



RESEARCH REPORT

LEARNING TO TEACH IN A SITUATED LEARNERSHIP MODEL OF TEACHER EDUCATION:

**A case study of the support provided by mentor teachers in the
process of learning to teach**

by

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ABSTRACT

In the South African education landscape, an apprenticeship/learnership model of teacher education is gaining traction, particularly in the private education sector. There is a general perception that student teachers who are immersed in a school context daily will gain a better understanding of the process of learning to teach. However, this assumption has not been empirically tested.

The purpose of this qualitative research was to understand how mentors of student teachers in a learnership programme in a private school in South Africa, understand and support the process of learning to teach, both theoretically and in practice. The mentors' criteria for good teaching and what is important in the mentoring interactions determines the kind of Zone of Proximal Development they are able to create in the mentoring interactions, specifically in the provision of feedback to student teachers on the lessons they teach. The research was conducted with three mentor teachers, each responsible for mentoring a student teacher in their subject area, mathematics. The research employed consisted of audio-recorded interviews with the mentors, as well as audio-recorded feedback sessions between the mentors and their respective student teachers after the mentor observed the student teaching two lessons.

The results show that there is a variation in the forms of knowledge and support provided to the student teachers. The mentors' support of the student teachers mostly focused on general pedagogical support in the form of tips and general classroom management advice. The more substantive mentorship, which focuses on the explicit communication of instructional design and pedagogical reasoning, was limited in some instances or not evident at all in other instances.

A formal cognitive mentorship programme is recommended to effectively support student teachers in the process of learning to teach and to develop them into professional teachers. Such a programme should interrogate the mentors' own assumptions about teaching, help them to understand the processes and complexities of learning to teach and guide them on how to design opportunities for making the pedagogical reasoning behind teaching choices explicit to student teachers.

Key words: learnership, mentorship, general pedagogical knowledge, pedagogical content knowledge, semantic gravity, semantic density

DEDICATION

I dedicate this research to my loving family, my husband Michele, and daughters, Nadia and Catia, for their unwavering support and belief in me.

I thank my deceased parents, Giulio and Dina Catinella, who instilled in me the value of education and always supported my career in teaching – Grazie.

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LIST OF ABBREVIATIONS

GPK	General Pedagogical Knowledge
PCK	Pedagogical Content Knowledge
UNISA	University of South Africa
ZPD	Zone of Proximal Development

CHAPTER ONE

INTRODUCTION

This qualitative study investigated how three mentors of student teachers in a learnership programme in a private school in South Africa, understand and strive to support the process of learning to teach.

The purpose of this study was to explore the type of feedback mentors provided to students in response to the lessons they taught. I then interpreted the extent to which they created a Zone of Proximal Development for student teachers' *professional development* in the learnership programme. This report will argue that the nature of feedback provided (and therefore the potential for students' professional development) depends on the mentors' conception of effective teaching, their approach to mentoring, and the way that they conceptualise what is most important in the process of learning to teach.

1.1 Background to the research problem and purpose

Learnership programmes for teacher education are increasingly being adopted by well-resourced private schools in South Africa as a means of addressing a perceived shortage of well-qualified teachers in South African schools. These 'learnership' programmes are based on an understanding of 'learning to teach' through an apprenticeship model. Learnership programmes introduced in private schools require that student teachers register for an undergraduate degree through a distance learning tertiary education institution, while obtaining practical experience in the classroom and receiving daily support in a school context. Student teachers are assigned an experienced teacher as a school-based mentor. The role of the mentor is construed as a provider of school-based support and the mentoring is intended to act as a bridge between the theory they learn through their coursework and the practices of teaching.

The assumption that the mentor's feedback will act as a bridge between the theory and practice is significant. It is well established that student teachers enter teacher education programmes with preconceived notions of what teaching is about which are based on an extended 'apprenticeship of observation' of teaching (Lortie, 1975, in Grossman, Hammerness and McDonald, 2009). In the course of their schooling, learners observe their teachers presenting lessons, asking and answering questions, arranging assessments and providing feedback on their assessment tasks. They

cannot 'see' the professional reasoning behind these actions; the decisions regarding the selection, sequencing and pacing of curriculum knowledge; the pedagogical rationale for the design of learning tasks and assessment activities etc. The logic of teaching cannot be directly observed. A true apprenticeship into teaching must both enable the student to develop a knowledge base for professional practice, and make the underlying knowledge and reasoning in, and for practice, explicit.

Morrow (2007) argues that a fundamental goal of teacher education is for prospective teachers to build a properly grounded conception of teaching. This involves an understanding of the professional practice of teaching as 'organising systematic learning' (p. 84). This knowledge is not an intuitive way of thinking about teaching and cannot be accessed through an apprenticeship of observation. Without a specialised academic knowledge base that underpins teaching practice, teachers cannot make conceptually informed professional judgements about the construction and evaluation of learning experiences.

One of the risks of apprenticeship models of teacher education is that without explicit links between a suitable formal curriculum and the mentoring received in school-based placements, teacher preparation may focus primarily on the technical skills of classroom management without integrating theoretical knowledge from the university course work into the support provided by mentors. If this were the case, then novice teachers who come through such apprenticeships would be lacking a "strong and properly grounded conception of teaching" (Morrow, 2007, p. 69). This is why it is important to investigate how mentors in learnership programmes support their students and how they act as the bridge between theory and practice.

1.2 Personal rationale

An important motivation for this research was my involvement in the learnership teacher preparation programme at the school where I was teaching. I was one of the coordinators responsible for the learnership programme and my responsibility involved overseeing the mentoring of the student teachers.

It is notable, that although the mentors generally accept that their role is to support their student teacher, there is no formal mentorship training or clear articulation of the mentor's role. What it means to mentor, and what it might entail is not made explicit.

Over many years, I observed the varying forms of support provided by mentors. There appeared to be a disjuncture between what student teachers were learning at the universities and what they were learning in the school context.

My impression was that the learnership model of teacher education was not as effective as it could be in preparing pre-service teachers. My concerns were that the mentorship focuses mainly on the practical aspects of teaching (knowledge-in-practice) and not enough on the integration of theoretical knowledge (knowledge-for-practice) into the feedback provided to the student by the mentor teacher.

The purpose of this research was, therefore, to understand how mentors of student teachers in a learnership programme in a private school in South Africa understand and support the process of learning to teach, both theoretically and in practice.

1.3 Research Questions

In this research the focus is explicitly on the mentor and how the mentor shapes the student's practices and development.

The primary research question was:

“How do mentors of students in a learnership programme understand and support the process of learning to teach, both theoretically and in practice?”

In order to address this question, the research aimed to find out:

1. What are mentors' conceptions about what student teachers need to know to become effective teachers?
2. What is the nature of the feedback that is provided by mentors to the student teachers?
3. To what extent does the feedback engage in developing student teachers' capacity for pedagogical reasoning?

CHAPTER TWO

LITERATURE REVIEW

The purpose of this literature review was to find out what has been written about how students learn to teach and what they need to learn in order to develop effective teaching practices. More broadly, it seeks to explore what learnership models of teacher preparation can offer and cannot offer to prospective teachers.

The key premises and concepts revolve around conceptions of what it means to teach, and then introduces key distinctions and relations, i.e. how is learning to teach conceptualised and what are the criteria for mentoring in school-based teacher education programmes?

2.1 Learning to Teach

Although in the 1960s teaching was presented as a skills-based routine (e.g. Bijou, 1968) research has shown that teaching is not natural and intuitive work, but intentional design work that requires varied types of knowledge, situational appreciation and judgement. However, students, having attended school themselves and observed teachers teach, rarely see this constitutive work of teachers.

Lee Shulman (1987) identified knowledge bases for teaching and the cognitive work that teachers do in mediating knowledge. Shulman's work enabled scholars to understand that teaching is a knowledge-based practice that is complex and requires conceptually informed judgement. Its practices are thus underpinned by a formal body of knowledge that must be formally studied and learnt. Therefore, teacher education programmes are responsible for how students learn to teach by addressing both theoretical and practical elements.

The relationship between knowledge, learning and teaching is best understood by examining what knowledge is required and the impact of this on learning to teach. According to Morrow (2007, p. 69) "Teacher Education is a kind of education which enables someone to become more competent in the professional practice of organising systematic learning and nurtures their commitment to do so. Systematic learning does not only refer to progression in learning content knowledge but also to the process of acquiring other types of knowledge over time with the intentional

guidance of a more experienced teacher. This is affirmed by Hammerness et al. when they state that:

In contrast to the individual problems confronted one at a time by doctors, lawyers or architects, teachers must find a way to meet the needs of a group of students who are diverse in terms of their teaching needs, strengths, backgrounds, areas of challenge, and range of abilities (2005, p. 378).

Systematic learning occurs within the subject teaching at all levels of schooling. Content and curriculum knowledge are not a series of random sets of knowledge thrown together, they follow a structured system of interconnected parts which together ought to lead to more complex understandings of aspects of the social and natural world. New knowledge is built on prior knowledge. Organising systematic learning involves a selection of concepts; sequencing of ideas into a learning progression and making decisions about pacing according to learner needs and understanding. The integration of knowledge and skills benefits learners in acquiring a clearer and deeper understanding of how concepts and principles are constructed and are interlinked.

Morrow (2007, p. 84) puts forward four fundamental goals that teacher education programmes need to fulfil if they are to ensure that prospective teachers are well prepared:

1. Develop a strong and properly grounded conception of teaching: this comprises a well-supported foundation of systematic learning;
2. Know how to make the content accessible to learners: this requires a sound understanding of content knowledge;
3. Knowledge of how the social, organisational and institutional context impact on the practice of teaching;
4. Competencies and knowledge of course design: ways in which learners are enabled to learn the relevant content.

The goals above may overlap between what is taught in academic teacher education programmes at tertiary institutions and professional teacher education programmes in schools. Student teachers may well learn different aspects in different contexts.

2.2 The Relationship between Knowledge and Practice

Cochran-Smith and Lytle (1999) identify three different relationships between knowledge and practice: knowledge-for-practice; knowledge-in-practice and knowledge-of-practice. Firstly, formal knowledge is considered by the authors as knowledge-for-practice. It is the theory that can be formally taught and is best acquired through formal instruction. This knowledge must have been abstracted out of particular contexts and generalised for learning that is relevant to all, no matter in what context they teach. This theoretical knowledge is fundamental in providing teachers with an exclusive knowledge resource necessary for the practice of teaching. Knowledge-for-practice is the how, when and what teachers do in their daily practice and includes disciplinary knowledge that informs educational practice, subject matter knowledge, educational theories, and conceptual frameworks, as well as strategies and effective practices for teaching a variety of content areas (ibid., p. 255). Without formal knowledge, students are inducted into the 'ways things are *here* and *now*' i.e. the present and the particular. Theoretical knowledge-for-practice is powerful because it gives student teachers the vision of seeing options and alternatives beyond the way things are done in a context, i.e. a shift to the *there* and *then*. Knowledge-for-practice helps teachers see complexities in their work and distances them from the classroom contexts so they can question their 'taken for granted' assumptions about teaching. It is assumed that prospective teachers will acquire their knowledge-for-practice through their engagement with university coursework.

In addition, prospective teachers need to know how to adapt to situations as they occur in the classroom daily. How do they learn to make wise or informed decisions on the spur of the moment, to respond to distractions or maintain classroom management while still delivering the lesson? They must be able to 'read' the social context and know how to respond to diverse students' individual needs.

This more experiential form of knowledge, which Shulman refers to as the "wisdom of practice" (1987, p. 11), i.e. practical pedagogical wisdom, is also an important component of the knowledge base for teaching. Cochran-Smith and Lytle (1999) refer to this second relationship as knowledge-in-practice and consider it as craft knowledge since it is acquired through experience and is context dependent. It is knowledge that is directly linked to classroom performance and it takes time to acquire this practical knowledge and to become an adaptive expert teacher. Knowledge-in-practice often forms part of the tacit knowledge of expert teachers and thus, once

again, it is imperative that more experienced teachers make this practical knowledge explicit to student teachers. It is knowledge-for-practice that is particularly suited to an apprenticeship model of learning to teach.

The third relationship between knowledge and practice is referred to as knowledge-of-practice. This relationship is premised on the notion that teachers, through a process of systematic inquiry in their classroom or school contexts will generate knowledge “about teaching and learning, about learners, their subject matter and curriculum, and about schools and schooling” in general (Cochran-Smith & Lytle, 1999, p. 274). Developing students’ knowledge-of-practice would require different kinds of mentoring in which the mentor explicitly prompts the student to undertake classroom enquiry. This is not conventional practice within South African classrooms.

Of the three ways in which knowledge and practice are related, it is most probable that mentor teachers would be best positioned to transmit ‘knowledge-in-practice’ in which they “provide the social and intellectual contexts in which prospective and experienced teachers can probe the knowledge embedded in the wise teaching decisions of others and/or can deepen their own knowledge and their own abilities to make wise decisions in the classroom” (Cochran-Smith & Lytle, 1999 p. 272). If they are to establish opportunities for knowledge-in-practice, their feedback to students would need to provide more than simply appraisals of their teaching. They would need to provide a reasoned account of why particular decisions were made, and why they were suitable/not suitable in the particular context. In this way, students would have access to both the observable forms of teaching and the invisible pedagogical reasoning that was largely hidden from them during their apprenticeships of observation. Through giving students access to a reasoned account of their teaching decisions, mentor teachers transmit their understanding of an inner logic of their practices to student teachers.

2.2.1 Challenges in the process of ‘Learning to Teach’

In the process of learning to teach, Hammerness, Darling-Hammond and Bransford (2007) identify three challenges that both pre-service and novice teachers face when learning to teach. These are firstly, overcoming the limitations of their apprenticeships of observation; secondly, their tendency to underestimate the complexity of teaching, and thirdly, the problem of enacting theoretical knowledge in practice.

Lortie's (1975) notion of the apprenticeships of observation results in prospective teachers holding preconceptions about learning and teaching which are often far removed from the realities of the practice. Joram and Gabriele (1998) explored the prior beliefs of pre-service teachers and found that prospective teachers had a well-developed set of personal beliefs about learning and teaching before entering their teacher preparation programme. For example, they commonly believe that teaching is a matter of knowledge transmission, that they are already capable of organising learning and that their biggest challenge would be classroom management. These prior beliefs stem from personal experiences of being a learner and a misunderstanding of the complexity of teaching practices arising from their apprenticeships of observation. Much of what prospective teachers observed from their classroom desks as a learner is invisible and much planning occurs 'behind the scene', long before the lesson is taught. Learners are not aware of the knowledge bases underpinning effective practices and the complex processes of conceptualising systematic learning. Because the classroom environment is a familiar space, when students decide to pursue a career in teaching, they think they already understand what teaching is about. Teachers' beliefs have been identified by Kagan (in Joram & Gabriele, 1998, p. 176) as "tacit, often unconsciously held assumptions about students, classrooms, and the academic material to be taught". The authors stress the importance of addressing these prior beliefs in teacher education programmes. Unless pre-service teachers receive feedback regarding their belief, these will remain unchanged. These preconceptions become misconceptions that need to be addressed if they are to formulate a strong and properly grounded conception of the practice of teaching. Darling-Hammond (2006) supports this argument by asserting that much of what teachers need to know to be successful is invisible to the students.

The second challenge facing student teachers, and linked to the apprenticeship of observation, is the problem of complexity. In the South African context, Rusznyak and Walton (2014) explored the use of metaphors in addressing students' apprenticeship of observation and how they viewed their values, beliefs and philosophies about teaching and learning. In the study, students had to choose from a cluster of metaphors that best represented their understanding of what it means to be a teacher. The study revealed that about two thirds of student teachers started their teacher preparation with a view that teaching was primarily about caring for children, with little consideration of the role of the teacher in knowledge mediation.

While caring for children is important, it overlooks an understanding of the core nature of teaching, i.e. organising systematic learning. This study exposed the tacit assumptions of student teachers that teaching is not too dissimilar to caregiving. The authors concluded that for students to gain a more realistic conception of the “complex, knowledge-based” practice (Rusznyak & Walton, 2014, p. 15), it is vital to address what it means to be a teacher. The problem of complexity stems from the reality that teaching is not a simple practice of transferring knowledge or providing a child-minding service.

The third challenge for pre-service and novice teachers that Hammerness identified was the problem of enactment. According to Hammerness et al. (2005), the problem of enactment refers to the teachers’ ability to apply their knowledge and thinking into the practices of teaching, i.e. how they transform the subject matter from the knowledge of the teacher into the content of instruction. Teachers do not only have to know what to teach but also how to do so effectively within the limitations and opportunities of a particular context. The problem of enactment poses several challenges: How do pre-service and novice teachers learn to ‘think like a teacher’? How does a novice teacher transform the content knowledge into something that learners at school can understand? Teachers not only need to understand and reason but also need to know how to put that knowledge into action, i.e. know what to do. Student teachers can acquire this understanding through an apprenticeship model of teacher education, if the mentor teacher makes explicit to students what they do and why.

2.2.2 Knowledge bases of teaching

Teachers first need to understand what learners have to learn, then understand how to teach it, and furthermore, make decisions on which activities and resources are required to promote comprehension. Shulman (1987) outlines seven categories of knowledge that teachers are expected to grasp if they are to become effective teachers (ibid., p. 8):

- content knowledge
- general pedagogical knowledge
- curriculum knowledge
- pedagogical content knowledge
- knowledge of learners

- knowledge of educational context
- knowledge of educational ends or purpose

Content knowledge, which is more than just the facts or concepts of a discipline, requires an understanding of the structures of the subject, i.e. the ways in which and reasons why the basic concepts, principles and rules of the discipline are organised. General pedagogical knowledge includes broad principles and approaches to classroom management. Curriculum knowledge includes the complete series of courses that make up a subject as well as the resources required. This provides an overview of what needs to be taught and how. Pedagogical Content Knowledge (PCK) includes knowledge about a variety of ways in which the content can be represented in a conceptually accurate and coherent way to make it understandable to learners in the class. Through their experience, teachers will know which topics or concepts are more difficult for learners to grasp and what strategies are best suited to help learners overcome these difficulties.

Some of these knowledge bases are best learnt formally, in the tradition of knowledge-for-practice, however, others may be best learnt in an apprenticeship model, like a school-based learnership. Apprenticeship, as a means of acquiring skills of professional practice, has been studied extensively by Jean Lave and Etienne Wenger (1991) in their theory of situated learning, which claims that learning involves a process of engagement in a 'community of practice'. Communities of practice are groups of people who share a concern or a passion for something they do, and they learn how to do it better through regular interaction. Sites of learning become places where socially situated activities or communities of practice are found. The apprentice, guided by the master teacher, moves from a position of legitimate peripheral participation to full participation (Lave & Wenger 1991, p. 37). Learning is seen as a process of social participation, i.e. learning occurs in the relationship between people. Lave and Wenger (1991) argue that learning is necessarily situated and is a process of participation in a social context. Given that teaching is a practice, it must be understood within the context of the community of practice which reflects the roles and expectations of that context. This adds to the challenge of the apprenticeships of observation and the problem of enactment, since students coming from very different contexts have experienced teaching in very different ways – each having their own perceptions of what it means to be a teacher and how to put what they know into action. The risk of this immersion model is that the apprentice learns enactment

without the deep knowledge and understanding to support it. Teaching routines and strategies alone will not help address the complexities of teaching.

Shulman (1987, p. 5) states that teaching requires “basic skills, content knowledge and general pedagogical skills”. This forms part of the knowledge base of teaching. According to Morrow (2007), teacher education programmes should continue to strive towards deepening an understanding of knowledge beyond the school curriculum which will help student teachers organise systematic learning in any context and any situation. In a learnership programme, the school is a particular organisational and institutional context and mentors should enable student teachers to thrive by guiding them, both theoretically and in practice, to think like a teacher.

Darling-Hammond (2006) states that teachers’ abilities are crucial to students’ learning. She emphasises the need for students to learn from good, practicing teachers. However, observation alone does not guarantee learning, and learning to teach cannot be acquired merely by being told what to do or not to do. Theoretical knowledge is crucial for learning to teach. Gravett, Henning and Eiselen (2011) maintain that to become a teacher one needs to practice as a teacher. This is a call to address the problem of enactment. Only in the classroom do the students experience the reality shock and begin to understand the problems of complexity and enactment. Through cognitive mentorship, the teacher can challenge the student’s apprentice of observation, and the mentor can encourage the student to use theoretical knowledge to reflect on practice and pedagogical knowledge.

In the practice of teaching, teachers are required to have knowledge of the learners; an understanding of curriculum content and goals, and an understanding of and skills for teaching (Darling-Hammond, 2006, p. 303). Student teachers need to know how to assimilate the needs of the child with the cognitive demands of the curriculum. The teacher, the content and the learners align into one system. Just as Morrow (2007) proposed four fundamental goals required in teacher education programmes, so in her work on ‘Constructing 21st Century Teacher Education’ (2006, p. 306), Darling-Hammond recommends the following for teacher education programmes:

- a common, clear, vision of good teaching
- well-defined standards of professional practice and performance
- a strong core curriculum
- extended clinical experiences

- extensive use of case methods, teacher research, performance assessments and portfolio evaluation
- explicit strategies to help students
- strong relationships, common knowledge, and shared beliefs among school- and university-based faculty.

Both Darling-Hammond (2006) and Morrow (2007) call for systematic learning and see the need for formal theoretical knowledge-for-practice as well as knowledge-in-practice. The essence of the role of the mentor in the process of learning to teach seems to lie in the integration of theory and practice. The theory acquired at universities can be integrated with the practice of teaching through effective mentorship.

2.3 Importance of Pedagogical Reasoning in Learning to Teach

As we come to understand the practice of teaching, we realise that it involves “an act of reasoning” (Shulman, 1987, p.13). Teachers need to be able to reason thoroughly about their teaching, both conceptually and practically, i.e. they need to create opportunities for reflection or account for their reasoning. They need to use their knowledge base to inform their choices, decisions and actions, i.e. mentors need to account for their choices or externalise their reasoning. Shulman asserts that the quality of teaching rests in the quality of pedagogical reasoning that results in the pedagogical action (ibid.). Pedagogical reasoning involves a cycle. First teachers need to *comprehend* what they are expected to teach. They then need to *transform* the concepts to be taught in a systematic reasoned process, to prepare for the next phase, *instruction*, where the concepts are being taught. The cycle of pedagogical reasoning proceeds to the phases of *evaluation* and *reflection*, where the teacher checks for understanding and reflects on the teaching and learning process that has occurred. The cycle of pedagogical reasoning is part of the teacher’s conception of teaching as well as knowledge-in-practice. Reflection on the wisdom of practice is important as it brings the cycle to a close by moving towards *new comprehension*, i.e. a new understanding of knowledge that has been acquired through the reasoned process of teaching.

It is not easy to bring together the content, acquired in teacher education programmes, and the reasoned practice, into the school context. Henning and Gravett allude to a disparity between “theoretical, scientific knowledge and concrete,

craft knowledge” (2011, p. 22). The authors argue, however, that this perceived disparity is more about what stage in the teachers’ development they are able to express these types of knowledge, i.e. experienced teachers are more able to apply their pedagogical reasoning to express their knowledge-in-practice than novice or pre-service teachers. Henning and Gravett contend that theoretical (scientific) knowledge forms the basis upon which practical (craft) knowledge can be acquired, i.e. it is in understanding and reflecting on theoretical knowledge that a teacher can express and apply that knowledge in practice. Theory provides the grounds for systematic thinking and reasoning. Student teachers need to be guided by mentors to see the relation between theory and practice and the authors suggest that this can be done by personalising or “imagine practicing” the theory before they practice it (ibid., p. 26). The interconnectedness between theory and practice is supported by Morrow when he posits that “practice is theory-laden ... and cannot be understood independently of the theorising (understanding and concepts) that makes it the practice that it is” (2007, p. 79). Hence, practice has explicit links to theory and mentors need to make their own conceptions explicit.

2.4 The Role of the Mentor and Criteria for Effective Mentoring

Henning and Gravett (2011) discuss the results of a survey undertaken by new teachers regarding their early experiences in schools and their perceived needs. The data revealed that the new teachers were confident of their pedagogical knowledge, curricular knowledge and their understanding of the social development of the learners. The areas they felt the least prepared for were classroom management, teaching multilingual learners, being able to identify special needs of learners and knowing how to help them.

The expectations from schools of teacher education programmes are at times unrealistic. Schools and their stakeholders expect tertiary institutions to prepare teachers to walk into their first job fully prepared to teach. This is not, however, entirely possible, as some tasks can only be mastered in the school context itself and learning to teach is a life-long process. As Gravett et al. (2011, p. 125) state, “the only place in which to really become prepared for the full impact of the classroom is the classroom itself”. The authors affirm that in fact, the first two years of teaching still feel like “apprenticeship or internship” years (ibid.). Even though students feel they are well prepared for teaching, they struggle to adjust to new school contexts. Feiman-Nemser (2003) refers to the ‘process of

enculturation' whereby mentors guide students into an understanding of the culture of the organisation. This is particularly important for novice teachers in a new school context. Perhaps one should consider teacher education programmes as the beginning foundation of a professional career in which one can learn to teach through experience.

One crucial role of teacher educators (including mentor teachers) is to help students understand the complex nature of teaching (Morrow, 2007). Therefore, it is equally important to explore the mentors' beliefs about what student teachers need to know and what they regard as important criteria for evaluation when providing feedback on their observations of the student teachers' lessons. As mentorship is a socially mediated practice, the interactions between mentor and student teacher transmit criteria of what constitutes good practice. This paper argues that it is the mentor's own beliefs about this that creates an opportunity for a mentorship development programme in order to address mentors' conceptions of what student teachers need to know to become effective teachers and how to provide this support.

Through a process of mentorship, the pedagogical options and choices are articulated in interactions between student teacher and mentor teacher. In doing so, mentor teachers create opportunities to share their 'wisdom of practice' with novices. Ultimately, this contributes to the development of what Hargreaves and Fullen (2012, p. 3) refer to as 'professional capital'. In order to build professional capital, the authors argue that it is not enough for schools to attract talented and committed teachers, i.e. to build human capital. Schools need to foster cultures that allow teachers to work together, to support and mentor one another, thereby building social capital. In addition, teachers need to build a strong theoretical foundation to support their pedagogical reasoning when making discretionary judgements in the practice of teaching, something Hargreaves and Fullen refer to as 'decisional capital'.

In her study on apprenticeship Lave purported, "Who you are becoming shapes crucially and fundamentally what you know" (1996, p. 157). In the teaching practice, a teacher's identity changes from that of 'doing' to that of 'being', e.g. instead of saying, 'I teach mathematics', the teacher begins to use the words, 'I am a mathematics teacher'. On teacher identity, Cain sees it as the "way a person understands and views himself, and is viewed by others, a perception of self that is fairly constant" (Cain as quoted in Lave, 1991, p. 72).

When students are immersed into the school context and are given opportunities to participate and are supported in the learning process, they have the potential of learning from the practices of more experienced teachers. Rogoff (2008) also alludes to the process of identity transformation as individuals participate within a sociocultural context. She examined how peoples' participation and identity changes from apprenticeship, to guided participation and, finally, to participatory appropriation. In an apprenticeship, the less experienced student participates by observing a more experienced teacher. In the process of guided participation, the student is not only guided by the more experienced teacher (the mentor) but also participates by observing and involving him/herself in the activity. Lastly, participatory appropriation is the process of identity formation through the student's involvement in the practice. By immersing oneself in the practice, the student, the social and the cultural environment come together through the criteria conveyed in social interactions between practicing teacher and student teacher learning the practice.

There is a strong need for proper preparation of teachers that goes beyond training (Hobson et al., 2009). Building professional capital and shaping teacher identity is not just about gaining skills and knowledge but also about acquiring a 'way of being' (mentoring that provides dispositional support); understanding how to organise systematic learning (mentoring on instructional choices) and providing access to regulative practices such as classroom management. An apprenticeship model of education is widely practiced under the guidance of a more experienced master. Similarly, the criterion for quality of a learnership model is that the students are under the guidance of a more experienced mentor.

Mentoring has been defined as the one-to-one relationship of support between a competent more experienced teacher and a novice teacher or less experienced student (Hobson et al., 2009; Mukeredzi, Mthiyane & Bertram, 2015). Zachary defines mentoring as "a reciprocal and collaborative learning relationship between two or more individuals who share mutual responsibility and accountability for helping a mentee work toward achieving clear and mutually defined learning goals" (2002, p. 28).

As supported by Mukeredzi et al. (2015, p. 4) the data in the study indicated that the form and content of mentoring experiences that the participants encountered were threefold: subject-specific mentoring; general pedagogical mentoring and university compliance mentoring. Subject-specific mentoring would address content knowledge

and pedagogical content knowledge, while general pedagogical mentoring is not subject specific and refers to the knowledge that needs first to be experienced before it can be addressed, e.g. routines like classroom management and board work. Compliance mentoring is the least effective type of mentoring as it only serves to 'tick the checklist' provided by the universities.

Vygotsky's (1978) socio-cultural theory of learning also provides insight into the fact that acquiring knowledge is not an isolated practice but involves a process of collaboration in a social context. Vygotsky saw learning as a process that results in development. The expert teacher (mentor) can thus create an opportunity for such development by establishing a Zone of Proximal Development (ZPD) for pre-service or novice teachers. The ZPD is "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). The ZPD is created in the relation between mentors and mentees. The quality of the mentoring lies in the support provided beyond what the student teachers can do on their own. The feedback that the mentors provide is key because the lessons reflect what the students know and can do. How the mentors work with this and scaffold between what the student teachers can do and what they need to learn, will determine whether the student teachers develop further than they were before. The teacher education programme is thus the context in which a student teacher's competence and commitment to the practice is developed through the guidance of a more knowledgeable person who can create the opportunities for a ZPD. Using the concept of scaffolding developed by Wood, Bruner and Ross (1976) and Vygotsky, the role of the mentor teacher is to create ZPD opportunities for the student to focus, frame and understand the inner logic of the practice. Scaffolding refers to the support received through the interaction between the student and a more knowledgeable other (for example, adult, teacher, peer) to enable the student to do or understand something beyond what they can do/understand on their own. During feedback sessions mentors have the opportunity to provide such scaffolding, i.e. to explain the inner logic. Once learning has been acquired and the student teacher's competence improves, the support is slowly withdrawn.

Since teaching is a social practice, mentoring should be collaborative and if a positive relationship exists between mentor and student then learning is reciprocal. However, having a positive relationship between student and mentor does not guarantee

effective learning to teach. Collaborative mentoring is most effective when mentors have strong content knowledge and provide meaning to the learning process by creating opportunities for students to engage in practices of teaching and come to understand the rationale and pedagogical reasoning that underpin these practices.

2.4.1 Effective mentoring

Both Tomlinson, Hobson and Malderez (2010) and Hobson et al. (2009) explore the benefits and challenges of mentoring. The benefits and challenges are addressed from the perspective of the mentors, the students and the school. The benefits of mentoring for the mentors are personal and professional. Mentors gain the opportunity to reflect on their own practice by being able to discuss teaching and learning with their student teachers and to explain reasons for their decisions. This allows mentors to continue learning and discovering innovative ideas and different teaching strategies. Personal satisfaction of seeing their students develop is also a benefit for mentors.

For the student, the benefits of being mentored by a competent, experienced teacher are many. Student teachers feel part of a team; that someone cares about what they are doing and how they develop. The student also gains the opportunity to reflect on his/her teaching and that of the mentor. Many skills are gained that cannot be taught at university, such as classroom management, interacting with parents, administration and opportunities to attend professional development initiatives. Hobson et al. outline three reasons for introducing a mentorship programme in schools: to increase the supply of teachers; to encourage the retention of new teachers in the profession; and as a means of rewarding or recognising experienced teachers who take up the mentoring role (2009, p. 208). They confirm that “teachers who are mentored are less likely to leave teaching” (2009, p. 210).

For the benefits of mentoring to be realised, certain conditions need to be met. Mentoring must be intentional (Feiman-Nemser, 2003). Without a whole-school support of a mentorship programme, the benefits outlined above are less likely to be appreciated. Not all good teachers make good mentors. There must be a willingness on the part of the mentor (and the student) to commit to the responsibilities of mentoring. Feiman-Nemser suggests that incentives can be considered for the mentor, such as a lighter teaching load or less administrative or extra-curricular duties

to provide time to engage in the mentoring process. The training of mentors is also crucial to the success of such a programme. Mentors need to understand the expectations of the programme and the needs of the student. Evidence of effective mentorship, according to Tomlinson et al. (2010, p. 9), can be seen when mentors provide students with both emotional and psychological support; make students feel welcome and included (affirmation builds confidence); are approachable and willing to meet on a regular basis; allow the students to be part of decision making, i.e. teaching and planning is collaborative; and lastly, when lesson observations (of and by the mentor) are encouraged and the discussions of the processes (theory) involved are constructive and developmental. A successful mentoring programme goes beyond the willingness to build a positive, constructive relationship between mentor and student; it must include Morrow's (2007) four categories of competencies, and very importantly, the first one: developing a strong and properly grounded conception of teaching. In the Learnership programme of teacher preparation, the willingness to mentor seems to be there, but is there knowledge about what is needed to learn to teach, to build the properly grounded conception of teaching?

The challenges of mentoring as outlined by Tomlinson et al. (2010) and Hobson et al. (2009) need to be acknowledged. For the mentor, this means an additional responsibility and workload, which may result in more stress. Some mentors who have never had a student before may be nervous of the responsibility of being observed, and not knowing what is expected of them. For the student teachers, if they are not supported, the experience can be overwhelming. The student may also feel taken advantage of if the mentor leaves all responsibilities in the student's hands. Alternatively, mentors who are not effective, may leave students feeling that they are not being given sufficient opportunities to develop. In certain instances, the mentoring process remains very routine and all the student receives is general pedagogical mentoring and no content-specific or pedagogical content knowledge mentoring.

There remain certain unknowns regarding the impact of mentoring on student teachers. Hobson et al. (2009, p. 213) maintain that the cost-effectiveness of mentoring needs to be explored. In addition, he questions whether the process of mentoring has any impact on the learners in the classroom and whether the mentoring process does in fact retain teachers in the profession. Since mentoring is based on a positive relationship between mentor and student, there is also the

question of whether the mentor should also be the person evaluating the student.
Can the mentor wear both hats: developer and assessor?

2.5 Summary

This literature review provides background to the various concepts and research into the process of learning to teach and establishes a conceptual framework. Mentoring is a pedagogic practice, which entails evaluative criteria grounded in mentors' conception of criteria of practice and mentoring. These criteria need to be understood and to be made explicit.

It is vital that both mentors and student teachers understand that teaching is a knowledge-based practice and that it involves developing competencies in organising systematic learning. Student teachers initially do not have access to the inner logic of teachers. Although knowledge can be acquired formally, it can also be transmitted socially through the interactions between student and mentor. Learning to teach in the real world context of classrooms is also part of the process of induction into the practice, and involves students entering the practice and engaging with a 'more knowledgeable other' through observation, demonstration, discussion and reflection which potentially provides them with access to the inner logic and practices of the profession. Effective mentoring focuses on bridging the theory and situated practice. If all the challenges discussed above are not addressed, there is a risk of increasing the theory-practice divide and of students deciding that learning to teach is too complex. A scaffolded process, through the practice of effective mentorship, can potentially guide student teachers through the complexities of learning to teach, and help them to develop opportunities for pedagogical reasoning.

CHAPTER THREE

RESEARCH METHODOLOGY

This research aimed to discover how mentors of student teachers in a situated learnership programme understand and provide support in the process of learning to teach, both conceptually and in practice. The literature review outlined a connection between content knowledge, pedagogical content knowledge (PCK) and general pedagogical knowledge (GPK) and the competencies that pre-service teachers need to acquire in the process of learning to teach. It also recognised that teaching is a complex practice and it identified the problems that student teachers are likely to encounter as they learn to teach. The objective of this research was to describe *what* the mentors did to support student teachers and *how* and *why* they did this. Based on this, I then analysed the kind of support mentors provided and the extent to which mentors made their own pedagogical reasoning available to the student teachers as well as opportunities for student teachers to articulate their pedagogical reasoning or to justify their decisions or choices.

This research methodology provides the details of the research strategy adopted to address the research aims identified above, the reasons for choosing the research strategy and how I implemented this into the research study. This is followed by a discussion on the means of collecting data for analysis and the tools for analysing the data. Lastly, limitations of the research study are explored.

The research involved analysing the processes and social practices which underlie various behavioural patterns, and so qualitative research was a suitable research methodology. Qualitative research typically studies people or systems interacting in their natural environments (in situ) and focusing on their meanings and interpretations (Holloway & Wheeler, in Maree, 2007, p. 51). This was applicable to my research as mentor teachers were interacting with student teachers daily in the school context. Qualitative research concerns itself with answering the what, how and why questions of research. This research was aimed at interrogating the type of support mentor teachers provided to the student teachers under their supervision. A qualitative research is appropriate for small samples with the aim of generating richly textured data; however, its outcomes can also be measurable and quantifiable when one considers the frequency of certain data.

The sample size for the qualitative data was made up of three mentor teachers with an in-depth study of the interactions between them and the students they mentored. This research made use of a case study approach. According to Cohen, Manion and Morrison (2011, p. 289) a case study may be “a study of a specific instance that is designed to illustrate a more general instance”. A case study provides an exclusive example of real people in a real context which allows the researcher to better understand behaviours, ideas and abstract principles. The case study research design was appropriate to the study; the interactions and type of support provided by the mentors. In particular, the case study design allowed for a deep and nuanced analysis of what mentors saw as important information required in the process of learning to teach. In addition, the case study explored the extent to which this support allowed opportunities for pedagogical reasoning.

Hitchcock and Hughes (in Cohen et al., 2011, p.290) outline the following characteristics (amongst others) of a case study.

- It is concerned with a rich description of events relevant to the case
- It blends a description of events with the analysis of them
- The researcher is integrally involved in the case

The research aimed to interrogate the case of mentorship of student teachers in a situated learnership programme. All three of the above characteristics were evident in this case study as I analysed the feedback provided by mentors after they had observed their student teacher teaching two lessons. The case study took place in the context of three schools, one of which was the school in which I was teaching.

The research site was a situated learnership teacher preparation programme located in two primary and one secondary school in the Johannesburg area. The three schools were selected as they had a learnership programme which had been running for over 10 years. At the time of research there were 25 student teachers registered. Interested applicants submitted their curriculum vitae with the application which was advertised in the media. The applications were screened, and potential candidates underwent two rounds of interviews. The successful applicants registered for a Bachelor of Education degree or a Post Graduate Certificate of Education through UNISA. Mentor teachers were then assigned to each student teacher.

The research was conducted with a sample of three mentor teachers. Mentors were all over 25 years of age and were mentoring 2nd or 3rd year mathematics students who were most likely to have the same theoretical grounding from their university-based course work. Mathematics was selected to ensure a common content knowledge and PCK across mentors and students.

The description of the mentor teachers can be seen in the table below:

Table 1: Biographical details of mentors

Mentor	1	2	3
Gender	Male	Female	Male
Grades taught at the time of research	6	5,6,7	8,9,12
Years of experience	3	40	8
Mentorship training received	Informal workshop	None	None – mentorship experience in corporate environment

3.1 Data Collection

The data was collected in three phases. These phases sought to investigate mentor teachers' orientation to their role as mentors; the student-mentor interaction and their reflections on mentoring.

Phase 1: Audio-recorded interviews with mentors

Mentors were invited to participate in an interview which made use of open-ended questions. The interview questions (Appendix A) focused on the mentor's own understanding of mentorship, knowledge of the student's background, learning experiences and his/her university-based course work. The interviews attempted to elicit information on the mentor's support strategies, both theoretical (conceptual) and/or practical (technical) support. In addition, the interview explored the ways in which the mentor constructed a Zone of Proximal Development (ZPD) or a path for student teachers' development; and the access to their inner logic of the practice of teaching.

Phase 2: Two lesson observations of the student by the mentor followed by an audio-recorded feedback discussion of each observation

Two structured lesson observations were conducted which involved the mentor (i.e. not the researcher) observing the student teacher teaching two lessons. Both feedback discussions between mentors and student teachers were audio-recorded and transcribed. This allowed for a more in-depth understanding of the extent of support provided by the mentors in the process of learning to teach.

Phase 3: Audio-recorded interview with each mentor about the feedback discussions

This second set of interviews was aimed at finding out what were the criteria for evaluating a lesson; what was observed and what was noticed but not addressed in the feedback sessions by the mentor and reasons for not raising these issues with the mentee. The interview questions for this phase are also available in Appendix A. The audio-recordings of the interview were then transcribed. This set of interviews also provided an opportunity to provoke thinking regarding the establishment of a ZPD and opportunities for scaffolding the process of learning. This informed the conception of mentors regarding what is required in learning to teach.

The main dataset of the research was the two audio-recorded feedback discussions after each lesson observation. The two general interviews before and after the lesson observation formed part of background information on the mentors' conception of mentoring. The discussions between the mentors and the student teachers were dissected into episodes of coherent narrative units within the larger conversation.

There is a link between the two conceptual frameworks and the Zone of Proximal Development (ZPD). A ZPD focused on an explicit understanding of the inner logic, bridges the gap between what the student teacher can do without help and what he or she can do with help or support from a mentor. With reference to Shulman's (1987) categories of knowledge base, mentors should support student teachers in understanding what learners must learn (content knowledge), how to teach it (pedagogical content knowledge) and how to structure the classroom space, time and learning activities to enable a conducive learning environment (general pedagogical knowledge), and lastly, how to choose which activities and resources are required to

promote comprehension for the learners (part of PCK). The choices teachers make intentionally, justified by these categories of knowledge, especially pedagogical content knowledge, gives rise to pedagogical reasoning.

Where the mentor provides support in the form of a simple observation or an evaluation of whether something was done well or not, without any further explanation or elaboration, this closes the discussion to any possibility of creating a ZPD or opportunity for pedagogical reasoning. In instances where the mentor either reflects on something or allows the student teacher to reflect on his/her own practice and continues to discuss reasons for the practice, then it is evident that the opportunity for a ZPD and pedagogical reasoning is being created.

The literature review suggests that the way that these components come together will either highlight the separation between the knowledge bases or reveal their level of integration. The two levels of analysis in the conceptual framework allow for a consideration of the support provided by the mentors and the potential way in which their conceptions about what student teachers need to know intersected with the students' own conception of teaching. This allowed for an opportunity to examine the nature of the ZPD created for the student teachers they mentor.

3.2 Ethical Issues and Limitations

Mentor teachers were approached and asked if they would like to take part in the research study. To ensure anonymity, pseudonyms for mentor teachers and the schools were guaranteed in any publications arising from the research. No identifying information would be disclosed in the dissemination of the research results. The Ethics Committee in Education of the Faculty of Humanities granted ethical clearance and a protocol number.

Ethical considerations were made by recognising that mentors carried an extra load of responsibility and their work was highly appreciated. They were contributing to the professional development of teachers and were assured that the outcomes of the research were aimed at enhancing the mentoring process. As the coordinator of the mentorship programme at one of the schools, it was imperative that the mentors felt safe to participate and were assured that they had a right to withdraw at any stage. During the feedback sessions, the researcher was not present. This was important so

that both mentor and student teacher felt free to discuss the lesson observations. The mentor was requested to record the feedback sessions to which the researcher listened and transcribed.

A limitation of the research was that it was initially planned to be undertaken with four mentors, however, owing to one of the student teacher's personal circumstances, the fourth mentor was not able to complete the lesson observations. A fourth mentor may have added some more insight into the different conceptions of mentoring. However, a case study is very localised, therefore, given that there were only three mentors, and that they each observed only two lessons being taught, it is not possible to reliably generalise the findings to other learnership contexts, other mentors or other schools.

A further limitation in the analysis and scope of study is that the conceptual framework is very expansive. Concepts such as general pedagogical knowledge and pedagogical content knowledge; as well as semantic gravity and semantic density are underpinned by deep theories which given the scope and level of this report, were dealt with in a cursory manner. It may be useful to explore this framework as groundwork for a future study on this topic.

CHAPTER FOUR

ANALYTIC FRAMEWORK AND CODING

The literature review provided the theoretical foundation from which a conceptual framework for a more in-depth analysis of the support provided by mentors in the process of learning to teach, can be built. If mentorship focuses mainly on technical, routine practices of teaching and school-based practice, then it is likely to produce teachers who are skilled practitioners but whose practice of teaching works well in the context in which they have been taught. Their knowledge and skills may not be easily transferable to a different context. On the other hand, mentorship which is theoretically rigorous, may provide student teachers with access to the rationale for their own teaching decisions and the choices that students make in their own teaching, the impact of these choices in terms of the mediation of knowledge and supporting the learning of the children they teach. In addition, there is opportunity to share craft knowledge – the technical know-how of what to do and why.

This research project analyses the nature of the feedback that mentors provide to student teachers on two levels. Firstly, Shulman's (1987) categories of knowledge base that teachers are expected to acquire. Of importance within the mentoring interactions are those that focus on the mediation of knowledge, namely content knowledge and pedagogical content knowledge (PCK), and those comments that focus on the practices of teaching more generically, informed by a general pedagogical knowledge (GPK) base.

The first two of Shulman's knowledge bases (content knowledge and PCK) are crucial for instructional discourse, while general pedagogical discourse forms part of regulative discourse. Mentors should ideally support their students in making these knowledge bases explicit. The first level of analysis in this project was to distinguish between feedback that developed students' understanding of the mediation of knowledge (i.e. the interactions that were transmitting criteria of PCK or content knowledge) and those interactions that were focused on developing teaching competence more generically (and therefore transmitted criteria of GPK). The data from the transcripts of the feedback was analysed and coded. Shulman's (1987) categories of knowledge were evident in discussions which included reference to subject content and/or to processes in which this content could be acquired by the learners. Where the nature of the feedback from the mentor was related to routine tips and advice on how to deliver the lesson or on how the student teacher related to the

learners and regulated the learning process, this was coded as *general pedagogical knowledge* (GPK). Where the feedback and discussions between the mentor and the student teacher included explanations or reasons why it was best to make use of specific strategies, examples or representations of theoretical knowledge, this was coded as *pedagogical content knowledge* (PCK).

The second level of analysis, Legitimation Code Theory (LCT) (Maton et al., 2016), provides an analytic tool for coding knowledge-based practices in education along several dimensions. The dimension that will be applied to this research is that of Semantics and the organising principles of this dimension are 'semantic gravity' (SG) and 'semantic density' (SD). According to Maton (2013), all social practices (such as the feedback provided by mentors to the student teachers in their care) have both semantic gravity and semantic density, with the relative strengths varying over a continuum. Semantic gravity (SG) refers to the degree to which meaning is context-bound (Maton, 2011, p. 65). When meaning is closely related to context then semantic gravity is stronger (i.e. SG+) than when meaning is less dependent on context (SG-). Semantic gravity therefore gives an indication of the extent to which the feedback provided to the student is general and abstract, or deeply embedded in the context of teaching a particular lesson, with particular children. In this research, semantic gravity highlighted whether the mentor's feedback of a lesson observation was specific to the school/class or lesson context or whether it could be generally applicable over a wide range of contexts. Support which is embedded in context of the events in a lesson tends to have stronger semantic gravity. This means that conversations between mentors and student teachers tend to be grounded very strongly in the context of what takes place in the classroom. When a principle is lifted out of its specific context then it weakens its semantic gravity. This is crucial if the student is to learn things about teaching that would be relevant in different contexts.

Semantic density (SD) refers to the degree to which meaning is condensed within symbols, terms, concepts, phrases, gestures etc. (Maton, 2011, p.66). When meanings are more condensed or located in a network of relationships, then semantic density is stronger (SG+), while when meanings are less condensed or straight forward, semantic density is weaker (SD-). Semantic density therefore indicated the complexity of the feedback provided to student teachers by the mentor. To build student teachers' understanding of the complexity of teaching practices, there also needs to be strengthening of the semantic density in mentor feedback. If professional learning from lessons and feedback is simply presented as technical routines (with

weaker semantic density), the possibility for showing students relationality in their practice (e.g. links between learners, knowledge, content, pedagogy) is limited. Using the concepts of semantic gravity and semantic density allowed for meanings from the transcripts of the feedback to be arranged into categories of abstraction and complexity. What mentors did to support student teachers and how they did this, highlighted their understanding of learning to teach. Support which was limited to technical routines was deemed to have a weaker semantic density, while support which was focused more on the integration of theory into practice through pedagogical reasoning had a stronger semantic density. The degree of reasoning in practice was often invisible, which reflected a weaker semantic density.

The following translation device will be used to code the feedback provided by the mentor teacher to the student teacher in his/her care. The relative strengths of the SG and SD are coded using the following indicators on the translation device (Maton & Chen, 2016).

Table 2 Translation Device

Semantic Gravity	Indicators
SG - -	Mentor's feedback on lesson is widely applicable to teaching generally , i.e. could be equally relevant to other subjects, or other levels of learners or in other contexts
SG -	Mentors feedback is directed to the implication of what happened in teaching and learning going forward/backwards in time
SG +	Mentor's feedback focuses on the non-visible aspects of the teaching and learning during this lesson (e.g. learner understanding; explanations, questioning, answering; pacing; sequencing of lesson steps etc.)
SG + +	Mentors feedback focuses on the visible concrete / material aspects of teaching during this lesson (e.g. nature and use of teaching resources and learning materials, set up of activities; learner behaviour etc.)

Semantic Density	Indicators
SD++	Discussion theorises success of his/her lesson with explanation of how the parts worked together (e.g. learners, content representation, resources, context and/or teaching methods used)
SD+	Discussion makes links between parts of the lesson (e.g. learners, behaviour, content representation, resources, context and/or teaching methods used) OR focuses on one aspect of practice with some elaboration or explanation of that aspect.
SD -	Mentor provides a tip on a teaching skill or technique with some explanation
SD - -	Mentor feedback provides a straightforward and stand-alone tip , maxim, view, instruction, evaluation or directive. There is no elaboration, justification or explanation attached

The organising principles of SG and SD allow for an analysis of the interactions between the student teacher and the learners in the classroom, as well as between the mentor and the student teacher in the feedback sessions post lesson observation. The second level of analysis explored the dimension of semantic gravity and semantic density as part of Legitimate Code Theory (LCT) (Maton et al., 2016). In instances where the feedback and discussions made use of terms or explanations which were grounded within the particular lesson and/or school/classroom context, these were coded as having stronger semantic gravity. If the qualitative data was more generalised and abstract and therefore less context dependent, and could be applicable to other lessons, schools or groups of learners, it was coded as having weaker semantic gravity.

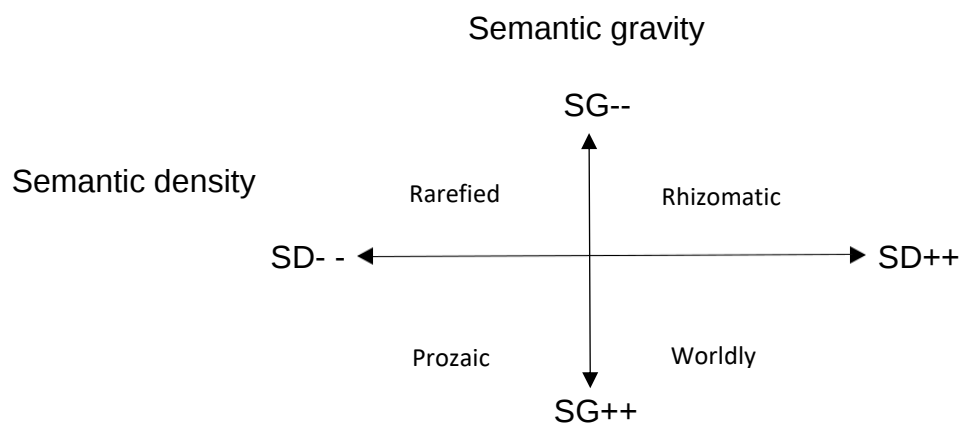
Data coded for stronger semantic density took the form of discussions which alluded to complexity of concepts and ideas that would require further elaboration. In cases where the discussions between the mentor and the student teacher focused on simple tips, procedures or routines, these were coded as having weaker semantic density.

The strength or weakness of semantic gravity and semantic density assisted in understanding the nature of the feedback provided by the mentors and its potential for constructing a ZPD for their professional development. In particular, comments that have weaker semantic gravity (like tips) and weaker semantic density (without complexity or needing elaboration into the practice) would construct the least opportunity for professional development, whereas comments with a stronger semantic gravity and stronger semantic density (complex insights into practice that are contextually grounded) establish greater opportunities for students' professional development.

The semantic density of each episode of feedback reveals the extent to which the feedback provided access to the inner logic of teaching as a practice. It also evaluated the extent to which these feedback sessions engaged in developing students' capacity for pedagogical reasoning.

4.1 Interpretation of data analysis

Once the strength of semantic gravity and semantic density are separately awarded to each pedagogical interaction between mentor teacher and student teacher, the two organising principles are then considered in relationship with one another. These two semantic codes are represented along a continuum of two axes. This cartesian relationship between SG and SD provides four codes that govern the legitimation of a knowledge-based interaction. In the case of this study, a pedagogical interaction between mentor teacher and student teacher, is depicted below:



The four codes each represent a particular semantic code, with a different combination of abstraction and complexity.

Rarefied code: more generalised with simpler / straightforward meanings

Prosaic code: Grounded in context but straight forward, can be quite procedural / routine based

Worldly code: complex – making the links or interrelationships between aspects of practice explicit but still grounded in the context

Rhizomatic Code: abstract and de-contextual, with more complex meanings

If the feedback from the mentor is in the form of generic knowledge, it would represent a rarefied code. Feedback in the form of everyday practical knowledge implies prosaic code. When mentors share their 'wisdom of practice' by creating a ZPD to bridge theory and practice they are providing feedback in the worldly code. Lastly, if mentors' feedback refers largely to knowledge-for-practice (theoretical knowledge) it is characterised by a rhizomatic code.

CHAPTER FIVE

DESCRIPTIVE INTERPRETIVE ANALYSIS

This chapter focuses on the description of each mentor's interview about their conceptions of teaching, mentoring and learning to teach. This is followed by an analysis, with supporting evidence, of each mentor's feedback session post lesson observation. Lastly, there is a description and analysis of the semantic codes of the feedback provided by each mentor to the students whose lesson he/she had just observed.

Amongst all three mentors there were 29 episodes of pedagogic feedback focusing on different aspects of teaching. 24 of these referred to general pedagogical knowledge (GPK) and five episodes of feedback which referred to pedagogical content knowledge (PCK). Appendix B provides evidence of each episode in the post feedback session by each mentor coded according to type of knowledge and the relative strengths of each of the semantic principles.

5.1 Mentor 1

During the first interview, Mentor 1 explained that he had only a few years teaching experience. When he was first allocated a student teacher to mentor, he was unsure of what he needed to do, and he reflected that his interactions with the student teacher were at first ineffective: *"I didn't actually receive any training beforehand so it was kind of just thrust upon me"*. He then volunteered to attend a mentoring workshop organised by the school which gave him a clearer conception of mentoring. This made a big difference to the support he was able to provide the student teacher. As the evidence will show, it provided him with a set of criteria about what counts as legitimate feedback to students. Mentor 1 was committed to establishing a positive mentoring relationship with his student teacher and to learning about mentoring, although the feedback discussions focused mostly on developing the student teacher's general pedagogical knowledge (90.9%).

5.1.1 Conceptions of teaching, mentoring and learning to teach

Mentor 1 saw his role as a supporter, one that gives critical feedback and as an investor in the growth of the student teacher. He believed it was important to have a positive relationship with his mentee and that feedback played a vital role in mentoring. This was evident in the following comment from him: *"Feedback enables*

students to think critically about their own development and allows them to see their actions and their teaching through a different perspective”. However, he admitted that sometimes he found the feedback difficult to give as it could jeopardise the relationship between mentor and student. He acknowledged that mentorship was difficult, and that it took a lot of time and energy to invest in the development of student teachers, but he found the experience very rewarding and it made him more empathetic towards the challenges that student teachers face in learning to teach. Mentor 1 believed that lesson planning and showing initiative was an essential component in becoming an effective teacher:

She is always prepared for her lessons, she makes sure that she gets some guidance from me as well; she’s been showing more and more initiative and wanting to get involved; and then finally, what I really liked about her lesson as well was the closure that she had.

5.1.2 Lesson observation feedback

Mentor 1’s student teacher was in her second year of studies. The topics of the two lessons observed were Grade 6 mathematics: capacity/volume, and weight and density. After each lesson observation Mentor 1 provided various types of support in the feedback sessions.

He made an evaluation on how the student engaged positively with the learners. He observed and acknowledged that the student was able to make the lessons fun, and this drew the learners’ attention. He provided explicit clarification of what she did to make the lesson fun:

You got them to come and write their answers on the board and that got them all involved and they were interested and excited to see if their friends would get it wrong, so they could correct them, so it kind of created a little bit of an element of fun at the beginning of the lesson which was really nice.

Regarding classroom management, the student teacher admitted that she struggled to keep certain individuals engaged when everyone was demanding her attention. The mentor confirmed that it was challenging to ensure every learner understood and a teacher did not get the time to go around to each learner to help them when they are working on activities. This episode on classroom management highlighted the complexity of teaching; that it is not just a simple practice of transferring knowledge. Controlling the learning process requires skills of classroom management. These skills are acquired over time in the classroom itself. Classroom management is very context bound as it depends on factors such as classroom size,

disciplinary procedures of a school, etc. and should thus be classified as stronger semantic gravity if a mentor provides support on how to overcome such challenges in that context. However, the mentor merely acknowledged that was it difficult and that with further experience, the student teacher would learn how to cope. This interaction between mentor and student teacher suggested general pedagogical knowledge, however, the support on how to manage the different abilities and attention required in the classroom was not made explicit.

When referring to homework, the mentor praised the student teacher for connecting the content of the lesson to the learners' own experiences and for recognising prior learning and linking this to the content: "*... you got them to look at it, think about how it relates to their daily lives, so it's quite nice that you actually related it to their daily lives.*" The student's instructions were clear, and learners knew what to do. An area where the mentor identified room for improvement was the time management of the lesson: "*... those activities could have been done in the first 15 – 20 minutes and then moved onto some more stuff; you spent just a little bit too much time on the board.*" In this example, we see him suggesting she "moves on", however, he only briefly refers to the consequence of her slower pacing in relation to learner understanding or participation: "*I think that caused a little bit of restlessness*". It therefore has a weaker semantic density than it potentially could have had if he had made his reasoning more explicit.

In addition, the questioning technique was identified as an area for development: "*I think your use of question words can maybe be worked on a little bit just to get them to think critically a little bit more, so just get them to explain their thinking a little bit more.*" Here, he does not only give her advice, he also explains the reason for the advice, thereby giving it a slightly stronger semantic density than the previous example. The lesson goals and objectives were noted, and the effective closure of the lesson was acknowledged.

The mentor provided a positive evaluation on the way in which the student teacher presented the lesson. Reference was made to her being energetic and excited which resulted in a positive classroom environment. Other observations highlighted the nature of the student's character: "*You were kind, you were gentle, and invited them to really give you their thoughts, ... you were approachable.*" The temperament of the student teacher made it possible for the learners to feel comfortable in the lessons. This was acknowledged by the mentor: "*... your rapport with the boys has improved,*

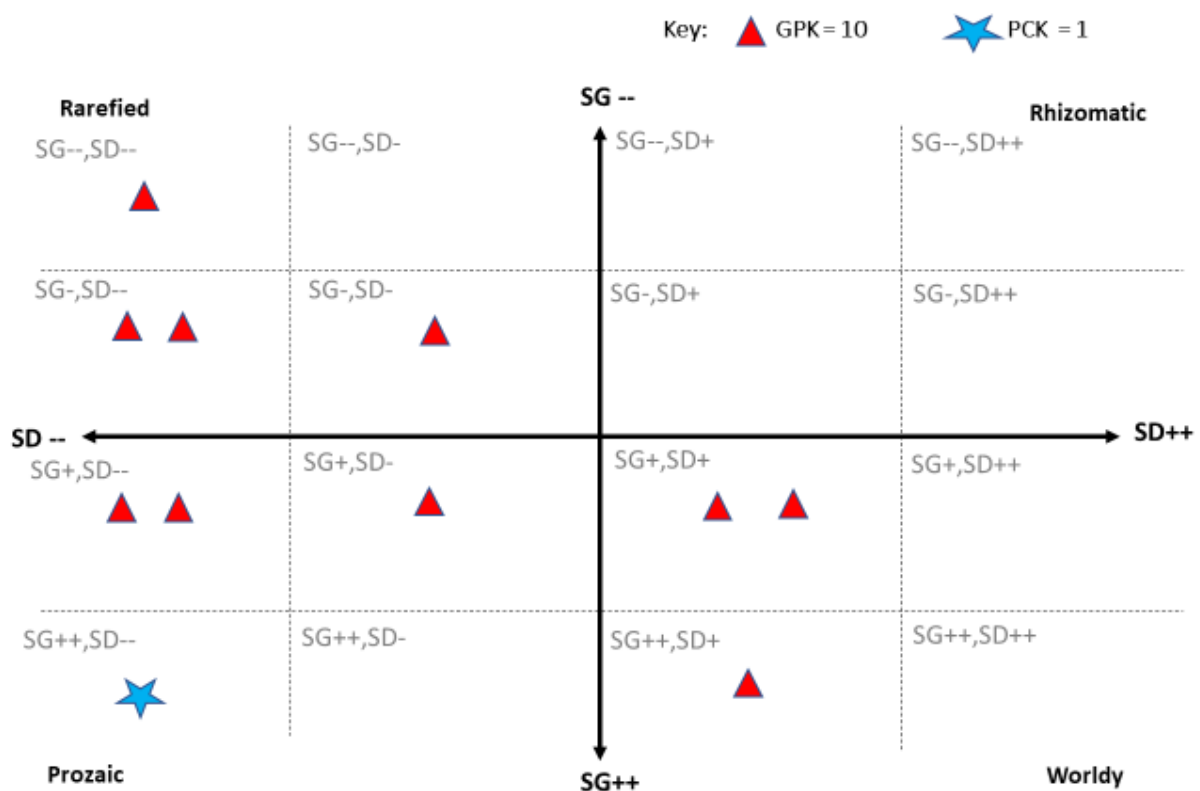
so they obviously, don't know if trust is the right word, but they have a connection with you now, which is nice to see." The student teacher's behaviour towards the learners was recognised as good practice. The mentor acknowledged that it was important to make lessons enjoyable to ensure participation from the learners. This feedback was very general and could apply to any school context and although the explanation was simple, the mentor clarified his observation, often elaborating on the reasons for his suggestions. This feedback had a weaker semantic gravity but a slightly stronger semantic density as the mentor elaborated on why he thought the lesson was fun.

5.1.3 Reflection and Analysis

Developing the student's general pedagogical knowledge was the focus of the feedback. The mentor gave feedback that revealed attitudes and values as well as the social order of the interaction between the student teacher and the learners in the class.

Below is the semantic plane reflecting the episodes of semantic gravity and semantic density along a continuum for Mentor 1's feedback.

Figure 1 Semantic Plane – Mentor 1



The mentor explicitly evaluated certain aspects of the lesson by providing either positive feedback or suggestions for improvement. The mentor allowed an opportunity for a ZPD by providing guidance on how the time management could be more effective. However, regarding the questioning technique, the space for a ZPD was not evident, as the mentor did not offer support or elaborate on how the student teacher's questioning technique could be improved upon, hereby keeping the feedback simpler and more straightforward (SD-). This was a missed opportunity for revealing the inner logic of the mentor to the student. This episode focused on the *how* of teaching but did not elaborate on the *why*. The support was not context dependent nor was there any elaborate explanation and thus was classified as weaker semantic gravity and weaker semantic density.

There was limited evidence of pedagogical content knowledge in the feedback, or support regarding the teaching and learning of the subject matter. In most cases the mentor offered an account or interpretation of the teaching and then followed this with either a tip on what the student could do in future lessons, or an evaluation about what had worked well or what could be improved upon. With this type of feedback, the mentor created an opportunity for a ZPD by discussing what the student could do to improve.

Other episodes of mentoring took the form of statements or observations. The mentor commented on different ways learners could acquire knowledge – either by direct instruction or by enquiry and research. There was no elaboration on these observations that would provide an opportunity for mentoring in pedagogical content knowledge (PCK). These episodes were thus coded as weaker semantic gravity and weaker semantic density.

Mentor 1 allowed the student teacher to reflect on her lesson: *"What specifically about the lesson did you like? How did you feel about it generally, any comments that you want to make, to start off?"* The reflective prompt was provided both at the beginning as well as at the end of the feedback: *"Any other comments, anything else?"* This empowered the student to provide a reason for her pedagogical choices. The student's responses showed that she was able to do this: *"I think they liked that they don't have to use their text book all the time... with the board I did feel that I needed to use that a lot today showing the examples and trying to remind them what we did yesterday."* Mentor 1 then confirmed or clarified the student's comments which reinforced the students own understanding of the lesson.

Mentors 1 understood that the role of mentoring included providing support in theoretical knowledge and they did this with some reference to PCK. For example, Mentor 1 was trying to make the student teacher understand that she needed to probe the learners' thinking much more: *"... it's not the answer that's important, especially in maths, it's the working and how they got there."*

Mentor 1's feedback was varied. The knowledge base referred mostly to general pedagogical knowledge with one episode focusing on pedagogical content knowledge. There were some instances where the mentor's feedback developed an opportunity for a ZPD and other occasions that developed the student teacher's capacity for pedagogical reasoning. The mentor's conception about what the student teacher needed to know to become an effective teacher was focused predominantly on the *how* of learning and teaching. In the feedback sessions, there was evidence of compliance mentoring (Mukeredzi et al., 2015), as the mentor made use of an evaluation checklist with general criteria against which the student teacher was given advice and support.

In general, the feedback provided by Mentor 1 shows a fairly large semantic range, with some feedback variously displaying rarefied, prosaic and worldly codes. Much of it was tied closely to context, with some general principles and some complexity revealed to the student. As mentioned, he focuses his guidance primarily at developing the student's GPK rather than her PCK. However, the one episode of feedback that did potentially contribute to her PCK was very simple and straightforward (SD--). All in all, he sets up many opportunities for her to develop insight into teaching, albeit in generic ways.

5.2 Mentor 2

Mentor 2 was a very experienced teacher who had mentored student teachers for many years. The mentor was mentoring a second-year student teacher whom she regarded as *"sweet and quietly spoken"*. She emphasised the importance of being assertive in the classroom and that the student teacher also needed to be an assistant to the mentor, taking up some of the responsibilities of the teacher. Support provided by Mentor 2 was mostly focused on general pedagogical knowledge (71%), with a great deal of reliance on experience. Mentor 2 also had less focus on developing the student's pedagogical content knowledge (29%) and pedagogical reasoning, although substantially more than with Mentor 1.

5.2.1 Conceptions of teaching, mentoring and learning to teach

In the first interview, Mentor 2 expressed that her responsibility as a mentor was being a good role model to the student teachers: “ ... *someone who is good at teaching, [has] good depth of knowledge, [is] organised in the classroom, discipline is good.*”

Like Mentor 1, Mentor 2 also emphasised the importance of establishing a positive relationship with the student teacher. Mentor 2 acknowledged that her conception of mentoring was acquired through years of experience and that she had not received any formal mentorship training. Other characteristics that she attributed to mentoring were to guide, and to be gentle but firm. She described some of the support that a first-year student teacher may require: “*The first years are very nervous, and they speak quickly, and they write shockingly on the board, or they stand in front of their work.*” However, Mentor 2 also had an understanding that the role of the mentor was to provide pedagogical reasoning when necessary: “*Sometimes I say the reason I’m doing this is because ...*” Mentor 2 was passionate about her role as a mentor and saw it as an important responsibility for developing teachers. She believed that without mentoring or without having someone to lean on and to guide them, student teachers would not stay in the profession.

Mentor 2 referred to the need for student teachers to plan lessons which would keep learners engaged: “*If you’re a student teacher you do need to make your lessons very practical. I would have liked to have actually seen her use water in the work.*” Mentor 2 also emphasised the need for student teachers to have a good depth of knowledge:

And you can tell, when they, when they explain, or the kids are asking questions, how they respond to those questions, as to what their depth of knowledge is like. Can they only teach up to Grade 6 or can they teach further, and you need to teach further in the upper classes otherwise you don’t have the good depth of knowledge.

5.2.2 Lesson observation feedback

The topics of the two lessons observed were Grade 6 mathematics: fractions and capacity/volume. The mentor recognised that the student needed help with lesson planning and classroom management and how to be more assertive. The mentor took time to explain to the student about the impact of her physical position in the classroom. At times the student stood in front of the board, blocking the view for the learners. The mentor discussed this with the student and in the second lesson commended the student on the way in which she had changed this: “*You changed position in the classroom. Instead of standing in the front, you moved to the side and*

then you moved to the other side ... I really liked that, and it also changes the focus of the classroom." The student walked about while she was explaining, and the learners were thus required to follow her movement to remain focused. This feedback focused on everyday practical knowledge and hence represented a weaker semantic gravity but a slighter stronger semantic density as the mentor explained the impact of the student's positioning on the learners' participation in the lesson.

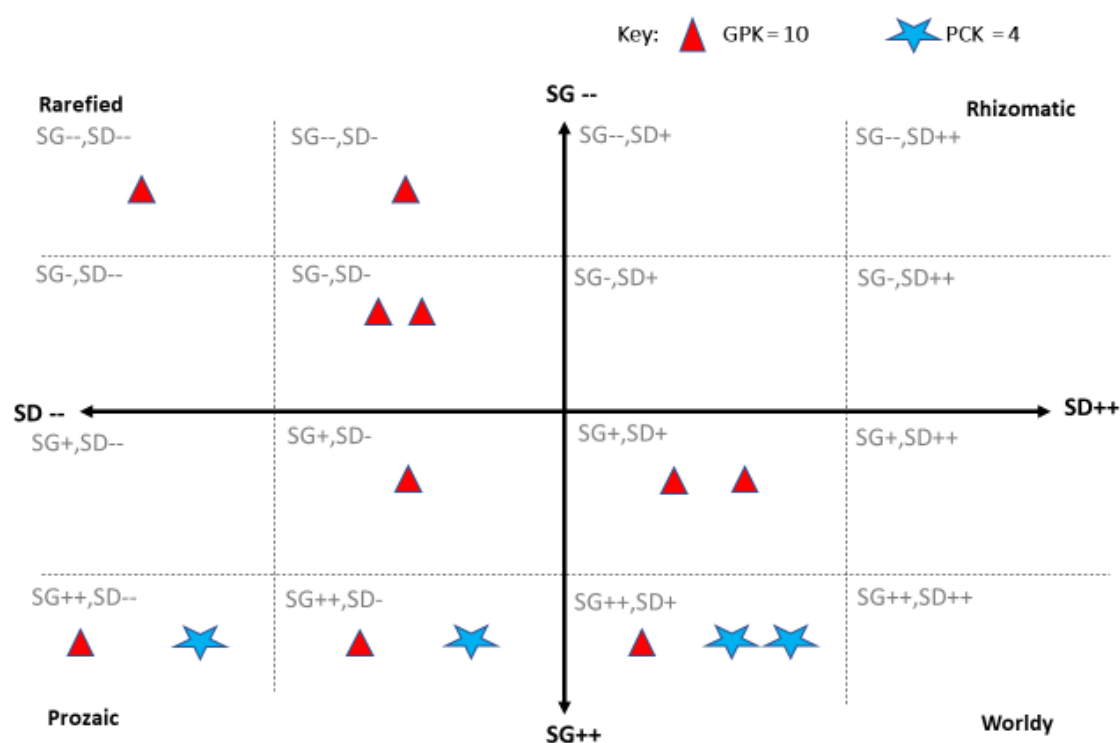
The mentor observed that the student teacher's content knowledge was good and that although her general instructions were clear and learners knew what they had to do during the activities, more specific instructions were required. It was also noted that the student teacher handled classroom management issues relatively well: *"You put the one in her place and sent her to go and sit by herself."* The student was commended on the way in which she recognised the prior knowledge of the learners and used this to build on new knowledge: *"I liked the way you approached it from what they knew in Grade 4."*

5.2.3 Reflection and Analysis

The student teacher was provided with extensive mentoring on the teaching and learning process, regarding both the teaching practice itself as well as the behaviour management of the learners. The nature of the feedback focused on both general pedagogical knowledge as well as pedagogical content knowledge.

Below is the semantic plane reflecting the episodes of semantic gravity and semantic density along a continuum for Mentor 2's feedback.

Figure 2 Semantic Plane – Mentor 2



Evidence of general pedagogical knowledge was noted when the mentor described what the student did well to ensure that learning could occur: *“You were slow, and you were patient with them, ...”* When the mentor elaborated on the impact that the student teacher’s position in the classroom had on the process of learning, this created a space for a ZPD and it opened up the mentor’s inner logic or pedagogical reasoning.

Further general pedagogical knowledge was evident when the mentor gave feedback on the student teacher’s clarity of instructions. The mentor provided clarification: *“So, I think just be clear on your instruction: ‘Ok, I want you to write this in your books’ or ‘I don’t want you to write this’.”* Although this feedback on general pedagogical knowledge was valuable, it was coded as weaker semantic gravity and weaker semantic density as it represents stand-alone tips which are applicable to any classroom context, with very little explanation or theorisation.

The student teacher had good content knowledge as well as good general pedagogical knowledge. Mentor 2 commented on the effective way in which the student provided opportunities for the learners to be actively engaged in the learning process: *“... you had them up at the board, putting their answers on. They enjoyed it.”* The PCK of how to make the content coherent to the learners, however, required

further mentoring. The student planned the lessons well, but this was not done with the guidance of the mentor and thus areas with a lack of PCK were only being observed during the lesson: *"It's difficult with capacity, because you've got to have water and if you're in a classroom it's not very easy."* Although Mentor 2 acknowledged that the role of a mentor is to guide the student, the guidance cannot only occur after the lesson has been taught. Support and guidance are developmental and need to occur before, during and after the process of learning to teach.

Other episodes of the student's pedagogical reasoning and the way in which learning from previous lessons was integrated with new knowledge were acknowledged by the mentor: *"I also liked the fact that you put on the board that one millilitre equalled one over a thousand litres, so they saw this fraction ... so now they've seen that fractions [have] a practical application."* This episode was coded as having a stronger semantic gravity and a weaker semantic density as the mentor expressed a tip but with limited explanation.

The instances when the mentor's feedback reflected a very strong semantic gravity together with a strong semantic density was when the mentor went into a more detailed explanation on pedagogical content knowledge: *"And then what I also saw was that some of them stuck to your method ... and she was drawing your bar, your line. She's cutting it into five equal pieces and then I said, 'Do you think there's a shorter way of doing that?' And she said, 'Oh, I think there probably is.' And the others said, 'No, can't you do it this way?' But they got it, they got it very quickly".* Another examples was when Mentor 2 allowed the student teacher to explain why she chose to use smaller numbers in a number bar (pedagogical reasoning): *"I think ... with bigger numbers, we can revise the method without using the bar because, imagine if I say, 'One hundredth of a thousand', they can't draw the bar. I did that because the numbers were smaller. They can apply it."*

The student teacher allowed learners to reflect on their learning and this was noted and positively evaluated by the mentor: *"I thought you engaged the learners on reflection very well and I thought you also made them responsible for their own learning."* This teaching strategy empowered the learners to be accountable for their own learning and the support by the mentor affirmed this general pedagogical knowledge.

Mentor 2's conception about what student teachers needed to know to become effective teachers focused mainly on general pedagogical knowledge, with a few references made to pedagogical content knowledge. Her feedback also displays a good variety of codes, with many episodes in a worldly code, some in a prosaic code, and some in a rarefied code. This means that there is a good balance of simple, complex, abstracted and contextually embedded feedback, focusing both of GPK and PCK.

5.3 Mentor 3

Mentor 3 came into teaching from a tertiary educational environment and then a corporate environment where he had mentored interns, but not as an educator. He considered himself 'self-taught' in terms of his own teaching, and he had received no guidance on the developmental needs of student teachers who were being inducted into teaching practices. Mentor 3 was mentoring a third-year student teacher. The support provided by Mentor 3 focused mainly on generic skills with very little pedagogical knowledge. Although Mentor 3 opened opportunities for pedagogical reasoning these were left unexplored, possibly because his own understanding of the internal logic of teaching practices has not been formally developed.

5.3.1 Conceptions of teaching, mentoring and learning to teach

Mentor 3 saw the responsibility of the mentor as nurturing, helping, guiding and growing somebody into the profession. He also emphasised the importance of patience, building positive relationships and role modelling as a mentor. He was a big proponent of mentorship as he believed the process gave the student teacher an opportunity to see what the job entailed, its complexities and administrative loads. In this way, he sees his role as providing personal development, rather than the critical reflection approach deemed necessary by the other mentors.

Mentor 3 also highlighted the importance of planning and, in particular, of scaffolding, i.e. linking the concepts taught from a previous lesson to the introduction of the next lesson: "... *you've actually got to go and say, 'Ok, do you remember we did this yesterday'?*" Although the feedback provides a pedagogical link between successive lessons, the guidance is instructional, in that it tells the student what to do, but does not elaborate on the reasons for the action. It is therefore presented as a straightforward tip, that stands alone from any network of knowledge (so has SD-).

5.3.2 Lesson observation feedback

The topics of the two lessons observed were Grade 9 mathematics: factorisation of trinomials. General pedagogical knowledge was evident in the mentor's feedback. He was encouraging of how well the student teacher engaged the learners. There was a positive rapport between the student and the learners, and they were actively involved in the lesson. In the first lesson the student made use of a smart-board – an interactive digital board for writing notes and drawing diagrams. The mentor gave extensive feedback on the ineffective use of a green marker pen on the smartboard: *“That green is not the greatest colour, ... you don't see that green pen well at all... next time, you must make sure that you use a black or a blue or a purple or one of those really dark colours.”*

The mentor observed that the student teacher did not struggle with classroom management. He gave feedback that the learners were engaged, asked questions and there was a positive interaction between student and learners. This was also made possible by the student's engagement with the learners individually, by walking around the classroom while they were doing work on their own: *“... they were engaged, asking you questions, ... the help that you give, the walking around the class, the interaction, you excite them, and you give them confidence.”* This episode of general pedagogical knowledge confirmed for the student teacher that this strategy was effective and formed part of good practice.

An opportunity for a ZPD was evident when the mentor reflected that the student chose to implement a different way of teaching the topic which he had not seen before. Mentor 3 provided extensive mentoring on the introduction to each lesson, explaining the importance of linking knowledge from the previous lesson to the beginning of the next lesson: *“ ... you've actually got to go and say, 'Ok, do you remember we did this yesterday?' ... you're rushing in at the start, you could spend just a couple of minutes saying, 'Ok, this is what we've done in the past couple of lessons. Now we're going to do something slightly different and we're going to ...’”*

This was a good example of sharing the inner logic of the mentor giving very specific (albeit straightforward) pointers to the student about better ways to direct the attention and activities of learners.

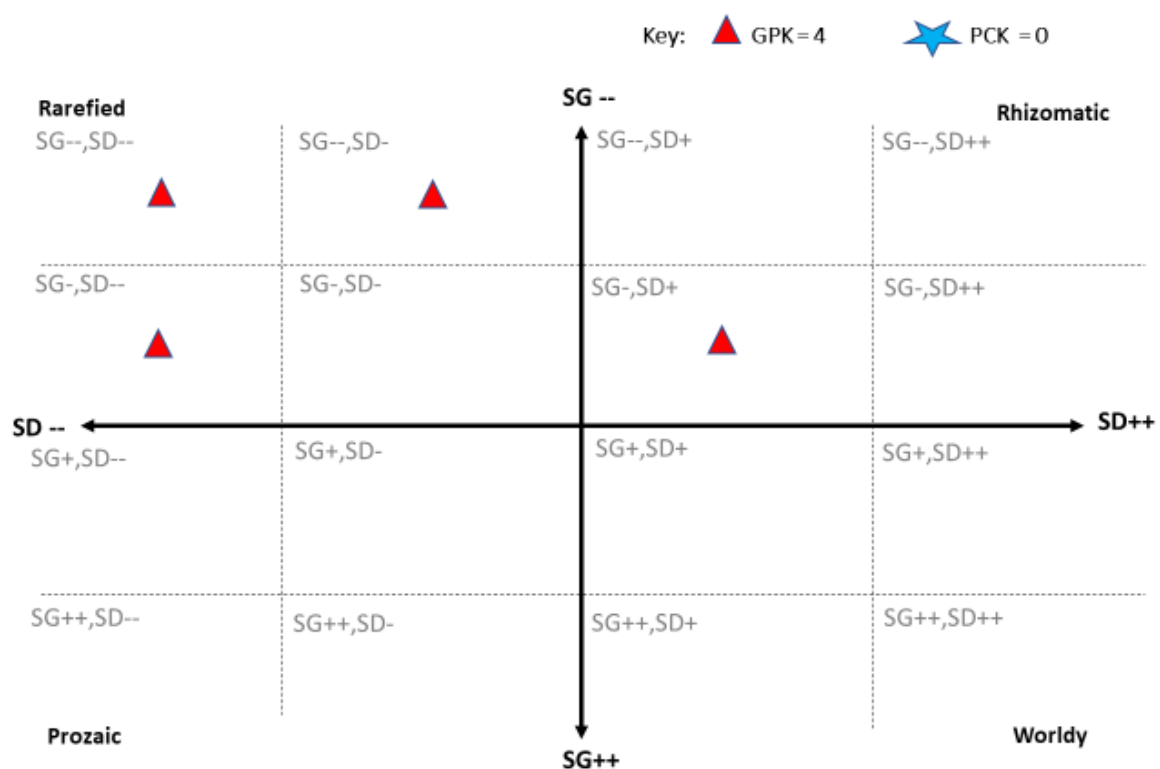
The student teacher's positive temperament and confidence was acknowledged by the mentor: *"You did an awesome job ... I think generally you come across so confident and it rubs off on the class. You come across completely confident, completely competent, absolutely sure of what you're saying."* This positive feedback was encouraging as it also acknowledged that this was what the learners themselves would have seen and experienced. The fact that the student was confident reassured the learners that she knew what she was doing.

5.3.3 Reflection and Analysis

Mentor 3's feedback post lesson observation focused on general pedagogic knowledge. He was very encouraging of the student teacher and complimented her on her general disposition and manner. Although there were several opportunities for a ZPD and for discussion on pedagogical content knowledge, the mentor's feedback did not explore these opportunities further.

Below is the semantic plane reflecting the episodes of semantic gravity and semantic density along a continuum for Mentor 3's feedback.

Figure 3 Semantic Plane – Mentor 3



The feedback on general pedagogical knowledge regarding the use of the green marker pen emphasised the *how* of learning and teaching, and the mentor backed this up with reasons *why* this aspect of teaching was important. This helped the student teacher realise that if learners could not see clearly what the teacher was doing on the board, then it would be difficult for them to follow and understand what was being explained. This repeated reference to the visibility of what the student was writing on the board focused the type of support as teaching tips. This episode was coded as very weak semantic gravity (SG--) and weak semantic density (SD-) as it reflected a tip on a teaching skill that could be applicable in any context. The mentor did, however, provide some explanation which helped the student to understand the inner logic of the feedback.

As in the case of Mentor 2, it appears that the student's lesson planning was not done in conjunction with the mentor prior to the teaching (a point that was acknowledged by the mentor in the second interview). Although the mentor was complementary of the innovative teaching strategy, he did not prompt the student to explain her pedagogical reasoning behind the choice of teaching method. This would have created an opportunity to establish a ZPD and to stimulate a discussion on pedagogical content knowledge. Mentor 3's feedback was entirely focused on general pedagogical knowledge. His conception of teaching and mentoring was largely based on his own experiences and assumptions of what the student teacher needed to know, rather than on formal pedagogical knowledge. He did not interrogate the student teacher's choice of teaching methodology even though he recognised that it was different to how he had taught the topic. This episode was thus coded as weak semantic gravity (SG-) and very weak semantic density (SD--).

This feedback on the importance of planning the introduction to a lesson was evidence of general pedagogical knowledge. This episode highlighted the importance of how the learning process must be systematically organised and how knowledge (particularly in mathematics) is not acquired in separate silos but is hierarchical and builds on from one concept to another. This opportunity for pedagogical reasoning could have been explored further with a discussion on how theory and practice work together to build knowledge. This episode was coded as SG-; SD+ as it connected what happened in teaching and learning from the previous lesson to the current lesson, focusing on one aspect of the lesson, i.e. the introduction.

The mentor asked the student right at the end of the lesson if she understood and if she had any comments. The opportunity to reflect is a useful practice and perhaps this reflective prompt may be more effective if a student is asked what she thinks at the beginning of the lesson before receiving feedback from the mentor.

In her reflection, the student teacher admitted to being nervous and not being taken seriously by the learners. The mentor reassured her this was not evident in the lesson and offered a different perspective on the context: *"They (the learners) have no idea what you're going to teach them, and so you shouldn't be actually nervous."* The mentor reassured the student teacher she was very capable and needed to be confident and believe in herself. This confirmed that nature of the support was encouraging and nurturing which alluded to what Mentor 3 considered to be the role of mentoring. The mentor's conception of what the student teacher needed to know to become an effective teacher tended to focus more on helpful tips and general pedagogical knowledge than on developing a strong and properly grounded conception of teaching by addressing the pedagogical content knowledge or offering any pedagogical reasoning. The nature of the feedback displayed rarefied and rhizomatic codes which emphasised generic and abstract feedback.

5.4 Summary

Mentor 1, who had volunteered to take part in an internal mentorship workshop during the year, and Mentor 2, who had many years teaching experience, focused their feedback on developing the students' PCK as well as their GCK. Their support was aimed at clarifying and affirming teaching strategies and they provided explanations for their observations. Mentor 2 provided more feedback on this than Mentor 1 and Mentor 3, by providing some reasons for the teaching practice observed.

Mentors 1 and 3 gave more feedback regarding their student teachers' behaviour, character and disposition than Mentor 2. Their feedback referred to the positive relationship that the student teacher had with the learners and how this enhanced the effectiveness of the learning process.

Although general pedagogical knowledge dominated the overall feedback, the nature of this support, in terms of semantic gravity and density, was largely context independent (weak semantic gravity). The feedback ranged between specific tips and advice, for example, the use of the green marker pen (weak semantic density), to

more elaborated discussions on teaching practice, for example, explanations on strategies to teach capacity and mass (strong semantic density).

Mentor 3, who did not have a conceptual understanding and language of teaching as a practice, tended to provide feedback which focused on general pedagogic knowledge (characterised by weak semantic gravity and weak semantic density). Mentor 2, who was more experienced and better-versed in the conceptual underpinnings of teaching pedagogy and who had access to a language of practice, provided more pedagogical content knowledge with variable strengths of semantic gravity and semantic density. Mentor 2, who had undertaken a short course on mentorship, had a more focused and structured approach to mentoring.

Mentor 1 and Mentor 2 were providing PCK with a focus on connecting the learners' experiences to the content being taught. This was mostly coded as weak semantic gravity and weak semantic density on the semantic plane as it was not context bound. Examples of strong semantic density and strong semantic gravity were very few. For example, a discussion on the meaning of capacity and mass was coded as strong semantic density, as the meanings associated with these terms were condensed and needed to be explained.

Mentor 1, who had experienced a short workshop on mentoring had a lens on what mentoring entailed. Mentor 2 had developed a gaze on mentoring through the many years of experience, while Mentor 3, with limited conceptual understanding of the language of teaching, had no lens on mentoring and a limited gaze based on previous mentoring experience in another context.

Cognitive mentoring which focuses on strong semantic gravity and strong semantic density is most effective. In these instances, the mentor should be able to highlight specific observations (strong semantic gravity) and link these to general pedagogical knowledge (the *how*), to content knowledge (the *what*) and to PCK (the *why*) (strong semantic density). The nature of the feedback needs to shift from rarefied and prosaic codes towards worldly codes if student teachers are to understand the process of learning to teach in any context.

CHAPTER SIX

DISCUSSION

The research question was “How do mentors of students in a learnership programme understand and support the process of learning to teach, both theoretically and in practice?” The literature review established that learning to teach is not an intuitive practice but rather a knowledge-based practice and thus requires a strong and properly grounded conception of teaching and a clear understanding of how to organise systematic learning.

The knowledge base which includes general pedagogical knowledge, and pedagogical content knowledge acquired through teacher education programmes at tertiary institutions forms part of the knowledge-for-practice. This includes not only *what* teachers do in their daily practice, but also the *how* and *why*. In each mentor's feedback there was evidence of both types of knowledge base.

In order to respond to the research question, the study aimed to explore three aspects of mentoring, namely, the mentors' conceptions about what student teachers need to know; the nature of the feedback that is provided by mentors; and the extent to which the feedback engages in developing student teachers' capacity for pedagogical reasoning. This chapter will attempt to answer each of these aspects in turn.

6.1 Mentors' conceptions about what student teachers need to know

The effectiveness of the mentors' support depended largely on their conceptions of teaching, learning to teach and mentoring. As can be seen in the summary of knowledge discourse, in Table 3 below, there is a significant difference in the number of episodes in the feedback sessions which related to the two knowledge bases, GPK and PCK.

Table 3: Summary of post observation feedback coding

No. of episodes per Mentor	No. of episodes of General Pedagogical Knowledge	No. of episodes of Pedagogical Content Knowledge	No. of episodes of Semantic Gravity	No. of episodes of Semantic Density
Mentor 1 = 11	10 (90.9%)	1 (9.1%)	SG++ 2 SG+ 5 SG- 3 SG -- 1	SD++ 0 SD+ 3 SD- 4 SD-- 3

Mentor 2 = 14	10 (71%)	4 (29%)	SG++ 7 SG+ 3 SG- 2 SG -- 2	SD++ 0 SD+ 5 SD- 6 SD-- 3
Mentor 3 = 4	4 (100%)	0 (0%)	SG++ 0 SG+ 0 SG- 2 SG -- 2	SD++ 0 SD+ 1 SD- 1 SD-- 2

The literature review highlighted the role of mentors in helping student teachers understand the nature of teaching and challenging their apprenticeship of observation. Challenging the student teachers' apprenticeships of observation was not explicit in the feedback sessions. Part of the mentor's responsibility is making student teachers understand that the purpose of teaching is to organise systematic learning.

Shulman's (1987) knowledge bases of teaching (content knowledge, PCK and GPK) are crucial and need to be made explicit in preparing student teachers. However, in the case of Mentor 3, understanding what students need to know to become effective teachers was mostly limited to general pedagogical knowledge about the *how* of teaching. Since the inner logic of teachers is invisible, *what* needs to be taught and *why* it is important, needs to be made explicit. It is vital that both mentors and student teachers understand that teaching is a knowledge-based practice and that it involves developing competencies in organising systematic learning.

All three mentors were consistent in their understanding that the role of a mentor is to guide and to be a good role model to the student teacher. They also acknowledged the importance of building and maintaining a positive relationship with their mentee. This made it difficult at times to give feedback which pointed out areas where the student teacher was found wanting.

6.2 The nature of the feedback

The nature of the feedback was primarily based on the mentor's own teaching experience and very little reference was made to knowledge-for-practice from the student teachers' own tertiary courses. Any reference to PCK was incidental and not explicitly linked to theories of learning and teaching.

Although the feedback from all three mentors was varied, Mentors 1 and 2 did provide some feedback that focused on PCK, while Mentor 3's feedback, was predominantly on GPK. Without formal knowledge-for-practice, mentoring becomes very generic and lacks the rigour of interrogating the *what*, *why* and *how* of teaching and learning. This results in the feedback on PCK remaining very much in the prosaic and worldly codes. Learning to teach requires an understanding of the complexities of teaching and how to transform what the teacher knows into something that the learners can understand.

Vygotsky's (1978) socio-cultural theory of learning was evident in the process of mentoring as each mentor was focused on the development of their mentee in the context of the situated learnership programme. Through the daily interactions, the mentors were well placed to create opportunities for such development by establishing a Zone of Proximal Development (ZPD) for the student teachers. Through this process the mentors could develop the student teachers' competence and commitment to the practice by guiding them through opportunities to articulate their pedagogical reasoning. These opportunities to create a ZPD were not very frequent across all three mentors. The mentors could have had more of a discussion on pedagogical content knowledge (the *what* and *how*) and explored the possibility of addressing the student teachers' apprenticeships of observation as well as their pedagogical reasoning (the *why*).

6.3 Extent to which the feedback engages in developing student teachers' capacity for pedagogical reasoning

Mentoring provides opportunities for both the mentor and the student teacher to reflect on their own practice. This is achieved when mentors make their pedagogical reasoning (knowledge-in-practice) explicit and allow the student teachers to do the same. Many experienced teachers no longer think about what, how and why they teach what they teach. By having to make their inner logic explicit, both mentors and students continue to learn and to apply new teaching strategies. In a situated learnership programme this develops into a professional learning community (knowledge-of-practice) where both mentor and mentee are being developed.

Feedback provides access to the inner logic of teaching as a practice. If mentor teachers focus primarily on the technical aspects of teaching, it is unlikely that students will develop the pedagogical reasoning needed for successful practice when they are teaching in different contexts.

The three mentors' understanding and support of the process of learning to teach was largely influenced by their own conception of teaching and of mentoring and by their own experiences. The mentors themselves had their own apprenticeships of observation regarding teaching and mentoring. The criteria for evaluation of what makes an effective teacher and for interacting with their student teacher on certain issues was not consistent. Generally, they had a common understanding that mentoring was about guiding and supporting the student teacher and being a good role model. However, their understanding of the theory of learning to teach was limited and only Mentor 2 made explicit reference to the role of the mentor as providing pedagogical reasoning and provided explicit opportunities to mentor in pedagogical content knowledge, based on her many years of experience and not on formal knowledge taught at a tertiary institution.

With reference to the semantic dimension of the feedback, Mentor 1 and Mentor 2 had a few episodes where the GPK and PCK were stronger in semantic gravity (SG++/SG+),¹⁷ in total, within the prosaic and worldly codes. This confirmed that their feedback was grounded in the context of the lessons/school and on the visible aspect of teaching that they observed. Of these, only eight were coupled with stronger semantic density (SD++/SD+) which reflects effective mentoring focusing on integrating the theory and situated practice. In the case of semantic density there were 12 episodes in total that displayed weaker density, dominated by the rarefied code. This implies that the mentors gave feedback in the form of generic stand-alone tips on a teaching skill or technique with some or no explanation. This form of mentorship is limiting as it does not prepare the student teacher to understand the pedagogical reasoning behind the choices that teachers make in what, how and why they deliver the content. This does not provide student teachers with the confidence to organise systematic learning and develop a strong and properly grounded conception of teaching.

CHAPTER SEVEN

CONCLUSION

The mentors' conceptions about what students needed to know to become effective teachers were influenced by their experience and personal understanding of mentorship. The nature of the feedback that was provided by mentors to the student teachers was mostly in the form of general tips, routines and advice from their own experience, with little reference to pedagogical content knowledge. This meant that the extent to which the feedback engaged in developing students' capacity for pedagogical reasoning was limited.

Since mentoring is an important aspect of learning to teach, schools that have responded to the growing need to address the shortage of well-qualified teachers by investing in a situated learnership programme need to take this initiative one step further. Very experienced teachers (such as Mentor 2) are well placed to provide feedback that addresses both GPK and PCK. They have the content knowledge but need to make this knowledge explicit and provide support to student teachers on how to transform this knowledge into something that learners can understand. However, less experienced teachers require formal training on mentorship that will help them to:

- interrogate their own assumptions about teaching
- understand the processes and complexities of learning to teach
- design opportunities for making the pedagogical reasoning behind teaching choices explicit to student teachers

The literature review explored the concept that the practice of teaching involves an act of pedagogical reasoning and that mentoring creates the opportunity for developing a properly grounded conception of teaching.

Cognitive mentorship challenges the student teacher's apprenticeship of observation. Mentors need to encourage student teachers to use their content knowledge to reflect on practice and pedagogical knowledge. Mentors must understand that content knowledge is not a casual sequence of information thrown together but a structured system of interrelated parts which form a whole. Learning to teach thus involves an understanding of the process of organising systematic learning and the role of the mentor is to support the student in this process.

Since the situated learnership programme focuses primarily on the student teachers, there is a lack of formalised mentorship training. Mentoring requires that teachers taking the student teachers 'under their wings' with explicit support, both theoretically and in practice, of the process of learning to teach and how to develop them into professional teachers. A formalised programme of cognitive mentorship is required, whereby a scaffolded process will potentially help mentors to develop opportunities for pedagogical reasoning and guide student teachers through the complexities of learning to teach.

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9. APPENDICES

APPENDIX A – INTERVIEW QUESTIONS

MENTORSHIP OF STUDENT TEACHERS

Phase 1: Recorded interviews with mentors

1. How is the learnership model similar or different to how you learnt to teach?
2. How do you understand your role as mentor?
3. What preparation/training have you received for this role?
4. To what extent do you regard yourself as an ideal mentor?
5. Why is it important for students in the learnership to have a mentor?
6. Tell me about the student you mentor.
7. What are the strengths of your mentee?
8. In which areas does your mentee still need to develop?

Phase 3: Recorded interview with each mentor about the feedback discussions from each observation

1. How did you find the student teacher's lessons? What went well in your opinion and what did not go well?
 2. What was the most important lesson about teaching you wanted the student teacher to learn during the feedback session?
 3. What did you notice, in the lesson observation, that you might not have commented on? Why did you not raise this with the student?
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APPENDIX B – CODED DATA

MENTOR 1

EPISODES	EVIDENCE	PEDAGOGIC DISCOURSE	SEMANTIC GRAVITY	SEMANTIC DENSITY
		General Pedagogical Knowledge (GPK)	SG++ Meaning is very strongly related to context	SD++ Meaning is strongly condensed
		Pedagogical Content Knowledge (PCK)	SG-- Meaning is weakly related to context	SD-- Meaning is weakly condensed
1.1	What did you think about the lesson in general? It's nice to see a little more of a visual aspect included.	GPK	SG--	SD--
1.2	I really liked how it wasn't the standard just go do your homework; come back; mark the homework. So, you got them to look at, think about how it relates to their daily lives. e.g. (learner's question) 'if I have this amount of capacity, how much of the low capacities can I fit into it?'	PCK	SG++	SD--
1.3	We're not just directing and we're not just telling them and giving them information, we're asking them to find it and tell us about it as well.	GPK	SG+	SD--
1.4	Those activities could have been done in the first 15 – 20 minutes and then moved on to some more stuff. I think you spent just a little bit too much time on the board. I think they were given a little bit too much time to sit on there, and you saw obviously the boys ... took the chance to kind of just waste their time.	GPK	SG++	SD+
1.5	I think your instructions were clearer today. They knew what you wanted from them	GPK	SG-	SD-
1.6	I think your use of question words can maybe be worked on a little bit just to get them to think critically a little bit more. So just get them to explain their thinking a little bit more	GPK	SG-	SD-
1.7	They agreed that it was right and then you didn't actually check the answer with them. You didn't ask, "how did you get to that answer, let's explain it to class, let's show them".	GPK	SG+	SD+
1.8	You obviously had planned out the lesson well. You thought about what you were going to focus on.	GPK	SG+	SD--

1.9	You need to develop that repertoire of questioning, those questioning words that kind of get them to elaborate on their thinking a little bit. There's specific wording that you need to start learning to use to get them to elaborate on their thinking	GPK	SG+	SD+
1.10	It was a relatively effective closure, maybe could have just gone over the answers to that one exercise quickly	GPK	SG-	SD-
1.11	You got them to do a little bit of research and come up with some questions	GPK	SG+	SD-

MENTOR 2

EPISODES	EVIDENCE	PEDAGOGIC DISCOURSE	SEMANTIC GRAVITY	SEMANTIC DENSITY
		General Pedagogical Knowledge (GPK)	SG++ Meaning is very strongly related to context	SD++ Meaning is strongly condensed
		Pedagogical Content Knowledge (PCK)	SG-- Meaning is weakly related to context	SD-- Meaning is weakly condensed
2.1	I liked the way that you were slow, and you were patient with them, even though a couple of the girls were pushing you.	GPK	SG+	SD+
2.2	And then what I also saw was that some of them stuck to your method ... and she was drawing your bar, your line. She's cutting it into five equal pieces and then I said, "Do you think there's a shorter way of doing that?" And she said, "Oh, I think there probably is." And the others said, "No, can't you do it this way?" But they got it, they got it very quickly. ... we were wanting to find fractions in a whole, so I think they get it.	PCK	SG++	SD+
2.3	Yes, even Jess did say that, "You know how I do it? I just divide then multiply." (<i>Student</i>) I didn't want to expose them to that method because they were not going to understand the concept, that there are fractions in a whole, because that method doesn't really say anything, it doesn't. (<i>Mentor</i>) – No, it doesn't. It doesn't give them understanding	PCK	SG++	SD+
2.4	And you obviously know your subject well because you had thought out how are you going to teach this, in a basic way, that they will get straight away.	GPK	SG+	SD+
2.5	... when you had them up at the board, putting their answers on, "Ah, please can I have a turn", "Please can I have a turn". So, the enthusiasm was there, and they felt confident enough to do it. They enjoyed it.	GPK	SG++	SD+
2.6	Just be careful when you are at the board, don't stand in front of the board. So, when I was sitting over there, we couldn't really	GPK	SG--	SD-

	see on that side and then luckily you moved to this side, so we could then see.			
2.7	And you had a nice ending. They all put their answers on the board. And I think that some of them were already moving ahead. You could see them.	GPK	SG++	SD--
2.8	So maybe revise a little bit with them, refresh their memories. Or maybe give them five sums to do.	GPK	SG+	SD-
2.9	And I quite liked the way that you said, ok, this is a 2-litre bottle, this is a 1-litre bottle, this is a 1,5-litre bottle and how many millilitres were in the litre bottle.	PCK	SG++	SD--
2.10	... the kids weren't sure whether they had to write it down or didn't have to write it down. So, some of them were writing it down and some of them weren't. I think they were a little unsure about that. So, I think just be clear on your instruction, 'Ok, I want you to write this in your books' or 'I don't want you to write this'.	GPK	SG--	SD--
2.11	I liked the way you approached it from what they knew in Grade 4. So, you knew they had to know there was 1000 millilitres in a litre. And you just needed to refresh their memories and just give them some practical things to do it.	GPK	SG-	SD-
2.12	I also liked the fact that you put on the board that one millilitre equalled one over a thousand litres, so they saw this fraction and one comic kid said, "I've never seen a fraction like that before!"	PCK	SG++	SD-
2.13	I think your personal knowledge of the subject was evident. You knew what you were talking about	GPK	SG-	SD-
2.14	Then I also think that when we come onto measurement, in terms of, mass, I think we'll make it really practical – use those scales, get them into groups.	GPK	SG++	SD-

MENTOR 3

EPISODES	EVIDENCE	PEDAGOGIC DISCOURSE	SEMANTIC GRAVITY	SEMANTIC DENSITY
		General Pedagogical Knowledge (GPK)	SG++ Meaning is very strongly related to context	SD++ Meaning is strongly condensed
		Pedagogical Content Knowledge (PCK)	SG-- Meaning is weakly related to context	SD-- Meaning is weakly condensed
3.1	I thought it was a fabulous way to introduce (<i>explain</i>) the topic. It was not the way I would have done it and for that, it's really amazing	GPK	SG-	SD--
3.2	I know there were no marker pens in that class and so you used a green marker pen. So, what we need to do next time is prepare better in the classroom and you need to recognise that green is not the greatest colour, particularly when the pen is dying a little bit and it doesn't write as dark as the brand-new pens write. So, what happens is in the lights, if the lights are very close to the front of the classroom, there's a lot of glare and you don't see that green pen well at all.	GPK	SG--	SD-
3.3	I just thought to make it an absolute complete lesson, you could have just done that introduction just slightly better and just told them where you were going and so on: 'Ok, do you remember we did this yesterday?' I think for the first five or ten minutes they weren't sure where you were going. I think that if you had said, "Ok, we are doing factorization. We are going to start slow and we're are going to do this and we're going to start with ..."	GPK	SG-	SD+
3.4	I thought your use of the smartboard this time was significantly better than last time. I thought that your writing was nice and big, easy to read.	GPK	SG--	SD--