Radical visible pedagogy and specializing the everyday

Leandri Joubert

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Department of Education

Faculty of Humanities

University of Cape Town

Supervisors:
Assoc. Prof Ursula Hoadley
Prof Johan Muller

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PLAGIARISM DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works, of other people has been attributed, and has been cited and referenced.

Leandri Joubert

Signed by candidate

Signature: _____ Date: 17 December 2021

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There and Back Again.

I always thought Bilbo Baggins' book title rather odd, too plain for the magnitude of the adventure, too simple for the complexities he had to navigate. But as I find myself with "home" in sight I think Bilbo got it right. The value of the big-ticket events in life is coming back to the start and realising how the view has fundamentally altered. So, as I take in this view I want to acknowledge my companions on this adventure.

Ursula and Johan, the main navigators that made me turn the map the right way up, pointing out both streams and dragons, and providing a gentle pressure to keep me going, yet allowing the moments where I had to just pause. As I read through this work for the 100th time I see the brush strokes of your guidance and patience, and the product of understanding with the luxury of time. My deepest thanks.

Mom and Dad, you did your best to prepare the way so I can finish this journey, from clearing forests to preparing meals and endless other adaptations to whichever location this out-of-her depth hobbit found herself. Dankie. To all of those that travelled with me at some stage, whether we battled trolls, galloped across meadows, or simply recharged in moments of mutual support and validation – Audrey, Irma, Leah, Soa (and your mom), Megan, I hope to return the favour. To those that stayed in the Shire but cheered me on – Marli, Anchen, Terry, Kgomotso, Natasha. Thanks for steadying the work ship when I couldn't.

Then lastly, and perhaps a little unorthodox, I need to express gratitude to this piece of work itself. Halfway into the journey I suffered a great loss, and this study has been a cathartic companion bridging the divide between the old and the new, representing the last unfinished piece of an old life. I am however ready to let go now – not even Bilbo took this long.

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ABSTRACT

Studies in pursuit of understanding a pedagogic practice to optimise learning across socio-economic classes have taken various forms, with classroom-based studies ranging from focussing on single pedagogic elements to Bernsteinian-type studies allowing for the investigation of the relationship between elements. What has been less prevalent is understanding the relationship between knowledge and pedagogy within the pedagogic discourse. In this study the aim was to explore this relationship as it operates within an apparent optimal pedagogy, especially in relation to a classroom comprising learners from mixed socio-economic backgrounds.

The study was done via classroom observations of two teachers at a high achieving high school serving learners of mixed socio-economic status. In high school the subjects are more specialised and the selection of two different subjects, with different knowledge structures, was done to foreground and optimise the knowledge component. Teacher competence was selected for using qualifications and experience. The analysis was done in two parts: first, developing the concept of a teaching episode to generate units for analysis, and second, coding each episode in terms of strength of classification, framing and the purpose of the horizontal discourse, where present.

Analysis showed that both teachers used a dynamic variable pedagogy, which constituted of a dominant traditional visible pedagogy, but moments of weakened framing occurred where it temporarily took the form of a mixed pedagogy. Investigation into these moments revealed, firstly, that they were intentionally used, and secondly, the weakening was enacted by the strategic and managed introduction of the horizontal discourse. The latter was recruited for different purposes in the different subjects but operationalised in the same manner through “specializing” the everyday by relocating it into the meaning structure of the vertical discourse. The impact thereof resulted in the differentiation of the class rather than the individual and generating a cultural connectedness via a new common specialised discourse, thus potentially showing in operation Bernstein’s radical visible pedagogy.

1. CHAPTER ONE

Introduction

What makes a good teacher? The potential parameters for investigation, and the foundation for their evaluation, are as diverse as those that would attempt to answer this question. Overlay this conversation with the reality of the differential achievement of children from different socio-economic backgrounds, and the juggle of variables becomes even more complex. Such debates find themselves located in various scenarios, from the school staffroom to the expertly crafted marketing material designed to sell an educational solution, from teacher training institutions to the plethora of motivational quotes about teaching that fills social media. Formal studies in pursuit of investigating the idea have taken several approaches, from analysis of texts to entire curriculums, schools, and education systems, from large scale school effectiveness type studies to small scale classroom-based investigations. For this investigation I conducted a case study on the composition of the pedagogic discourse at a high achieving high school comprising of learners from mixed socio-economic backgrounds. I selected for competent teachers, to allow for a comparison with the idea of an optimal pedagogy as approximated in literature, as well as subjects with different knowledge structures to enable the potential exploration of the relationship between knowledge and pedagogy.

In this chapter I will position this case study within a broader research conversation, by first providing a high-level overview of traditions in classroom-based research drawing on a review done by Hoadley (2012). From here I will highlight some key concepts regarding an optimal pedagogic practice as it pertains to classrooms hosting learners with low socio-economic status (SES). Finally, I will give the rationale and research question of this study before concluding with an overview of this thesis.

1.1. Traditions in Classroom Based Studies

Early traditions in classroom-based research comprised mainly of three different approaches, that of systematic, socio-linguistic, and ethnographic studies (Hoadley 2012). In all three cases, classroom-based observations were the sites of data collection, with the differences lying in the focus of the study and the methodology of the analysis.

The earliest classroom-based research is considered the work done by Flanders in the United States (Amidon and Hough 1967). Classroom observations focused on the socio-emotional environment in operation within the classroom by studying the verbal behaviour of the teacher and students. The methodology used to analyse data provided the first coding scheme to investigate classroom interactions.

The ORACLE Study was the first systemic and large-scale longitudinal classroom study in the United Kingdom. It made use of a similar methodology and further developed the coding scheme from Flanders to study the effectiveness of various teaching approaches in primary school classrooms (Galton and Simon 1980). The study was considered to only contribute with insights into how classroom interaction is organised (Alexander 2001), but it did add to the understanding of an asymmetrical pedagogy, that is, the ratio between teacher-talk and student-talk, which laid the foundations of what would later become known as teacher-centred or learner-centred teaching styles (Hoadley 2012:188).

These types of studies made use of pre-specified coding schemes, derived from theory, using classroom-based observations to test these theories, rather than derive them. Such investigations are considered deductive in their methodology. The alternate inductive methodological approach is characteristic of ethnographic type studies. These are grounded in theory, exploratory and often small in scale, with the aim of capturing rich classroom records from where theoretical frameworks could be derived. These studies would ask questions pertaining to wider sociological, linguistic, and cultural classroom aspects.

The third approach was socio-linguistic, where the focus was around the composition of discourse and the patterns of classroom interaction. A key example here would be the work of Sinclair and Coulthard (1975, 1992) where the analysis moved away from examining teaching styles to investigating the actual knowledge exchange in the classroom.

These three approaches continued into the 1990s and presented from the body of research three focus areas, namely that of teaching styles, interaction patterns within the classroom and the importance of time. From here there was an emergence of more large-scale and cross-cultural studies. Among the most noteworthy of these were the IEA Classroom environment study (Anderson et al, 1989), the TIMSS video study (Stigler and Hiebert 1997) and the Five Cultures

study of Alexander (Alexander 2001). In each case several classrooms across different countries were observed and analysed. These studies brought to light some key issues. Firstly, at the level of the classroom, teaching is not a collection of separate features but a "system of tightly connected elements" (Stigler and Hiebert 1997:61) where the modification of a single feature will likely have little effect. Secondly, they showed the cultural embeddedness of classroom activity and the interrelatedness of the entire school system, in which classrooms and teaching are positioned within schools and their systems, as well as social, economic, and political forces.

Although moving away from the classroom and focusing on the level of the school, there was also a rise of School Effectiveness studies through the 1960s and '70s and is still prevalent today. These studies aimed to understand differential school achievement by identifying school factors that most contribute to student success, in other words *what* works and *why*. The most prominent, and prevailing, study is that of Coleman (1966) which reported that the impact of school is very little compared to that of home background and that the latter was the most reliable predictor of success. The study further suggested that the second biggest impact factor being that of teacher quality. Since the Coleman report, this research approach has become widespread and is often the driver behind educational reforms. These studies are however criticized for their focus on inputs such as resources and management, with less emphasis on factors such as curriculum content, pedagogy and issues pertaining to social class (Chitty 1997). It treats the classroom as a black box, considering the inputs and outcomes, but provides little insight into the processes that produce these various outcomes.

1.2. The South African context

When looking at classroom-based research in the South African educational landscape, very little existed prior to 1990 largely due to the legacy of apartheid and hostility towards researchers in the classroom (Hoadley 2018). The transition into democracy opened the door for classroom-based research, where the initial focus was mostly on understanding what was going on in various South African classrooms. One such study was the President's Educational Initiative (PEI) which consisted of 35 small scale studies investigating teacher practice, curriculum, and use of learning support materials, where the most prominent finding was that of poor teacher knowledge (Taylor and Vinjevold 1999). A further noteworthy study of the immediate post-apartheid era was the Threshold Project that investigated the nature of language and the barrier to learning it presents

when learners are required to switch from their mother tongue to that of English as the language of teaching and learning (MacDonald 1990). It found that learners did not have nearly sufficient vocabulary or knowledge of the language structure to engage with schoolwork, leaving them alienated and resorting to rote-learning work they did not understand.

School Effectiveness studies were fewer and only increased in popularity much later as more school performance data became available. Once such studies were undertaken however, their results aligned with the international findings pertaining to the significance of home background as the primary predictor of success. Although some studies pursued the effect of school-based factors on student performance, these were not able to differentiate between school and classroom factors (Hoadley 2012:191). In contrast School Improvement research was more abundant with the work done by Taylor (2007; 2008). From these large and medium scale studies, a picture emerged of the descriptive features of South African primary school classrooms. This included: the dominance of oral discourse with little opportunity to read and write, classroom interactions taking the form of collective chanting, low level of cognitive demand, slow pacing, weak forms of assessment, the absence of feedback to learner responses and the lack of print material in the classrooms (Hoadley 2012:192).

Findings such as these have been further investigated and supported via several smaller scale classroom-based studies, especially around the issues of time, language, and knowledge. It confirmed findings from larger scale studies and contributed additional descriptive features such as the erosion of instructional time, collectivized learning, multiple issues pertaining to second language teaching and learning, low levels of teacher knowledge and dominance of everyday, context dependent knowledge (Hoadley 2012:197-199). These studies however also revealed factors associated with learning gains. At the level of discourse, appropriate assessment and provision of feedback to learners was identified. At a knowledge level teacher proficiency in the language of instruction, a focus on reading and writing and the amount and type of reading and written work were key factors. When considering time, most learning gains happened where knowledgeable teachers effectively planned curriculum coverage in terms of content exposure and cognitive demand, as well as adjusting pace to suit pupil ability (Hoadley 2012:199).

1.3. Research Shortcomings

The factors listed above take steps towards characterizing a curriculum and pedagogy to maximize learning gains. Hoadley's (2012) review also provides a useful example to illustrate the complementary fashion of smaller scale studies to corroborate or inform larger scale projects. This potential interplay is particularly important considering the shortcomings of small-scale classroom-based research traditions, both in research focus and methodology.

Methodologically, the various approaches mentioned thus far each present with its own limitations. Larger scale systematic and quantitative studies produce large data sets from where data analysis can be undertaken with a certain level of confidence. These studies are however limited in that the data collection is a "closed system" that requires pre-determined coding schemes or data collection devices. Smaller scale, qualitative ethnographic studies can go in with less fixed pre-specified ideas and so allow for discovery, but here sample size and methodological rigor may limit the generalizability of the findings. Large scale studies also carry issues of sampling, measurement (where self-reporting of participants is relied on) and *how* the data set is analysed. Whereas in smaller studies data collection is potentially easier to navigate in terms of access and recording.

A further issue to consider is that of research focus. The understanding gained from cross cultural studies shows that teaching is an "inter-related system of organisation, discourse and values" (Alexander 2001) and this interrelatedness highlights the potential shortcomings of large-scale studies where factors are studied and characterised in isolation. Studies would provide insights into features such as pace, amount of reading and writing, and teacher knowledge, but not on the relationship between these factors.

As a next step, a classroom research methodology that allows for a structured approach into investigating classroom variables and their relationships would therefore be ideal. The work of Basil Bernstein provided researchers with a framework to explore such classroom factors and their relatedness, by examining the organisation of knowledge as well as its transmission. In the next section I will consider a few key studies of this nature, especially as it pertains to optimal pedagogy.

1.4. Towards an Optimal Pedagogy

The early descriptors under which curriculum and pedagogic features were grouped was that of traditional versus progressive teaching styles. The former refers to a teacher-led classroom, where the curriculum is content driven and categorised into subjects. The latter represents the other extreme of the continuum where learners are more independent, the curriculum integrated with weaker boundaries between subjects and with less content specification. As more knowledge about child and learning development emerged, these progressive classroom environments have gained popularity. The efficacy of such teaching approaches does not always have the desired effect when deployed in classrooms, especially those with low SES learners. In the South African context much of the failure can be ascribed to implementation limitations and in terms of poor teacher knowledge of both the subject matter and the curriculum requirements (Hoadley 2018; Muller and Hoadley 2019). There are however arguments against the effectiveness of learner-centred approaches when engaging with low SES learners, even in the case where there is teacher competence. To illustrate such limitations in the context of a mixed SES classroom, I want to draw on a study done by Lubienski (2004).

The pedagogy under investigation is a discussion-intensive, problem-centred instruction where the curriculum is centred around "real world" problems that are structured such that through engagement, learners would abstract important mathematical ideas for themselves, rather than being given formulas and set procedures. The role of the teacher is that of facilitator, rather than the conventional role of transmitter. Lubienski was interested to find out how this pedagogy would be experienced by learners from different socio-economic backgrounds, considering its movement away from what learners are used to.

Firstly, the role of teacher was not clearly understood. Despite the teacher clearly explaining her role, it was not experienced equally, and therefore optimally, by all learners. For example, in the case of a high SES, mid achievement student, her view on the teacher's facilitative style was that the class figured out what was right and wrong through "hints" given by the teacher so that they can "figure it out", in other words she identified the alternative pedagogy at work (Lubienski 2004: 113). In contrast, the low SES, low achievement learners attributed the non-direct guidance of the teacher to her (the teacher) not wanting to hurt the students' feelings and teacher "hints" as constant correction. (Lubienski 2004: 117).

Secondly, the discussions themselves were not experienced or participated the same by all. Both high SES learners interviewed stated that they experienced the discussions as an opportunity to learn more, hear the points of view of others, express their own and learn from each other through hearing alternative ways of solving a problem (Lubienski 2004: 114 - 115). Their contributions were frequent and moved the conversation forward, at times pushing the conversation to an abstract level. The low SES learners participated with varying degrees of enthusiasm, but said that they found all the ideas confusing, with one stating that she would prefer a return to a more direct didactic style (Lubienski 2004: 116-117). More telling however is the nature of their contribution, which ranged from correct answers to straight forward questions, to doing basic tasks such as volunteering to read a paragraph. In both low SES examples, the learners' solutions were rooted in real life examples using real life reasoning. An example was a mathematics problem requesting the learners to calculate a per unit price to determine which is the better buy. Here the learner based her choice on the cheapest, not realising the intended exercise of comparing unit prices (Lubienski 2004: 116).

In this scenario low SES learners could not identify the pedagogy at work and was left unsure of what was required of them and did not fully participate or make any learning gains from the experience. In other words, for all children to equally engage in meaningful learning, the pedagogy in operation must be clearly visible to all. In Bernstein's pedagogic discourse that which makes clear to the learner what is expected and what correct and appropriate performance entails is termed evaluative criteria. This forms a critical component to an alternative *mixed* pedagogy proposed by Morais (2002). Here elements of a traditional pedagogic practice are retained and supported by others from the more progressive modality. Evaluative criteria, the role of the teacher and the selection and sequencing of the content or skills to be learned are considered part of the elements reminiscent of traditional pedagogies. At the progressive end, the mixed pedagogy calls for a relaxation of interpersonal relations, i.e., although the teacher maintains the role of the knowledge authority, more open communication relations need to exist between teachers and learners, as well as between the learners themselves. Accompanying this is a relaxing of pace to allow for the individualisation of the rate of learning.

The pedagogic elements however do not operate independently, but the change of one can lead to a change in another (Morais 2002, Morais et al 2004). A case study presented by Barrett (2017)

provides an illustration of the interplay between two pedagogic elements. Observations were done of a 5th grade teacher achieving academic success with her learners, despite being in an education district known for its socio-economic segregation. The observations showed significant evidence of teacher integration with the community and the everyday lives of the learners. Barrett argues that this connectedness enables her to position new material and concepts in line with learners' everyday realities and so keep them engaged, which ultimately provides the pedagogic space to communicate clear evaluative criteria. In other words, the relaxing of the hierarchical teacher-student relations allowed for the strengthening of evaluative criteria.

The prevalence of everyday knowledge in the classroom is another point of contention in the progressive versus traditional classroom debate. Although there are arguments for the use of everyday knowledge adding value to the learning experience (Bourne 2004; McLean, Abbas, and Ashwin, 2013) the proposed mixed pedagogy calls for curriculum content where the use of specialised school knowledge is privileged over that of everyday knowledge (Morais 2002:561). To illustrate impact of the poor use of everyday knowledge, as well as the absence of evaluative criteria, I will refer to a study done by Hoadley (2007).

This study contains a comprehensive investigation into understanding social class inequalities in South Africa conducted through investigating maths pedagogies. Teachers from both working- and middle-class schools were observed and analysed, and a sample group of learners from each class was assessed for the acquisition of the relevant mathematical concepts and problem-solving methodology. The results of the latter showed that the learners from the middle-class classrooms outperformed those from the working class. Average scores ranged from 80 – 91% for the middle-class learners, with nearly all able to solve eight or more of the 13 test questions. Learners from working class groups averaged 32 – 48%, with 25% of the learners being unable to do more than two of the questions.

Extracts from teachers shows the distinct difference in the use and dominance of everyday knowledge in the classroom. In that of the teacher from a working-class school it is seen that although the lesson topic was that of rounding off, the theme of trees was dominant and became the object of the lesson. Most of the lesson time was used on the wording of the problem from the textbook, chanting phrases, drawing, and discussing tree shapes as the teacher would move beyond

the text and mathematical context. When she finally did engage with the maths question, learners had to solve a problem with no mathematical principle being taught. When learners could not solve the problem, the teacher resorted to having learners chant an incorrect rule (Hoadley 2007:687-689). This stood in contrast to the teacher from the middle-class school. Here the teacher dealt with the wording of the problem swiftly and used an example of different coloured sweets in a jar to illustrate the mathematical procedure, eventually dropping it entirely and only using the mathematical terminology (Hoadley 2007:690-692). Everyday knowledge was therefore used as a tool to navigate the specialized knowledge but remained subordinate throughout the lesson.

The idea of a mixed pedagogy therefore moves the conversation beyond the binary notion of a progressive or traditional approach and proposes a pedagogic practice that shows real promise in enabling learners from low SES to access academic achievement. Furthermore, the characterization of the pedagogy is done in terms of the Bernsteinian notions of classification and framing (elaborated on in Chapter Two), which allows the abstract characterizing of each element in terms of its own status and change in response to another. This language of description, alongside other theorisations of Bernstein, has contributed to the research and analysis of classroom-based research in varied environments, especially as it pertains to the sociological aspects of educational practices.

If one returns to the concept of an optimal pedagogy, what does appear to be less prevalent in empirical studies to date are two areas. The first is at the level of sampling, especially in a South African context. Here the idea of an optimal mixed pedagogy is mostly used as a yardstick to identify what is going wrong in the classrooms of underperforming schools serving low SES students, with few studies of similar schools that "work" and so possibly develop the identified practice further. Additionally, studies done are mostly at the primary school level, which then asks the question if the proposed practice and underlying theory can be extrapolated into the higher grades. Secondly, although the methodology allows for the observation and analysis of the interplay of the identified pedagogic elements, such as that between interpersonal relations and evaluative criteria, the relationship between knowledge and pedagogy is less well defined.

To continue the optimal pedagogy journey, I was initially interested in simply investigating the classrooms of a high achieving high school serving learners of low or mixed SES, through the lens

of a mixed pedagogy. The use of a high school classroom as a study site however presented an additional opportunity. At the senior grades learners are more likely to have the basic acquisition of the subject discourses and the subjects themselves are presented in a more specialised form. In addition, earlier studies in the South African context highlighted teacher knowledge as a precondition for success, with the most recent survey once again advocating for improvement of teacher knowledge levels before expecting significant gains in academic success (Muller and Hoadley 2019).

If one then holds steady the factor of teacher competence, by selecting for knowledgeable and experienced teachers teaching different subjects, a large portion of the observed pedagogic differences could reasonably be ascribed to the different subjects that are being taught. In combination, such an investigation could potentially foreground the interplay between pedagogy and knowledge and so provide an opportunity to explore this interaction.

1.5. Motivation & Rationale

The personal motivation for this study comes from a professional pursuit of exploring classroom teaching "best practice" in the various formal teaching environments in which I have found myself in the past 14 years. Although these ranged from NGOs, government, and private high schools to corporate training programmes, the common theme has been the socio-economic diversity of the students, and subsequently asking myself the question: how best can I develop and deliver content to provide an effective learning experience for all? Having witnessed the transformative power of well timed and executed teaching methodologies, I am interested in what characterises the operational core of an effective and inclusive pedagogic practice.

Investigating such a practice against the backdrop of classroom studies necessitated purposeful sampling of the research site, where student success and the classroom composition of low or mixed socio-economic status learners were factors that were required to be kept constant. In addition, to allow for the exploration of the interaction between pedagogy and knowledge two subjects with contrasting knowledge structures would have to be selected for. I first encountered School X as a substitute teacher, where I was struck by the unity among learners despite the large school size and its multicultural and socio-economic status. Learner conduct, achievements and general level of school commitment appeared, at face-value, on par with those of learners from

surrounding schools with a much higher socio-economic status. A few years later I encountered the school again during an engagement with the principal whom I interviewed around her subject specialisation and approach to Life Orientation. During this interview, she made explicit the range of socio-economic backgrounds the learners originate from, with a large proportion coming from working class homes. The school has effectively maintained a 100% pass rate and a significant number of learners go on to study at university and graduate in the minimum time allowed, many in the field of medicine. This school therefore presented itself as a quasi-experimental site to conduct a classroom-based case study.

My main research question therefore is:

What is the relationship between knowledge and pedagogy in two contrasting subjects in a high achieving, mixed SES high school?

I will approach this question through considering the following sub questions:

1. *How is the pedagogic discourse constituted in the classroom of two contrasting subjects?*
2. *What type of knowledge is privileged in each of the classrooms?*
3. *How do the pedagogic features compare between subjects with different knowledge structures, i.e., between Life Science and Life Orientation?*
4. *How do the findings speak to the dominant models of optimal pedagogy (mixed and radical visible pedagogy) in the research literature?*

1.6. Overview of thesis

In this chapter I have positioned this study in the context of classroom-based research, specifically around the question of differential achievement of learners from low SES backgrounds. I also stated my research question and the four sub questions I will use to build towards answering the primary question. In the following chapter I will elaborate on the theoretical framework used for this study as well as use this to unpack key studies from literature relating to the idea of an optimal pedagogy. The third chapter constitutes the methodology undertaken for this study, first outlining the sampling strategy, data collection and research ethics. This is followed by describing the analytical frameworks used to analyse the data, especially in the context of a high school classroom. Chapter Four constitutes the analysis of the data. Here I will address the first two sub-

questions regarding the features of the pedagogic discourse and knowledge type, by first analysing the data for the Life Science lessons before repeating the analysis for Life Orientation. The key findings of the analysis will then be brought over into Chapter Five where I will interpret these by answering the two remaining sub questions. Finally, I will consider the research limitations of this study before addressing the primary research question in the conclusion.

2. CHAPTER TWO

Theoretical framing of the study

2.1. Introduction

In Chapter One reference was made to the work of Basil Bernstein that provided the central theoretical background, and language of description, for classroom-based studies that investigated the differential achievement gap in learners from different socio-economic settings. This case study follows in that approach. In this chapter I will address the primary theoretical framework and the key associated concepts that will be applied, after which I will use it to review some of the empirical studies pertaining to an optimal pedagogy.

2.2. Theoretical Framework

Bernstein's career in sociology reflected his search towards the comprehension of the "barriers to upward social mobility" (Sadovnik 2001: 687) and central to his theories lie the notions of power and control and how these are enacted at the various levels of society. His early works produced the concept of sociolinguistic codes, where the "code" refers to principles regulating the verbal planning function. He identified two general coding systems: the elaborated and the restricted code, where the definition of these two codes did not lie in the vocabulary used, but in the users' orientation to meaning (Bernstein 1964: 57). In the restricted code the language is context bound and the meanings particular to the social environment of the user. The elaborated code however is considered context-independent with the meanings universal. Although these initially had a linguistic application, these codes became a point of departure to understand the differential school achievement of low SES learners compared to those from middle-class backgrounds. He argues that learners enter the schooling system either more, or less, inclined to take on and operate in the specialized knowledge of schooling or the school "code". This variable predisposition does not necessarily lie in the innate ability of the child, but in their social relations and social structure. Learners from a working-class background only possess the restricted code and enter school with this localized community "code" as their basis, with no prior development or exposure to the school code. Middle and upper-class learners on the other hand have access to both the restricted and elaborated code, with the school code comprising the latter. Thus, learners from working class backgrounds are disadvantaged as they are not orientated to this code (Bernstein 1964: 66). In light

of this, pedagogy comes to the fore as being the crucial practice through which learners, and their orientation to meaning, can be inducted into that of the school code. (Hoadley 2008)

2.2.1. The pedagogic discourse

Bernstein turned his attention more explicitly to the social reproduction within education, where he introduced the idea of an education knowledge code, which refers to the principles underlying curriculum, pedagogy and evaluation. He developed sets of concepts, or a further language of description, that can be used to characterise the pedagogic discourse (Bernstein 1975), where the pedagogic discourse is the "specialized communication whereby differential transmission/acquisition is effected" (Bernstein 1990: 158).

The first concept is that of two different types of curricula. Here Bernstein distinguishes between a collection type and an integrated type of curriculum, with the primary distinction lying in the relationship between content (Bernstein 1975: 78). If the contents are insulated with clear boundaries between each other, one is dealing with the collection type, whereas if the contents are in a more open relationship, with reduced insulation, it is known as the integrated type.

Bernstein then addresses the second set of concepts of classification and framing. In the case of classification, it speaks to the message system of the curriculum within the education code. It builds on the boundary principle used to distinguish between the two curricula where classification is the measure of the degree of boundary maintenance and the nature of differentiation between contents. Strong classification indicates that contents are well insulated by strong boundaries, where weak classification implies the opposite, with less insulation and blurred boundaries between content (Bernstein 1975: 80). In the context of the classroom this can refer to the boundary between every day and specialist knowledge, or knowledge between specialized disciplines. Classification is concerned with the "what" of teaching, whereas the concept of framing is concerned with the "how". Framing specifically speaks to the relationship between the teacher and the taught and the degree of control they can exercise over the elements of selection (what is communicated), sequence (the order in which communication takes place), pacing (the rate of required acquisition), criteria (the appropriate realization of the discourse) and the social relations. Strong framing suggests more control by the teacher over the process, whereas weak framing suggests more control by those being taught (Bernstein 1975: 80).

Bernstein further identified two systems of rules that encapsulates the above elements of the pedagogic discourse, namely the rules of social order and the rules of discursive order. He termed the rules of discursive order the instructional discourse, which is concerned with the selection, sequence, pace and criteria of the knowledge content and competencies being transmitted, whereas the regulative discourse pertains to the rules of social order and the expectations around elements such as conduct and manner. The two discourses operate simultaneously within the classroom, but their framing values can vary independently. The instructional discourse is also considered to be embedded in the regulatory discourse, with the latter being the dominant discourse. (Bernstein 2000: 13). In practice this implies that even though framing values can vary, there is an interplay between the two discourses, where even though one could attribute a framing value to the instructional discourse, it would always be influenced by the regulatory discourse in operation.

2.2.2. Horizontal and vertical discourse

The last concept that is fundamental to this study, and the analysis of the data, brings the conversation back to classification and the "what" of teaching. Here Bernstein develops a language of description for two fundamental forms of discourse that is often seen as oppositional and contrasting to each other. His theory builds upon Durkheim's view that society can distinguish between two types of knowledge: esoteric (sacred) knowledge and mundane (profane) knowledge (Durkheim 1967, Bernstein 2000). In this instance Bernstein's focus is on the structures that comprise each form of knowledge. In the educational context, one form is considered official school knowledge and the other everyday or common-sense knowledge. Bernstein termed the former a vertical discourse and the latter a horizontal discourse with the subsequent definitions derived from the forms of knowledge realised in the two discourses.

Horizontal discourses are characterised by being "local, context dependent and specific, tacit, multi-layered and contradictory across but not within contexts" (Bernstein 2000:157). Bernstein takes the theorisation of this discourse further by drawing on an additional critical feature, that of segmentation. The segmented nature refers both to the way the knowledge is organised and in the manner through which it is acquired. He argues that the segments are not related by a greater organising principle that integrates their meaning, but rather by their functional relations to the context of everyday life. There is no pedagogic progression as such through the knowledge, the acquisition of one segment may bear no relation to the acquisition of the next.

The composition of vertical discourses on the other hand is considered "coherent, explicit and systematically principled" with strong distributive rules that regulate access, transmission, and evaluation thereof (Bernstein 2000:160). This discourse is further divided into two knowledge structures. The first is hierarchically organised, where knowledge at the lower levels can be integrated, extrapolating uniformities in pursuit of establishing general propositions and abstract theories. Bernstein called this a hierarchical knowledge structure, and an example would be that of the Natural Sciences. The second is known as a horizontal knowledge structure. Here, rather than that vertical stacking from general to abstract, the structure is composed of a range of specialized languages that stand in parallel relation to each other with specialised "modes of interrogation". These languages are however not translatable, and each holds its own criteria for the production of legitimate texts. An example of this would be the Social Sciences.

2.3. Bernstein and optimal pedagogy

The above concepts and languages of description subsequently sets the scene to theoretically characterise and empirically investigate a pedagogic practice that can induct learners into the school code. I will start by looking at two generic types of pedagogic practices identified by Bernstein, namely visible and invisible pedagogies.

2.3.1. A Visible Pedagogy

Central to the relationship between pedagogy, or codes of transmission, and the "shaping of the pedagogic consciousness of the acquirer" (Bernstein 2000: 16) Bernstein introduces the notions of recognition and realisation rules. The recognition rule refers to the acquirer and their ability to recognise the context of the discourse, such as the school context, and the realisation rule refers to the production of the appropriate text by the acquirer within that context. If these criteria are not made explicit by the transmitter, i.e., the framing is weak, then it renders an invisible element to the pedagogy in operation to the acquirer. Bernstein refers to this as an invisible pedagogy. On the other hand, if the classification and framing is strong, and criteria are made explicit, the pedagogy in play will become more visible to all learners.

Bernstein took the idea of visible and invisible pedagogies and used it as a means to characterise the two major, and often thought of as opposing, modalities of pedagogic practice, namely the 'conservative' or traditional teacher-centred versus that of a 'progressive' learner-centred

pedagogy referenced in Chapter One. He positioned these two practices along a continuum from a logic of transmission to a logic of acquisition. The former refers to visible pedagogies where the discursive rules are known to both the transmitter (teacher) and the acquirer (learner). The focus is on the performance of the learner and the extent to which the texts created by learners are meeting the criteria. Such a pedagogy will therefore produce a difference between learners, i.e., they are "stratifying practices of transmission" (Bernstein 1990:62).

For invisible pedagogies, the discursive rules are only known by the transmitter who acts in a facilitation style to assist the acquirer in "filling the pedagogic space" (Bernstein 1990:62). The approach is competency-orientated and focusses less on individual performance against an external standard, or other children, but on internal procedures of acquisition. When this is intentionally used in the classroom there appears to be weak classification and framing, but the teacher would still be required at a high level to select and sequence tasks. Similarly, learner's productions will at some point need to be evaluated against a norm, yet the responsibility to discern between what is success or failure now lies with the learner. Evaluation therefore replaces instruction, where learners (such as those from low SES backgrounds) that need overt induction into the vertical discourses will be left out.

If we return to the study of Lubienski discussed in Chapter One, we can therefore see that through the facilitative style used the low SES learners were unsure of what was required and, as in the unit cost example, unable to perceive what the question was asking (recognition rule) and therefore did not produce the required answer in that context (realisation rule) even though the answer given was a sensible one.

In the South African context, the need for clear and intentional strong framing, especially with regards to the evaluative criteria element of the pedagogic discourse, is argued by Shalem (2015). Framing is deemed strong when such criteria are made explicit to the learner and little is left to interpretation, whereas weak framing would be when the criteria are implicit and not made known to the learner. Strong framing in this case overtly orientates learners to the school context, or school code, and so allows learners to develop the recognition and realisation rules required for achievement (Morais 2002: 560). Shalem reflected on the failure of the introduction of scripted lesson plans (SLPs) to significantly improve academic achievements in low performing schools.

The idea of the SLPS, compiled by subject experts, was to improve on teaching practice by breaking down and applying the curriculum into daily lesson plans, where content selection, sequence and pace were stipulated, as well as specifying core teaching and assessment routines. Although teachers had access to these plans, these did not script or (could not) account for evaluative criteria. Therefore, although framing was strong due to the use of SLPs, the supposed visible pedagogy still had invisible the crucial component of evaluative criteria.

So far, a visible pedagogy takes us closer to approximating an optimal pedagogy for a mixed SES classroom, where the central characterisation lies in strong classification and framing over all pedagogic elements. Classification and framing however can, and does, vary within the pedagogic discourse, and so the logical progression in pursuit of an optimal pedagogy would be to establish the most suitable variation thereof.

2.3.2. A Mixed Pedagogy

In Chapter One I introduced a proposed optimal pedagogic practice that emerged through research done into understanding the disparity in achievement of students in science education (Morais 2002). Morais draws specific attention to Bernstein's theory of the pedagogic discourse, in terms of the regulative and instructional discourse, their interplay and impact on the recognition and realisation rules. The research identified the need for a mixed pedagogic practice in terms of classification and framing of the various elements of the pedagogic practice, in order to position learners in such a way to optimise their chances of placing themselves, and their learning experience, in the school context. She characterised this pedagogy with weak classification and framing pertaining to pacing, hierarchical rules, knowledge relations and space, but stronger classification and framing in terms of selection and evaluation criteria, with the latter being considered the most critical component (Morais 2002: 560). Morais et al (2004) followed up with an empirical study to explore the pedagogic practice that allows for the successful acquisition of scientific knowledge and competencies of learners irrespective of social class background.

In this investigation both the "how" and the "what" of teaching was studied, with a focus on teacher scientific competence in terms of knowledge and investigative abilities. Four teachers of fourth year primary school classes, with mixed social backgrounds, were selected, trained, and observed using instruments that were developed for each pedagogic dimension and measured according to

Bernstein's concepts of classification and framing. Indicators for each were developed and attributed to a four-point scale that ranged from e.g., strong classification to weak classification, i.e., C++, C+, C-, C--. The results obtained in this way allowed for the characterisation of the individual teacher's pedagogic practice in relation to the theoretical profile. Teacher scientific competency was also assessed. This information was analysed in relation to student performance and socio-economic background (Morais et al 2004: 77-80).

The results and subsequent analyses provided strong support for the case of pedagogy being able to overcome the effects of social background in student achievement, as well as support for the structure of such a pedagogic practice. In the first instance the teacher with a pedagogic practice closest to the theoretical practice had less than 50% of the students of any social class level achieve below level 2 (low achievement), whereas the teacher furthest from the proposed pedagogy had more than 50% of all social groups showing low achievement. What is more important however is the understanding of which factors had the greatest impact (Morais et al 2004: 82).

For the "what" of teaching intra-disciplinary relations and evaluation criteria emerged as the strongest contributors after the first teaching unit, with only evaluation criteria being the strongest after the second teaching unit. In the regulative context space relationship between teachers and students, and child-child hierarchical rules were the largest contributors after the first teaching unit, with the teacher-student space relation being the most significant after the second teaching unit. (Morais et al 2004: 83-84). These components were however only effective when combined with strong scientific competency on the part of the teacher. This includes both knowledge proficiency and the skills-based competencies that need to be present.

The significance here is therefore twofold, firstly it supports the case for the proposed mixed pedagogy as an optimal pedagogy for achievement of learners from all socio-economic backgrounds. Secondly, it highlights a vital addition to the pedagogy's success: teacher knowledge competency. Teacher knowledge of the subject being taught seems an obvious prerequisite for teaching, but the significance thereof does not only lie in the teacher being able to recall and apply knowledge but is the foundation from where the teacher must navigate the requirements of making evaluative criteria explicit. If we return to Shalem's review of Scripted Lesson Plans, she argues that "unless the teacher has strong conceptual knowledge of what she teaches, she will struggle to

decide what evaluative criteria should count and how to make these explicit to the new acquirer" (Shalem 2015:185).

Evaluative criteria, however, do not operate in isolation and are impacted by other factors, such as pacing. Weak framing of pacing is when the learner has some control over the time taken to acquire a concept, or move on from one concept to another, and is considered a critical component in clarifying evaluative criteria. Abundant time is however not a reality in many classrooms so those learners with secondary sites of acquisition, such as family at home, allows for more learning time available to the learner and so an increased chance of success. In the case of low SES learners, the home is unlikely to be such a site and the learner remains at a disadvantage. Weakening of pacing is however not merely achieved by increasing the time available to the learner but can be achieved through other components of the pedagogic practice (Morais 2002: 561).

One such example is weak classification of spaces. In such an instance the teacher is physically in the proximity of the learners and can engage with them on a personal level, and learners can interact with each other. This concurrently results in a weakening of framing over the hierarchical rules, allowing for discussion, questions and clarification which serves to reduce overall acquisition time and so provide opportunity for weakening of pace. It also strengthens framing of evaluative criteria as learners can share ideas and receive instant feedback (Morais 2002: 561).

The last pedagogic dynamic pointed out by Morais is that of the interplay of the instructional discourse with the regulative discourse in terms of evaluative criteria and hierarchal rules. It is argued that where, using the example of test feedback as a privileged form of communication of evaluative criteria, the nature of the feedback given by the teacher can either refer to the instructional discourse, e.g., content correctness, or the regulative discourse, e.g., behavioural correctness. In the presence of such explicit feedback the framing of evaluation criteria is strengthened, but in the personal nature of the feedback the framing of hierarchical rules is weakened. Similarly, if the feedback is absent or limited, the evaluative criteria remain weakly framed, but the framing of the hierarchical rules becomes stronger (Morais 2002: 562). The case study by Barrett (2017) referred to in Chapter One provides another example of this interplay between hierarchical rule and evaluative criteria. We see that the weakening of hierarchical rule

between teacher-student relations through her community involvement created the required space for evaluative criteria to be meaningfully transmitted.

This interplay of the increase of framing of one discourse resulting in the weakening of another does not necessarily hold for all components of pedagogic practice, but it does illustrate how these dimensions interact and are not singular commodities that can be dialled up or down independently.

2.3.3. Knowledge structures

In the studies discussed thus far reference has been made to the classification of knowledge in the classroom, i.e., the relation between school and everyday knowledge, or academic and non-academic knowledge. The emerging optimal pedagogic practice suggests strong classification between academic and non-academic knowledge, but weaker classification between subjects. This does not exclude any reference to non-academic knowledge, as the use of everyday applications can enrich the learning experience, but the use of such knowledge must be communicated in such a way as to not lead, especially low SES learners, to experience this as a weakening of the classification (Morais 2002: 561). Reviewing all epistemological arguments in relation to mixed SES classrooms however exceeds the scope of this study, but I do want to pause and consider a further argument in favour of a knowledge-based curriculum.

Earlier I elaborated on Bernstein's distinction between vertical and horizontal discourses where his focus was not on the content of each, but on their structure, production, and modes of acquisition. Horizontal discourses are tied to specific social contexts and mostly only relevant in that context, whereas the vertical discourse originates due to the integration of knowledge and meanings, not tied to any context. The induction into the latter requires the individual to develop the capacity to also integrate meanings independent of the context in which it is delivered. Vertical discourses therefore become sites of the "unthinkable" and "yet to be thought" (Bernstein 2000) and consequently hold the potential to transform knowledge and its application, which can ultimately challenge the social distribution of power.

In a classroom context this means that vertical discourses need to be recontextualised from the original site of production and appropriately relocated in the relevant pedagogic discourse. Wheelahan (2007) examines this when she deliberates the consequences of a vocational education

and training curriculum where the knowledge included in the curriculum is need-to-know content only, that enables the receiver to simply do the job, i.e., the knowledge has been relocated out of the original vertical discourse, closer to the horizontal discourse. In reference to this content selection, she argues the following:

> "… students are provided with access to specific content, and not the systems of meaning in disciplinary knowledge. … Unless students have access to the generative principles of disciplinary knowledge, they are not able to transcend the particular context. Students need to know how these complex bodies of knowledge fit together if they are to decide what knowledge is relevant for a particular purpose, and if they are to have the capacity to transcend the present to imagine the future. Knowledge is not under their control." (Wheelahan 2007:648)

If one applies this to a mixed SES classroom, the above implies that by presenting students with content alone, even if specialised, if such content does not systematically expose learners to age- and grade-appropriate underlying principles of the greater subject discourse, learning will be limited to the immediate implementation thereof. Coupled with the "dis-orientation" to the school code explained at the beginning of this chapter, it bars access to a more generalised grasp of subjects for low SES learners.

2.3.4. A radical visible pedagogy

Privileging specialised knowledge in the classroom does not however mean that it should be implemented at all costs, but rather that it should be the default, accurate, engagement with the subject discipline. To conclude I want to highlight a study that makes the case for the strategic introduction of the horizontal discourse into the classroom, where this introduction serves to enrich and support the delivery and acquisition of the subject discourse.

This study builds on the two opposing pedagogies, conservative and progressive, characterised by Bernstein. When he characterised these along a transmission and acquisition continuum, he also introduced an additional vertical dimension: the object of change. Intra-individual is when the pedagogy is to produce changes in the individual, with Inter-group being at the other extreme where change lies between social groups (Bernstein 1990). This can be seen in the figure 2.1 below.

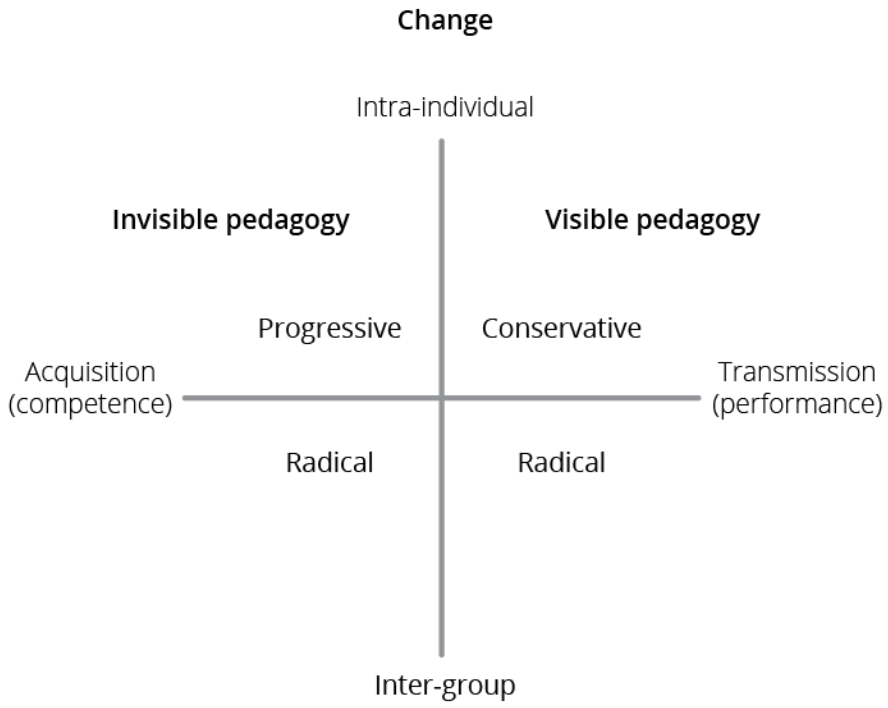


Figure 2.1 Bernstein's Forms of Pedagogy (Bernstein 1990:63)

The upper left-hand quadrant therefore represents the progressive, invisible, pedagogy and the upper right-hand quadrant that of the visible and conservative. The addition of the vertical dimension however opens two other variations, and the one of interest here is the bottom right-hand pedagogy, which Bernstein describes as a "radical realisation of an apparently conservative practice" (Bernstein 1990:64). At face value this pedagogy might not seem too different from the conservative pedagogy, due to its transmission and teacher centred nature. The difference however lies in the objective, where in this radical form rather than focussing on the individual ability, the competitive element is replaced by learning as a collective endeavour to produce changes in the relations between social groups. Bourne (2004) elaborates on this stating that it inverts the competitive individual ability learning approach to one of collective access and participation, situated within "the social and political context which learners are themselves socially positioned" (Bourne 2004:66). This practice requires on the part of the teacher the "explicit effective ordering" (Bourne 2004:63) of the discourse and one additional characteristic of this pedagogy: the weakening of framing as it pertains to communication by allowing local forms of discourse. In other words, the strategic introduction of the horizontal discourse is used to create cultural

connectedness, where the content is delocated out of its local and contextual location and relocated within the classroom discourse which is integrated by meaning, such that the integration-by-meaning ordering prevails. This is illustrated in Bourne's observed lesson for this study.

During this lesson, the teacher facilitated the reading of a text to a group of students aged 14-15. In the initial extracts, the lesson was teacher-led from the front of classroom; her language was formal, and she required equally formal responses from the learners and correct use of the English language. The pedagogy in play could thus be characterised as conservative and teacher-centred. In a key extract there was however a deliberate change, where the teacher physically changed her position in the class, as well as posture, language, tone and the questions asked. She encouraged students to contribute using their knowledge, experiences, feelings, and opinions on the matter, which resulted in animated, student-led informal debates. In other words, the legitimate discourse of the classroom was temporarily changed by the teacher. The teacher initially inducts students into the formal discourse of the English language and interpreting texts, but then engages in a managed relinquishing of her role as teacher and allows herself to be positioned as a woman in relation to the topic and encourages her learners to do the same. In subsequent interviews she explains this shift as a deliberate attempt at making the text relevant to her students' own personal and cultural experiences. This switch did not confuse learners, in fact there was remarkable alignment between their interpretation of what the teacher was trying do and her actual strategy. Learners stated that they felt heard, could hear the views of others, and evaluate the knowledge as a whole, whilst fully aware that the primary objective of the lesson was still to learn.

Barrett & McPhail (2021) refers to this managed introduction of the horizontal discourse as " "border crossing" between knowledge type and forms" (Barrett & McPhail 2021:8) and that it is the presence and intentionality of these that differentiates a radical visible pedagogy from a traditional conservative practice. Whilst such a pedagogy potentially takes one closer to an optimal pedagogy, what remains less clear is exactly when and how local forms of knowledge should be introduced, and its relation to the vertical discourse, considerations which are both explored in this study.

2.4. Conclusion

In this chapter I elaborated on the theoretical framework that forms both the theoretical base from where this investigation departs, as well as the language of description for the analysis of the data. These concepts were also used to elaborate on some of the empirical work done in pursuit of an optimal pedagogy that serves learners from all socio-economic backgrounds. In the following chapter I will focus on the research methodology and the specific analytical framework used for this study.

3. CHAPTER THREE

Methodology and Analytical Framework

3.1. Introduction

The research strategy for this study took the form of a case study as I was investigating a single school. The research objective also satisfied the preconditions of a case study as outlined by Yin (2013), where the research question was concerned with the "how", there was no control over the actual behavioural events and the emphasis is on contemporary issues. My investigation was focused on understanding the "how" of academic achievement in the selected school, through looking at the implementation of the formal curriculum at the micro level of the classroom. In this chapter I will outline the research methodology by first discussing the sampling strategy used for both the school and the teachers, followed by the data collection methodology and ethical considerations. I will then turn my attention to the frameworks used for the analysis of the data, where I will address the first challenge that presented itself — that of adapting existing lesson structure demarcations to the high school classroom in order to generate units for analysis. Following from this I will draw on the literature and theory discussed in Chapter Two to present the coding framework used to analyse the data.

3.2. Sampling Strategy

The type of sampling strategy used was a combination of convenience and theory-based sampling. I encountered the school used in this investigation prior to this study on several occasions. First as a substitute teacher, followed by work-related interactions and again through my professional relationship with the principal. These frequent encounters provided me with ample background knowledge about the school. This ranged from the socio-economic makeup of the learners to the macro-level management and academic achievement, where the school ranks as one of the top schools in the province.

When designing the study, the high-level criteria for selecting a school site was:

- high academic attainment and achievement,
- comprising learners from mixed socio-economic backgrounds, specifically that of mid and low SES.

The rationale was to select a site that optimized the chances of encountering an ideal pedagogy whilst keeping constant the learner component of mixed socio-economic status.

Furthermore, my interest in the knowledge component of the pedagogic discourse, my own experience as a high school teacher, and the small number of studies at the high school level generated an additional preference for a high school research site. This school therefore proved ideal, both through its accessibility and meeting the selection criteria.

Sampling at the level of the teacher was more challenging. Here one wanted to select for the "best teacher", but not only was this a vague criterion, exploring best practice is what was in fact under investigation. The temptation was therefore to move to the next most obvious criteria of selecting the teacher: academic results. This did not however guarantee a case of ideal pedagogy since the results could be due to academic streaming or the teacher teaching to the exam. The criteria were therefore rephrased to select two teachers that exemplify the typical pedagogic practice in operation in the school. From here I collaborated with the principal to generate specific criteria to enable such selection which was: seniority and years of experience teaching at the school.

To observe the potential role different knowledge structures could play in the investigation it required one further criterion: selecting one teacher engaging in a typical school subject based on a hierarchical knowledge structure and one teaching a subject area that is derived from of a horizontal knowledge structure. Based on my own subject expertise I chose Life Sciences as the typical school subject with a specialized knowledge structure. The most obvious choice for the second subject area was that of Life Orientation, where the subject discourse draws on topics from everyday life that is not specialised with respect to conventional school subjects. Furthermore, the school made use of dedicated Life Orientation teachers thus optimising the chances of this subject being taught in its intended form.

The last sampling consideration was selecting the class and grade to observe. The initial line of thought was to observe grade 8 learners as they were new to the school and not yet socialised into the classroom and school's way of working. On the same basis however, I decided to go the opposite direction and select for senior classes, where the classroom interactions would be well established and therefore more likely to present a typical pedagogic case for the purpose of this study. The curriculum at the senior levels is also conceptually more demanding and requires strong

subject knowledge on the part of the teacher. This positions the sample better in terms of the knowledge component of the research question. In collaboration with the selected teachers, lesson content that was to be taught to their senior classes were considered and lessons selected where new topics would be taught for the first time.

3.3. The Sample

Teacher LS is an experienced Life Sciences teacher, with a Bachelor of Science degree and holding various senior management positions within the school. Teacher LO is the school counsellor and is based in an office for this purpose but uses the school library as her classroom. She is one of three dedicated Life Orientation teachers and holds a Bachelor's degree in Human Resource Management.

In consultation with the teachers, I requested two sequential lessons where content is taught for the first time, and two Grade 12 classes were agreed upon. For Life Sciences the topics to be covered was that of the uterine and menstrual cycle, as part of the Human Reproduction module. The Life Orientation lessons focused on the world of work, drawing on legislation such as the Labour Relations Act, Basic Conditions of Employment Act and the Employment Equity Act. The Grade 12 group that year comprised of 25% low and 75% mid income learners, with an ethnic profile of 21% Black, 48% Coloured, 10% White, 12% Indian and 9% mixed or not specified.

3.4. Data Collection

Following the teacher selection, the principal informed the relevant teachers and briefed them on the requirements and purpose of the study. A follow up meeting was held between myself and the teachers where I explained the process, ethical matters and we decided on which lessons to observe. The teachers proceeded to manage the student consent process by issuing and collecting the consent forms. Data was collected over the course of two consecutive lessons, of the same class, per teacher and consisted of classroom observations, where detailed observation notes were taken. All four lessons were also video and voice recorded.

3.5. Ethical Considerations

For this study, the main ethical consideration was that of the learners who would be participating as part of the classroom observations, video and voice recording. The consent of the learners as

well as that of their parents or guardians were obtained. This was done via the teacher explaining the purpose of the study to the learners and issuing letters to both the learner and their parents. In these letters a brief overview of the study was given once again, confidentiality and anonymity were guaranteed throughout and participants were given the right to withdraw at any time. Parents and learners were required to sign giving consent and return these letters to the teachers. Similarly, the teachers were also required to sign a consent from.

The focus of the communication throughout was on the fact that the school was selected based on it delivering excellent results and would be studied in terms of what "works". This proved to be significant especially in the context of teacher classroom observations where it prevented teachers feeling they were under negative investigation.

3.6. Data Analysis Frameworks

3.6.1. Lesson Structure & Unit of Analysis: The Teaching Episode

An initial challenge to the analysis of this data set came in the form of reducing the whole lesson down into units to apply the relevant coding schemes. Classroom studies are often divided into "tasks" as units of analysis where these are considered an "activity with a single goal or theme that the learner is required to do" (Ensor 1999, as referenced in Hoadley 2007). The use of this concept of a task however proved problematic for two reasons. Firstly, this case study finds itself located in a high school classroom, where although teaching methodology could take on a task nature, both teachers taught using lecture style transmission of new content. Lessons would start with brief administrative updates from the teachers, followed by a short overview of the lesson topic(s) in relation to the main theme, after which the teachers would swiftly move on to the delivery of the content until the bell signalled the end of lesson. Learners were required to "do" very little in terms of activities; they were mostly expected to answer questions or participate in impromptu discussions. The theme at hand would also span the entire lesson, but the presence of subtopics did provide potential content-based demarcations within the lesson. Preliminary use of this method became problematic when the coding instruments were applied and revealed an additional limitation to the use of "task".

This second limitation of using tasks as the unit of analysis lies in what might be omitted from the data. A task provides a snapshot sample of the pedagogic practice in operation for that task, at that

time, and as such interim moments and their contribution to the overall discourse is left unstudied. The task also presupposes a constant pedagogy that would emerge as trend over several tasks but does not account for any fluctuation within the task or lesson, should this occur. This was in fact the case in this study when initial coding was done using content as boundaries to demarcate units for analysis. Here several units would present within them the presence of both strong and weakened classification or framing over a pedagogic element, which would then require one to allocate an "average" score during coding, or seek an alternative method to allow the capturing of such fluctuations for the entire lesson.

Alexander (2001) provides a useful point of departure with his framework for describing lesson structure and form within the classroom, where these lessons exist in a fixed timeframe. For his lesson structures he divided a lesson into a basic beginning, middle and end, namely introduction, development and conclusion, with each stage characterised. The introduction stage can be further categorised according to its purpose, as either Procedural, where the teacher navigates the necessary tasks and logistics to get the lesson started, or Instructional, where the teacher introduces and positions content in preparation for the development stage of the lesson. The introduction can also be Procedural/Instructional when instructional introductions include procedural elements. Procedural introductions are usually shorter, and the lack of instructional focus is made up for in the development stage of the lesson. Similar categorisations apply for the conclusion stage. Procedural conclusions consist of routine cleaning up actions and any follow up administrative matters, whereas instructional conclusions play a critical role in the lesson outcome by the re-iteration and summarisation of the development stage of the lesson.

The central, development stage of the lesson is however where the main interest lies and the location of the specific challenge of further demarcation of the data set. Here Alexander characterised the development stage as either unitary or episodic. Unitary development stages consist of one extended learning interaction that is either closed, i.e., it must be completed for the lesson to continue, or open ended, where the teacher can decide the appropriate time to progress to the next stage. Episodic central stages are characterised by a sequence of separate interactions or tasks, related to the lesson's main theme which are either self-contained or linked. Unitary tasks must be completed in order to make sense of the lesson, whereas episodic development stages can be halted at any time and resumed in the next lesson.

The lessons observed in this study were episodic and linked in nature, where in both classrooms the teacher would have short procedural introductions before a brief overview of the key topics for the lesson and then systematically work her way through the content in this episodic manner. The concept of an episode therefore speaks more to the nature of this data set, but the challenge remains to clearly identify the boundaries between each episode. When engaging with the data some episodes were evident and the switch from one to the next very clear. These switches could be content-based (as initially considered) where the teacher completes a sub section of the content and the change is indicated by a clear pause, changing a presentation slide or announcing the change e.g., "let's move on". The episode transitions could also be interjection-based, where the teacher pauses the immediate delivery of content to answer a learner's questions, deal with a discipline issue or any other disruption, before returning to the teaching at hand. In such an instance the "interruption" would stand as an episode of its own. Other times the progression from one episode is more subtle and less clear, especially between episodes dealing with the same content.

Here Alexander's further characterisations of episodes once again proves valuable, where he draws attention to the purpose of the episodes. He proposes that episodes can be either re-iterative or cumulative in the case of self-contained episodes, or cumulative and developmental in linked episodes. Purpose here is understood as the underlying function or reason for the manner in which the teacher is delivering and engaging with the content. Is the content being presented and explained for the first time, or is the same content being repeated to re-iterate key concepts? Is the teacher repeating the content to include an additional tier of knowledge, or is she applying the knowledge in a real-life situation? Using this idea that each episode has an underlying teaching purpose, one can therefore use a change in purpose of (the teacher's) content delivery as the episode boundary to identify the subtler episode transitions. To illustrate this, I will draw on an extract from the data.

In the following transcript the teacher stands at the front of the classroom and the class has just come to the end of an informal discussion around experiences of starting menstrual cycles. The teacher allowed a few seconds of animated talk and chatter amongst the learners before getting the class's attention back to the lesson.

Transcript 1

Teacher:	All right [light clapping of hands]	3:21
	Ok, so, we said that if implantation didn't happen, because fertilisation didn't happen, we are going to get menstruation, and that menstruation is just basically blood, mucous and that mucous and blood is discharged together with what?	
	[pause and looks at class]	
Learners:	[soft jumble of answers inaudible on video]	
Teacher:	No, think, what must come out?	3:43
Learners:	[more mumbling of answers]	
	Waste	
	An egg	
Teacher:	Whoa, I hear it there… is a whisper… [extends arm out pointing and inviting a response]	3:50
Learner1:	An egg!	
Learner2:	An unfertilized egg!	
Teacher:	An egg!	3:57
	Because remember every month an egg will…	
Learners:	Be released!	
Teacher:	Be released.	4:04
	Ok, so that egg must be discharged, because if that egg remains there [gestures with left hand to demarcate "there"] and next month we produce another egg [moves other hand in place next to left hand] there is two eggs to fertilize.	
Learner3:	Twins [shouts out]	
Teacher:	Exactly, and imagine there is 20 eggs?	4:14

Learner4:	20 Babies!	
Teacher:	20 Babies. So this is prohibiting that sort of a thing [gestures with hands symbolising the two eggs again]. Ok? So, you have your menstruation happening. [Teacher speaks as she walks to change slide. New slide has same image but the bulleted text above it is different] Now, again, at the end of that menstruation the endometrium will start thickening again. Why?	4:17
Learner4:	Prepare for another baby.	
Teacher:	Prepare for another baby. How?	4:37
Learners:	[general mumbling] How? What do you mean how?	
Teacher:	In other words what is controlling it, because something is control…	4:43
Learner5:	Hormones [shouts out answer]	
Teacher:	A Hormone. Which is?	4:46
Learner4:	Oestrogen	
Teacher:	Oestrogen, so what is happening to the level of oestrogen now? [raises her arm in slow upwards manner whilst speaking]	4:49
Learners:	Increasing	
Teacher:	Increasing again [says affirmatively] Ok. [pause]	4:52
	Now, *some* of you experience pain during your period.	4:55
Learners:	Yes! Mm-hmm	
Teacher:	Exercise is your answer.	5:00
Learners:	[General mumbling between learners.]	

Teacher:	[raises voice over mumbling]	5:03
	Because exercise relieves that pain and loosens up what is happening in the endometrium. Ok. So I will always say [proceeds to imitate learner asking her to sit out sport] "Ma'am it's that time of the month I can't today" "Huh uh, go change it's good for you."	
Learners:	Some laughter	
Teacher:	But it *is* good for you. Exercise is good for you. Especially if you have a painful period. Ok. And obviously some people have no side effects, they don't even know they having a period because their hormones are ok, others' hormones goes through the roof [gestures with arm and smiles as her tone takes on a joking manner] and then it goes… ja…we won't … well just leave it there	5:19
Learners:	[Laughter]	
Teacher:	Ja... we'll just leave it there... [says in humorous manner over the learners' laughter]	5:37
Teacher:	[Laughs with learners as she changes slide and allows chatter to continue briefly]	
	Right, now, all of this, the uterine cycle, this ovarian cycle makes up your menstrual cycle, and they are all controlled by hormones like we've said. Now we had the talk yesterday, ok, about these hormones and I am going to put it into perspective for you now in terms of how the examiners want you to know it. Ok?	5:43

This extract covers two complete episodes and the beginning of a third. For illustration, I shall refer to them as Episodes One, Two and Three, and the shading of the table is indicative of each. Episode One starts at the beginning of the transcript. The start to this episode is typical of the more apparent transitions between episodes, with the teacher drawing the learners' attention back by speaking up and the light clapping of hands. The teacher then does not carry on with the prior informal discussion but returns to the teaching content relating to the lesson's theme, that of the menstrual cycle. At the 4:17 the teacher makes her way to the laptop to change the slide, but this does not indicate the transition into a new episode. The rationale here is that the new slide had the same image, only the supporting text differed, and it formed a continuation with that what she was busy with. Similarly, the purpose behind the episode remained the same. The switch into Episode Two does however occur at 4:55 and is an example of a subtler transition. Mid teaching the teacher changes tack and starts to engage with learners around the topic of period pain. The general theme here is still that of the menstrual cycle, but the purpose of the engagement has changed. Where in episode one she was teaching & engaging around the facts and finer details of the menstrual cycle, she now engages with the application there off in a real-life situation. Furthermore, this interaction

is also more interpersonal and relational in nature, rather than purely instructional, again changing the purpose from simply teaching specialist knowledge to sharing advice. At 5:43 the teacher once again brings the learners back to the content at hand and so we transition into Episode Three.

Using this idea of teaching episodes demarcated by either content, interjection or purpose, the data set was reviewed, and all the episodes identified and described. No time limit was placed on these episodes with the shortest lasting 9 seconds (a bird interrupting the lesson) to the longest being just under 5 minutes. The significant feature here is that even though a teaching episode constitutes the unit of analysis, they are sequential micro-samples that span the whole lesson. This allows one to build, with a fair degree of confidence, a picture of what the teachers do for the entire lesson, rather than at selected moments.

Following on from this each episode was coded for as either *Procedural Administrative*, *Procedural Instructional*, *Transmission Pure*, *Transmission Interactive* or *Behavioural*. The Procedural coding applied to the introduction & conclusion stages of the lesson, with the administrative descriptor indicating episodes where the teacher dealt with logistical issues, whereas with instructional the teacher was engaging with lesson content. The Transmission coding applied to the development stage of the lesson, and as such the key teaching episodes. The two types were decided upon after further engagement with the data when it became evident that in some episodes the teacher did most of the talking with very little to no interaction with learners. These episodes were termed Transmission Pure. For the second type, Transmission Interactive, there was significant interaction between the teacher and the learners through either questions and answers or informal discussions. The last descriptor of Behavioural was when the episode consisted of the teacher dealing explicitly with an issue around discipline or misconduct.

3.6.2. Coding of Teaching Episodes

Once all teaching episodes were identified, described, and coded for in terms of the type of teaching episode, the analysis moved on towards characterising the pedagogic practice in operation for each individual episode. In order to do this, I coded each teaching episode according to Bernstein's concepts of classification and framing, as used in the studies investigating optimal pedagogies so far.

Framing

For each teaching episode I first coded it for framing for the following pedagogic elements:

- *Selection*: The extent to which the teacher and learner have control over the selection of the instructional knowledge.
- *Sequence*: The extent to which the teacher and learner have control over the sequencing of the instructional knowledge selected within the teaching episode
- *Pace*: The extent to which teacher and learner have control over the pacing of the delivery of instructional knowledge
- *Evaluative Criteria*: The extent to which teacher and learner have control over the evaluative criteria of the instructional knowledge, pertaining to the meaning of concepts and principles and their appropriate realisation.
- *Hierarchical Rule*: The extent to which teacher and learner have control over the order, character and manner of the conduct of learners, and the relation between teacher and learner.

For each of these elements an indicator value of either F++, F+, F-or F--was given. Strong framing where the control was with the teacher was indicated with F++ or F+ and conversely weak framing, where control over the modality was with the learner(s) was indicated with F- of F--. The specific allocation of these indicators was done using coding instruments with descriptions for each value. These indicators were derived from similar instruments used in other analyses of this nature. This particular set made use of those originally developed by Hoadley (2005) and were modified to be applicable for this data set. Below is an example of the coding indicator used for Pace:

PACE

The extent to which teacher and learner have control over the pacing of the delivery of instructional knowledge.

	F++	F+	F-	F--
	Always or almost always controlled by the teacher	Mostly controlled by the teacher	Learners have some control	Learners have substantial control
During the course of the teaching episode, in the delivery of new content by the teacher	The pace at which new content is delivered is always, or almost always, strictly controlled by the teacher. The teacher doesn't vary the pace according to the learners' productions (if any) and mostly defers or ignores learners' questions and interjections or allows and/or creates no opportunity for such interjections.	The pace at which new content is delivered is mostly controlled by the teacher. The teacher accepts some learner interventions and questions, or briefly creates such moments. She answers questions concisely and moves on, occasionally varying the pace in response to learners' productions.	Learners mostly determine the pace at which the teacher moves through the content. The teacher accepts most learner interventions and creates opportunities for such interventions in the process of teaching and/or discussion. This results in the teacher varying the pace in response to learners' productions.	Learners determine the pace at which the teacher moves through the content. The teacher accepts most or all learner interventions and questions, and foregrounds such opportunities that discussions may be extended, even deviate as a result. Learners decide when they are ready to move on to the next part of the lesson.

Figure 3.1: Coding indicator used to code teaching episodes for the pedagogic element of pace.

Classification

Following on from this coding exercise, the episodes were also coded for the classification of the following pedagogic elements:

- Space: The extent to which space/s in the classroom are marked off and specialised for teaching and learning.
- Interdisciplinary Relations: The extent to which reference is made to knowledge from other subjects in the course of teaching new content.
- Interdiscursive Relations: The relation between and degree of boundedness between instructional, subject knowledge and everyday knowledge.

These were also coded using an indicator value of C++ or C+ where classification was strong, i.e., strong boundaries between discourses and spaces, and C- C-- where classification was weak. Once

again specific coding indicators were developed for each modality, an example of the indicator used for interdiscursive relations is given below:

INTER-DISCURSIVE RELATIONS: Between School and Everyday Knowledge

The relation between & degree of boundedness between instructional, subject knowledge and everyday knowledge

	C++	C+	C-	C--
	Everyday knowledge is never referenced	Everyday knowledge is briefly referenced	Everyday knowledge is referenced often	Everyday knowledge is mostly referenced
In the referencing and knowledge used during the teaching episode	Everyday knowledge is never/seldom referenced. Only subject specific content, operations, definitions and procedures are introduced. If everyday knowledge is introduced (by a learner or as part of materials) it is dealt with swiftly and not incorporated into the learning.	Everyday knowledge may be briefly mentioned and partially incorporated into the learning should it be introduced either by the material or learner interjection.	Everyday knowledge is often referenced. If everyday knowledge is introduced (by a learner or as part of materials) it is dealt with at some length and incorporated into the learning.	Everyday knowledge is mostly referenced and dominates the discussion and may lead to the distinction between the subject topic and the everyday knowledge not being clear. If everyday knowledge is introduced it is dealt with extensively and becomes the focus of the paragraph.

Figure 3.2: Coding indicator used to code teaching episodes for inter-discursive relations

Horizontal and Vertical Discourse

Once the coding for classification and framing was complete, I wanted to further investigate the knowledge used during the lessons. The classification of interdiscursive relations provided a significant indicator to establish the prevalence of the horizontal discourse, but the first analysis suggested that the horizontal discourse was being used for different purposes. To investigate this, I generated a basic indicator to identify the apparent functionality:

- Instructional Exemplary: Everyday knowledge is used to support and give relevant application to the Instructional Discourse.
- Interpersonal: Everyday knowledge is used to engage with learners in order to build rapport.
- Moral Imperative: Everyday knowledge is used to engage with learners to give guidance.
- Unclear – The use of everyday knowledge appears random and with no particular purpose in mind, or the purpose is unclear.

Only episodes that coded C+, C- or C-- were coded for use of horizontal discourse. In each case the descriptor IE, IP, MI or a combination of any of them, were allocated to the episode.

Following the coding, the data sets were captured graphically, and key texts transcribed to be used in the analysis.

3.7. Conclusion

For this case study I investigated the relationship between knowledge and pedagogy through the analysis of the pedagogic discourse of two high school teachers teaching two contrasting subjects. I selected the study site such that I was able to hold fixed the variables of academic achievement, mixed socio-economic status and exemplary teaching. To analyse the classroom observation data, I made use of the concept of a teaching episode to subdivide the dataset into units of analysis. From here I made use of the Bernsteinian notions of classification and framing, and vertical and horizontal discourses, to code, and so characterise the pedagogic practice of the two teachers. In the next chapter I present this analysis and it pertains to the characterisation of the pedagogic discourse, as well as the use of knowledge, for both subjects and teachers.

4. CHAPTER FOUR

Data Analysis

4.1. Introduction

The focus of this chapter is the presentation and initial analysis of the data as it pertains to the first two of the research questions, namely – what features of the pedagogic discourse are present in the two classrooms, and what type of knowledge is privileged in both. I will do this by first giving a description of the two classrooms of the research site, before reporting on the overall lesson structures using the concept of teaching episodes developed in Chapter Three. From there I attempt to characterise the pedagogic discourse in operation in both classrooms by firstly looking at the framing of the pedagogic elements of selection, sequence, pace, evaluative criteria, and hierarchical rule, followed by the classification of interdisciplinary relations, interdiscursive relations and space. Here the further analysis of interdiscursive relations also provides the entry point into understanding the use of knowledge in both classrooms.

4.2. The sample

Observations took place in the final academic week of the third term with grade 12 learners, before their trial exams. In both classrooms there was an established routine of learners arriving in a staggered manner from their previous lessons and standing behind their desks for the teacher and further instructions. Whilst waiting learners would casually converse with each other, some would start to take out books and would remain doing this until the teacher greets them or instructs them otherwise. During this week lessons were shortened and the timetable adjusted to accommodate an extra test lesson, which resulted in the variable lengths of the lessons presented here.

Life Sciences

Teacher LS' classroom is of the laboratory type, which contains a large work bench at the front of the classroom and narrow work benches with basins and gas taps along the side. These however do not appear to be used as the classroom is filled to capacity with tables for learners to sit at. These tables are arranged in theatre-style seating, with the left side of the classroom having an aisle that gives access to the desks or the front of the classroom. The classroom is sunny, and the walls are decorated with subject relevant posters, either professionally or learner-made. Other

educational displays are also positioned on the side benches, along with books, folders and other items that is evidential of the teacher's document management system. The teacher's desk is positioned against the main work bench, both filled with numerous items, a desktop computer and her laptop. Behind her desk she has a pin board that is covered with pictures and mementos from learners, sports teams etc. She makes use of a PowerPoint presentation as her main teaching tool. The presentation is projected on a white board onto which she makes further illustrations during explanations. Learners follow the lesson using either a textbook or tablet (the latter being part of trial being run by the provincial education department). The learners appear comfortable, but respectful of the teacher, they were dressed neatly in the correct uniform. The class total was 33 learners, with no academic streaming taking place.

Life Orientation

Teacher LO uses the library as her classroom, and this set up is neat, warm, and inviting with a variety of educational displays distributed amongst the shelves. The librarian's office is positioned at the entrance; thus interruptions are minimal when people enter the library during a lesson. The tables are arranged in the centre of the room in a "U" shape with chairs positioned on both sides of the "U". This "pop-up" classroom necessitates the teacher to connect her laptop to the library overhead digital projector at the beginning of each lesson. She also has access to a white board. Teacher LO makes use of PowerPoint presentations as her main teaching tool, whilst learners either follow in their textbooks or tablets. Learners are once again neatly dressed, comfortable yet respectful of the teacher and totalled 32 in number. Even though no academic streaming was applied for this group either, time tabling resulted in this class having a small level of perceived streaming since all learners took Mathematics as a subject.

4.3. Lesson structure

As discussed in Chapter Three, the initial challenge to analysis of the data presented itself when trying to establish the micro-divisions in the lecture-style lesson format of a high school classroom. The concept of teaching episodes was developed, and Table 4.1 below shows a breakdown of the lessons' structures according to these episodes. The first column indicates the lesson that was observed, starting with the Life Science's Teacher LS Lesson 1 (LS1) to Life Orientation's Teacher LO Lesson 2 (LO2). This is followed in column two by the total time for each lesson. The third

column indicates how many minutes of the total lesson time was dedicated to procedural matters, and then how much time was spent teaching during the lesson is given in column four. The remaining five columns show the total number of teaching episodes per lesson and their distribution according to type.

Lesson	Total lesson time (mins)	Procedural time (mins)	Teaching Time (mins)	Teaching Episodes				
				Total Number	Procedural	Behavioural	Transmission Pure	Transmission Interactive
LS1	20:04	2:00	18:04	16	4	0	4	8
LS2	39:47	2:31	37:16	40	5	1	10	24
LO1	36:00	5:35	30:25	24	6	0	9	9
L02	39:00	4:30 (+2)	34:30	37	8	1	22	6

Table 4.1: Summary of Teaching Episode number and type per lesson

When studying the above table, the first noticeable aspect is the reduced lesson time for LS1. This was due to a timetable reshuffle to accommodate a test lesson that resulted in some confusion and the lesson starting late. The same reshuffle also caused the slightly shortened LO1. The second noticeable observation is that neither of the teachers spent large amounts of time on procedural episodes; any administrative issues or lesson introductions were brief and the teachers moved into the actual teaching as soon as possible. Teacher LO did spend slightly more time on these episodes, which was very likely due to her mobile class set up in the library and the time it took for learners to walk to the location. She also had an additional two minutes of procedural time mid lesson during LO2 when resolving a technical issue.

What is potentially the most significant feature illustrated by this table is the large total number of episodes for each lesson. In all four lessons the number of episodes correspond to almost an episode per minute of lesson time. Considering that an episode is a contained interaction dealing with a section of content and/or an underlying purpose, the number of these episodes suggest a fast pace at which the teachers moved through the content.

When looking at the nature of the teaching episodes, Teacher LS seems to spend two thirds of the time teaching via interaction with the learners. Teacher LO shows less consistency, with half the time being spent interactive in LO1 but only about a quarter of the time was interactive in LO2. In the latter case some learners were in fact absent and as such the remaining learners were more reserved, therefore interaction attempts from the teacher were less successful. Nonetheless the data suggest that neither teacher engages in a passive delivery of content and that there is introduction of interactions throughout the lesson. Lastly, there were very few behavioural issues with only one brief incident with each teacher.

4.4. Pedagogic elements

Having identified the various episodes, I selected the episodes where teaching of the content was taking place, i.e., the transmission episodes. These episodes were all individually coded according to the coding schemes introduced in Chapter Three. As established, we now know that these episodes, and their associated coding, provide a continuous array of micro samples and characterisations of the pedagogy that spans the entire lesson. Considering this, one can therefore not simply average the coding for each pedagogic element to determine the pedagogic practice of both teachers but would need to look at the information the coding provides in an alternative manner. I therefore decided to do the following: Firstly, I would determine how often a coding score is allocated in each lesson for each pedagogic element, and secondly, how these values changed as the lesson progressed. To do this I first calculated the frequency of each coding score for each pedagogic element per lesson. Following this I captured the change in the coding (strengthening and/or weakening of framing and classification) of the various elements over the course of the lesson by plotting the scores for each element against each teaching episode, i.e., time. Below I present and analyse this data first for the Life Sciences lessons and then for that of Life Orientation. In each case I present the two types of graphs as point of departure to discuss the various pedagogic elements, before drawing on specific extracts from the classroom interactions as further illustration and concrete examples.

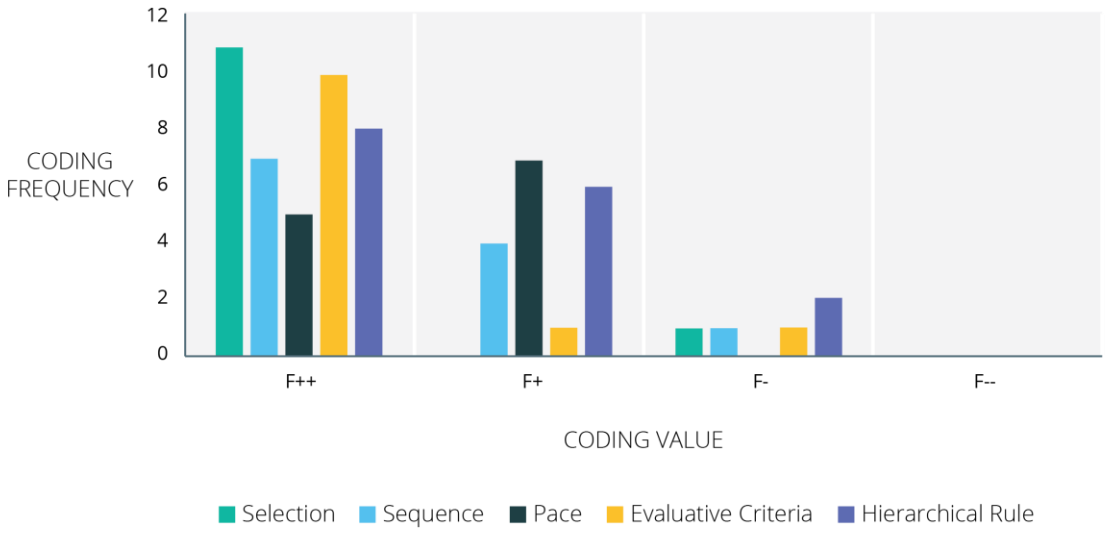
4.4.1. Life Sciences

Framing

The graphs below show the frequency and flow of coding as it pertains to framing over each of the elements of selection, sequence, pace, evaluative criteria and hierarchical rule for the two Life Sciences lessons. The graphs can be read as follows: Figures 4.1a and b show the frequency of the various coding values for each pedagogic element for the first (LS1) and second (LS2) lessons respectively. The first quarter of each graph gives the number of times the elements scored F++ during the lesson. The second quarter of the graph shows the number of times the same elements scored F+, where the third and fourth quarters of the graphs show the number of times F- and F - - were scored respectively. The separate elements can be identified using the key.

In Figures 4.2a and b the representation changes quite significantly where the graphs now illustrate the change in coding over time as the lesson progresses. Each line represents a pedagogic element in its own band. The higher the line is positioned within the band, the stronger the framing and the lower the line moves in the band the weaker framing becomes. The relative stacking of the lines is purely for illustrative purposes and carries no data value. The progress of time is given on the x axis in the form of the teaching episode number.

(4.1 a)



(4.1 b)

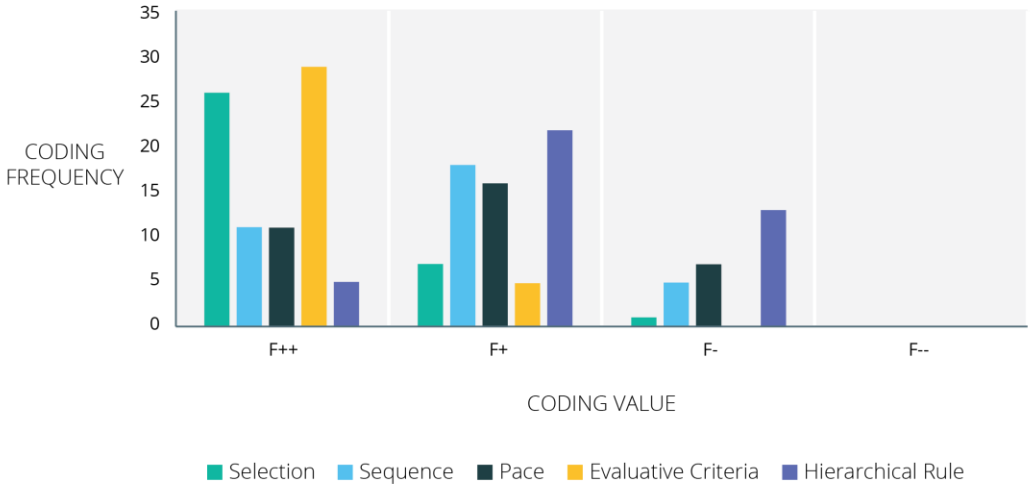
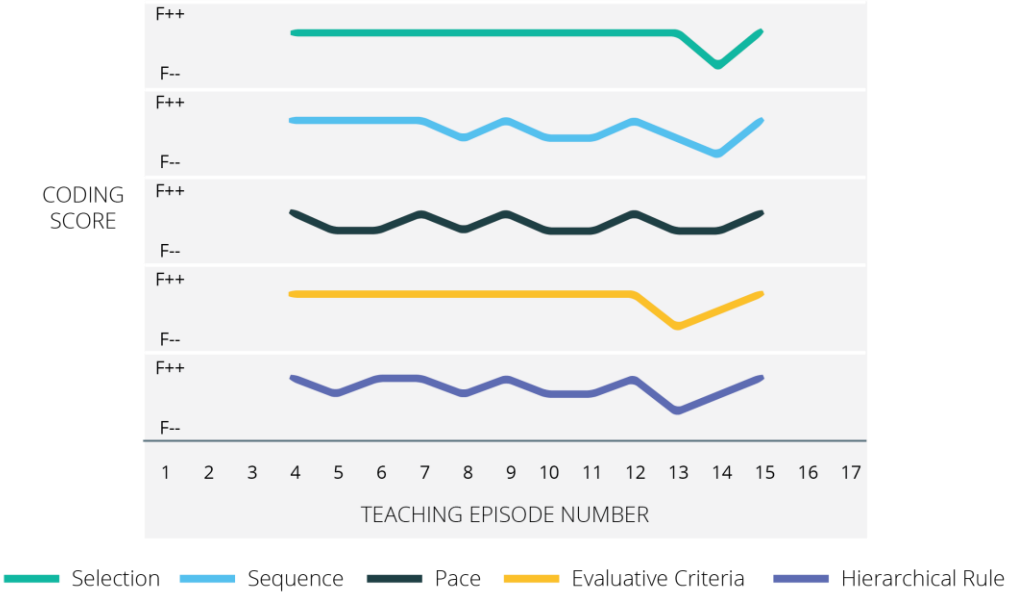


Figure 4.1: Frequency of coding for framing of each pedagogic element for the first (a) and second (b) Life Science lessons.

(4.2 a)



(4.2 b)

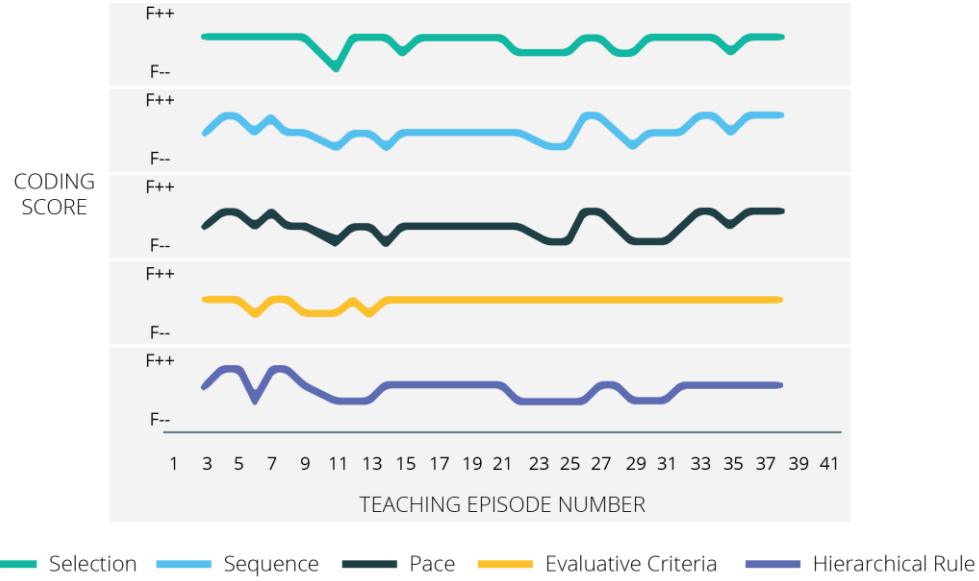


Figure 4.2 Change in coding for framing of each pedagogic element over the duration of the first (a) and second (b) Life Sciences lessons.

Selection

Figure 4.1 indicates that selection scored mostly F++, indicating that Teacher LS was almost always in control of selection, and she determined what was to be taught or discussed. She made use of a PowerPoint presentation and both lessons followed the content selection and progression of these slides. There were only two episodes where framing weakened to F- and these can be seen in Figure 4.2 where the line drops at episode 14 for LS1 and episode 11 for LS2.

The first of these occurred when a learner interrupted the flow of the lesson by asking a question that was considered outside the immediate scope of the topic. Leading up to the episode the teacher taught the various stages of the Ovarian Cycle, during which she made mention of scar tissue forming on the ovary after ovulation. After completing her explanation, and working through the diagram, she introduced a more informal episode where she shared a joke with learners. During the laughter that followed a learner raised her hand and asked, *"But ma'am isn't the build-up of scar tissue bad?"* The teacher proceeded to answer her by drawing on Grade 11 work before

continuing with the rest of the lesson. In other words, for that short episode the content was selected by the learner based on her question.

The second episode of weak framing occurred once again after an informal discussion. In this case during the episodes leading up to the discussion the teacher was explaining the stages of the uterine cycle. The teacher engaged in a practical, interactive discussion with learners around the duration of the menstrual cycle, encouraging girls to be prepared and as future parents to have "the talk" with their daughters. The discussion was interrupted by a bird at the window, and after a brief reference to this, the teacher attempted to conclude the discussion saying:

"Guys, don't think this is embarrassing for girls, you are going to have children one day and you going to have to have the talk with them".

Some surprise and amused laughter emanated from the male students and underlying talking ensued. The teacher responded to this by saying:

"No, it is important to have the talk", she paused and then proceeded to tell the story of how she never had the talk with her own daughter.

In this instance the teacher may have selected the "content" of the story about her daughter, but I would like to argue that it was the learners' prolonged amused responses to her statement that motivated her decision to continue with the informal conversation and not return to the formal teaching.

The remaining slight weakening of framing to F+ was indicative of episodes where learners interjected with questions directly related to the topic at hand. For example:

During an episode where the teacher was explaining the mechanisms and hormonal interactions preventing multiple fertilisations a learner asked:

"But ma'am what happens when a person has 6 babies?"

The teacher answered the question but made the link back to the work at hand. In this case even though the learner selected the content through her question, it was part of the topic under discussion and not a new content direction altogether.

Sequence

Framing over sequence for these teaching episodes were evaluated in terms of where the control lies over how the new content selected for the episode is navigated. Once again this was mostly strongly framed. When looking at Figure 4.1 the distribution of coding lies mostly between F++ or F+ but with more episodes scoring F+ compared to that of selection. When looking at both the flow diagrams (Figure 4.2) the weakening of framing over sequence corresponds with the weakening of selection, but there are additional episodes where sequence is weakened whilst selection remains strongly framed. These episodes typically involved the teacher selecting and introducing the new content, then posing questions to learners and allowing their answers to influence the immediate progression of the content delivery and explanations. Teacher LS also made significant use of the oral cloze teaching method to extract answers and maintain interaction with learners. In other words, she would introduce the new slide, proceed with her explanation and then at times give incomplete words or statements to prompt answers from learners. Other times she would ask explicit questions guiding the learners through the content.

To illustrate this, I draw on a section of the episode used in Chapter Three to explain teaching episodes. In this interaction the teacher is revisiting a concept introduced earlier in the *same* lesson.

Transcript 4.1

Teacher:	Now, again, at the end of that menstruation the endometrium will start thickening again. Why?	1
Learner4:	Prepare for another baby!	2
Teacher:	Prepare for another baby.	3
	How?	
Learners:	*[general mumbling]*	4
	How?	5
	What do you mean how?	6
Teacher:	In other words what is controlling it, because something is control…	7

Learner5:	Hormones *[shouts out answer]*	8
Teacher:	A Hormone. Which is?	9
Learner4:	Oestrogen	10
Teacher:	Oestrogen, so what is happening to the level of oestrogen now? *[raises her arm in slow upwards manner whilst speaking]*	11
Learners:	Increasing	12
Teacher:	Increasing again *[says affirmatively]* Ok. *[pause]*	13

In this interaction the teacher asks why the endometrium is thickening. The answer she is looking for is that there is an increase in the level of oestrogen. The first answer she received was not incorrect, so she affirmed the learner's answer and then used it to guide the next set of responses, by drawing on the "how" question (line 3). The general mumbling of the learners constituted attempted answers with some learners shouting out "How?" and "What do you mean" to clarify what the teacher is asking. The teacher then rephrased the question and immediately a learner shouted out an answer. Once again, this answer was not incorrect, but not specific enough. Again, the teacher affirmed the answer, but then built on those answers through enquiring about the specific hormone. Another learner answered with the correct hormone, and this allowed the teacher to ask the final question regarding what is happening to the level of this hormone.

This interaction is indicative of how the teacher selected the content to be taught, but in the delivery thereof she allowed learner input and interaction to influence the micro-movements of the sequence, which accounts for the weakening in framing for these episodes.

There were however a small number of episodes which were coded F-. These episodes were informal and conversational in nature, where learner responses were even more influential in the direction these interactions took. These episodes also resulted in a similar weakening of pace, and I shall elaborate on both these elements below.

Pace

Figure 4.2 shows the lines for sequence and pace following a largely similar pattern. Interactions such as the one illustrated in Transcript 4.1 above also resulted in a corresponding weakening of

framing over pace. During these episodes the posing of questions themselves were unrushed, and the teacher allowed for significant pauses and space for learner input before she would continue into the next question. The episodes where F- were coded for sequence and pace took on a slightly different nature. Here the teacher deviated from the immediate instructional knowledge and engaged with the everyday applications thereof, and as such the subsequent learner interactions created a brief pause to the entire lesson. I will draw Transcript 4.2, which captures the interaction also used as an example in selection, where the teacher engages with learners around the number of days in the menstrual cycle.

Transcript 4.2:

Learner1:	Ma'am is it from when you get it until you begin again?	1
Teacher:	From the time when you got it, that's day 1, until the time you get it again, that will be Day 1 again.	2
Learner1:	Ok.	3
Teacher:	These days you have an App? Am I right?	4
Learners:	Ja.	5
Teacher:	In my day we relied on the calendar.	6
Learners:	Ooh…	7
Teacher:	Yes, when you had your period, Day 1, you marked it on the calendar and then you count how many days and when your cycle is set, because some people's cycle is not set yet. Am I right? Some still have an erratic cycle, because stress and all those other factors do play a role in how your cycle goes. Do you know that?	8
Learner2	Yes ma'am	9
Teacher:	Stress can make your period stay away.	10
Learner2	Yes ma'am	11
Teacher:	Ok, and so exam time watch how your cycle goes. But a calendar is as good enough as an app for us, you guys are the technological age, but we used to mark on the calendar. But something I have a problem with girls, and you will understand from when you were a junior. When you used to get up from your seat you used to say: "Jenna, check if the coast is clear" *[said in joking tone imitating somebody getting up from their seat]*	12

Learners:	*[laughter & excited talking]*	13
Teacher:	*[speaks over learners' laughter]*	14
	Especially in the summer, in summertime when you have that summer uniform on.	
Leaners:	[some more laughter but then settle down]	15
Teacher:	But it is not necessary, because when I was young we were taught, my mommy said, you have a pouch, your panty is in there, a spare panty, and your pad. Because you don't know when Sarah is coming to visit, or Rooikappie, or whatever they call it these days. But you were prepared.	16
	[Pause]	
	Am I right?	
	[Pause]	
	Because that's what woman are supposed to do, not "ooh, I had an accident I must go home".	
	Because every day the grade 8s at the beginning of the year we find that, it's amazing, like 30 want to go home on one day because their uniform is messed.	
	And woman and men that is your responsibility to teach your children one day please. So that when one of you become a teacher, they don't have to worry about that still.	
Learner3	[Says something inaudible]	17
Teacher:	Hey? *[Indicating learner must repeat her statement]*	18
Learner3	It's embarrassing…	19
Teacher:	It's embarrassing, but that's why you need to prepare.	20
Learner3:	But ma'am, what if you bleed through on your dress.	21
Teacher:	Yes, but if you were prepared?	22
Learner3	Then you still going to bleed through…	23
Learners:	*[start to laugh]*	24
Teacher:	If your mommy taught you about your cycle?	25
	Because now all of you are taught about how to, to get to know how to do it, when your cycle will be.	26
	[bird at window interrupts lesson]	27
	So, guys don't think that this is embarrassing for girls, and, you're going to have children one day and you're going to have to have the talk with them.	28

Learner4:	Huh uh	29
Learners:	*[amused laughter]*	30
Teacher:	Noo, it is important to have the talk!	31
Learners:	*[more amused chatter]*	32
Teacher:	I didn't even have the talk with my daughter, and she was 10 years old. And I fell of my seat because *[pause]* She was sick all day and then 12 o clock she called me, she was in the bathroom and said "Ma", I said "yes", "I think I got my period". *[teacher laughs, shakes her head and throws up her hands]* 10 years old and I didn't have the talk with you yet. So, I mean, so girls, know it comes earlier and earlier.	33
Learners:	*[begin to excitedly talk to each other]*	34
Teacher:	10 years old! Some kids have it earlier.	35
Learners:	*[continue to talk amongst themselves]*	36
Teacher:	*[pause - allows learners to talk]*	37
Learners:	*[continue with excited talking]*	38
Learner1:	I was 13 *[shouts out]*	39
Learner2:	I was 13 *[shouts out in response]*	40
Teacher:	I was 15 But in my time touching was prohibited because you thought you were going to fall pregnant when you were touching a boy's hand!	41
Learners:	*[Laughter erupts]*	42
Teacher:	*[allows learners to carry on talking]*	43
	It is just.. ja!	44
	[pause - allows learners to talk]	45
	All right [light clapping of hands]	46
	Ok, so, we said that if implantation didn't happen, because fertilization didn't happen, we are going to get menstruation.	

This extract spans three episodes, and the beginning of a fourth, as indicated by the shading in the table. In the first short episode the teacher answered a learner's question pertaining to the work she just explained (lines 1-3). She subsequently moved into a new episode where she engaged with the practicalities around measuring the menstrual cycle. The framing over sequence is therefore slightly weakened, because although this is still part of the overall selected content, it is a deviation from the immediate instructional sequence most likely because of the learner's question. The conversation continued in an interactive manner around girls having to be prepared (line 16), where the teacher provided opportunity for learner engagement, and as such also resulting in a slight weakening of pace. After this discussion, the teacher appealed to learners as future parents to have "the talk" with their children (lines 25 & 29). The amused responses from the learners prompted another informal engagement episode from the teacher where she shared a personal story. In this third episode framing over sequence is weakened even further (F-) as the continuation of the discussion was as a direct result of learner responses. Similarly framing over pace is also weakened. The teacher told her story but created significant space for learner contribution and continuation of the discussion (lines 34-45) before concluding the episode (line 46).

Furthermore, both episodes also served as collective break in the immediate instructional flow of the lesson, which is otherwise strongly framed for pace.

Evaluative Criteria

Evaluative criteria of the instructional knowledge pertain to the meaning of concepts, processes and principles and their appropriate realisation within the subject discourse. For Teacher LS evaluative criteria were strongly framed for both lessons. During pure transmission teaching episodes, the teacher would deliver accurate content and logical explanations, substantiated with examples, alternative representations and repetition where required. During the more interactive transmission episodes the posing of questions and subsequent learner responses illustrates the teacher's orientation to the appropriate use and comprehension of the content and concepts being taught. To illustrate this, I draw on transcript 4.3 below, which happens early on during LS1. During this episode the teacher is busy positioning the content she is about to teach, the Ovarian Cycle, with the previous lesson where Oogenesis (development of the egg cell) was taught.

Transcript 4.3

Teacher:	In terms of the development, right, we said in the foetus you have your germinal epithelial layer, and what's going to happen there?	1
Learner1 &2:	Mitosis	2
Teacher:	No. Oooo…?	3
Teacher & Learners:	Oogenesis *[said collectively]*	4
Teacher:	And the first phase of Oogenesis is …?	5
Teacher & Learners	Mitosis.	6
Teacher:	So, when that happens it is going to form that Oogonium *[points to image]* and that oogonium is?	7
Learner1:	Diploid	8
Teacher:	Diploid *[affirming learners answer]*	9

This short interaction illustrates three points. Firstly, the teacher takes the time to position the new content within the context of the previous lesson and does not teach these two concepts in an isolated manner, i.e., she relates the Ovarian Cycle to oogenesis. This progression is a vital connection in comprehending the overall cycles being taught. The second point pertains to the appropriate realisation of the content. When the teacher asked what was going to happen at the germinal epithelial layer (line1), the learners' response of mitosis (line2) was not entirely incorrect. Mitosis will take place, but as a step within the process of oogenesis, which was the required answer. The teacher pointed this out by first correcting the learner and then indicating that mitosis does however come into play as a first step (line5 and 6). She therefore illustrated to the learners that mitosis was not incorrect, but not the optimal answer. The third takeaway from this extract illustrates the teacher making use of an appropriate opportunity for repetition. Central to the understanding, and subsequent application of oogenesis, is the chromosome number status of the cells as they develop, diploid being the term indicating a full set of chromosomes. At the end of this interaction, after establishing that oogenesis is happening in the germinal epithelium, the teacher added the question of "what" that oogonium is. This presented another opportunity to

check learner understanding, but also keeps the learners orientated to the parallel thinking required for this subject regarding both the process steps and chromosome number.

When looking at Figures 4.1 and 4.2 there were however instances where framing was slightly weakened. These episodes happened when discussions ventured into everyday applications of the knowledge and where the relevance and relation back to the instructional knowledge was not always clear. An example of this would be in Transcript 4.2. The initial discussion clearly related to the previous episodes around the key days in the menstrual cycle, but soon ventured off onto other stories not as obviously relevant, or adding value, to the understanding of the instructional knowledge at hand.

Hierarchical rule

Hierarchical rule, although still strongly framed, had the largest number of episodes where framing was weakened out of all the elements. This is indicative of the nature of the interaction between the teacher and the learners. The teacher is assertive and controls the classroom order with clear expectations of learner behaviour, however, the relationship is not completely formal. Learner interaction is encouraged and there is a sense of familiarity without the teacher relinquishing her position as the authority in the classroom. During episodes where the teacher engaged with the everyday applications of the content, there was an apparent suspension of the more formal interaction. Learner engagement took on a personal manner and as such framing over hierarchical rule weakened. One can see elements of this emerge from the various transcripts.

The familiarity between teacher and learners can be seen by the comfort and openness with which sensitive topics were discussed e.g., age at which menstruation started (transcript 4.2, lines 39-41) and the teacher's recounting of her own daughter's story (transcript 4.2, lines 33-35).

The familiarity from the learners is also evident in some of their responses e.g., "what do you mean?" (transcript 4.2, line 6), a learner countering the teacher's argument for being prepared for your period (transcript 4.2, line 23), a boy saying "huh uh" (transcript 4,2 line 29) in response to the teacher's appeal about having the talk with their children, and the generally accepted practice of shouting out of answers visible in all extracts.

At the same time, the teacher would dial back from these personal interactions using her position of teacher to end an informal interactive episode. An example of this can be seen at the end of Transcripts 4.2, line 46 when the teacher changes the topic back to the lesson at hand with learners immediately responding to her cue.

Emerging pedagogic features

To summarise, the emerging pedagogy so far shows strong framing over the various elements, especially that of selection and evaluative criteria, yet there are some episodes where weakening does occur for sequence, pace and hierarchical rule. When looking at the transcribed examples, the episodes of weakening appeared to correspond with interactive teaching episodes. To further investigate this possibility, I collated the frequency of coding in a different manner. This time I combined the coding for both lessons but made a distinction between the pure transmission episodes (TP) and the interactive transmission episodes (TI). The various elements were "stacked" for each coding indicator and the numbers normalised to create a comparable visual of the distribution of coding across the two types of transmission episodes. The results are shown in Figure 4.3 below.

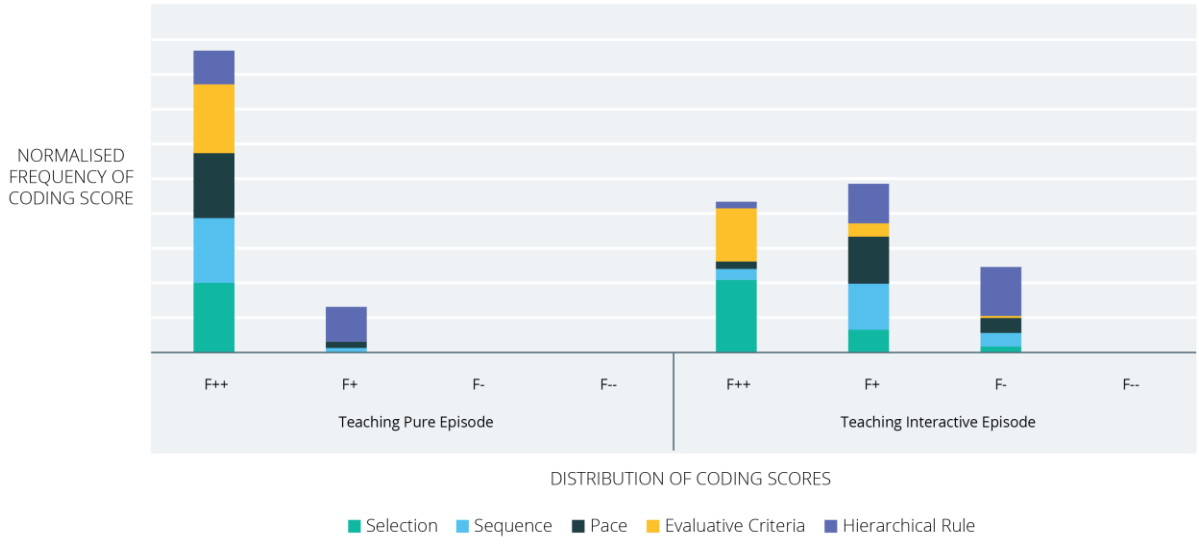


Figure 4.3 Distribution of coding for framing between Teaching Interactive (TI) and Teaching Pure (TP) teaching episodes for both Life Sciences lessons.

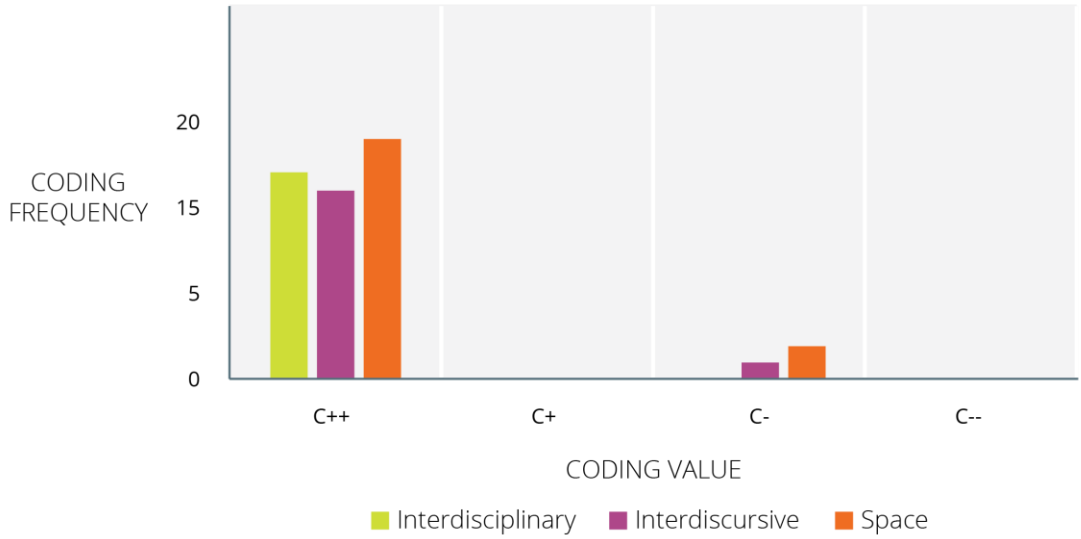
The graph shows that for the Transmission Pure episodes the coding was mostly F++ with no weak framing over any of the elements, only a few instances of F+ for hierarchical rule, and even fewer for that of sequence and pace. The Transmission Interactive episodes on the other hand displays a different picture. Here the coding is spread across F++, F+ and F-. The coding for F++ comprises mostly of the elements of evaluative criteria & selection, whereas F+ is that of sequence, pace and hierarchical rule. The instances of F- being mostly attributed to hierarchical rule.

This graph therefore reveals two key insights around the occurrence of the incidents of weakened framing. Firstly, when teaching via the pure transmission mode all pedagogic elements are strongly framed, as such almost all the incidents of weakened framing occur during the interactive teaching episodes. These are also the episodes where hierarchical rule weakens the most. Secondly, selection and evaluative criteria seem largely exempt for this distinction, remaining mostly strongly framed in both type of teaching episodes.

Classification

The pedagogic elements investigated thus far do not operate in isolation and the emerging pedagogy must be considered alongside the classification of the other components operating within the pedagogic discourse. The components that were coded for included interdisciplinary and interdiscursive relations, as well as space, and the coding for these were analysed in the same manner as framing. In other words, the frequency of coding of C++, C+, C- and C- - for each element was calculated and represented graphically. Below are the graphs illustrating these for both lessons.

(4.4 a)



(4.4 b)

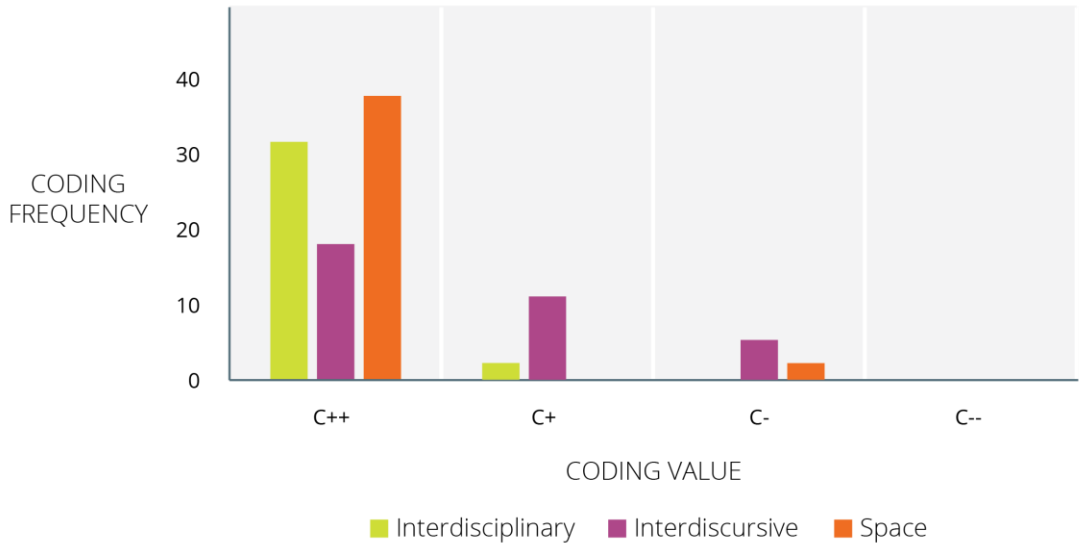
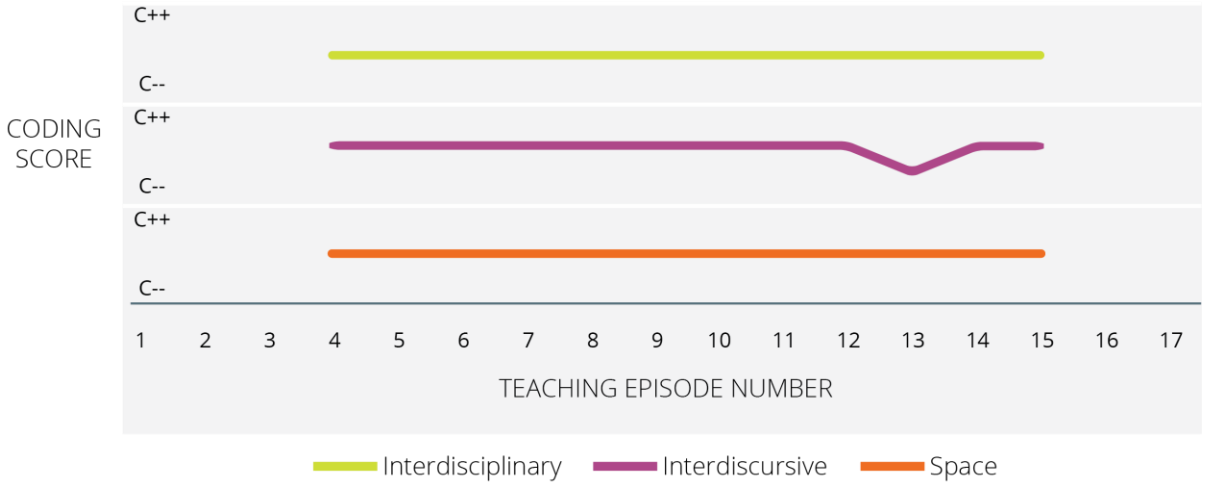


Figure 4.4 Frequency of coding for classification of each pedagogic element for the first (a) and second (b) Life Science lessons

(4.5 a)



(4.5 b)

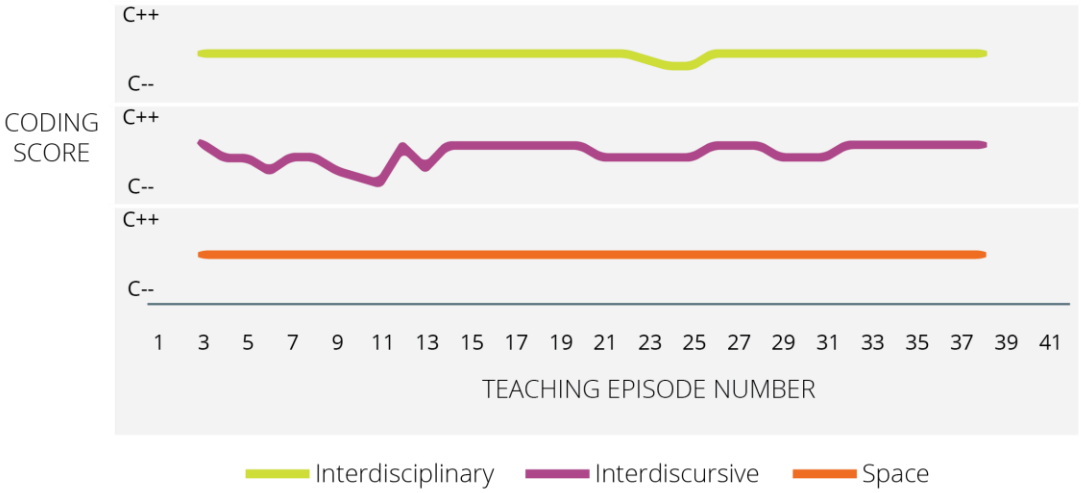


Figure 4.5 Change in coding for classification of each pedagogic element over the duration of the first (a) and second (b) Life Sciences lessons.

Interdisciplinary relations

Interdisciplinary relations in this instance were considered any reference to other subjects or knowledge fields whether formally or informally. For both lessons interdisciplinary relations were strongly classified throughout. The teacher's focus was on the content and the discipline at hand with hardly any references made to other subject areas, or even areas within the greater field of science. The two instances of slight weakening (C+) were when the teacher engaged with the learners on exam questions where they must be cognisant of the number of days in the month. This discussion then evolved into references to maths and primary school years over the course of two episodes.

Space

For this teacher, the use of space was also strongly bounded, where she remained at the front of the class and the learners at their desks for both lessons. The instances where C- were coded occurred at the end of both lessons when she left the front of the classroom and mingled with the learners and engaged in informal conversations. The only other case of C- was when a learner appeared to be engaging in his own work and the teacher walked up to his row of desks to address the issue. It is important to note that her ability to freely move beyond the front was somewhat limited based on the cramped space in the classroom, and it appears that she tried to make up for this by effectively moving between the white board and the front of the class, but for the purposes of coding she remained in her space and the learners in theirs.

Interdiscursive relations

Classification of interdiscursive relations presents a different picture and is the point of departure to investigate the type of knowledge favoured in the classroom. Classification of knowledge refers to relations within the instructional knowledge between specialised and everyday knowledge, in other words how strongly bounded is the distinction between the vertical discourse of the subject at hand and the horizontal discourses of everyday knowledge. When looking at Figure 4.5 it is shows that these relations are strongly classified for the first lesson with only one episode of slight weakening. In other words, for most of the episodes, specialised knowledge is privileged and

everyday knowledge is hardly referenced. The teacher makes use of the official jargon of the subject discourse, and consistently and accurately carries this throughout the lesson. To illustrate this, I have transcribed a sample from a pure transmission episode, where the teacher summarises and recaptures the hormonal interactions that regulate the menstrual cycle by working her way through the diagram projected onto the white board.

Transcript 4.4

Teacher:	So this is how we explain the negative feedback of it. Ok.	1
	So where do we start? FSH. *[circles hormone on diagram on the board]*	2
	FSH simulates the development of the follicle *[points at follicle on diagram],*	3
	when the follicle has matured into a Graafian follicle, Oestrogen *[points at hormone on diagram]* starts increasing.	4
	Right, with Oestrogen it builds up the.. [*points at endometrium]*	5
Teacher & Learners	..endometrium lining *[moves hand along with arrow]*	6
Teacher:	But at the same time on day 14 when ovulation has taken place, and the Corpus Luteum is there, Luteinizing Hormone *[points at hormone on image]* is doing all of this, *[circles section of diagram]*	7
	which stimulates ovulation. *[points to ovulation on diagram]*	8
	Right, now after ovulation the egg cell is released, either fertilization or no fertilization *[points along the split of arrows on diagram]*	9
	So, it's either implantation or no implantation *[points at follow up set of split arrows on diagram]*	10
	And what happens once the fertilised egg is there? Progesterone will increase to maintain what? *[asks while still pointing at progesterone on image]*	11
Teacher & Learners	The endometrium.	12
Teacher:	Ok. If no, if this *[points at progesterone]* is inhibited the folic follicle stimulating hormone will take over again to start the cycle over again *[points at FSH]*	13
	But if this *[points at progesterone again]* is maintained, remains high, then another one wont *[indicates to whole cycle].*	14

So it inhibits FSH as well as Luteinising Hormone is also inhibited by progesterone, because we don't want another ovulation to happen. *[points at ovulation]* Ok?	15
No fertilisation will inhibit progesterone, so progesterone levels will drop and we will have menstruation, which means FSH will take over after menstruation again.	16
And that is your negative feedback system.	17

The explanation given above is a final summary restatement of a notoriously confusing part of the Life Sciences curriculum, which the teacher navigated accurately, using the appropriate terminology throughout. There were moments when she spoke in simpler terms when physically referencing the image on the board e.g., "doing all of this" (line 7) and then circling the interaction on the image, but where applicable she used words such as "matured" (line 4), "inhibit" (lines 13,15,16) and "stimulate" (line 9) exemplifying the language of the discourse. This paragraph was also used to explain "negative feedback", which is a concept that does not simply speak to this part of the curriculum but is a generalising concept in the field of Biology.

The second lesson was also strongly classified in terms of interdiscursive relations, but this time there were more episodes of weakening. The lesson began with strong use of specialized knowledge as the teacher introduced the lesson and positioned it in relation to the previous one. From here the content taught, the uterine cycle, held direct application in everyday life situations with regard to its duration and the evidence thereof in the length of a menstrual cycle. This resulted in the slight weakening of classification as the knowledge in the subsequent two teaching episodes consisted of both the science and the interaction around real life applications and experiences. These interactions consequently resulted in the further weakening of classification as the teacher completely leaves the content knowledge and makes a joke about a common misconception around menstruation. From here she moves back to the work at hand until a learner asks a clarifying question about when to start measuring the menstrual cycle from. This change through the lesson can be seen in Figure 4.5b as the line indicating the interdiscursive coding gradually decreases until episode 11. Some further episodes of weakening occurred during the rest of the lesson as seen by subsequent dips in the graph. At face value one could therefore say that this lesson contains both weak and strong classification over interdiscursive relations, which illustrates the argument

made earlier about the risk of averaging coding skewing accurate representation of the lesson trajectory over time.

Horizontal Discourse

To investigate the nature of the episodes that indicated weakening of classification between specialised and everyday knowledge, I compared the coding of these episodes with the framing coding of sequence, pace, hierarchical rules and evaluative criteria for the same episode. The comparison for the second lesson is depicted in Figure 4.6 below.

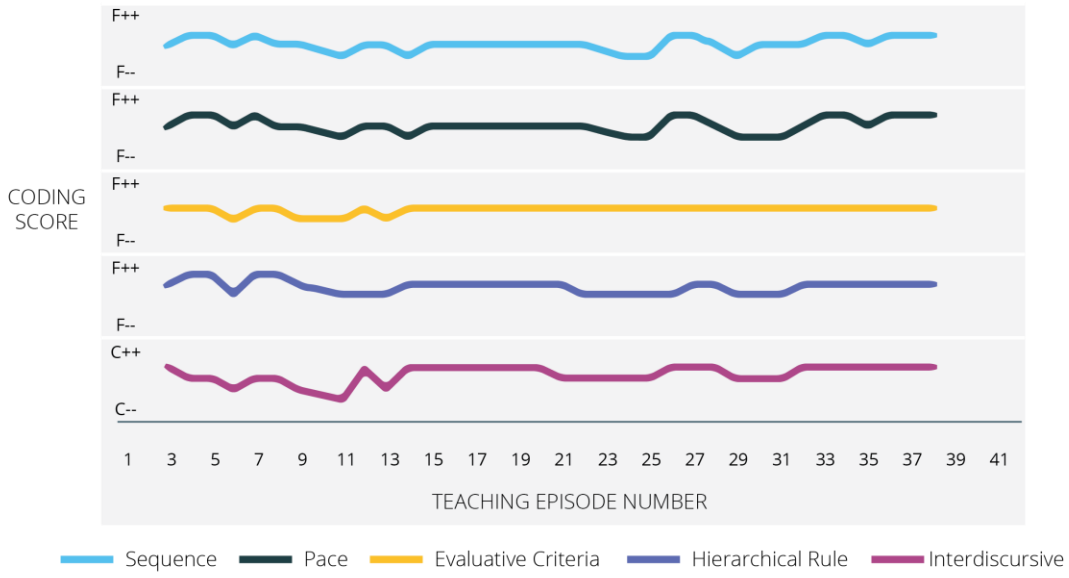


Figure 4.6 Comparison of coding for Inter-Discursive relations with sequence, pace, hierarchical rules and evaluative criteria for LS2.

The chart shows that the weakening of classification largely (but not exclusively) follows the same pattern as that of sequence, pace and hierarchical rule. In other words, where classification of knowledge weakens, framing over these elements is also weakened. The exception is once again evaluative criteria – where it mostly remained strongly framed. This therefore suggests that the introduction of the horizontal discourse into these episodes was not at random, but likely to have been recruited with an instructional purpose. To examine this, I coded each relevant episode (where

classification was even just slightly weakened) according to a potential purpose for the introduction of everyday knowledge: IE - Instructional Exemplary (application of the content in everyday situations), IP - Interpersonal (to establish and maintain rapport with learners), MI - Moral Imperative (appeal to an expected or beneficial behaviour) or U – Unclear (no apparent reason or connection made). Below the results are graphically summarised for each of the coding values of C+, C- & C--.

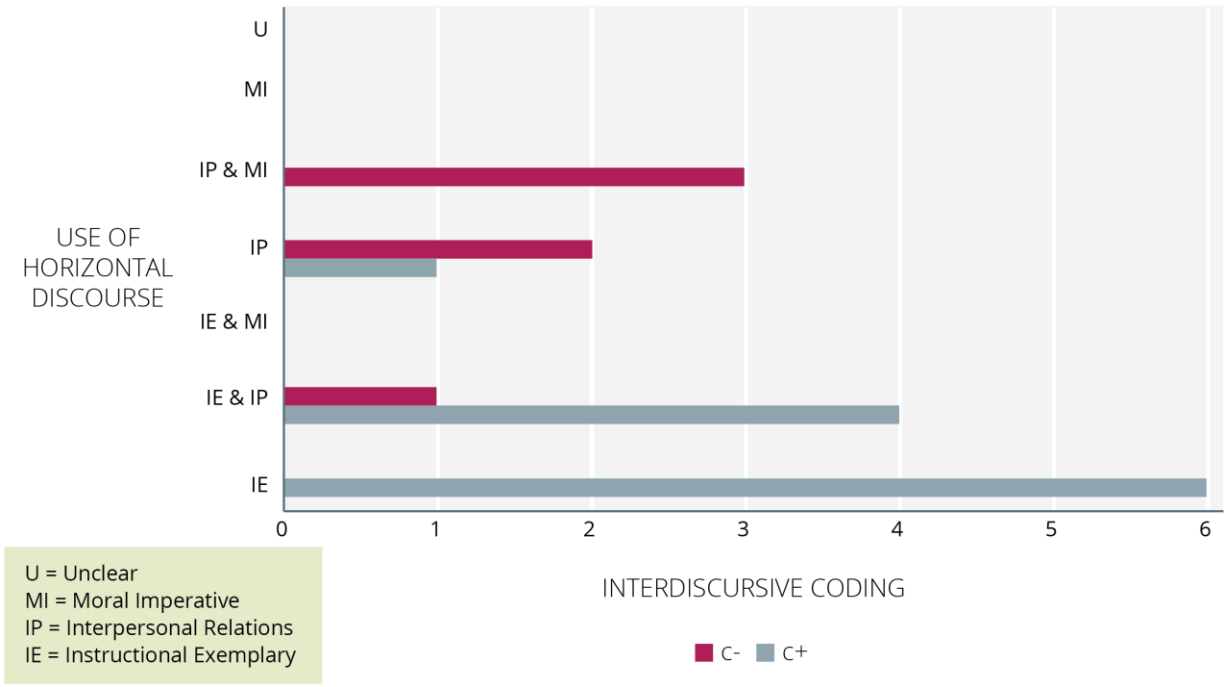


Figure 4.7 Instructional purpose for the introduction of Horizontal Discourse for LS1 & LS2.

The arrangement of the different purposes of the use of horizontal discourse ranges from the instructional (the bottom of the y axis) to the more regulatory purposes at the top end of this axis. The first observation is that for most of the time the horizontal discourse is recruited for Instructional Exemplary purposes. To illustrate an example of this I refer once again to Transcript 4.2.

In the second episode of this transcript the teacher talks about how girls can now make use of a mobile application to remind them about their menstrual cycle. Although this is very much

everyday knowledge, she deliberately includes relevant science knowledge (cycle count, various lengths of cycles and the effects of stress) in this discussion. Here, the presence of the everyday knowledge did not distract from the discourse but positioned it in the everyday context of the leaner.

A significant number of episodes however served a purely regulatory purpose. If one reflects on the episode where the teacher shares the story of her own experience with her daughter starting menstruation (Transcript 4.2, lines 33-45), it contained no formal subject content. The story is personal, with familiar language used but told concisely and to the point. The use of the story here served an alternative purpose: that of building interpersonal relations with the learners. This story was in response to the previous episode where the teacher displayed the moral imperative function when she appealed to learners to timeously teach their children about menstruation in future. Lastly, there were no episodes where it was unclear as to why everyday knowledge entered into the lesson.

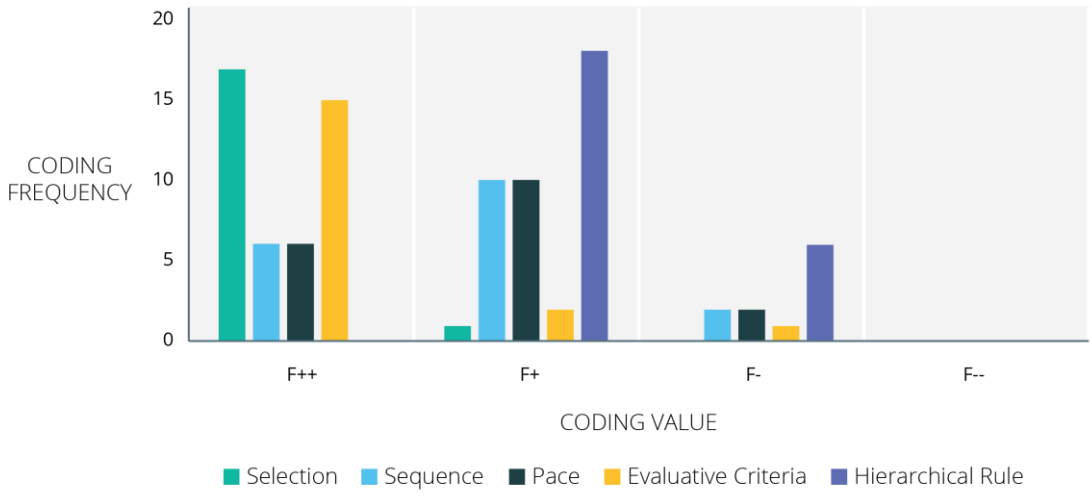
In summary this teacher displays strong classification over interdisciplinary knowledge and use of space, with mostly strong classification over interdiscursive relations with some episodes of weakening. These episodes however seem to be intentional and used to serve either a further instructional purpose, or alternatively a regulatory one.

Having now identified the key features of the Teacher LS' pedagogic practice, I will conduct a similar analysis on the data for the Life Orientation teacher.

Life Orientation

The second set of observed lessons was that of a Life Orientation class. This subject was chosen firstly because the school had a unique approach of using dedicated Life Orientation teachers rather than adopting the more mainstream convention of assigning Life Orientation classes to teachers specialising in other learning areas. The second reason for choosing to observe these lessons was due to Life Orientation's alternative knowledge structure compared to other school subjects. Life Orientation, whilst containing sections of specialist knowledge, is in fact mostly the "specialisation" of everyday knowledge. It is this delicate balance that I felt would provide an interesting internal comparison when trying to unpack the mechanics of this pedagogic practice in relation to knowledge use. The lesson topic of legislation pertaining to the world of work provided an ideal scenario as the content contained more noticeable specialised knowledge concepts, yet these ultimately needed to be applied in everyday life. I once again analysed and graphically represented the various episodes for frequency of coding and changes in coding over time. As was the case for Life Sciences I will first present the data for the pedagogic elements as they pertain to framing, followed by those of classification.

(4.8 a)



(4.8 b)

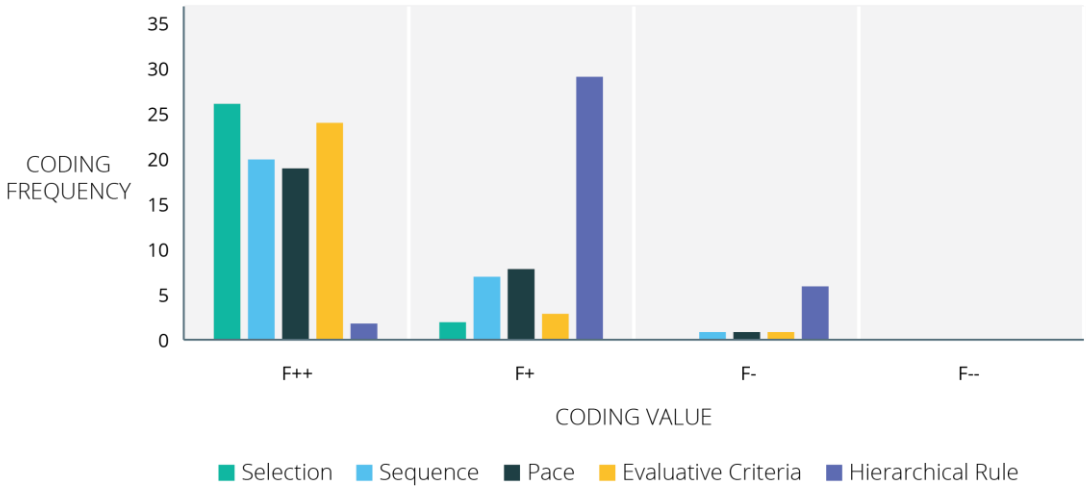
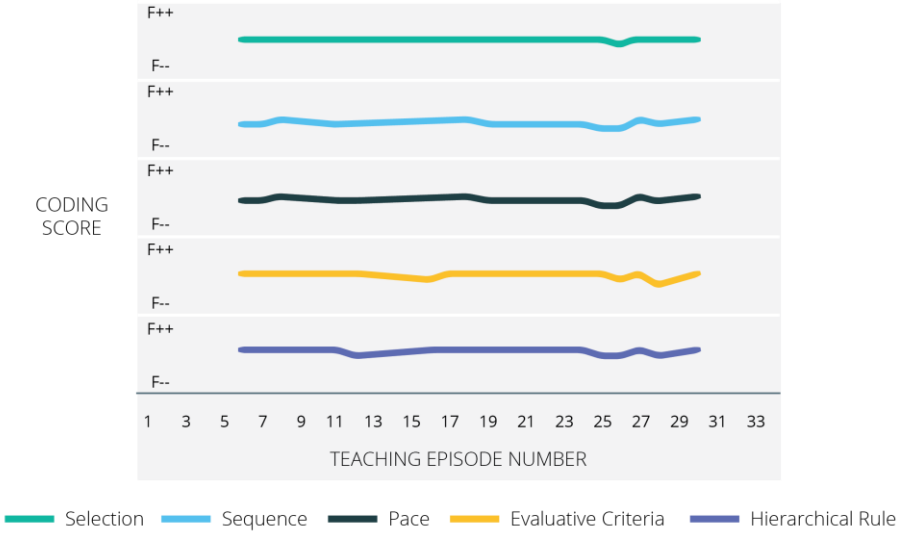


Figure 4.8 Frequency of coding for framing of each pedagogic element for the first (a) and second (b) Life Orientation lessons

(4.9 a)



(4.9 b)

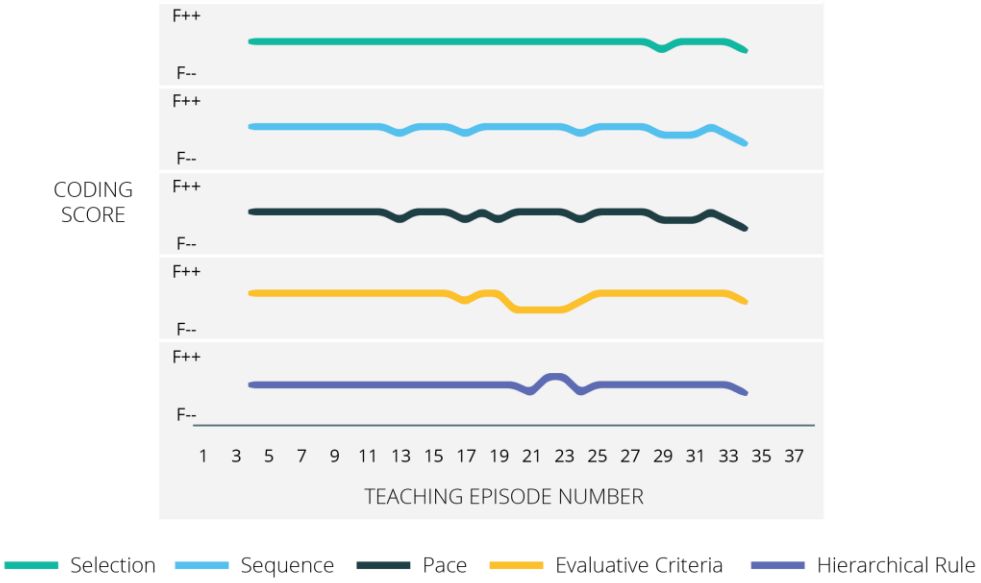


Figure 4.9 Change in coding for framing of each pedagogic element over the duration of the first (a) and second (b) Life Orientation lessons.

Framing

Selection

Figure 4.8 shows that selection was very strongly framed for both lessons as the teacher determined what was to be taught or discussed at all times. During the lessons, the teacher worked her way through the PowerPoint slides and sample documents that she had preloaded on the classroom site, which learners downloaded onto their tablets prior to the lesson. The selection of content within those documents were adhered to for both lessons. There were only three instances of weakening of framing over the course of the two lessons. The first episode, as was the case in Life Sciences, was when a learner asked a question pertaining to the topic at hand and the rest of that episode dealt with answering the question. The second episode (Table 2.1, Episode 20) arose from a prolonged informal discussion that resulted from three prior teaching episodes relating to the

Employment Equity Act. The third episode was due to a formal group discussion at the end of the second lesson, where learners were given the freedom to contribute as they saw fit.

To illustrate the second episode above, as well as other features of the remaining pedagogic elements, I will draw on the table below. The format of this table captures the episode descriptions and key extracts of five consecutive episodes. The rationale for using this format (as opposed to the direct transcripts used in Life Sciences) is that the Life Orientation episodes were extremely verbose, therefore the majority of interactions are transcribed, but other elements e.g., lengthy explanations, are only described.

Table 4.2 Descriptions of Teacher LS Lesson 1 Episodes 16 - 20

Episode nr.	Episode description	Line
16	Teacher slightly raises volume of voice as she changes slide and announces the next act (Employment Equity Act/EEA). She tells the class that the topic can be quite contentious and asks them:	1
	"What do you think we are talking about when referring to employment equity?"	2
	General mumbling follows, but nobody officially answers. Teacher encourages learners in Afrikaans *"Kom Economics mensies"* (Come Economics people).	3
	Teacher asks the question again, still general mumbling with nobody volunteering an answer. She waits for an answer and then makes a bird tweet noise in the silence and then says "anybody?" and imitates a learner saying, "Let's google it quickly ma'am".	4
	She makes her way to the laptop and states that they will look at the first aim whilst the googling is happening	5
17	The teacher proceeds to go through the aims of the EEA:	6
	"The first aim is to make sure that the workplace has equal opportunities for all groups of people. Ok. It doesn't matter your race, your sex, your sexual orientation etc., everybody, or all groups, need to be represented fairly and equally.	
	She then states the second aim.	7
	"Under the EEA there is also a focus on the removal of unfair workplace discrimination.	
	So you are not allowed to be discriminated against because of that. And there are certain policies in place there."	
	She then reads the third aim off the slide " 'Applying Affirmative action', which is not considered unfair discrimination. Affirmative action is in fact classified under something, the oxymoron, fair discrimination. Do you think fair discrimination is a valid term?"	8
	She gives it a moment and then addresses a learner by name to ask what he thinks. He initially does not respond, and teacher then checks if it is a "I don't know" or if he doesn't want to answer. Another learner asks the teacher to repeat the question. Teacher smiles and repeats the question.	9
	The first learner responds: "No, by definition all discrimination is unfair".	10

	The teacher repeats the learner's answer and relates it back to affirmative action. She says this as she moves closer to another learner that has put her hand up.	11
	The teacher gives this learner a chance to answer and the learner states that she disagrees with the previous learner. A few moments into her explanation the teacher asks learners to quieten down as she is struggling to hear her. The teacher then states she wants to hear all their points so will come back to them after this learner has spoken.	12
	The learner then continues and gives an example as to why she disagrees, "Because let's say ma'am you have an all-girls school and you don't want any males to teach there, you're only going employ females regardless of whether males have applied or not"	13
	The teacher then checks her understanding by asking her "So you think that is fair discrimination because they are meeting a certain need of theirs?". "yes ma'am'" Teacher considers the answer, nods and says "Ok, valid point".	14
	General mumbling starts up in class as learners talk amongst themselves	15
18	Teacher then speaks with a raised volume over the mumbling to whole class, to get their attention back: "Let's talk about affirmative action" She then elaborates on her statement "Does anybody know what the policy of affirmative action talks about.. what is it?"	16
	Some talking amongst the learners and the teacher volunteers a learner's name to answer. Learner gives her answer whilst teacher listens: "To give hope to the people with disadvantage" (pauses) Another learner corrects: "previously disadvantaged" Original learner responds affirmatively saying "Ja (accepting the correction), the upper hand (another learners says something inaudible, rest laugh) Leaner continues: To give them the upper hand in society (inaudible) till it reaches an equilibrium".	17
	The teacher then rephrases her answer as she restates with the tone of a question, implying she is checking with the learner if this is what she meant. "Ok… so to strive towards equality in the workplace to give certain groups of previously disadvantaged people an opportunity to advance in the workplace and to get certain jobs." Learner nods.	18
	She then links it back to EE Act by introducing a "beautiful word" that the Act is based and proceeds to write "Redress" on the white board and say it out loud.	19
	The teacher walks back amongst learners and asks if anybody knows what the word means. Learners mumbling throughout.	20
	One learner shouts out: "To go back and fix", which the teacher repeats and state that the learner is correct.	21
	She then proceeds to explain "To redress past inequalities they say that we need to look at fair discrimination polices such as Affirmative Action in the work place" and supplements with a hypothetical example to explain how affirmative action works.	22
19	Teacher highlights that to understand redress it is important to remember what happened in the past, that for a long time a "large grouping of people" were not allowed effective education or opportunity to progress.	23
	A learner makes a comment. The teacher continues saying that there are a lot of young graduates out there that say "But, err, ma'am its 2018" and "that was so 24 years ago" using a mocking / imitation posh English accent. "we don't care we just want to be equal" – learners laugh and interact with her taking on same mocking tone.	24
	The teacher then states that she agrees and disagrees with that point of view	25

	A learner shouts out that she disagrees.	26
	The teacher then steps back and encourages learner to explain why she disagrees. "So why does it make you mad – talk to me about that"	27
	The learner proceeds to answer about how much disadvantage is still out there and that they as learners are privileged, that something big needs to happen for inequality to change.	28
	The teacher responds saying that she also disagrees with the viewpoint she stated, as it is going to take generations for proper conversation around equality to take place in our country. The teacher then states that at the same time, that reason she does agree with the viewpoints is that as a person of colour she wants to know she got a job on merit.	29
	Two more learners respond to this giving their opinions that even if she got the job on merit there are still people out there that view certain races as "inferior".	30
	The teacher answers saying, "Racism is alive and well, ask Uncle Adam". Some excited chatter emerges from the learners and the teacher asks in Afrikaans "Het julle gelees van Uncle Adam?" (did you read about Uncle Adam)	31
	The learners talk amongst themselves; laughter and teacher interact with some learners, whilst other's talk among themselves. The teacher then speaks to class saying "Guys, current affairs hey!".	32
20	The teacher then proceeds with an animated retelling of the story of the racist video posted by a white South African holiday goer (Adam), as well as explaining the far-reaching consequences of the outfall after the video went viral.	33
	Lots of interactions from and between the learners	34
	Teacher highlights that the saga has opened the social media conversation of the inherent racism that still persists in the country and the questions being asked around what is being done about it "are we speaking up to the aunty or the uncle or my mommy who on a Friday night at the braai will throw certain things around…"	35
	She then finishes saying "Anyway, that is the conversation, I am getting side-tracked	36
	She promptly returns to the content of the lesson stating "Because discrimination and racism exists there has to be policies in place to protect people and promote certain groupings, that is what the Employment Equity Act is all about"	37

Episodes 16 – 19 all start with the teacher selecting the content and the general direction of the episode, for example in episode 16 she introduces the Employment Equity Act and in episode 17 she states and explains the general aims of the Act. The content of episode 20 is however a product of the discussion in the prior episode 19 where the teacher concluded the discussion by saying *"Racism is alive and well, ask Uncle Adam"*. The learner responses indicated that they were not all up to date with this current affairs topic and as such, even though the teacher chose to tell the story, her selection was based on the learner input. Towards the end of the episode, she even acknowledges the fact that she is getting "side-tracked" (Line 35.) This constituted the weakening of framing over selection for that episode.

Sequence

Framing over sequence was also mostly strongly framed for both lessons but showed more instances of slight weakening (F+) when compared to selection. Sequence was once again considered as how the selected content was navigated for the episode concerned. Episodes that coded F+ appeared to have a certain format where the teacher would start the teaching episode by stating the subtopic at hand and then she would pose a question to the class, allowing their answers to determine how she engaged with the subsequent explanation. For example, in episode 18 the teacher selects the content, i.e. "*Let's talk about Affirmative Action*". From here she asked the learners if they knew what the affirmative action policy was, and so created the opportunity for them to participate. In this case the learner's answer created an opening for the teacher to introduce the concept of "redress", and she then connected this back to the topic at hand as the underlying motivation for the Employment Equity Act.

In the episode that followed (episode 19), framing over sequence however weakened further. Here the teacher started the episode by stating that to understand the need for redress and polices such as Affirmative Action one must appreciate the realities of the past. She then embarked on a highly interactive episode where first she made a statement (line 24), which was followed by a learner stating that she disagreed with the statement (line 26), and then the teacher provided the space for the learner to take the conversation further by asking "*So why does it make you mad – talk to me about that"* (line 27). This allowed the learner to take the next micro-step in the direction of her choice. The teacher then did take some control back as she returned the conversation to her opening statement through saying why she agrees with this statement (line 28), but from there she once again allowed learner input to take the conversation further.

Pace

Pace was strongly framed for this teacher, but episodes that showed a weakening of framing over sequence also indicated a weakening of framing over pace. This can be seen in Figure 4.9 as pace largely followed the same frequency and fluctuation as that of sequence. In the instances described above the teacher did not only relinquish some control of the direction the selected content took, but there was also a relaxing of the pace in as such that space was created for learner productions, not only to determine how the teacher would proceed through the episode, but also when she

proceeded – if at all. In episode 19 the teacher allowed a flow of learner engagement after her initial statement on some graduate perspectives on Affirmative Action, she allowed each learner to speak without interruption. She did not wait for only one response but also waited for other learners to speak. The language she used e.g., Episode 19 line 27 *"talk to me about it"* invites an open-ended response, a clear shift from transmission to pause for interaction and engagement. This continued into episode 20, before she drew the discussion to a close. As was the case with the Life Sciences lessons, these episodes in and of themselves introduced a pause to the overall strongly paced lesson.

Evaluative Criteria

As stated previously, evaluative criteria pertain to the clear meaning of concepts and principles within the instructional knowledge, and the subsequent appropriate realisation of these. In the case of a subject area such as Life Orientation this distinction comes with an additional challenge. For traditional school subjects the subject discourse is defined and distinct, with potential everyday applications. In this subject the instructional content relates to everyday life, and as such for evaluative criteria to be strongly framed, the teacher needs to intentionally use available opportunities to specialize and capture the knowledge as concepts that get correctly applied in everyday settings. This was done particularly well by this teacher as a (likely implicit) strategy emerged that allowed evaluative criteria to be strongly framed throughout.

To illustrate this, I shall draw on episode 18 in the table above. As a first 'step' in the strategy the teacher leverages the everyday knowledge nature of the discourse by opening the episode through asking the learners to share what they already know, e.g., line 16 she says *"Let's talk about Affirmative action"* which is generic statement open to any commentary and learner responses will provide a baseline from where she can move them towards the specialised version of the content. In this episode, she refined her question and made the transition a bit more overt by asking the learners if they knew what the policy is about. Learners were initially hesitant to respond, and the teacher eventually asked a specific learner to answer. The learner gave her answer, to which the teacher responded by rephrasing it in the language of the discourse. This interaction and building on learners' answers to bridge into the knowledge appears to be a second step in her strategy. From here the teacher took control again and introduced the concept of redress as the foundation of the

EEA, which is typical of a third step or phase in her strategy: to deliberately populate the discussion with bite size pieces of specialized knowledge. Again, she opened it to the class to share their definitions. This time the learner that answered responded with the correct "specialized" answer, which the teacher acknowledged as such.

This strategy does not however hold all the time, as there were some instances where the digression into the everyday was not positioned in context of the current discussion, and the purpose was not clear. For example, when introducing a PowerPoint document that contained a summary of the EEA, it contained a cartoon of former president Jacob Zuma. The teacher made a humorous reference to "Uncle JZ" and a learner also shouted out a comment. This resulted in a brief breakaway discussion around the inquiry into state capture that the former president is implicated in. This discussion had no relevance or added meaning to any of the topics at hand and no attempt was made to position it in any way.

Hierarchical Rule

Framing for this pedagogic element was relatively strong, F+, throughout the lesson. The teacher uses her position as teacher to control interactions, such as getting learners to listen to their fellow students (episode 17, line 12), or asking a learner directly for an answer when there are no voluntary answers (episode 17, line 9) (episode 18 line 17). She does however position herself amongst the learners and when she introduces opportunity for interaction, she does interact with a less formal manner. This change is often rooted in her language use where she switches from formal English and uses conversational Afrikaans / mixed language phrases such *"Kom Economics mensies"(Let's hear from the Economics people)* (Episodes 16, line 3), *"Het julle gelees van Uncle Adam"(Did you read about Uncle Adam)* (Episode 19, line 31) and *"Julle is mos die 'rights' generation" (You are the 'rights' generation)* (Episode not shown – phrase in reference to employee rights). Other instances where she slightly weakens relations are outside formal discussions, when she allows learners to have a few seconds to chat amongst themselves and she herself would interact with a small group. Lastly, she would also reference her own opinions, experiences, or stories during interactive episodes, for example, her need to know that she was appointed on merit and not as a woman of colour (episode 19, line 29).

Emerging Pedagogy

The pedagogic practice for this teacher shows strong framing over selection and evaluative criteria, with sequence, pace and hierarchical rule, although mostly strongly framed, having pockets of weakening. To investigate these occurrences, as was the case for Life Sciences, I reconfigured the data to see how the coding of the elements was distributed in pure transmission episodes versus those of interactive teaching episodes. This is shown in Figure 4.10 below: we can see that the weakening incidents mainly occur during interactive episodes. In pure transmission (TP) episodes all but one coding value is either F++ or F+, whereas in the interactive episodes (TI) the coding for sequence, pace and hierarchical rule were either F+ or F-, with the coding values of F++ consisting of selection and evaluative criteria only.

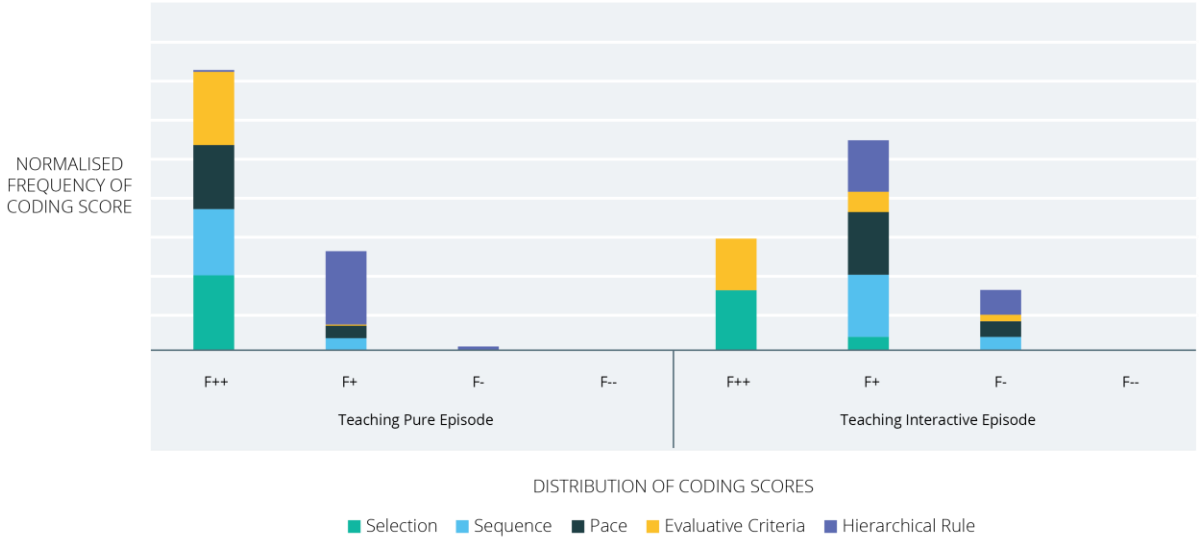
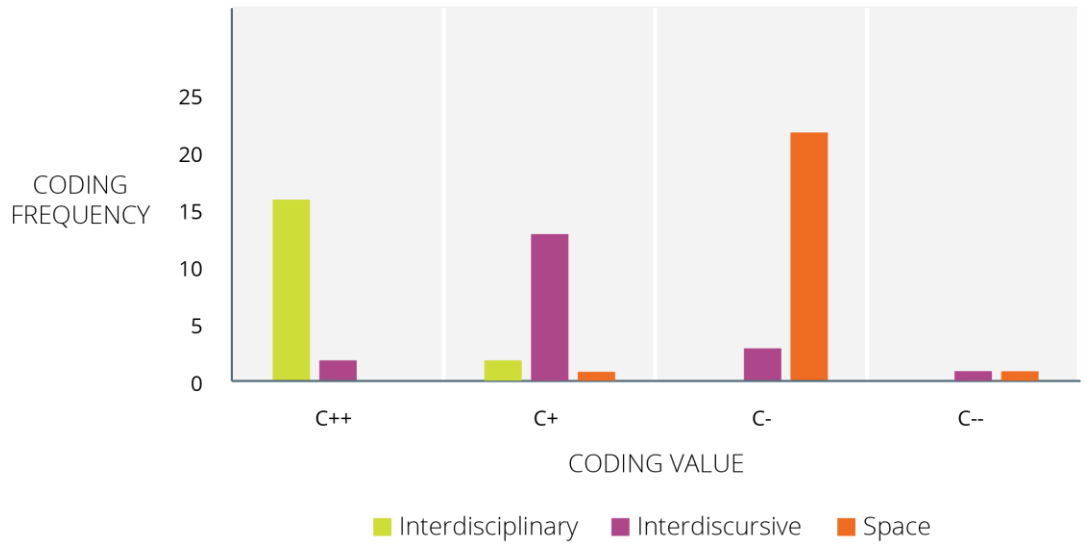


Figure 4.10 Distribution of coding for framing between Teaching Interactive (TI) and Teaching Pure (TP) teaching episodes for both Life Orientation lessons.

Classification

The graphs below take the same format as the prior graphs in this chapter, illustrating the coding frequency and flow for the classification of interdisciplinary relations, interdiscursive relations and space for the two Life Orientation lessons.

(4.11 a)



(4.11 b)

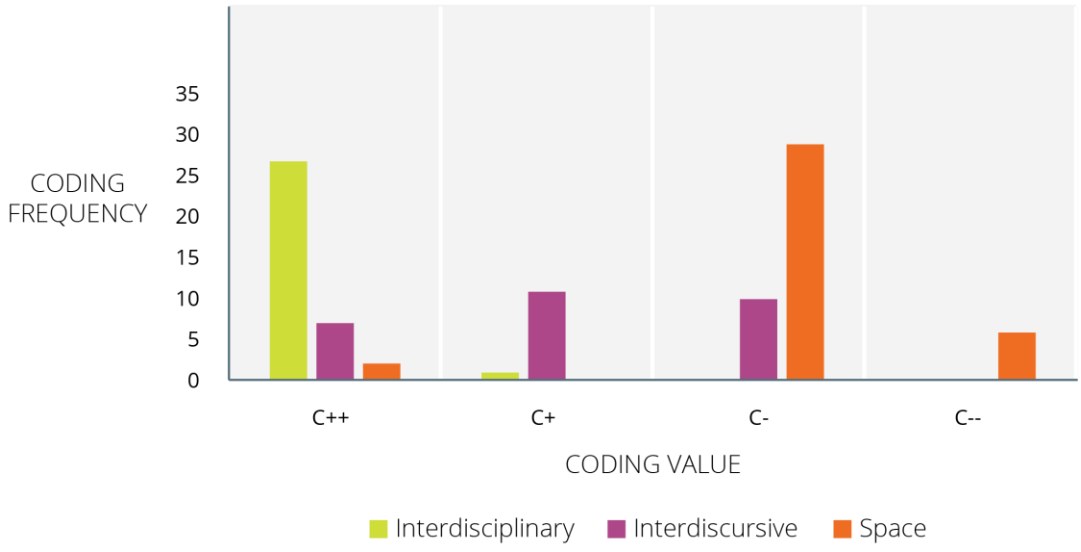
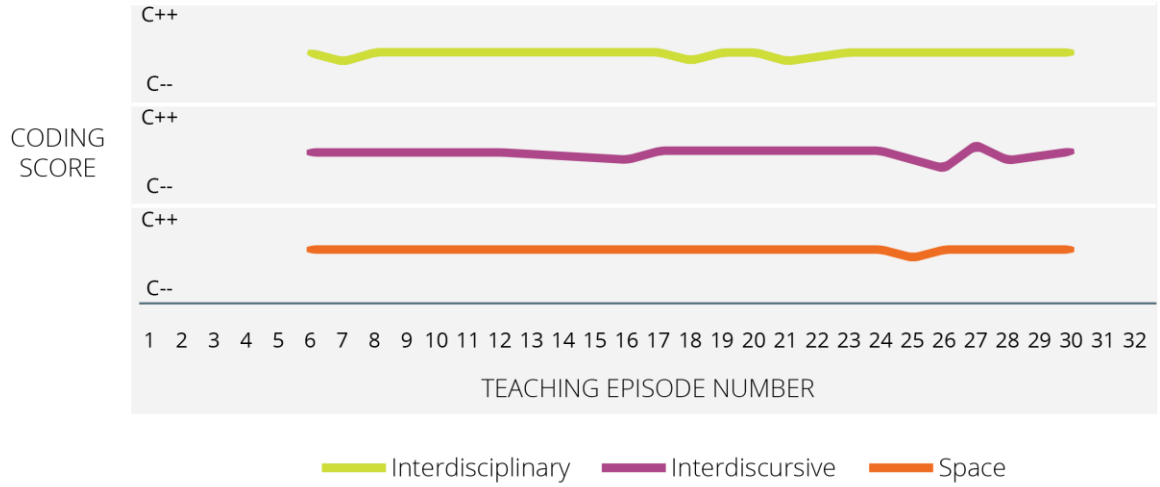


Figure 4.11 Frequency of coding for classification of each pedagogic element for the first (a) and second (b) Life Orientation lessons

(4.12 a)



(4.12 b)

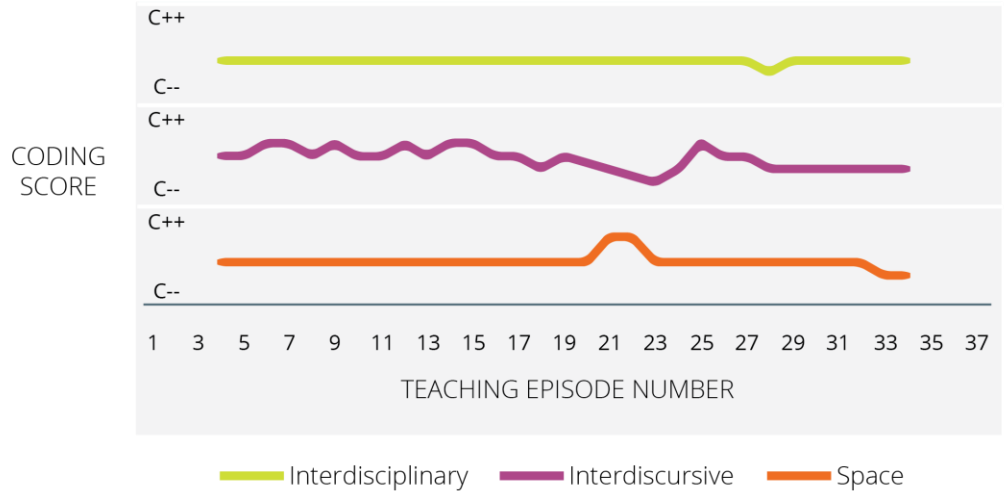


Figure 4.12 Change in coding for classification of each pedagogic element over the duration of the first (a) and second (b) Life Orientation lessons.

Interdisciplinary relations

The opportunity to reference other subjects or knowledge fields presents itself more easily in a subject such as Life Orientation, where the application of the instructional knowledge can take shape in a variety of scenarios and from various disciplines. Despite this, interdisciplinary relations remained strongly classified for both lessons. The teacher would apply the knowledge in everyday settings, but seldom drew explicitly on other fields. One such example is the casual reference in episode 16 above where the teacher was encouraging answers from the learners by calling on the Economics students. In another episode (not shown) when the teacher introduced the Labour Relations Act, she explicitly highlighted to the learners the relevance of this piece of legislation to those that want to go into the fields of Business, Law or Human Resources.

Space

For this teacher, the classification of space was weak. Although her laptop, which she used to drive the presentations, was located at the front of the class, she frequently made her way back to the learners and walked among the tables. The U-shaped classroom in the spacious library made this ideal. During prolonged interactive discussions, the teacher would even sit on a learner's desk and facilitate the discussion from there. Very seldom did she simply remain at the front, as can be seen on graph 4.11, where the frequency of coding shows hardly any for C++ and C+.

Interdiscursive relations

In the same way that evaluative criteria proved more complex to explicitly transmit, differentiating between specialized and everyday knowledge for this subject is also potentially trickier. The teacher privileges the use of the specialized version of the discourse as much as possible through her relentless use of formal jargon when teaching, and the repositioning of learner texts into that of the discourse. To illustrate this, I will draw not on the "how" of episode 18 (as per the evaluative criteria example), but on "what".

Below is the learner's response to what she thought the policy of affirmative action was:

> *"To give hope to the people with disadvantage … give them the upper hand in society ..."*

This statement was likely very much rooted in her social context and reality, as she attributed the function to an emotional need of people who remain disadvantaged. Her answer alluded to what she perceived as the ultimate end goal for such actions in society, rather than the specific objective of the legislation. The teacher did not discredit her answer, as it was not incorrect in relation to the everyday discourse, but nodded and said "ok" before she rephrased the learner's answer as a part-statement, part-test of her interpretation of the leaner's statement:

> *"So, to strive towards equality in the workplace to give certain groups of previously disadvantaged people an opportunity to advance in the workplace and to get certain jobs"*

Although this rephrasing is not littered with specialized content or jargon, it is exemplary of the discourse she constantly appropriates. Firstly, she brings it back to employment, as it is the EEA under discussion – not inequality as a whole. She uses the phrase "*strive towards equality*" rather than *hope*. She refers to the politically correct term of *"previously disadvantaged*", rather than "*people with disadvantage*" or "*them*" and lastly she uses "*an opportunity to advance in the workplace"* rather than *"the upper hand in society"*. She does not collapse her language at any point into "us" and "them" language, nor talk about white or black people. This professional and discourse aligned language use continues in other episodes. Another example can be seen in the preceding episode 17 where she stated the aims of the EEA:

> *"The first aim is to make sure that the workplace has equal opportunities for all groups of people. Ok.*
>
> *It doesn't matter your race, your sex, your sexual orientation etc., everybody, or all groups, need to be represented fairly and equally."*

Here she again used the phrases *"race"* vs that of colour, *"sex"* rather than *"man or woman"*, *"sexual orientation"* instead of any of the colloquial phrases.

In the following EEA aim, reference was made to the *"removal of unfair workplace discrimination"* and she subsequently introduced the phrase *"fair discrimination"*. These phrases have everyday meanings, but in the context of the subject discourse has an alternative, subject-specific meaning. The learners' likely orientation to the everyday meaning were evident in the subsequent discussion where a learner said there cannot be such a thing as fair discrimination (line

10) Another learner countered with a different argument presenting a practical example that might constitute the application of fair discrimination as a labour practice (line 13). The teacher validated her point and then built on the discussion by introducing Affirmative Action as a policy. In subsequent episodes (not shown) the teacher would revisit the term fair discrimination and use it in the appropriate text. Episodes for this teacher was therefore mostly coded C+, although everyday knowledge featured her dominant orientation and representation was that of the specialized form of the discourse.

As was the case of the Life Science teacher, I wanted to investigate episodes drawing on the horizontal discourse and these episodes are examined below.

Horizontal Discourse

To investigate the use of the horizontal discourse, I once again compared the coding for interdiscursive relations with those of sequence, pace, hierarchical rules and evaluative criteria for the same episode and represented this for LO2 in Figure 4.13.

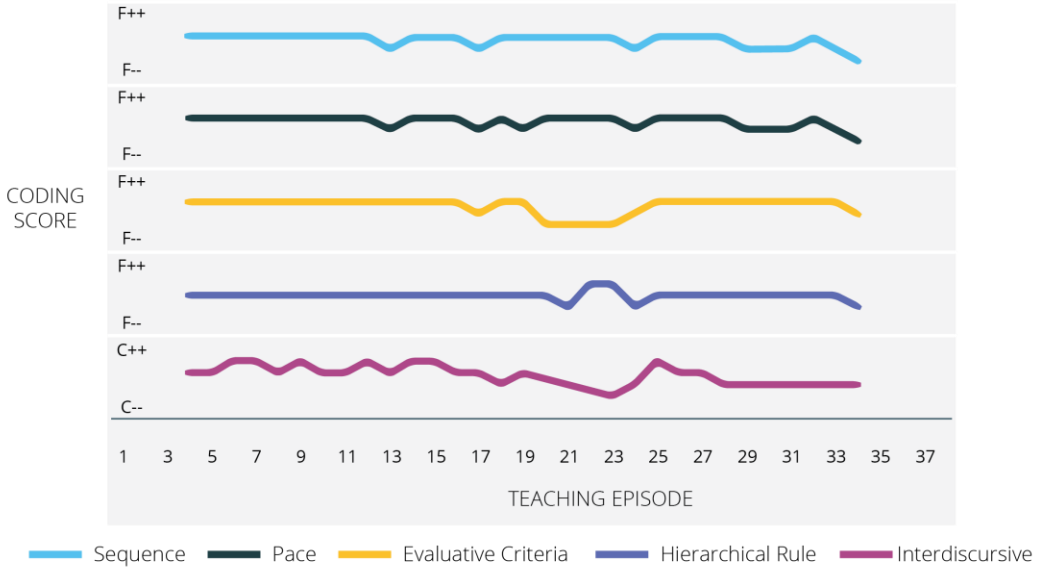


Figure 4.13 Comparison of coding for Inter-Discursive relations with sequence, pace, hierarchical rules and evaluative criteria for LO2.

For the first part of the graph in Figure 4.13 the coding for interdiscursive relations appears to hold no correlation to the other elements. Classification fluctuates as other elements remain unchanged until episode 13, after which no changes hold any apparent correlation. Evaluation criteria once again holds steady except for one major weakening which aligns with the episodes of weakest classification. These episodes took place around the time the teacher struggled to set up the video, and the subsequent showing of the video (television interview) was done with no positioning or debrief done by the teacher to bring it into context. The initial analysis here, as was the case for Life Sciences, also suggested that this teacher deliberately made use of the horizontal discourse. A similar analysis was therefore also conducted by revisiting the episodes that showed weakening of classification and coding them for their potential use. Once again coding was done in terms of IE (Instructional Exemplary), IP (interpersonal), MI (Moral Imperative) or U (Unclear). These results can be seen in Figure 4.14 below.

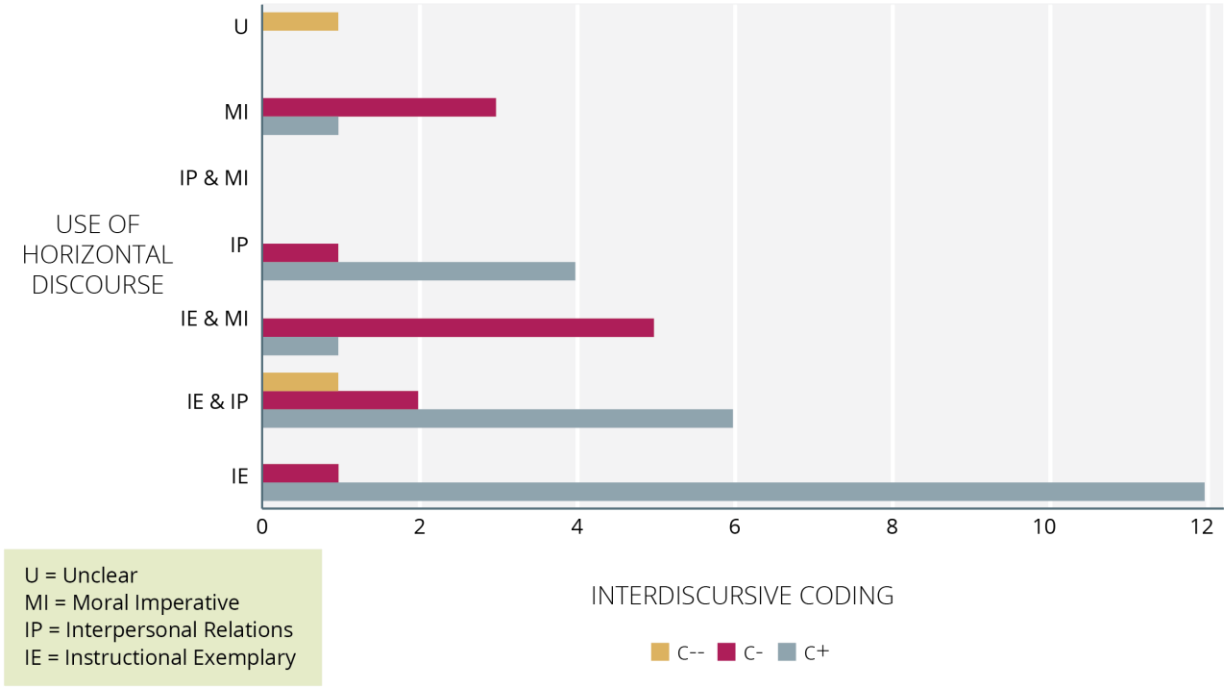


Figure 4.14 Instructional purpose for the introduction of Horizontal Discourse for LO1 & LO2.

A high-level examination of this graph shows that in the majority of instances the horizontal discourse was used for instructional purposes to show application of the content. This is especially true for episodes coded C+, which is to be expected based on the suggested strategy used by the teacher to use the everyday understanding of the learners as a baseline to move them towards the specialized orientation of the subject. There were however also significant instances where the engagement with everyday knowledge was taken beyond the application, to build rapport with learners and transfer certain life skills, beliefs, or attitudes. For example, in an episode (not shown) where the teacher takes the learners through the formal job recruitment process, the topic of work ethic was introduced. Here she stopped the immediate flow by allowing an episode where she took a moment to relate the school's custom of the "value of the week" to those attributed to a good work ethic. She followed this with a story of when she recruited sports coaches and how she looked for these skills and values. She therefore appealed to the learners to consider what the different values meant and what they would look like in the learner's lives. Lastly, there was only one episode where the introduction of the horizontal discourse was unclear, and that was when a video was shown mid lesson with no context given before or after the viewing.

In summary this teacher shows weak classification of spaces, but strong classification over both interdisciplinary and interdiscursive relations. The latter does have episodes of weakening where the teacher deliberately leverages learners' everyday knowledge to not only apply the subject knowledge, but also provide a pathway to the specialised version of the discourse. She also uses other pockets of weakening to engage with learners in a personal way and encourage certain moral orientations.

In this chapter, classroom episodes for both teachers were coded for in terms of classification and framing, as well as the use of horizontal discourse. In the following chapter I will take the investigation further by comparing the two pedagogic practices to each other, as well as to the dominant models of optimal pedagogy in the literature.

5. CHAPTER 5

Discussion

5.1. Introduction

The analysis conducted in Chapter Four allowed for a characterisation of both teacher's pedagogies in terms of the strength of classification and framing over the selected pedagogic elements. It also showed the variation of the coding of these elements within the lesson. In this chapter I will take this analysis further and interpret the results by addressing the remaining two sub questions namely:

How do the pedagogic features compare between subjects with a different knowledge structure, i.e., between Life Science and Life Orientation?

How do the findings speak to the dominant models of optimal pedagogy (mixed and radical visible pedagogy) in the research literature?

I will do this by first drawing on the high-level similarities between both teachers and that of a mixed pedagogy, which in turn introduces two key features of this discussion: that of the teaching episode and the use of knowledge. I will then expand on these points in attempt to further characterize both pedagogic practices and explore the relationship between knowledge and pedagogy. I conclude by considering the limitations of the study and consolidating the findings in the conclusion.

5.2. Comparison to Mixed Pedagogy

The research site for this case study was purposefully selected due to presence of key features. It was a high school that comprised of learners from mixed (low and mid) socio-economic backgrounds, with a long-standing track record of academic success. Furthermore, to optimise the study site, I chose two subjects with different knowledge structures delivered via exemplary teaching, through the selection of experienced senior staff holding tertiary qualifications in their respective fields. Although any given observation can be attributed to a feature of that teacher, the analysis delivers useful points for consideration.

For both classrooms, and therefore both knowledge structures, there was mostly strong framing over selection and evaluative criteria, with mainly strong framing over sequence even though there

were some instances of weakening. Both teachers also presented with strong classification of interdiscursive relations; in other words, specialised knowledge was dominant in the classroom. Similarly, there was strong classification of interdisciplinary relations, with both teachers focusing on their subject area, only making the occasional link to other subjects. The coding of these pedagogic elements is in alignment with those proposed for a mixed pedagogic practice. Also in line with this was Teacher LO's weak classification of space, whereas Teacher LS showed very bounded use of space. Teacher LS however had very little room available in her classroom, making entering the learners' space difficult. Teacher LO's set up in the library, with no fixed classroom, perhaps also played a role in why she moved closer to the learners, making both teachers' movements possibly circumstantial. I therefore did not consider this distinction and/or deviation further. The pedagogic elements that did however consistently deviate from the proposed mixed pedagogy were those of hierarchical rule and pace.

A mixed pedagogy proposes weaker framing over both these elements. In the case of hierarchical rule, the rationale is that a less formal teacher-student relationship better positions the teacher to produce the open communication required to effectively engage with content and navigate evaluative criteria. Similarly, weakened framing over pace offers learners greater control over their progression through the work. For both classrooms hierarchical rule was somewhat strongly framed, with the teacher as the point of authority in the classroom. Similarly, in both classrooms the teacher mostly determined the pace of progression through the curriculum content. Despite this however there were episodes where pockets of weakening occurred and there was a temporary suspension in the stronger framing of sequence, pace, and hierarchical rule. These observed pockets of variation can be understood as a product of both the method of analysis and the use of knowledge in the classroom. In the next sections I will elaborate on both.

5.3. Method of Analysis: Teaching Episode

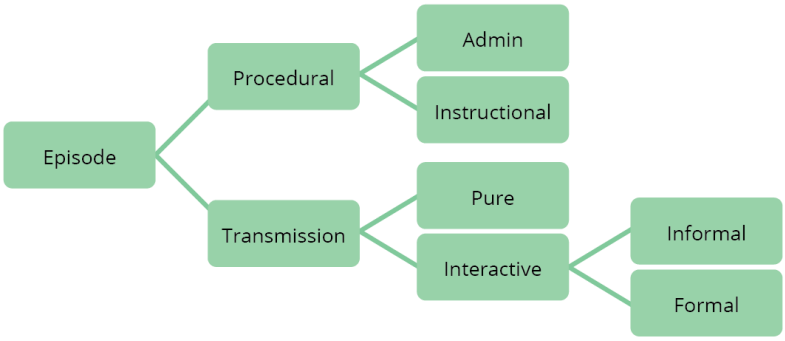
The teaching of younger children in the early grades often centres around a task or activity. When analysing such classroom observation data, it seems logical to use these tasks as a snapshot representation of the teacher's pedagogic practice. The pedagogy of the teacher is likely to remain consistent for that task and at this level there is also not yet large differentiation between subjects that would necessitate any change in the delivery and engagement with both the content and the

learners. In the context of a high school however, subjects are more specialized, especially at the higher grades, and significant amounts of content needs to be covered. The latter being particularly true for the current South African curriculum. This therefore means that the delivery of content in senior grades is likely to be in a lecture style format, and as such the use of a task for the purpose of analysis is rendered unsuitable.

To enable the analysis of the data for this study the notion of a Teaching Episode was introduced in Chapter Three, where such an episode allows for the splicing of the entire data set into consecutive units for coding. Each episode's transition is demarcated by either content change, interjection from learners or a change in the purpose of the content delivery. Teaching episodes therefore provide a tool to both identify units to analyse as well as examine the dynamics of the lesson as a whole.

Both teachers employed the same general structure to their lessons. Episodes were *procedural* where either class *admin* was dealt with, or *instructional*, where instructions were given in terms of homework, exam logistics etc. The remainder, and majority, of the episodes entailed transmission of the learning content. These were considered either *transmission pure* episodes, where it was mostly the teacher engaging in one-way delivery and explanations of the content, or *transmission interactive*, where there was some form of extended interaction between the teacher and the learners. These interactions were either formal in nature, such as questions posed to learners around the content, or apparently informal, where more relaxed discussions took place. This structure is summarised in Figure 5.1 below.

Figure 5.1: Types of Teaching Episodes typical of both classrooms



In the analysis in Chapter Four we saw a high number of episodes per lesson, where even though the duration varied, the average time corresponded to nearly an episode for each minute of lesson time. This suggests two things. Firstly, considering that an episode deals with a contained idea or interaction pertaining to a section of the content, the high number indicates an overall fast pace for the lesson, making the strong framing over pace less surprising. The second suggestion arises when one considers the high episode number alongside the strong framing over all the pedagogic elements, especially that of evaluative criteria. The strong framing means that the control of content selection, sequence and pace lies with the teacher, and that evaluative criteria were clear, that is, for each episode the selected content, concept or principle was engaged with accurately and clearly, demonstrating the required realisation of the discourse. This level of control and discourse relevance suggests that episodes were used intentionally, and their transitions managed by the teacher. This does not mean they are planned, but that they form part of the implicit pedagogic strategy of the teacher as she engages with the lesson. Such a pedagogic operation is likely only to be achieved by a knowledgeable and experienced teacher – as is the case for both our teachers.

In the comparison between the interactive and the pure transmission episodes, we see that although there was no consistency in the number of interactive episodes used per lesson for either teacher, their presence was a noticeable feature. The analysis in Chapter Four further shows that for both teachers the pockets of weakening of framing occurred during these interactive episodes. If one then considers this, alongside the managed use of episodes on the part of the teacher, the introduction of these interactions was once again not random. Therefore, I would argue that both teachers used interactive episodes at an instructional level to engage with content in an alternate manner, but also as a means to achieve the required interpersonal relations, such as those recommended by a mixed pedagogy. In other words, the pockets of weakened framing during interactive episodes not only impacted the instructional discourse, but also the regulatory. Even though weakened framing was not present all the time, these episodes were sufficient to affect the prevailing regulatory discourse in the classroom.

The use of interactive episodes did however not only serve to inject variation in framing of pace and hierarchical rule, but these were also the sites where both teachers recruited the horizontal discourse.

5.4. Use of Knowledge

The analysis of coding for interdiscursive relations showed the dominance of the vertical discourse in the classroom of both teachers. Life Science's Teacher LS mostly coded for C++, with Teacher LO in Life Orientation C+, that is, classification between the specialized version of the discourse and everyday knowledge was strong for both teachers. Some of the interactive episodes, however, did present with weaker classification where the use of everyday knowledge characterised the type of content that was engaged with. The specialised nature of the subjects in Grade 12 allowed for the analysis into the purpose for which everyday knowledge was used by each teacher. If one considers this alongside the composition of the other pedagogic elements, potential insight into the relationship between knowledge and pedagogy can be gained.

Firstly, as discussed in the previous section, the use of episodes was not arbitrary. Episodes contained a clear beginning and an end, and learners recognised and responded to the transitions as they were navigated by the teacher. Secondly, in almost all the episodes where the horizontal discourse was recruited, evaluative criteria remained strongly framed. This indicates that the topics that were introduced, although non-specialised, remained relevant to the immediate content being taught, was positioned appropriately and as such likely drawn on with a purpose in mind. It is here, in the purpose to which the horizontal discourse is used, we see a difference between the two classrooms and subjects, and a potential interplay between knowledge and pedagogy.

Life Sciences as a subject represents a vertical discourse with a hierarchical structure. Although it deals with the science that operationalises life, it is rooted in the principles of Physics and Chemistry, and the concepts being taught at Grade 12 level far exceeds that which would naturally be able to take place without acquisition of prior knowledge. Although very abstract ideas and generalising principles are fewer, these are present and critical to the discourse. An example would be the biochemical principle of hormonal feedback loops highlighted by Teacher LS. Similarly, due to the applied nature of this science, there is ample opportunity to draw upon learners' everyday experiences to position the formal subject knowledge, and Teacher LS made use of these opportunities.

During formal interactive episodes she used everyday knowledge to provide examples of the application and realisation of the instructional knowledge in real life. This was accompanied by the weakening of framing over sequence and pace. Therefore, these episodes provided a marked

interval to improve learner understanding by repositioning the content in a familiar and culturally relevant context, without blurring the boundaries between the two forms of discourse. The weakened sequence and pace meant that the learners had some control on how this interval was navigated, allowing them to reveal through questions and/or responses their level of understanding to the teacher. In other words, the primary purpose for recruiting the horizontal discourse was to create an alternative space for knowledge acquisition and refining of evaluative criteria, by applying the academic knowledge in its everyday context.

In addition to this Teacher LS used everyday realities of the discourse to springboard informal and free flowing conversations that pertained to moral arguments, which in this instance was the realities girls faced when starting menstruation and the role of parents in raising young children conscious of these matters. These episodes were also characterised by the weakening of framing over hierarchical rule, and a further weakening of sequence and pace. Although the teacher still operated from the position of the teacher, in that she would introduce the topic and close off the episode, the moments in-between saw a suspension of the formal teacher-student relationship and discussions were open and spontaneous. Through these short interactions the teacher builds rapport with the learners by temporarily reconfiguring the relational and conversational dynamics, which, even though not overtly present in other episodes in this form, the impact thereof remains.

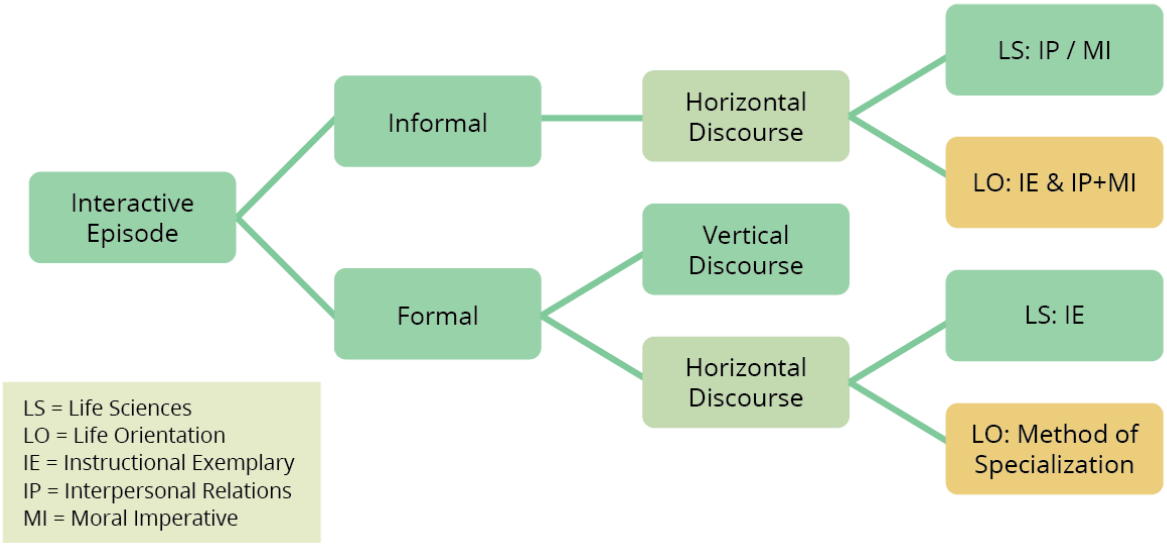
The subject of Life Orientation consists of content knowledge that pertains to everyday life. It ranges from study skills to labour relations. In other words, it comprises of a collection of topics with a thematic thread: preparing learners for the world around them. Each topic carries its own specialisation e.g., whilst teaching study skills methodology, it will have roots in Psychology and Neurobiology. Topics require no prior knowledge to move from one to the other, as such the sequence of progression through the topics is not crucial to their individual acquisition. For Teacher LO, unlike Teacher LS, the instances where the horizontal discourse featured showed no correlation with any of the other pedagogic elements. This occurrence possibly speaks to "why" *and* "how" she used the discourse. Although Teacher LO also used everyday knowledge for instructional exemplary purposes her primary use of this discourse appears to be as a method of specialisation.

In Chapter Four we saw that this, likely implicit, strategy comprised of three parts. First the teacher would start the episode by posing a question. For example: *What is affirmative action? Is there*

such a thing as fair discrimination? The question would be relevant to the content, but the phrasing thereof allowed learner responses to consist of everyday knowledge as it is relevant to them. The teacher would not dismiss these contributions and movement into the horizontal discourse. She would instead use it to generate more questions, whilst rephrasing key pieces of text to start approximating the specialised form of the discourse. Finally, she would draw the immediate discussion to a close by using the preceding learner inputs to introduce the formal content knowledge as it relates to her opening question. This teacher therefore specialises the everyday. She moves it from its context-dependant position in the learners' everyday lives by extracting aspects that bridge into the specialised form of the discourse. This movement not only allows for specialising, but it meets the learners at their level of interpretation and introduces a pathway into the discourse without dismissing their contextual reality. If we bring this back to the Bernsteinian characterisation of the discourses, where the horizontal discourse is integrated by context and the vertical integrated by meaning, this pathway is a two-step process where the contextual example is delocated from the contextual segment and relocated into a larger segment which is integrated by meaning, whilst maintaining this ordering.

Building on Figure 5.1, the use of knowledge by both teachers during interactive episodes is summarised in Figure 5.2 below. Formal interactive episodes were either dominated by the vertical discourse, where discussions or question-and-answer sessions took place, or these episodes were dominated by the horizontal discourse. In the case of the Life Sciences classroom the latter was used in an instructional exemplary manner, whereas in Life Orientation it was used as a method of specialising the discourse. Informal interactive episodes were all rooted in the horizontal discourse, where in the Life Science context it served to weaken framing over hierarchical rule through building interpersonal relations. The Life Orientation teacher used it in a similar manner, but it was also the site where she could showcase the application of the subject knowledge.

Figure 5.2 Distribution and use of knowledge structures for both classrooms



5.5. Radical Visible pedagogy

If one studies the pedagogic picture thus far it potentially characterises a radical visible pedagogy in operation. Bernstein referred to a radical visible pedagogy as a "radical realisation of an apparently conservative practice" (Bernstein 1990), where the association with a more conservative practice is due to the mutual characteristics of a teacher-centred visible pedagogy. I showed earlier that the visible component of the pedagogy is through the presence of clear evaluative criteria in the classroom, that allows learners, irrespective of social background, to be orientated to the school code and so given access to vertical discourses. What constitutes the radical component, and the transition out of the conservative, is the purpose of this visibility. In a conservative practice the aim is to produce change between individuals, whereas in the radical form it is to produce changes between social groups, through "understanding of your own position in society, through coming to an understanding of the relationship between social groups, and through this new appreciation, the ability to change practice" (Bernstein as referenced in Bourne 2004).

Bourne (2004) characterises this dimension of radical pedagogy as one where learning centres around the concepts of collective access and participation by all learners, within their social and political context. This implies that not all students need to be directly involved in all activities or

discussions, but that those witnessing the interaction of the student(s) engaging with the activity, or teacher, are still actively learning through the peripheral participation of watching and listening. This does however require on the part of the teacher effective navigation and positioning of the discourse that is to be acquired and using student interaction as a method of assessing teaching efficacy, rather than an indicator of individual learning ability. The cultural connectedness of this endeavour being further enhanced by the managed used of the horizontal discourse.

If we return to the two classrooms, we see that key features of both pedagogic practices may contribute to the conceptualisation of a radical visible pedagogy in operation. We established that there was mostly strong classification and framing present in both classrooms, which would position this as a traditional teacher-centred pedagogy. The presence of deliberately introduced pockets of weakening over classification and framing places these practices temporarily in a learner-centred space. Therefore, the pedagogies in operation are neither teacher- or learner-centred, nor is it consistently a mixed pedagogy, but rather a dynamic variable pedagogy, where the classification and framing are weakened for an instant, but the dominant coding is always reverted to. Switching the focus to these episodes of weakening, we can tease out some components that possibly reflect the *radical* attributes in practice.

As established; episodes of weakening happens during interactive episodes. These episodes provide the primary platform for engagement between teachers and learners and consistently presents certain features. Firstly, discussions are always directed to the class as a whole. The teacher may call on a learner to answer the question, but the learner answers it on behalf of the whole group. Although the presence of individual activities during the course of the school year is likely, the transmission interactive style observed relies on the collective participation of the whole class. Secondly, both teachers use learner responses to determine how they proceed through the content in that episode, and, I would like to argue, these responses can determine the nature of the ensuing episode. If student responses prove sufficient to display the basic acquisition of the discourse, the teachers move onto the next topic, if not they will enter into a new episode where she will engage with the content in an alternate manner. Thirdly, although both teachers clearly operate from their position as a teacher, they achieve cultural and social connectedness with the learners through the temporary weakening of framing over hierarchical rules. This is achieved by recruiting the horizontal discourse.

The introduction of everyday knowledge not only relaxes the communication dynamics, but it provides the opportunity to intentionally incorporate local forms of knowledge. We see this used in Life Sciences to strengthen evaluative criteria through the application of subject knowledge in the real-life context of the learners, whereas in Life Orientation it is used as a method to specialize the discourse. Teacher LO encourages these perspectives from the learners and then builds on them. Where some might view this practice as correction, I argue that this engagement, rooted in healthy interpersonal relations, opens choice to all learners to take up the practice of differentiating and transitioning between the two forms of discourse. In other words, where strong framing of evaluative criteria communicates the expected realisation of the discourse, the effective use and specialisation of the localised horizontal discourse positions the criteria closer to learner's realities. It models a method of access to, and reflection on, both forms of discourse irrespective of the learner's socio economic or cultural background. This illustrates the radical component of the pedagogy: the effective use of the horizontal discourse weakens framing to attend to various common-sense understandings and thereby creates cultural connectedness by bringing all learners into a new and common specialised discourse, whilst leaving intact individual cultural discourses.

Lastly, a feature that potentially forms part of the operational reality of a radical visible pedagogy but is not overtly mentioned thus far, lies in the dynamic status of the pedagogic practice, i.e., that *classification and framing varies over the course of the lesson*. These changes are mainly in response to learner productions, yet the overall objective remains that of moving the class forward as a whole. The changes reside in and are implemented via the notion of teaching episodes, and these can range from strongly framed and classified transmission pure episodes dominated by the vertical discourse, to weakly framed and classified informal interactive episodes. One can therefore view these episodes as a pedagogic tool, but with a knowledge organising function.

5.6. Knowledge and Pedagogy

Thus far we have seen the interplay between certain pedagogic elements, each contributing to exploring the relationship between knowledge and pedagogy. To connect these, I want to return to a concept within Bernstein's theory of pedagogic discourse. Bernstein positions the elements of sequence, selection, pace, and evaluative criteria as part of the instructional discourse, whereas hierarchical rules comprise that of the regulatory discourse. The significance here is that these two discourses can change in their strength of framing in relation to each other, but the instructional is

always embedded in the regulatory. In other words, the instructional discourse will always be influenced by that of the regulatory. The analysis and discussion thus far show that this relationship is in fact an operational reality in both classrooms. For both subjects the status of the interpersonal relationship between the teacher and students is critical in enabling key instructional features such as use of teaching episodes and the effective collective participation by the learners in class discussions. Conventionally the attainment of the desired regulatory discourse status is ascribed to the weakening of framing, but in the case of these two teachers it is achieved in how they use knowledge.

We have seen that both teachers recruit the horizontal discourse to create pockets of weakening in otherwise strongly framed lessons. The introduction of this knowledge structure can result in the strengthening of evaluative criteria by the weakening of sequence and pace, providing everyday application opportunities as well as a pathway for specialising the discourse. Key episodes are however dedicated to the everyday moral or social implications around the discourse, where framing over hierarchical rule is significantly weakened, and space is created where learners are invited and encouraged to bring their perspectives and realities into the discussion. During these episodes the primary purpose for the presence of this knowledge structure is to maintain open yet respectful interpersonal relations. These teachers therefore use the horizontal discourse to weaken framing appropriately and so generate the regulatory discourse required to support learning.

5.7. Conclusion

This study aimed to explore the relationship between knowledge and pedagogy as it operates within an optimal pedagogy, especially in relation to a classroom comprising learners from mixed socio-economic backgrounds. In this section I summarise the key findings in relation to the dominant schools of thought, before addressing some limitations of the study and possible future research considerations.

In line with attributes associated with a traditional visible pedagogy, both teachers demonstrated strong classification and framing over most pedagogic elements, especially selection and evaluative criteria. However, this did not hold steady for the entire lesson and temporary deviations occurred. The investigation into the nature and composition of these variations resulted in the key findings of this study. Firstly, there is the notion of a teaching episode that the lecture-style

teaching of a high school necessitated to generate units for analysis. These episodes did however not only serve an analytical purpose, but it became apparent that they were used as a pedagogic tool by both teachers, where they intentionally navigated and controlled the movement from one episode to the next. The second set of findings came from looking at the episodes where the deviations with regards to a traditional visible pedagogy resided: interactive teaching episodes.

Interactive teaching episodes revealed two things. Firstly, both teachers used these episodes to introduce pockets of weakening in the otherwise strongly framed lessons; these pockets allowed a temporary approximation of a mixed pedagogy before returning to the more conservative default. We can therefore more accurately describe the pedagogic practice of these two teachers as a dynamic variable pedagogy rather than a static mixed pedagogy, where the temporary weakening of classification and framing is used in the interest of strong classification. The second finding these episodes brought to light speaks more directly to the original research question: the interplay between knowledge and pedagogy.

What became apparent was that the change in the framing of pedagogy was brought about in terms of how the teachers used knowledge, specifically everyday knowledge. Both teachers recruited the horizontal discourse with specific purposes in mind. The sophistication of this recruitment can be seen due to high school subjects taking on a more specialized form, thus adding a dimension to pedagogy that is largely invisible in earlier, and mostly primary-school-based, studies. In Life Science, the subject representing a vertical knowledge structure, the horizontal discourse was used for instructional exemplary purposes and to develop interpersonal relations between students and the teacher. In Life Orientation, a subject with a different knowledge structure consisting of thematically linked topics each with its own specialised form, the teacher also used everyday knowledge in an instructional exemplary or interpersonal manner, but her primary use of the horizontal discourse was as a method of specialisation. She would build on learner responses and model a pathway into the specialised form of the discourse. Where previous studies advocate for the privileged use of the vertical discourse over that of the horizontal discourse, or the side-by-side use of the two forms, these teachers demonstrate an alternate understanding of the relation where the everyday knowledge is delocated from the local context and relocated into the vertical discourse, whilst the integration-by-meaning ordering prevails.

This manner of relocation of the horizontal discourse in return brings about one additional and key finding: it potentially illustrates the radical element of a radical visible pedagogy in operation. The interactive episodes where the horizontal discourse is used draws on collective class participation where the teachers use this to gauge understanding and knowledge acquisition, differentiating the class and not individuals. Simultaneously, the weakened framing brought about by the use of the horizontal discourse allows the teacher to deal with the learners' various common-sense understandings before modelling a pathway to the specialised form of the discourse. In doing this the teachers create cultural connectedness, where the culture that is connecting them is not home culture or socio-economic status but a new and common discourse. It leaves intact individual cultural discourses, whilst creating a new specialised discourse that all can share in.

Study limitations

If one reflects on the shortcomings of this study the most obvious factor lies in the sample size, with only two teachers being observed over two lessons. Furthermore, where the academic attainment of the school with the socio-economic composition motivated the selection of the site, any observed features can likely only be attributed to the individual teacher and not as a product of the school. Nevertheless, the nature of the investigation, and the use of episodes to create several micro samples in the greater sample, does provide sufficient data for the various findings of this study. To take these further, however, I would suggest a repeat investigation within the same school with a larger sample size and the inclusion of additional subjects. Similarly, as was done in the Bourne (2004) study, structured interviews with teachers and students can shed light on the intentionality and experiences of both parties. A repeat of this study at a similar high school site as well as one with a more homogenous cultural and socio-economic profile would provide an interesting contrast, where one can investigate if this radical visible pedagogy is an all-round optimal practice, not only for classrooms of mixed SES.

In summary both teachers showcase a variable pedagogy embedded in a radical visible pedagogy, where the strategic use of the horizontal discourse, against the backdrop of an otherwise strongly classified and framed lesson, is used to effect variation within the pedagogy, thus establishing and maintaining a regulatory discourse that supports the instructional discourse as inclusive and visible to all learners.

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