting funds, they have to go through several levels. But, as for us, it goes directly to the eye hospital, which I'm recommended to all our work plans [7]"

Vignette 12: Demotivation and self-orientation

Interviewee [04]'s challenges include her lowly resourced workstation, her misfit in the organisational hierarchy, and her failure to understand her role in the health system outcomes desired. She is probably not enjoying much interest from her line manager and fills much of her slack time with clinical training. She realises that she did not do PgDCEH to learn about management, she wanted to have further specialization education in eye care. and she is comfortable in that position for many personal reasons. She is frustrated, but very comfortable in her work, has no desire really to get out of clinical work. As optometrist feels strongly partisan. "I'm not working in isolation, I'm working with the other disciplines in eye care." [4]

Vignette 13: Lack of opportunity - private practice

Interviewee [15] entered the PgDCEH with a Bachelor of Optometry degree, working as a private optometrist in his own practice. He did the course because he wanted to improve his chances of teaching at the university. He was funding his own studies. At the time of the interview he was in the final stages of a Master of Optometry, which he was allowed into by virtue of his PgDCEH. Although working in the private sector gives little opportunity for engagement with public eye health, he remained in contact with public health eye care through delivering subsidised services to patients at government hospitals and participating in the relevant governing bodies. Although the owner and senior optometrist, he performs little more than regular clinical optometry, and running his practice, much the same way he did before the training. In the context of programme management, he exhibits low application of competencies. We thought that this is the kind of candidate the PgDCEH was not meant for.

Vignette 14: Lack of opportunity wrongly placed

Interviewee [09], an ophthalmic clinical officer, entered the PgDCEH through RPL. He works at a district hospital that is situated in an extremely remote setting, performing clinical eye care tasks. He reports to a senior ophthalmic clinical officer, who in turn reports to a unit manager. The chances of applying management, and the opportunities for management promotion are extremely limited. He talks text book like about management issues but lacks the application. The need for clinical staff in the region is severe. The hospital manager is very supportive of the management training and sees the value of effective management in a health service facility. The graduate could learn from the hospital manager, but he is too far below him.

S. PgDCEH ASSIGNMENTS SCHEDULE

The below is an example of a typical Assignments schedule, which formed part of the practical aspect of the PgDCEH. The assignments were used for assessment and coaching of the students whilst in their work settings.

	DETAILS OF ACTIVITIES	SUPERVISOR	DUE DATE	VULA DATE
1	Eye care programme activities plan and budget, templates provided.	The course faculty were providing support and supervision to the students doing the assignments. The University's online learning platform (Vula) was used during the distant aspects of the PgDCEH.	15 April	N/A
2	Health professional education and health promotion		13 May	29 April
3	A. Abridged situational analysis of district eye care programme B. Presentation of district eye care plan		10 June	27 May
4	A. Multi-year financial plan for ideal district B. Presentation of funding strategy		8 July	24 June
5	Development of a project plan for school eye screening		5 August	22 July
6	Human resource development and management		2 September	19 August
7	Leadership strategies		30 September	16 September
8	Controlling frameworks		28 October	14 October