The Changing Dynamics of Teacher Learning: An Exploration of Teacher Learning through the Lens of Assessment

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By

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DECLARATION

I, Shivani Maharajh (student number 204001378), declare that this thesis is my own work, and has not previously been submitted by me, at any other university. It is my original work and I have acknowledged all the sources consulted and quoted in the bibliography.

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Researcher

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Date

DEDICATION

I would like to dedicate this thesis to my mum, Premeela, who has been instrumental, not only in the completion of this thesis, but in every facet of my life.

"Mummy, I am so blessed to have you in my life. To me, you are an angel gifted by God, a priceless jewel, who I treasure with all my heart. You have stood by me through all my sorrows, offering moral support, in the form of a shoulder to cry on, as well as sound advice to get me through the tough times and bounce right back. In the same breadth, you have been there to share my triumphs and laughter, making my achievements and memorable moments, that more special.

You have been an impeccable role-model, with values I have also tried to live my life by. The firm religious and moral convictions to which you have always subscribed have shown me that the righteous path ultimately leads to inner peace and tranquillity. Your self-discipline, strong work ethic and perseverance have not only ensured success in your life, but have also inspired me to emulate these qualities in my own life. Mummy, your strength of character, determination and optimism are the essence of what defines you. You are a woman that exudes confidence, grace, elegance and an inner beauty that is the very core of your being.

Your academic achievements and strong emphasis on academia, have served to motivate me on this path of pursuing my studies. You were instrumental from the outset, in me registering for, and completing my PHD. Throughout this journey of pursuing my PHD, you have offered me an abundance of support and love, something that I am eternally grateful for. Words cannot express what you mean to me, nor do they adequately express how blessed I am to have you in my life. You have been a guiding star in my life, someone I wouldn't trade for anything in the world. You are the world's greatest super-mom, who I love immensely.
Mummy, this one is for us!"

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ABSTRACT

The National Curriculum Statement advocates a shift in focus with regards to the manner in which assessment and learning are conceptualized (Department of Education, 2002). Consequently, new forms of assessment that are in keeping with the principles of the National Curriculum Statement (Department of Education, 2002), are expected to be implemented within the South African classroom context. Set against this backdrop, the study set out to explore teaching learning through the lens of assessment, by focussing on the content, process and application issues associated with teacher learning. This study attempted to unpack what teachers know about assessment and how they have come to acquire this knowledge. It was envisaged that through an analysis of how teachers learn about assessment, this study would reveal valuable insights about how teachers learn, and in this way, bring to the fore additional meaningful insights about the conditions that lead to effective teacher learning. In striving to achieve the outcomes of the research project, this study focused on the interplay between theory and practice to explore the process of teacher learning and how this learning translates into practice, through exploring how teachers' knowledge of assessment, influenced their classroom assessment practices.

The study was a qualitative one, within a case-study design. The use of semi-structured, iterative interviews, document analysis, and observations, formed the instruments used in the study. The thesis unpacked the journey of learning about the new forms of assessment, among three primary school educators, who formed the participants of the study. The findings of the study allude to the notion that teachers learn in a variety of different ways, and through a plethora of learning experiences, making a simplistic, superficial understanding of teacher learning, inadequate. In addition, the study pointed to teacher learning being shaped by a number of factors, indicating the significant influence that a multitude of factors, both internal and external, have over teacher learning. Further, the challenges and issues associated with teacher learning were brought to the fore. The implications of the study suggest that teacher learning is complex and multi-faceted, making it most necessary to adopt a multi-focus approach to teacher learning.

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ACRONYMS

AFL- Assessment for Learning

AOL- Assessment of Learning

DoE- Department of Education

GET- General Education and Training

NCFOT- National Centre for Fair and Open Testing

NCS- National Curriculum Statement

NS- Natural Science

RAP- Research on Assessment Practices

RNCS- Revised National Curriculum Statement

GLOSSARY

Continuous assessment – assessment model that encourages integration of assessment into teaching and the development of learners through ongoing feedback

Foundation Phase- the first phase of the General Education and Training Band: Grades R, 1, 2 and 3

General Education and Training Band – the ten compulsory schooling years, made up of Foundation, Intermediate and Senior Phases

Integration- a key design principle of the Revised National Curriculum Statement Grades R-9 (Schools), that require learners to use their knowledge and skills from other Learning Areas, or from different parts of the same Learning Area, to carry out tasks and activities

Intermediate phase- the second phase of the General Education and Training Band: Grades 4, 5 and 6

Learning Areas- the eight fields of knowledge in the Revised Curriculum Statement Grades R-9 (Schools): Language, Mathematics, Natural Sciences, Technology, Social Sciences, Arts and Culture, Life Orientation, and Economic and Management Sciences

Learning Programmes- programmes of learning activities, including content and teaching methods; these are guided by the Revised National Curriculum Statement Grades R-((schools) but developed by provinces, schools and teachers

Senior Phase- The third and final phase of the General Education and Training Band: Grades 7, 8 and 9

Assessment Literacy- The possession of knowledge about the basic principles of sound assessment practice, including terminology, the development and use of assessment methodologies and techniques, familiarity with standards of quality in assessment.

Authentic Assessment - Evaluating by asking for the behavior the learning is intended to produce. The concept of model, practice and feedback in which students know what excellent performance is, and are guided to practice an entire concept rather than bits and pieces in preparation for eventual understanding. A variety of techniques can be employed in authentic assessment. Tasks used in authentic assessment are meaningful and valuable, and are part of the learning process. Such tasks should mirror and measure student performance in a "real world" context.

Assessment Task -An illustrative task or performance opportunity that closely targets defined instructional aims, allowing students to demonstrate their progress and capabilities.

Formative Assessment- Observations which allow one to determine the degree to which students know or are able to do a given learning task, and which identifies the part of the task that the student does not know or is unable to do. Outcomes suggest future steps for teaching and learning.

Self-Assessment -A process in which a student engages in a systematic review of a performance, usually for the purpose of improving future performance. Self assessment may involve critiquing one's own work or may be a simple description of the performance.

Summative Assessment -Evaluation at the conclusion of a unit or units of instruction or an activity or plan to determine or judge student skills and knowledge or effectiveness of a plan or activity. Outcomes are the culmination of a teaching/learning process for a unit, subject, or year's study.

Chapter 1- Setting the Scene

1.1 Introduction

This chapter serves to orientate the reader to the study, by firstly providing a background to the study, thereby contextualising it. Attention is drawn to the rationale for embarking on the study, and the statement of purpose and critical questions guiding the study are outlined. The theoretical perspective and methodology underpinning the study serve to provide the backdrop against which the study was conducted. The scope and limitations of the study are outlined, as are the ethical considerations. Measures sought to enhance the quality of the study are discussed. The chapter concludes by providing an outline of the format of the thesis and a summation of the chapter contents.

1.2 Orientation and Background to the Study

"Who dares to teach must never cease to learn" (John Cotton Dana, undated)

The above quote, encapsulates the necessary and significant activity of learning that teachers need to embark on as part of their continuous growth and development. Darling-Hammond (1998) supports this sentiment, adding that a professional teacher is one who learns from teaching rather than one who has finished learning how to teach.

Given the emergence of a new kind of society within the international context, of which „supercomplexity', is a key characteristic, the problematic nature of the frameworks that inform and shape our understanding of the world is heightened (Barnett, 1999/2002). Further, our acting on this understanding in relation to other individuals within a specific context fuels this complexity, as Barnett (1999/2002) asserts:

> *"We live in a world characterized by contestability, changeability, uncertainty and unpredictability [and under such conditions] work has to become learning and learning has to become work."* (Barnett, 2002: 7).

Barnett (1999/2002) justifies the sentiments that "learning to learn" and "learning to teach" are interconnected; by suggesting that being conscious of one's ability to teach raises one's understanding of one's ability to learn. In light of this, the pivotal role that continuous professional development plays in the effective growth of teaching staff, as well as in

enabling the successful application of new educational initiatives being formed within the context of a knowledge-based society, cannot be underplayed (Craft, 2000; Fullan, 2001; Hargreaves, 1999).

In addition, it is a widely acknowledged and accepted assumption that the quality of learning is directly, although not entirely, linked to the quality of teaching (Angelo & Cross, 1993). A logical inference from this assumption would be that in order to foster and enhance student learning, the quality of teaching needs to be improved. In this respect, Shepard (2000) highlights the pivotal role of the curriculum in promoting and developing a close interlink between instruction for meaningful learning and assessment.

The international trend with regard to assessment has undergone a gradual shift from the traditional and dominant culture of testing and examination to a more accommodating and flexible assessment culture, where a vast kaleidoscope of assessment techniques is being implemented in the classroom (Linn & Miller, 2005). South Africa is no exception here. Taylor et.al (2003) report that studies conducted in South Africa between 1998 and 2002 reveal that learners' scores are far below what is expected at all levels of the schooling system, both in relation to other countries (including developing countries) and the expectations of the South African curriculum. In addition, when learners are assessed they are unable to perform at levels which are acceptable both nationally and internationally. An even more alarming finding is that learners are performing one to two years lower than Grade 3 level and three years below Grade 6 when assessed in relation to the level expected of the Revised National Curriculum Statement. A fine-toothed analysis of these findings clearly points to reasons for concern with the output of current educational initiatives.

Samuels (2010) adds that since most teachers were formally trained to enact the old apartheid system under the transmission model, the scale of reform needed to uplift South African educators is enormous. He believes that teachers now have to be‚re-technologised' to the new curriculum. The problem lies in the fact that educators are not expansively equipped as to how to deal theoretically and practically with change and make epistemological judgements about changes as they occur in policy and curriculum.

1.3 Statement of Purpose

The purpose of this study, therefore, is to explore teacher learning through the lens of teacher assessment practices in the intermediate phase of schooling.

1.4 Research Questions Guiding the Study

The study will attempt to answer the following research question and sub-questions:

1.4.1 Critical Question

The critical research question is as follows: How do teachers learn?

Due to the expansive and multifaceted nature of teacher learning, this critical question has been further subdivided into four sub-questions that will assist in exploring the topic in a more focused and detailed manner through the lens of assessment.

1.4.1.1 Sub-questions

The sub-questions that the critical question has been divided into are as follows:

a. What do teachers know about learner assessment?;

b. How do teachers acquire knowledge on learner assessment?;

c. How do teachers explain their practice of learner assessment?; and

d. Why do teachers offer the explanations they do for the assessment choices they make?

1.5 Rationale for and Context of Study

The rationale for undertaking this study has academic (theoretical), professional (practical) and personal (experiential) components to it. This section is informed by the gaps evident in literature reviewed, thereby providing the backdrop against which this study is located, as the discussion below will highlight.

The Norms and Standards for Educators (DoE, 2000) clearly spell out seven expected and critical roles of educators, those of:

- Learning mediator;
- Interpreter and designer of learning programmes and materials;
- Leader, administrator and manager;
- Scholar, researcher and lifelong learner;
- Community, citizenship and pastoral role;
- Assessor; and

- Learning area/subject/discipline/phase specialist (DoE, 2000) (refer to Appendix 5 for an elaboration of these roles).

The above roles are encompassed in the Integrated Strategic Planning Framework for Teacher Education and Development in South Africa: 2011- 2025 (DoE, 2011), which emphasizes the development of teacher knowledge and practice standards. These standards are specific to a particular subject, as well as to a school phase. In addition, teachers are placed at the heart of all attempts to promote teacher development, on both an individual level, as well as collectively, through teacher participation in professional learning communities (PLCs). Further, within this new framework, the dynamic nature of teaching and learning, where various types of expertise are required at all levels for optimum teacher growth and development, is acknowledged. Within this framework, teachers are encouraged to become involved in an array of professional development activities, including developing expertise in the assessing the performance of their learners and in analyzing the results of these assessments, in curriculum orientation activities to develop teacher understanding and competence in interpreting and using curriculum policy documents and associated resource materials, and working together to learn from practice and other learning materials.

In the light of these changing roles of educators, Darling-Hammond and Bransford (2005) point out that the new and perhaps additional responsibilities of teachers mean that educators need to be equipped with the relevant skills to fulfil these obligations. To achieve this, a change in mindset, that involves teachers expanding their knowledge base through engaging in a plethora of learning activities, becomes pivotal to teachers increasing their competence in their new role functions.

Amid the rapid and dramatic changes within the context of the educational environment, and the accompanying demands being placed on teachers it becomes crucial that educators redefine their roles accordingly. This shift in context has brought with it changes in student expectations, where traditional assessment practices are no longer adequate. This has necessitated that teachers develop themselves in two crucial areas, these being obtaining knowledge of assessment and acquiring proficiency in assessment. In short, this amounts to acquiring assessment literacy (Mathews, 2007).

According to Ross et al. (1998a) assessment literacy can be defined as follows:

1) “the capacity to examine data and make sense of it;

2) the ability to make changes in teaching and schools derived from those data, and

3) commitment to engaging in external assessment discussions."

Further, assessment literacy entails teachers becoming knowledgeable about the basic principles of sound assessment practices, including terminology, the development and use of assessment methodologies and techniques, and familiarity with standards of quality in assessment (Hearne, 2001).

Stiggins and Conklin (1992) assert that teachers with a strong sense of assessment literacy possess a working knowledge of when and how to design, develop, use and value a wide variety of methods for assessing learner achievement. The implication is that developing competence in assessment literacy will give educators the confidence to defend their evaluation practices, by providing the rationale for the assessment choices they make. According to Hargreaves and Fullan (1998), by engaging in discussions about standards and accountability teachers will become more equipped to make critical use of externally generated assessment data.

The level of the complexities of assessment compels teachers to pay attention to assessment, due to the different and in certain cases new ways of assessment that educators are forced to understand and implement. Further, as Papastamatis et al. (2009) assert, the complexity of the teaching profession makes the transition from training to practice rather difficult. By implication, the intricacies associated with translating teacher learning into practice are no simple task, by any means. Teaching cannot be standardised because teachers as professionals need to create knowledge on use as they practice. In addition, research points to a significant shift in focus from what teachers do to what they know and what informs this knowing (Cochrane-Smith & Lytle, 2001).

Traditionally, the focus of teacher learning initiatives was based on general teaching methods and on strengthening subject knowledge, and a belief that teachers with more subject knowledge teach better irrespective of teaching practice in place or how teachers come to know this knowledge, dominated much of the discourses surrounding teacher learning (Parker & Adler, 2005). There has been inadequate emphasis on underpinning conceptual knowledge that needs to be taught (Taylor & Vinjevold, 1999). Consequently, questions pertaining to teacher knowledge, the relationship between knowledge and practice in teaching, and the kind of knowledge that teachers need for practice, have arisen (Parker & Adler, 2005). This study attempted to explore such relationships of knowledge and practice.

The constantly evolving role of teachers in the 21st century is best encapsulated in the following quote:

> *"Teachers will become 'learning engineers' presenting and facilitating a range of cross-curricula learning experiences based on investigation and problem solving scenarios. There will be a balance between independent research and enquiry and collaborative learning involving 'teams' of learners (potentially multinational, multiethnic groups) working together to solve complex problems and drawing on each others' unique skills and talents. Learning from each other – teaching and learning roles are inter-changeable. The concept of learning will become a cyclical process".* (Bert Jaap van Oel, undated)

The significance of teacher learning in the process of educative teaching is undeniable. This is supported by Darling-Hammond (1999, p. 32), who encapsulates the indispensible need for an emphasis on teacher learning when she asserts that:

> *"Investments in teachers' knowledge and skills net greater increases in students' achievements (in the United States) than other uses of an education dollar'.*

Grodsky and Gamoran (2003) assert that teacher renewal in the form of professional learning is imperative as its effects on practice enhance learner performance. Skilbeck and Connell (2003) contend that while older teachers may be experienced and confident in their teaching role, there is definitely a need for renewal to update their curriculum knowledge and pedagogical procedures, in order to rethink the structures of their teaching career. However, while the merits of teacher learning are acknowledged, the purpose, nature and outcomes of teacher learning are not always desirable, as indicated by Bredeson (2003) and Scribner (2003), who suggest that learning is sometimes sought to cope with external demands and not necessarily to expand the content expertise of teachers. This alludes to the fact that although teachers engage in learning activities related to their teaching practice, there seems to be a low indicator of knowledge gain by teachers through these activities. The possible reasons as to why this happens was also a subject of exploration within this study as it sought to understand the conditions that lead to effective teacher learning.

Bubb (2005) believes that the learning styles, habits and forms of teachers are important as these are linked to their central work activity, that being helping others to learn. By individual teachers acquiring knowledge about how they learn, and by understanding that learning styles may differ among their colleagues in the teaching fraternity, they will be in a better position

to support the learning of their students and colleagues. Cochran-Smith and Zeichner (2005) believe that more research that focuses on what teachers actually learn from presented opportunities, is necessary to increase our knowledge about how particular programmes contribute to the development and use of teacher knowledge. Further, they add that scant information is available on how this learning impacts on the quality of teaching and learning. This study was an attempt to address these areas through the lens of assessment.

Further research on teacher learning (Hawley & Valli, 1999; Sykes, 1999; Thompson & Zeuli, 1999; Lytle, 1999, as cited in Scribner, 2003), indicates a mismatch between teachers' knowledge and student performance goals, as well as a disconnection between academic content covered and students' thinking and learning, thereby creating a sense of disharmony between teacher learning activities and teacher work. While exploring the variance between teacher knowledge and learner performance was not within the scope of this study, acknowledging the notion of the possibility that teacher learning activities might very well be disassociated from the context of the work of teachers, would prove necessary to explore how teachers learn. The context within which teacher learning occurs cannot be ignored, as Eraut (1994) believes that there is a strong link between classroom contexts and teacher learning. Further, since teachers are in a „doing' environment more than a „knowing' environment, they tend to rely on procedural (how to) knowledge rather than conceptual knowledge (Scribner, 2003). Eraut (1994) suggests that while procedural knowledge is often acquired unreflectively, implying that such knowledge equates to implicit theories that guide practice, it remains and serves to make life bearable. However, Scribnner (2003) cautions against the use of such knowledge without being aware of the possibility of displacing one set of teaching goals for another, that is, strongly associated with the unquestioning application of procedural knowledge being put into practice.

Further, since the teachers themselves are the chief individuals who validate knowledge within the classroom context, the validation is individual rather than collective (Scribner, 2003). It was for this reason that I have chosen teachers as the subjects of my study. By engaging in discourse with teachers about how they have acquired their knowledge and unpacking the explanations they offer with regard to their assessment practices, it was envisaged that this study would reveal valuable insights about how educators learn.

The association between theory and practice is further elaborated upon by Eraut, cited in Scribner (2003), who asserts that the knowledge acquired in the academic context is often

detached from practice. Schulman (1997) adds that when theories are developed independent of practice, they tend to be either wrong or dangerously incomplete. Sykes, cited in Scribner (2003) concurs, adding that the academic framework is beneficial to teacher learning as it is within this context that theories are made explicit for critical analysis. Both Eraut and Sykes (cited in Scribner, 2003) agree that multiple sources of evidence (especially the assessment of student work) should be integrated into teacher learning experiences. To fully explore theory and practice one needs to embark on a study encompassing both elements (Schulman, 1997; Sykes, cited in Scribner, 2003; Eraut, cited in Scribner, 2003). If we add to this the consideration of Guskey (2000), who contends that transformation occurs first through changing practices and eventually through changing beliefs, it becomes imperative to examine the practical component of assessment within the classroom context. Seeing evidence of some positive transformation facilitates this change of beliefs. This study therefore attempted to focus on the interplay between theory and practice to explore the process of teacher learning and how this learning translates into the practice of assessment by teachers.

By engaging in discussions with teachers as to how they explain their assessment practices within the classroom and by critically unpacking the reasons they offer for their explanations, this study attempts to understand how teachers acquire their knowledge of assessment and how this knowledge informs and shapes their classroom practices. While policy outlined in the National Curriculum Statement (NCS) necessitates a shift in focus with regard to the manner in which assessment and learning are conceptualised (Department of Education (DoE), 2002), the accompanying need for a shift in thinking among implementers of policy, that being the educators, cannot be underplayed.

In addition, while teachers have little, if any control over national or school policy or curriculum, they do have a considerable degree of autonomy within the classroom context (Kidder, undated). Consequently, the success of any reform initiative in education rests precariously on the skill and virtue of the people at the bottom of the institutional pyramid, namely teacher professionals. Having said this, it would prove most beneficial to explore how these individuals embark on learning and how this learning shapes their teaching; and in the case of this study, how this influences their classroom assessment practices.

According to Shalem and Reed (2007), the NCS advocates that assessment be used during teaching as a form of support rather than just as a benchmark to measure learners'

achievement. Assessment of the learning process should therefore be interwoven with teaching. For this shift in thinking to successfully occur, Hill (2002) stresses the need for educators to be confident about assessment so that they can make informed decisions about their classroom practices. If educators are clear and confident about how they conceptualise assessment, they will be in a more informed position to make educationally sound decisions regarding their instructional (more specifically, their assessment) practices within the classroom. Further, if we acknowledge and accept that teachers' uncertainty and perhaps resistance to change is influenced by their beliefs (Rahim, Venville & Chapman, 2009), it makes sense that teachers' beliefs will be explored to the extent that they hold significance for teacher learning. This was also an area covered in this study.

In addition, Pajeres (1992) asserts that beliefs influence the decisions teachers make in the classroom. Brown (2003) agrees, adding that all acts of pedagogy (including assessment), are affected by the views that teachers hold about the act of teaching, the process and purpose of teaching, and the nature of learning. These beliefs act as frameworks through which teachers view the teaching environment to make it meaningful. In an attempt to address the research sub-questions, pertaining to why teachers offer the explanations they do with regard to their assessment practices, this study sets out to expose the views that teachers in the study hold about assessment and learning. Further, if we subscribe to the view that teachers act as change agents and mediators between policy and practice, it follows that their knowledge of assessment should be explored to better understand how and why they utilise the assessment practices that they do. This fell within the domain of the located study.

Being an educator myself, I am aware of the many challenges that face educators with regard to assessing learner performance. According to the DoE (2001), a history of poor pre-service and in-service training programmes that are inadequate in concept, duration and quality were major limiting factors with regard to curriculum change in South Africa between 1996 and 2000. Consequently, many educators lack the knowledge and skills to change their teaching practices or perceive that they have not been provided with the external assistance they need. This is in line with the thinking of Sukhraj, Mkhize and Govender (2004), who assert that the pronounced shortcomings of professional training programmes have a limiting effect on implications for classroom application.

Various studies allude to the severe lack of training on assessment practices that teachers receive (Black & William, 2004; Cizek & Fitzgerald, 1996). These studies reveal that

teachers, including those who had been teaching for several years, were still lacking in their assessment practices (Cizek & Fitzgerald, 1996). These studies point to two essential inadequacies: firstly, teachers have limited opportunities to attain learning and competence in assessment; and secondly, even experienced teachers need their knowledge base of assessment to be renewed. To this end, Lukin (2004) reports that programmes targeted at training experienced teachers in the area of assessment were indeed successful in improving teacher confidence, knowledge and skills in key areas of assessment. Vandeyar and Killen (2007) have found that recent educational policy changes have not necessarily resulted in major changes at classroom level since some educators still apply the same pedagogical practices they used a decade ago. It therefore becomes imperative to understand why South African teachers are not conceptualising assessment in ways that are consistent with current Government and DoE policies.

By engaging teachers in articulating and reflecting on their conceptions of assessment, and how and why they use the assessment practices they do, it was envisaged that important insights about how learning is acquired among teachers will be brought to the fore. By pushing the boundaries further in an attempt to understand why teachers offer the explanations they do with regard to explaining the thinking behind their practices, the study also aimed at shedding some light on ‚teacher thinking'. Having presented a range of literature that clearly demonstrates the need for extending the current theoretical perspectives on teacher learning, the located study was conducted with an explicit focus on teacher learning.

The expectation that teachers need to expand their knowledge base to increase their competency in their new role functions (as outlined in the Norms and Standards for Educators (DoE, 2002)) presents an urgent case for teachers to renew their current knowledge. Coupled with these so-called ‚new roles', the new curriculum statement (DoE, 2002) advocates new assessment practices that teachers are expected to implement, implying that teachers need to acquire proficiency in the assessment of learners. However, the literature presented in this study suggests that learning has typically been sought by educators to merely cope with external demands, and not necessarily to expand the expertise of teachers. The located study attempts to explore how teachers learn and understand the factors conducive to initiating and promoting teacher learning.

Further, the shift in focus from what teachers do to what they know and what informs their knowing alludes to the significance of exploring the relationship between knowledge and practice. The association between theory and practice was a significant area of focus within the study, to identify how teachers learn by exploring the assessment practices they employed within the context of the classroom. Further, by exploring how teachers justified their assessment practices, the underlying notions and beliefs that influenced how they actually assessed learning within the classroom created an avenue for understanding and unpacking the relationship between knowledge and practice that manifested within the context of this study. In this way, issues pertaining to content (assessment), process (how teachers learn about assessment) and form (the nature of learning teachers embark on and the different types of knowledge acquired in the learning process) were addressed in the located study.

1.6 Theoretical Perspective

The theoretical perspective that informed this study was an interpretivist one where the researcher sets out to understand and explain the phenomenon under study through the eyes of the participants, as he or she attempts to gain an insider perspective of critical issues surrounding the area of study (Cohen, Manion & Morrison, 2007). This study sought to explore how teachers learn, through the eyes and insights of the three participants in the study.

The acknowledgment that different people bring different perspectives to an experience and therefore attach their own meaning to that experience is an important one, since the possibility of multiple meanings emerging out of the same experience arises (Punch, 2009). Through the deep insights that the participants revealed in the data collection process, this study attempted to explore the various perspectives that they brought to their respective learning processes. Since meaning is constructed on individual interpretation within the interpretivist paradigm, meaning therefore becomes subjective (Mack, 2010). The intention behind providing a comprehensive and detailed description of the research site and participants was to provide a holistic picture of the study. In this way the reader would be in a position to assess the interpretation of what was being said, in line with who was saying it.

The study utilised a combination of grounded and apriori approaches to the analysis of the data. Emergent themes from the literature surrounding assessment and teacher learning formed the basis of designing the research instruments, and helped identify the themes for

analysis. In addition, the emergent trends evident from the data that were collected also helped to shape and identify the themes for analysis. In addition, conclusions and theories were drawn around the area of teacher learning, as well as from the themes that emerged from the data. This was in addition to the supporting literature on teacher learning and assessment. Details of how the apriori and grounded approaches were used as analytical frameworks in the located study are given in section 4.7.

1.7 Research Site and Participants

The study was conducted at a co-educational urban primary school in the Durban North region in KwaZulu-Natal. Through purposive sampling, three Natural Science teachers participated in the study. The rationale for the selection of the research site and the participants is detailed in Chapter 4, which focuses on the methodology employed in the study.

1.8 A Brief Discussion on the Methodology used in the study

The study was qualitative within a case study design. Semi-structured, iterative interviews, document analysis and observations formed the instruments used in the study.
The manner in which these instruments were used to collect data in an attempt to address the research questions guiding this study is detailed in section 4.4 of Chapter 4. Data were presented as narrative stories constructed from the semi-structured interviews to explore the meanings that participants ascribed to their experiences of learning about learner assessment. The manner, in which the narratives were presented, is detailed in section 4.8 of Chapter 4. The techniques of discourse analysis and content analysis were both employed in the assessment of data, which assumed a thematic approach. An elaboration of how these techniques were employed in the study is detailed in section 4.9 of Chapter 4.

1.9 Issues of Context and Contextual Factors

Context includes notions such as temporal context, spatial context and context of other people (Clandinin & Conelly, 1996). Through a detailed description of the research site, participants and contextual factors pertaining to the study, attempts to address issues of context were made. An entire chapter (Chapter 5) is dedicated to detailing the context within which the study took place.A descriptive account is given of the author of this dissertation pertaining to her background as teacher-researcher in terms of qualifications, subject preferences, engagement with policy documents and resources pertaining to assessment and teacher

learning, training undertaken, experience and personal predispositions. These are explicitly detailed in the section on „Voice and Signature' in this chapter (section 1.13) and also presented in various forms throughout the dissertation.

1.10 Scope and Limitations of the Study

The study focus was on understanding how teachers learn, using the lens of assessment. The study was confined to the experiences of three educators at one particular school. The initial purposive and subsequent network sampling process identified the three participants in this study. Further, all three were relatively seasoned teachers, each with more than a decade of teaching experience. The experiences of how novice teachers embark on a process of continual learning or the process that informs how they have come to know what they know might have been somewhat different, and was not explored.

Since the study set out to present a theoretical perspective of the participants from the school under study, there was no intention to generalise the findings beyond the context of the field of inquiry. The extent, to which the findings and interpretive account of a study can be applied to a broader population, as well as contexts other than the one being studied, pertains to generalisability (Durrheim & Wassenaar, 2002; Kelly, 2002; Fraenkel & Norman, 2006). While the possibility of generalising the findings of this study relative to other contexts may not exist, insights revealed and the resultant theory that developed from this study could contribute to understanding how teachers learn. By presenting a rich and detailed description about the research site and the participants, it was envisaged that this would equip the reader with skills to decide whether the inferences alluded to by the findings of this study would suit their own situation. In this way the potential for exploring the concept of transferability becomes possible (Seale, 2000; Huberman & Miles, 2002; Durrheim & Wassenaar, 2002).

1.11 Enhancing the quality of the study

Working within an interpretivist paradigm necessitated that attention be directed to the trustworthiness and authenticity of the study. In an attempt to do this, issues associated with credibility, transferability, dependability and conformability were addressed. Each of these aspects is detailed in section 4.10 of the methodology chapter. Suffice to say, measures were sought to enhance the quality of the study and an overview is presented here. An interactive and iterative approach to data collection and analysis unfolded in the manner outlined below. My position and perspectives as well as my biographical details, teaching experience and background and areas of interest were presented at the very outset in an attempt to address

any prejudice that might have jeopardised the authenticity of the study. I also kept written notes on my reflections during the course of the study. These were constantly revisited, amended and modified as new insights were revealed, and as I began to interact with the data and ascribe meaning to what was emerging. I also commented on how my own interpretations of data began to evolve during the course of the study, and this was done throughout. Such measures also helped enhance the trustworthiness of the study.

Member checks, as advocated by Patton (2002), were used to verify and confirm interpretations of what the participants were saying in interview sessions as a way of enhancing the credibility of the study. Credibility refers to the process of ascertaining whether the results of a study are believable or true from the participants' perspectives (Trochim, 2001). Follow-up interviews also helped afford participants the opportunity to verify, affirm, and elaborate upon what they were trying to say, and ensured that their perspectives were portrayed accurately.

In an attempt to address issues associated with confirmability (the degree to which the results of the study could be confirmed or corroborated by the participants (Seale, 2000; Trochim, 2001)), and transferabilty (the degree to which the results of a study can be generalised or transferred to another context or setting (Trochim, 2001)), presented a rich and in-depth description of the research site and participants in the study. The sampling procedures used to select the participants were detailed. In addition, I attempted to thoroughly explain the rationale for the choice of data collection methods as well as the manner in which data were collected. I provided a detailed description of how the data were collected and kept notes on the themes that informed follow-up interviews, the findings, and ultimately how the conclusions were drawn.

Dependability, which is how one can ascertain whether the findings of a study can be repeated with the same participants under the same circumstances (Veale, 2001), was addressed, with interview transcripts, notes, memos, field-notes, samples of lesson plans and assessment activities and other forms of evidence pertaining to study methodically arranged and filed for safe-keeping. Further, the original audio-tape recordings of interviews and detailed records of personal notes on steps taken during the different stages of the research process, as well as the reasoning behind taking such measures, were also stored safely. Notes on my personal reflections as I began to interact with the data and ascribe meaning to what was coming through were also maintained. These notes were constantly revisited and reviewed as new insights began to emerge. Since this study entailed dealing with human

beings, a consideration of associated ethical issues needed to be addressed, as outlined in the ensuing section.

1.12 Ethical Considerations

Very simplistically put, ethical issues relate to the researcher acting responsibly (Simons & Ushers, 2000). This involves showing respect for self and others; considering issues of social justice, human rights, norms and expectations; interacting in a manner that does not exploit or hurt others; and where there is conflict between various values and norms to seek to achieve balance between these (Simons & Ushers, 2000).Gaining access is an important first stage in planning educational research (Simons & Ushers, 2000). In this study, written permission to conduct the study was obtained from the DoE and the Ethics Committee of the University of KwaZulu-Natal. In addition, the principal agreed (in writing) to the study taking place at the school in question. Further, permission from the select participants was obtained via them signing consent forms agreeing to their taking part in the study. From the very outset participants were informed of the intended outcomes of the research process, the process by which the data would be collected, and how the research would be used. In addition, participants were made aware of the fact that they took part in the study voluntarily, and were free to withdraw at any time should they wish to do so. The study only commenced once written permission from all relevant parties was obtained. The use of pseudonyms helped to ensure the anonymity of participants. A pseudonym, namely Sterling Primary, was formulated for the school at which the study was conducted. In this way I maintain the confidentiality of the identities of both the research site and the participants throughout the study.

In an attempt to address issues associated with power relations that may have been present, I requested that the participants feel free to express their concerns and raise any questions that they may have as the research process unfolded. Interview sessions and observation of lessons were scheduled at times and venues most convenient for the participants. In fact, the participants dictated when and where these sessions took place and how long they lasted. The notion of negotiated meaning, where meaning is co-created between the researcher and the participants (Babbie, 2001), was adopted in this study. An acknowledgement of my role in creating meaning was the first step to addressing issues associated with negotiating meaning.

During the interview sessions I used probes and clarification of participant responses to unpack and explore the meanings that I attached to what I believed the participants were

saying, as well as to verify and affirm that I was representing the participants' meanings accurately.

The strategies outlined above served to address issues pertaining to ethical considerations. A detailed discussion on how these were employed in the study is presented in the methodology chapter of this dissertation (see section 4.11).

1.13 Voice and Signature

Clandinin and Connelly (1996) suggest that voice may be thought of as belonging to participants, researcher and other participants and researchers for whom a text speaks. Furthermore, these authors (1996) assert that there may be a multiplicity of voices both for the participants and for the researcher. Consequently, one needs to consider both the voices heard and those unheard when reporting research (Clandin & Connelly, 1996). The following discussion is an attempt to outline how I proceeded to represent the different voices that came through during the course of this study. The voices that permeated the study constitute the voices of the participants, which I tried to bring to the fore through the narratives. Naturally, the manner in which I constructed these narratives was influenced by own reflections, predispositions, preferences and biases. In this way the study reflects a combination of the voices of the participants and my own, both as a researcher and fellow teacher.

Being an educator at a primary school afforded me the opportunity to reflect on my personal journey of learning in acquiring an understanding of learner assessment. Further, having being expected to implement the new forms of assessment, myself, I was in a position to relate to the complexities associated with acquiring competence in assessment that emerged, as I began to collect and analyse the data. I had to constantly and critically evaluate my own understanding of key concepts and ideas associated with assessment. While it is undeniable that the meaning that I ascribed to these concepts would influence my interpretations and understandings of what the participants were trying to convey, measures were sought to ensure that my personal meanings did not dominate how I represented the perspectives of the participants (see section 4.10). Further, I had received similar training to the participants in terms of DoE workshops attended. Also, I had read extensively around the body of literature pertaining to teacher learning and assessment in preparation for both professional development workshops that I conducted at school and as part of the literature review for this study.

In addition, I am a trained and practising science teacher, and this influenced my choice of which discipline to focus on. In the light of this background, I had to take precautionary measures to ensure that my own knowledge base, training and engagement with documents related to assessment (on both a personal and professional level) would not overshadow the way in which I interpreted and analysed participants' meanings. A detailed discussion of these measures is presented in section 4.10 of Chapter 4. My background, predisposition, preferences, bias and acknowledgement of all of these, as presented above, is reflective of my personal stamp on the reporting of this research (referred to by Claninn and Conelly (1996) as a "signature"). The lens or gaze through which I processed, ascribed meaning to, analysed and reported the data reflects to an extent my own personal prejudices and preferences as both educator and a researcher. Although attempts were made to minimise the effects of my own personal bias (as detailed in the methodology section, 4.10), the influence that such bias might have exerted on the reporting of this research is acknowledged.

1.14 Format of the thesis in terms of a breakdown of the chapters

Chapter 1 attempted to set the scene for the demarcated study. Through outlining the current trends with regard to teacher learning against the backdrop of assessment, this chapter strove to make a case to justify the study. It presented the critical research question and sub-questions, purpose and scope of the study and rationale for embarking on it.

Chapter 2 critically explores current trends in assessment by reviewing the literature on assessment with regard to implications for teacher learning. Chapter 3 describes the theoretical framework informing the study, that being teacher learning. The theoretical constructs dominating the discourses surrounding teacher learning are unpacked, as are the implications of these for the located study.

The methodology employed in the study is detailed in Chapter 4, as are the research design employed, instruments used to collect data and the rationale for these methodological choices. Details on how data were collected and analysed as well as methodological constraints and ethical issues also receive attention.

Chapter 5 attempts to contextualise the study by detailing a description of the research site, participants and assessment practices employed at the school under study. In addition, the factors that initiated learning about assessment, along with an elaboration of how data will be presented and analysed in the ensuing chapter, are highlighted.

Presentation and analysis of the data collected during the course of the study receive detailed attention in Chapter 6, which assumes a thematic approach.

The final chapter, Chapter 7, attempts to build a theory of teacher learning that emerged as a result of the data collected and analysed within the context of the demarcated study.

1.15 Chapter Summary

This chapter set the scene for the study undertaken by providing the context and rationale for the research. In addition, the objectives of the study along with the statement of purpose as well as the critical questions that the study intended to address were highlighted. Next, the rationale for embarking on the study and the theoretical perspective informing the study were detailed. In addition, an outline of the methodology and a brief description of the research site and the participants in the study were offered.

A discussion relating to the contextual factors impinging on the study and issues relating to the scope and limitations of the study, as well as measures sought to enhance the quality of the study, were outlined. Ethical issues were prevalent during the course of the study and measures to address these were detailed. An explanation of issues pertaining to voice and signature were also addressed. Finally, the chapter concluded with a presentation of the format of the thesis by providing a succinct description of each chapter.

Since assessment was the lens through which teacher learning was explored in this study, it would appear logical to conduct a comprehensive study of the available literature on the current trends and thinking on assessment. The next chapter attempts to provide an overview of assessment and its implications for the present study.

Chapter 2 – Scanning the Literature on Assessment

2.1 Introduction

This chapter is divided into two segments. The first part attempts to synthesise and analyse the literature on assessment as it pertains to the area of study. The chapter begins by exploring the scope and purpose of assessment, leading to a critical discussion on how assessment was traditionally conceptualised. This is followed by a presentation of subsequent and alternative views on assessment and how these have come to influence and shape the manner in which assessment is currently conceptualised within educational circles. The implications of these different views of assessment for teaching practice are explored in so far as this relates to the located study.

The second segment of the chapter attempts to roadmap the study and in this way, contextualise the manner in which, assessment is conceptualised within the framework of the NCS (DoE, 2002). The intention behind presenting this segment of the chapter is to provide a backdrop for the reader to conceptualise the context within which the located study could be positioned. Key concepts and terms associated with assessment within the context of the NCS (DoE, 2002) are detailed here. Finally, the implications of these conceptualisations of assessment for classroom practice are detailed.

2.2 The Use of Discourse Analysis in the Review of Literature

The section is a prelude as to how discourse analysis was used in the review of literature in the current chapter on assessment and in following chapter on teacher learning. This section also provides a brief overview of the rationale for employing discourse analysis as a tool to analyze the literature in chapters 2 and 3, respectively. In addition, since discourse analysis was also used to analyze the data generated from the interviews, documents analysis and observation sessions in the current study, data analysis is explored at length in Chapter: 4, the methodology chapter.

In the case of the literature review, discourse analysis, as adopted from Fairclough (2000) entailed a deconstructive reading of and interpretation of the current trends in assessment and an unpacking of the issues associated with teacher learning. The intention behind this was to understand deeply the issues associated with assessment and teacher learning and to bring to the fore the gaps or silences in issues pertaining to the two bodies of knowledge. By

exploring the assumptions surrounding the discourses of assessment and teacher learning, it was envisaged that an intensive view of the problem would be presented (Rogers, 2004). In this way, discourse analysis enabled the door to be opened for continuous debate and argumentation, based on insight and knowledge (Candlin, 1997), allowing for various facets of teacher learning to be explored. Moreover, by moving beyond a descriptive level with regards to engaging with the literature, I was in a position to present a critical exploration of the literature rather than a mere superficial one.

2.3 Section 1: A Critical Exploration of the Literature on Assessment

This segment of the chapter aims to give the reader insight into the terrain of assessment with regard to current trends in thinking. It commences with an exploration of what assessment entails through highlighting the scope and purpose of assessment. A critical discussion follows o traditional summative modes of assessment and how these have come to be scrutinised in favour of assessment practices that are integrated into the process of learning, those being practices that utilise the principles of formative assessment. The application of formative assessment principles as advocated under the umbrella of assessment for learning is also detailed.

Finally, this section presents a critical analysis of challenges associated with implementing formative assessment principles in the context of the classroom and the implications of these for teacher practices and future research.

2.3.1 Understanding the Scope and Purpose of Assessment

The literature in the field of assessment in the educational arena is expansive, with numerous possibilities for the practical implications of assessment within the classroom context. In light of the enormity of the area of assessment, the following discussion is presented in a manner that logically attempts to achieve two very significant outcomes. First the discussion sets out to explore the field of assessment in terms of its primary areas of foci by outlining the aims and objectives of assessment as evident in the literature consulted. While defining what assessment entails would prove a necessary point of departure in conceptualising assessment, acknowledging that the purpose of assessment could be varied - as the discussion below highlights - creates a sense that the complexities associated with assessment need to be afforded due consideration. In light of these complexities (detailed below), the discussion also attempts to provide a critical account of traditional views of assessment and how such

views have come to be scrutinised in pursuit of viable alternatives for the assessment of learners. The second part of this section serves to roadmap the manner in which different conceptions of assessment have evolved over time, and how this shift in thinking has come to influence current trends in assessment within the academic arena.

Broadly speaking, assessment can be viewed as any process that provides information about the thinking, achievement or progress of students (Crooks, 2001). Moreover, assessment includes all those activities undertaken by educators and learners in assessing themselves, which provide information to be used as feedback to adapt and modify the teaching and learning activities involving learners (Black & William, 2004). Rahim et al. (2009) contend that such feedback can provide useful insights into the meanings constructed or assigned by the learners to ideas and concepts taught in the classroom, and in this way prove invaluable in enabling the teacher to monitor the effectiveness of teaching and learning.

Another significant purpose of assessment that could be deemed as being indirectly related to the teaching and learning process would be to determine the efficacy of policies (Nuttal, 1994). Stemming from this purpose of evaluating the effectiveness of policies, traditional views of assessment have typically advocated the use of assessment as part of a grading process (Sax, 1997). Such assessments constitute summative means of assessment, which are conducted at the end of a period of acquiring new knowledge or skills and has been the dominant mode of assessment in the past (Black & William, 2003).

Summative assessment has been appropriated with "assessment of learning" (Sax, 1997; Black & William, 2003; Stiggins, 2005). However, the "ills" associated with summative means, as serving purely a diagnostic purpose (to ascertain the status of learning), has invited much criticism as the following section highlights.

2.4 Traditional Summative Assessment Practices and Criticisms Levelled Against These: Making a case for a shift in thinking with regard to assessment

The following discussion serves to provide a critical analysis of issues surrounding traditional summative means of assessment in an attempt to contextualise how the current thinking on assessment came to be. Criticisms levelled against summative assessment predominantly pertain to issues associated with delayed intervention and remediation measures, the negativity associated with the grading of learners and the ills associated with assessing

merely for accountability as well as the adverse effects that such assessment forms could have on the learners. All of these contribute to hampering the learning process, as detailed below.

Since the process of summative means of assessment typically gathers information about learning after the learning has occurred, Anderson and Krathwohl (2001) have consequently criticised such assessment forms as happening too far down the learning path for any meaningful remediation to occur. Further, the fact that this type of assessment has traditionally been used as part of a grading process and been met with negativity since it can only help to evaluate certain aspects of the learning process (Sax, 1997).

Essentially summative forms of assessment typically produce evidence of achievement for public reporting (Stiggins, 2005). Consequently this implies assessing for accountability, and the danger lurks that school quality can be reduced to nothing more than a numeric formula at the expense of marginalising the evaluation of many other significant aspects of schooling (Whitford & Jones 2001). Issues associated with accountability have resulted in summative assessment being negatively labelled as "summing up and checking up" (Harlen et. al, 2004).

To exacerbate matters there has been surmounting evidence that summative means of assessment can adversely affect students' learning achievement (Black & Williams, 1998; National Centre for Fair and Open Testing (NCFOT) (1999).

A very real and serious consequence of the utilisation of traditional assessment systems is that it gives rise to large numbers of disaffected students, especially among lower achieving students (Harlen & Deakin Crick, 2003). Further, the traditional notion of grading students according to scores has come under much scrutiny for widening the disparity between low and high achievers (Linn & Gronlund, 2000; Sax, 1997). Newton (2007) has criticised the term ‚grading' as having application only at a judgemental level. In addition, Crooks (1988) contends that for far too long summative assessments have been dominant and that greater emphasis should be given to the potential of classroom assessments to assist learning. With the increasing belief that assessment is now more about learning than testing, such systems of grading learners has come under much controversy (Mothata, Van Niekerk & Mays, 2003). The benefits of assessment for the learners and for their teachers, rather than for accountability to some outside body or programme, are of primary importance. To this end, Kotze (2002) asserts that assessment should be more developmental that judgemental. In this context, development is defined as:

> *" A definite movement from simple to more complex cognitions, with each stage, level or position becoming more elastic but moving towards greater cognitive complexity"* (Taylor & Marienau, 1997: 234).

In addition, the ongoing need to develop the ability of classroom assessment to support learning has been emphasised by a great number of educational researchers (Assessment Reform Group, 1999). In fact, studies conducted on assessment by researchers at the Freudenthal Institute (de Lange, 1987; Gipps 1994; van den Heuvvel-Panhuizen, 1996) place assessment as an important part of the teaching and learning process and emphasise assessing for understanding. Further, the intricate association between learning and assessment is now widely recognised as being central to informing pedagogy (Tittle, 1994). This shift in thinking in the way assessment is conceptualised emanated from the search for alternatives to traditional summative means of assessment, has given rise to the advocacy of formative assessment as a suitable option, as the following discussion suggests.

2.5 Pursuit of Formative Assessment as an Alternative Form of Assessment

Within the context of formative assessment, which has rapidly been gaining momentum, the thinking is that effective assessments should be indivisible from instruction (Black & William, 1998). Essentially, formative assessment entails the following:

> *"all those activities undertaken by teachers, and/or by their students, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged"*(Black & William, 1998, pp.7-8).

The critical elements of information, feedback and modification of teaching and learning practices serve to highlight the complexity of formative means of assessment (Black & William, 1998). Associated with this complexity is the dynamic, interactive and evolving nature of the assessment process (Lidz, 1995) and in this respect, formative assessment augurs well for success.Coupled with this shift in thinking in the way assessment is conceptualised is the concept of „sustainable assessment', which incorporates the characteristics needed to support activities of lifelong learning (Boud, 2000). Such characteristics entail equipping learners with the preparation required to continue independent assessment of their future learning experiences (Boud, 2000). Stemming from such thinking, the pedagogical approach of assessment for learning has been receiving growing support within educational circles for its utilisation and application of the principles associated with

formative assessment, and as a vehicle to facilitate the learning process (Leitch et al., 2006). The focus of attention is now aimed at this area of assessment for learning.

2.5.1 Assessment for Learning as a Form of Formative Assessment

The notion of „assessment for learning' (AFL) has been gaining increased momentum, especially in the United Kingdom, United States of America, New Zealand and Australia. This has also been extended to South Africa (Crooks, 2001; Torrance & Pryor, 1998; Black & William, 2003; Stiggins, 2005).

The Assessment Reform Group defines AFL as:

> *"The process of seeking and interpreting evidence for use by learners and their teachers to decide where the learners are in their learning, where they need to go next and how best to get there"* (Assessment Reform Group, 2002).

The basic principles underlying AFL are critical to understanding the context within which AFL finds its practical application in the classroom. The following discussion serves to highlight the key principles of AFL.

2.5.1.1 Principles of AFL

The use of formative assessment in the learning process is central within the pedagogical approach of AFL (Leitch et al., 2006). In fact, proponents of AFL view assessment as a learning process. In this respect, Earl (2003) advocates AFL where assessment is used as a learning tool rather than a grading tool. For these reasons assessment is viewed as an activity that should be integrated as an integral daily part of teaching and learning (Kellough & Kellough, 2002; Chappius, 2005). Further, following from the thinking that the success of any system of assessment can be judged by the modelling and monitoring of critical abilities through valued performance in real life, the concept of using authentic assessments as an assessment strategy has received widespread popularity (Clarke, 1996).

Authentic assessments involve solving problems that reflect real-life situations by drawing on a variety of disciplines to generate solutions and new knowledge (Kraak, 2002). The intention is to promote sustained learning with the ultimate goal of preparing students for life in the real world though application of meaningful assessing theory as applied in practice (Kellough & Kellough, 1999; Ross et al, 1998). Within the context of AFL, authentic assessments are viewed as developmental. These assessments encourage the kind of self-reflection and perceptual shift that gives rise higher orders of awareness (Davydov, 1995; Taylor &

Marienau, 1997). Moreover, proponents of AFL advocate the use of various different assessment methods to provide learners, teachers and parents with an ongoing spate of evidence of the learner's progress, with regard to achieving the competencies that underpin the curriculum (Black et. al., 2003). This approach is in line with the thinking that by using a variety of assessment methods, teachers will provide a more complete picture of students' progress and areas of need (Natural Renewable Energy Laboratory, 2000). It is envisaged that by employing such a multi-mode strategy approach to assessment, the learning experience becomes more meaningful and enriching for learners (Sax, 1997; Linn & Gronlund, 2000).

Further, the relationships that permeate the classroom context are critical to contextualising assessment, the most significant one being the relationship between teacher and learner (Black et al., 2003; Grech, 2005). To this end, Chappuis (2005) highlights the human element in the process of AFL where teachers and learners come together to generate accurate information about student learning and then using it effectively to promote even greater learning. An important tenet of AFL is that learners along with teachers share responsibility for learning.

Learners are made aware from the beginning about achievement expectations in an attempt to understand the uphill journey that they will be undertaking as they approach expected standards of performance (Chappius, 2005; Gronlund, 2000).The intention is to enable learners to work towards acquiring competence in a particular area of knowledge or skill synonymous with contract grading, where teachers make the objectives of the learning experience known to learners from the outset (Linn & Gronlund, 2000; Sax, 1997). In addition, the teacher also provides qualitative criteria to explain how these objectives can be accomplished (Chappius, 2005). Students are then involved in selecting the activities and/ objectives that will help them achieve competence in these learning activities (Linn & Gronlund, 2000). In this way a contract is entered into where learners share responsibility for their own learning (Chappius, 2005; Gronlund, 2000). Closely associated with this joint responsibility of learning between the teacher and the student is the notion of „mastery learning', which emphasises differentiated and individualised instructional practices as strategies to increase student achievement through the use of feedback, corrective procedures and classroom assessment to inform instruction (Zimmerman & Dibenedetto, 2008). This approach allows for „practice' so that learners can achieve the required outcomes.

Consequently, formative assessment requires that learners become involved in the learning process through self-assessment so that they can understand the main purposes of their learning, enabling them to grasp what they need to achieve (Kletcher, 2000). By setting a foundation for learners to self-assess and set goals, AFL attempts to enable learners to believe that the target is within reach (Kletcher, 2000). The intention is to help close the gap between the level at which they are functioning and the level to which they wish to function at. By providing learners with descriptive and meaningful feedback that serves to confirm or disconfirm against a specific standard or goal, the nature of learning that has taken place facilitates learners to be guided on how to move forward in their learning (Black & William, 1998; Stiggins, 2005; Popham, 2006). In this way feedback serves to elevate the standard of the learner's work (Stiggins, 2005). The descriptive and non-evaluative nature of this feedback highlights the fact that no personal value judgement is made (Black & William, 1998).

Furthermore, Popham (2006) believes that the results of formative assessment are critical to forming ongoing instruction and learning, suggesting that merely employing formative assessment practices in the classroom is inadequate. Rather, the information obtained from assessment must be effectively used by teachers for early intervention so that decisions regarding the measures that need to be taken to positively influence student learning can be taken (Stiggins, 2005; Chappius, 2005). Such intervention is beneficial in that instructional adjustments and interventions can be made should problems and areas of concern arise. These adjustments help to ensure students improve their performance, thereby facilitating the learning process. Formative assessment is particularly effective for students who have not done well in school, thus narrowing the gap between low and high achievers while raising overall achievement (NCFOT, 1999).

The above discussion suggests that application of the principles of AFL, detailed above, is beneficial to enhancing the achievement gains of both learners and teachers. Furthermore, research suggests that an effective means of incorporating the principles of assessment in teaching is through curriculum reform (Klenowsi, 1996; McKellar, 2002). Stiggins (2005) believes that such reform would imply a shift in focus from assessment to establish the status of learning to assessment to promote greater learning. However, few teachers are equipped with the necessary knowledge and skills to face the complexities associated with classroom assessment, in light of the fact that they have not been given the opportunity to learn how to

do so despite acknowledgment that developing assessment knowledge and skills is an integral part of becoming an effective teacher (Volante & Cherubini, 2007). In addition, McCallum et al. (1995) and Pryor and Torrance (1997) suggest that teachers have a limited theoretical understanding of how assessment could and should be integrated into the learning process.

In an attempt to address the issues associated with curriculum reform, Ramsuran (2006) asserts that workshops and in-service training affords teachers the opportunity to engage with official policy discourse that are contained in policy documents, and in this way enable teachers to realise the expectations of the stipulated policy in practice. Furthermore, making the previously implicit standards for assessment explicit through the provision of assessment criteria for each assessment task from the outset would assist in enabling meaningful curriculum reform (McKellar, 2002).

In addition, an understanding of the interrelationship between the three critical areas of assessment, curriculum and pedagogy is imperative in the employment of formative assessment and necessitates changes in curriculum and pedagogy (Klenowsi, 1996). McKellar (2002) concurs, adding that through curriculum reform meeting the assessment needs of diverse learners is built into the curriculum itself. This has enormous implications for the located study as it implies that teachers need to be involved in a continuous process of learning with regard to understanding and correlating the three areas of assessment, curriculum and pedagogy. The located study sets out to explore these interrelations in so far as it relates to teacher learning. However, developing and strengthening the skills and acquiring the knowledge necessary to develop one's expertise in these three crucial areas is not always easy to achieve. In fact, Rakometsi, (2000) views assessment as the area causing schools and teachers the most problems. Consequently, while attempts have been made to challenge the way assessment is conducted traditionally, the success of these have been negligible, as the following discussion indicates.

2.6 Challenges Associated with Implementing Formative Means of Assessment as a Tool to Facilitating AFL

The discussion below highlights the challenges relating to applying the principles of AFL within the context of the classroom. The presentation of three critical areas, namely teacher conceptions of assessment, issues associated with professional development programmes pertaining to assessment, and the apparent mismatch between the theory and practice of

assessment, are detailed. The intention is to provide the reader with an informed understanding of the issues and challenges that permeate the domain of assessment and the implications of these for educational research and teaching practice.

2.6.1 Teachers' Conceptions of Assessment: Holding onto existing beliefs

Despite mounting evidence to support the value of integrating assessment into the learning process itself, the mindset that assessment is an end within itself still persists. To complicate matters further, contending arguments surrounding the employment of summative forms of assessment or formative means of assessment continue to exist (Chisholm, 1999). Biggs (2001) suggests that this can be attributed to deeply entrenched and historical notions of assessment as a selection tool as the ensuing discussion suggests.

In a qualitative case study to explore the extent to which the conceptions of assessment held by three urban primary school teachers were revealed through the observation and analysis of their assessment practices in Mathematics, Vandeyar and Killen (2007) found that participants in the study continued to conceptualise assessment in ways that reflected traditional notions of assessment. Moreover, assessment practices were largely based on what participants had learned from experience, which meant a strong emphasis on accountability. The dominance of the accountability conception of assessment exuded itself to the extent that participants predominantly used summative means of assessment where tasks were assessed at the end or upon completion thereof. In addition, traditional means of assessment such as tests and examinations were still dominant. Furthermore, the only feedback offered by the participants assumed the form of marks allocated for an assessment task, reflected in term-end reports that were issued to parents. Participants contended that their limited understandings of outcomes-based assessment, coupled with the relevant departmental policies, rendered change difficult. In short, the study alluded to the fact that the educators were unable or unwilling to adapt their assessment practices to suit the changing expectations of the curriculum, primarily due to their entrenched conceptions of assessment (Vandeyar & Killen, 2007).

The study of Vandeyar and Killen (2007) suggests that teacher conceptions of teaching, learning, curriculum and assessment exert a pervasive influence on their classroom practices, despite the fact that these conceptions may not resonate with those advocated in current assessment policies. Studies conducted in the United Kingdom and China report similar results alluding to the fact that teachers' ability and willingness to change their assessment

practices in line with policy objectives is largely related to their long-standing and deeply entrenched ideas of the objectives of assessment, as well as their understanding of what the process of assessment entails (Torrance, 1995; Radnor, 1996; Proudford, 1998). The study of Vandeyar and Killen (2007) and those of Torrance (1995), Radnor (1996) and Proudford (1998) suggest that adopting a stance that new policy initiatives will in itself, result in change in educators' conceptions of learning and assessment is far too simplistic and therefore problematic.

To exacerbate matters, while there is strong supporting evidence that teachers may hold a predominant view of assessment (Stamp, 1987; Warren & Nisbet, 1999) there is also evidence (Brown 2003) that teachers can hold numerous interacting conceptions of assessment. For example, a teacher could believe that the sole purpose of assessment is to improve learning but still view assessment as an important means of providing evidence for certain measures of school accountability, alluding to the complexities associated with conceptions of assessment and their relation to assessment practices (Vandeyar & Killen, 2007). In addition, if we accept Hills' (2002) assertion that teachers need to be confident about assessment so as to enable them to "make informed decisions about their practice", the potential for achieving this desired state of confidence becomes problematic if teachers hold multiple and conflicting views on assessment (Vandeyar & Killen, 2007). Furthermore, if teachers are deficient in their knowledge and skills to translate their conceptions of assessment into practice, there may be a dire need to provide teachers with a considerable degree of assistance in addressing such issues and challenges (Vandeyar & Killen, 2007). To this end, McKellar (2002) proposes that teachers examine the implicit assumptions and practices about assessment to which they subscribe or those already embedded within themselves, and in this way enhance their potential to reflect critically on what they do and consequently make the necessary changes to their practices. By implication, adopting the stance of McKellar (2002) could prove invaluable in attempting to break away from existing beliefs, practices and experiences with regard to challenging and adjusting traditional assessment practices to actively promote student learning.

The discussion above creates a sense that teachers are not conceptualising assessment in ways consistent with the current modes of thinking or, for that matter, with those stipulated in policy. Consequently, exploring why this may be the case becomes a burning issue that necessitates further exploration. In addition, issues surrounding the ineffectiveness of professional development initiatives pertaining to assessment have resulted in the

employment of undesirable teacher practices, further complicating matters, as the ensuing sub-section suggests.

2.6.2 (In)ability of Professional Development Initiatives to achieve intended outcomes

Black and William (1998) add that there is no quick fix that can be added to the existing practice with the assurance of rapid reward. Rather, it is imperative that each teacher find his or her own way of incorporating the lessons and ideas advocated by formative assessment into their classroom realities.

Such a process is relatively slow and can only be achieved through continuous programmes of professional development and support. Various studies have emphasised the significance of helping to develop teachers through professional support in their efforts to apply formative assessment principles in their teaching practices (Black, 1993; Dwyer, 1998; Harlen & James, 1997). However, research suggests that few teachers are prepared to broach the area of classroom assessment because they have been given little or no opportunities to learn how to use assessment as a teaching and learning tool (Stiggins, 2005). In fact, a significant finding of the research of Bourke, Poskitt and McAlpine (1996) revealed that many experienced teachers have had little pre-service and in-service training in assessment philosophy and practice - despite having the crucial responsibility for implementing change within their school.

Dixon and Williams (2001), in their study investigating teachers' understandings of formative assessment, found that while teachers felt that assessment was integral to enhancing scholastic learning, they admitted that staff development related to assessment had very little if anything to do with equipping teachers with strategies to assist them in improving learner performance. The same study revealed that teachers tended to believe that the focus on staff development initiatives was more on determining what to assess rather than how to assess and use information extrapolated from formative assessments (Dixon & Williams, 2001). Furthermore, while there was a fair amount of attention given to assessment on a school-wide basis, the focus of this attention was still predominantly on the summative aspects of assessment and very little, if any, attention was given to formative aspects of assessment (Dixon & Williams, 2001).

Moreover, when requested to describe their formative assessment practice, apparent gaps and areas of confusion in teachers' articulated understanding of assessment existed (Dixon &

Williams (2001).Such a situation has various implications for the application of formative assessment principles in the classroom context, as the quality and effectiveness of staff development initiatives become questionable. To this end, Black (2000) believes that teacher development programmes that are compatible with teachers' capacity to assume ownership of change, and that concurrently help teachers rebuild their theories in a form that supports and allows for coherence in practice, will be effective in assisting teachers in translating theory into practice. However, translating theory into practice has proved problematic, as the discussion that follows suggests.

2.6.3 Incompatibility between Intended Purpose of Assessment and Actual Assessment Practices that Teachers Employ: The gap between theory and practice

Formative assessment as it is theorised is seldom practised in its entirety at classroom level (Brookhart, 2000). NCFOT (1999) attributes this to the fact that most teachers don't know how to engage in such assessment. Further, studies conducted in The Netherlands and in the USA often show that teachers display a limited understanding of formative assessment practices and therefore presented learners with incomplete information about their progress (Research on Assessment Practices (RAP) project, as cited in Romberg, 1999). This mismatch between the intended purpose of assessment and actual assessment practices that teachers employ within the classroom context is problematic. Tunstall and Gipps (1996) report that while some teachers did use assessment in support of learning in many classrooms, it was clear that much of classroom assessment did not support learning and was often used more to socialise children than to improve achievement. Dixon and Williams (2001) support these sentiments with their research conducted overseas, showing that formative assessment is not well understood by teachers and is weak in practice. In their study of teachers in the UK it emerged that teachers were not clear about the distinction between formative and summative assessment as stipulated in policy documents, and that this lack of clarity manifested itself in teachers' assessment practices (Harlen & James, 1997). In such instances teachers wrongly believed they were assessing formatively, when in fact they were primarily employing summative assessment forms for reporting purposes. Similar findings were reported in studies conducted by other researchers (Bell & Cowie, 1997; Black, 1993; Harlen & Qualter, 1991; Nitko, 1995).

In this respect, Redfield et al. (2008) warn against the use of short-term summative assessments as formative assessments. Using benchmark and interim assessments as

formative assessment is problematic, since it is the purpose of the assessment and how the results will be used that distinguishes formative means of assessment from summative means (Chappius, 2005). Merely using these benchmark assessments and other tests without immediate feedback to enable instruction to learners to be guided does not constitute formative assessment (Chappius, 2005; Redfield et al., 2008). According to Black and William (1998), it is only when the evidence obtained from assessment activities is actually used to adapt the teaching process to meet the students' needs that it becomes formative.

Furthermore, the development of formative assessment relies on the development of new tools. To maximise the use of these tools teachers would have to change their classroom practices (Black & William, 2003). It would appear that masking traditional summative assessment practices as being formative in nature would therefore prove ineffective. In addition, formative assessment utilises a variety of assessment techniques other than just tests to modify and adjust teaching practices to reflect the needs and progress of learners.

Brookhart (2000) is quick to assert that "most teachers do not know how well to engage in such assessment". The assumption in this instance is that teachers are ill-equipped and lack the skills necessary to execute assessment practices that are in keeping with formative assessment principles. Moreover, the changes in terminology and simplification of concepts in policy documents have developed into a controversial issue as a result of uncertainties and unclear guidelines (Harlen & James, 1997). The findings of Ramsuran (2006) in her study of teachers pursuing a course entitled Assessment in Education, which was highly theoretical in nature and entailed an analysis of assessment policy documents, bears testimony to this. Ramsuran (2006) reports that teachers pursuing a Bachelor of Education Honours degree who formed the participants in her study were conducting assessment procedures that were in fact running *counter* to the expectations of policy, due to the related documents not being explicit enough. In addition, concerns regarding the voluminous amount of information being presented in these documents were raised (Ramsuran, 2006).

Research supports the view that conceptually teachers are confused about the nature, purpose and effect of formative assessment (Torrance & Pryor, 1998; Crooks, 2001; Black & William, 2003). This is problematic if we accept Von Glasersfeld's (1995) view that conceptual development is the key to learning. To this end the assertion that reflection is a significant activity that precedes understanding and that concept development constitutes a

process of fostering further reflective abstraction (Von Glasersfeld, 1995) is an important one.

By implication, this would suggest that teachers' conceptual development is critical to facilitating learning and that conceptual confusion about the nature, purpose and effects of assessment could have crippling effects on both the process and outcomes of learning, as suggested by Luckett and Sutherland (2000):

> *" ... If purposes of assessment remain implicit and vague, there is a danger that different purposes become confused and conflated, so that assessment as a consequence fails to play an educative role"* (Luckett & Sutherland, 2000, p. 102).

2.6.4 Concluding Comments

What clearly emerges from the above discussion is that the difficulties associated with implementing the principles of AFL are far more complex than one would imagine. Teachers' existing conceptions of assessment exercise a pivotal role in the assessment practices they choose to adopt within the classroom context. Furthermore, these conceptions tend to blur, and in some instances filter out altogether the possibility of considering alternative ways of assessing learners as teachers firmly cling onto long-held beliefs of assessment and learning. Such beliefs tend to reflect traditional notions of assessment and are consequently at odds with new and alternative ways of conceptualising assessment. The implication is that the potential for exploring alternative ways of assessing learners in the classroom context becomes somewhat limited.

Staff professional development programmes aimed at equipping teachers with the tools and strategies necessary to carry out formative assessment principles within the classroom content have proved inadequate, for a kaleidoscope of reasons. The predominant reason is the inability of these programmes to be aligned with the capacity of teachers to become involved in the process of change, and yet at the same time help teachers review their conceptions of learning and assessment in a manner that allows for continuity between theory and practice. The incompatibility between the intended purpose of assessment and actual assessment practices that teachers employ within the classroom context has served to widen the gap between theory and practice.

The above discussion alludes to possible gaps and silences that exist among teacher professionals with regard to conceptualising assessment. The resultant influence that such a

situation could have on assessment practices as presented above points to a dire need for further exploration of conceptual issues pertaining to teachers' understanding of assessment. In an attempt to understand how teachers conceptualise assessment and learning and how this understanding influences their classroom practices, this study attempted to bring to the fore additional insights about how teachers learn about assessment. In this way the study set out to explore issues relating to gaps and silences with regard to conceptualising assessment, as evident in the critical discussion of the literature presented above. It was intended that this study, through exploring the links between theory and practice, would help formulate a platform from which educational theory can be filtered to classroom practitioners through the revelation of invaluable insights about how teacher learning is acquired, as well as how this learning translates into classroom practice.

This study was conceptualised within the framework of the NCS (DoE, 2002). Consequently it would appear logical and most beneficial to present a background of the NCS (DoE, 2002) and the manner in which assessment is conceptualised within this framework, as detailed in the following section.

2.7 Section Two - Assessment in the NCS

2.7.1 Conceptualising Assessment within the NCS framework

By way of providing a backdrop against which the located study was positioned, this section attempts to provide a detailed discussion on the context that informed and shaped the thinking on new ways of assessment, within the context of the NCS (DoE, 2002). The ensuing discussion attempts to do this through an exploration of crucial terms and concepts that have come to be associated with assessment within the NCS framework (DoE, 2002), in so far as they pertain to the area of study. The following section and sub-sections are based on study and analysis of the following policy documents:

- *The Revised National Curriculum Statement for grade (R - 9 Schools), Policy, Natural Sciences* (DoE, 2002).
- *National Curriculum Statement: National Policy on Assessment and Qualifications in the General Education and Training Band* (DoE, Undated)
- *The National Protocol on Assessment for Schools in the General and Further Education Training Band* (Grades R -12) (DoE, 2005)

- *Curriculum News: Improving the Quality of Learning and Teaching - Planning for 2010 and Beyond: Basic Education* (DoE, 2009)

Within the parameters of the NCS, assessment is an integral part of teaching and learning and is defined as follows:

> *"Assessment is a continuous planned process of identifying, gathering and interpreting information about the performance of learners. It involves four steps: generating and collecting evidence of achievement, evaluating this evidence against the outcomes, recording the findings of this evaluation and using this information to understand and thereby assist the learner's development and improve the process of learning and teaching"* (DoE, 2007, p. 5).

According to the DoE (2002) the purposes of assessment within the context of the NCS include the following:

- Baseline assessment of prior learning: This usually takes place at the beginning of a phase or grade to ascertain what learners already know, with a view to assisting teachers in their planning of learning programmes and learning activities;
- Diagnostic assessment, which is used to find out about the nature and cause of barriers to learning experienced by specific learners. It is expected that the necessary and appropriate guidance, support and intervention strategies will follow from this type of assessment;
- Formative assessment: This is intended to monitor and support the process of teaching and learning. Further, it is used to inform learners and teachers about learners' progress so as to improve learning. Constructive feedback is critical in the process of enhancing learner growth;
- Summative assessment: This gives an overall picture of learners' progress at a given time, for example at the end of a term; and
- Systemic assessment: This is typically conducted at the end of each phase of the General Education and Training band. A sample of schools and learners are selected provincially or nationally for systemic assessment. By assessing learner performance in relation to national indicators, systemic evaluation is a way of monitoring the performance of the education system (DoE, 2002: pp. 77-78).

In addition, the attainment of learning outcomes and the assessment standards used to assist in the acquisition of these outcomes is central to NCS principles. The following discussion highlights the significance of these two critical areas within the context of the curriculum.

2.7.2 Learning Outcomes and Assessment Standards

Each learning area has a set of learning outcomes to be achieved by the end of a given academic phase. In the case of this study, it would be at the end of the intermediate phase of schooling (Grades 4-6):

> *"A learning outcome is a description of what (knowledge, skills and values) learners should know, demonstrate and be able to do at the end of the General Education and Training band."* (DoE: 2002, p.14)

It is important to note that the content and method to be used to achieve the learning outcomes are not prescribed. This is left to the expertise of the teacher of that particular subject discipline. Furthermore, for each learning outcome there is a set of stipulated assessment criteria used for the purpose of assisting the teacher and the learner, with the attainment of the learning outcomes. These are grade-specific:

> *"Assessment standards describe the minimum level at which learners should demonstrate the achievement of a learning outcome and the ways or range (breadth and depth) of demonstrating its achievement"* (DoE, 2007, p. 76).

In other words, the assessment standards provide guidelines as to how the attainment of learning outcomes should be assessed. An important consideration is the fact that the learning outcomes, together with their assessment standards, are based on the minimum or essential knowledge, values and skills to be covered, but should not be all that is taught (DoE, 2002, pp. 13-14). In other words, the process of learning should incorporate the learning outcomes and assessment standards at some basic minimal level, with additional opportunities for learners to expand their knowledge and skills base. In this respect the notion of integrated assessment has been advocated as the means through which such learning can be acquired. The following sub-section provides an overview of integrated assessment within the context of the NCS (DoE, 2002).

2.7.3 Integrated Assessment

The National Standards Body regulations state that integrated assessment is a form of assessment that allows the learner to demonstrate applied competence using a range of formative and summative assessment methods. Integrated assessment is not a once-off event since it uses a range of formative and summative assessment methods (South African Qualification Authority, 1998, p. 4).

These assessments may have more than one purpose and may take different forms. According to the DoE (2002), integrated assessment entails making use of integrated tasks and activities and a variety of methods, tools, techniques and contexts in assessing learners' performance. More than this, it refers to:

- Assessing a number of outcomes together;
- Assessing a number of assessment criteria together;
- Assessing a number of unit standards together;
- Using a combination of assessment methods and instruments for an outcome or outcomes;
- Collecting naturally occurring evidence about learner performance; and
- Acquiring evidence about learner progress from various sources (South African Qualifications Authority, 2001, p. 55).

Assessing integrated learning implies assessing a combination of knowing, doing, understanding and application of knowledge. In short, integrated assessment seeks to link theory and practice. This should afford learners the opportunity to demonstrate depth and breadth at all learning stages and in a variety of ways throughout the learning programme. A range of assessments is used as the intention is to build and support understanding and application. This stems from the belief that a single assessment would be insufficient to provide opportunities for diagnoses, development and remediation. Proponents of integrated assessment believe that assessment should be of the whole and not set out to assess small fragmented parts of the learning experience. If integrated assessment is applied across clusters of learning areas it should be such that these clusters have something in common. Assessment can occur across domains, terrains and disciplines, if appropriate, in line with the intended purpose and outcomes of that learning experience. However, the thinking is that integrated assessment should never be forced.

It is important to bear in mind that integrated assessment will not always occur across subject areas. Coherent „chunks of learning' within a particular subject area and areas composed of learning disciplines, should also be assessed, through integrated assessment approaches. Consequently, a range of integrated assessment approaches may be required. These may be formal or informal in nature, as the DoE (2002) advocates the use of both forms of assessment to gather evidence about the learner's performance.
Such evidence should be made available by teachers and/or learners whenever needed by heads of department, school management teams, curriculum advisors, teaching and learning support staff, or other education officials or parents. The following discussion serves to highlight the use of formal and informal assessment within the context of the NCS (DoE, 2002).

2.7.4 Formal Assessment

The following discussion is based on an overview of the information presented in the policy document *Assessment Guidelines for Natural Sciences: Intermediate and Senior Phase* (DoE, undated, p. 6).Formal assessment comprises tasks that are marked and formally recorded by the teacher. The number of tasks required to be recorded by the teacher are specified in the *National Protocol on Assessment: Recording and Reporting* (DoE, 2005). These tasks, which form a core part of the teacher's planning, make up the Programme of Assessment. Consideration to provide additional support needed by learners who experience difficulty should be factored in teachers' planning. It is envisaged that the evidence of learners' performance in these tasks provides feedback with regard to content, concepts and skills that have been acquired by the learning area in a specific learning area or subject. The marks obtained in these tasks will be used for promotion and progression of learners to the next grade, as well as to give feedback to parents and various stakeholders. It is intended that the feedback will indicate what support is planned for learners who are not able to master all the content, concepts and skills and need more time or reinforcement.
Informal assessment tasks can be used to inform learning within the context of the NCS (DoE, 2002), a presentation of which follows.

2.7.5 Informal or Daily Assessments

The following discussion is based on an overview of information presented in the policy document *Assessment Guidelines for Natural Sciences: Intermediate and Senior Phase* (DoE, undated, p.7).Informal assessments constitute tasks regarded as stepping stones to monitor or

assess the progress of a learner in the subject classroom and to prepare them for formal tasks. Class work, homework and verbal question-and-answer sessions are examples of informal assessment. These tasks need not be recorded. Teachers may let learners assess their own work to reinforce learning. The teacher then ensures that corrections are done. These assessments also allow learners access to more opportunities to develop and practise what they have learnt and recognise what they can do. Assessments can also assist teachers identify learners who are experiencing any difficulties, so that the necessary steps can be taken to assist. According to Angelo and Cross (1993), effective teachers should employ both formal and informal means of assessment. It is important to recognise that most teachers already have a vast kaleidoscope of techniques to gather informal feedback. The ensuing discussion provides a concise overview of the forms of assessment that could be used within the NCS framework.

2.7.6 Forms of Assessment

The following discussion is based on an overview of the information presented in the policy document *Assessment Guidelines for Natural Sciences: Intermediate and Senior Phase* (DoE, undated, p. 22**).** Within the NCS framework, there is a vast array of assessment forms that the teacher could use to assess the learners (Refer to Appendix: 6). Essentially, these forms of assessment are different kinds of activities that learners could be asked to do, in order to demonstrate their competence in a number of ways. The thinking is based on the premise that a variety of methods is needed to give learners an opportunity to demonstrate their abilities more fully. Moreover, the form of assessment should be aligned to the purpose of the assessment and should also match the outcomes to be assessed. Irrespective of the form of assessment employed, an assessment plan detailing all the assessment activities to be used has to be compiled. The nature of such a plan is detailed below.

2.7.7 Assessment Plan

According to the DoE (2009) an assessment plan is based on the assessment requirements as set out in the *National Protocol on Assessment: Recording and Reporting* (DoE, 2005). The teacher must have an assessment plan for the year for each grade. This plan should indicate the formal assessment tasks such as tests and exams (and other forms of assessment selected for a learning area or subject) that will assess the knowledge and skills for that particular learning area or subject. The assessment plan for each learning area or subject must be reflected in the school's formal assessment plan for the year and be communicated to learners

and parents in good time, preferably at the beginning of the school year. Assessment plans should be made available to role-players so that they are familiar with the plan.

Formal assessment tasks should be carefully designed and consist of a variety of forms of evaluation that cover the content taught. All tests and examinations form part of the formal programme of assessment. All marking memoranda, grids or rubrics and checklists, etc. are to be included. Any comments for strengthening assessment activities can be notarised and used for planning the formal assessment plan for the following year. Any adaptation to tasks for learners who experience barriers to learning is to be recorded as part of the plan. Presentation of the above discussion suggests the complexities associated with assessment as conceptualised within the framework of the NCS (DoE, 2002).

By exploring the key concepts and terms associated with assessment, the discussion serves to contextualise the located study, as assessment was the vehicle through which teaching learning was explored and analysed. Following on from the discussion above, the question then arises as to what may be considered as new or different about assessment within the NCS framework (DoE, 2002). The discussion below attempts to explore potential for looking at assessment in a different and perhaps novel way.

2.7.8 Assessment within the NCS: A framework different from traditional ways of assessment?

The discussion that follows attempts to explore the potential for assessment within the NCS framework to promote a different view of assessment that stands out from the usual way/s in which it has typically been conceptualised. The discussion serves to channel the reader into considering implications of the conception/s of assessment as advocated by the NCS (DoE, 2002) for practice.

The apparent newness of assessment within the NCS framework emanates from the fact that the emphasis is on promoting assessment as part of the learning process, rather than assessing learning as a one-shot, isolated task performed at the end of a learning activity, as was traditionally done. Having said this, the NCS does not completely brush off traditional means of assessment as being of no educational value. In fact, the NCS encourages the use of both formative and summative means of assessment, recognising the merits of each (DoE, 2002). However, what is strikingly different is the way in which summative means of assessment are used. Rather than employing summative assessment forms as a sole means of assessing

learner progress, NCS encourages the use of summative means of assessment as complementing formative assessment.

In keeping with the principles of AFL, the NCS promotes the use of continuous assessment, which is designed to support the growth and development of learners (DoE, 2002).While there is still an emphasis on accountability in the NCS, there is also an accompanying clear-cut message that assessment should form an integral component of teaching and learning so as to provide clear indications of learner progress to enable learners to integrate and apply knowledge and skills in an effective manner (DoE, 2002).

Assessment within the NCS framework advocates the use of a vast kaleidoscope of assessment forms to assess learners in a variety of different contexts and to suit different purposes (DoE, 2002). In addition, a transparent approach to assessment, as reflected in providing continuous feedback to learners and gathering ongoing evidence to support learning, permeates the thinking within the NCS framework (DoE, 2002). Evidence pertaining to the learners' progress is also expected to be made available to all relevant and vested stakeholders in education. Also, the learning outcomes to be achieved as a result of engaging in a particular learning experience necessitate that learners be made aware of what is expected of them as they aspire to achieve the intended outcomes. The explicitly stipulated assessment standards that feature in relevant assessment policy documents clearly spell out the criteria that learners are expected to meet as they participate in a variety of authentic learning experiences (DoE, 2002).

While the discussion suggests there is an apparent newness in the way in which assessment is conceptualised within the NCS framework, it also reflects a sense that a complete disregard for assessment practices of the past is inconceivable. The apparent contradiction in these sentiments gives rise to the thinking that the so-called novel ways in which assessment is conceptualised within the NCS framework rests more on how assessment is used within the classroom context to promote learning.

2.8 Chapter Summary

This chapter provided a review of the landscape of current trends and thinking on assessment and its implications for classroom practice, in particular for this study. The literature reviewed served to provide the back-drop against which the study was conducted. In addition, it served to allude to some of the possible gaps or silences that might have been present in the

area of assessment at the time the research study was undertaken. However, no study exists in isolation. It has to be framed within a theory or set of theories to sustain its chain of thought so as to give the study a platform on which to build. The ensuing chapter focuses on current literature on teacher learning; teacher learning (aside from being the subject of exploration) is the theoretical framework that shaped and informed the study.

Chapter 3 - Theorising and Framing the Study within the Context of Teacher Learning

3.1 Introduction

This chapter critically explores and synthesises the literature on teacher learning as it pertains to the area of study. The chapter begins with focusing on how traditional notions of professional development have come to be scrutinised for a multitude of reasons, and in this way makes a case for a necessary shift in thinking with regard to conceptualising teacher learning. The intention is to provide the reader with an understanding of how the current thinking in teacher learning evolved. The chapter focuses on how the current emphasis in teacher learning struggles to maintain its footing as traditional notions of professional development continue to exist. The problematic nature of narrowly subscribing to traditional notions of teacher learning is highlighted. However, despite the enormous amount of literature to support this claim, there is still a tendency for traditional conceptions of the scholarship to persist, suggesting that there are significant loopholes in the way teacher learning is conceptualised. The objective of landscaping teacher learning in this way is to present to the reader with the challenges and issues associated with conceptualising teacher learning in a manner that moves away from typical historical notions of what teacher learning entails.

This chapter also attempts to demystify teacher learning by exploring the various forms of knowledge and different types of learning that underpin teacher learning in an attempt to provide a holistic picture of what teacher learning encompasses. The issues associated with the theory-practice divide that have typically dominated the scholarship of teacher learning, and the implications of this divide, are detailed next. Further, since it has been widely acknowledged that teachers' conceptions of knowledge have an undeniable influence over their classroom practices, the various conceptions of knowledge as well as the implications of these conceptions for acquiring new learning receive attention. The chapter concludes by providing a critical perspective on the theories surrounding teacher learning, alluding to the complementary nature of these theories in fostering teacher learning. The complexities associated with teacher learning, as presented here, ultimately suggest that teacher learning is an elusive, multi-faceted scholarship concerned with both the process and content of learning.

3.2 Re-examining Traditional Notions of Professional Development: Making a case for the much-needed shift in thinking

The discussion below attempts to provide the reader with an understanding of the traditional notions of professional development, in theory and in practice, and how these have come to be re-examined in light of research in the area. The discussion commences with an exploration of what professional development entails and proceeds to provide a critical discussion on issues associated with traditional professional development initiatives. Finally, implications for application of traditional notions of professional development to teaching practice are highlighted.

Professional development is the more generic term for a range of activities concerned with teacher learning aimed at providing teachers with new ideas, skills, and competencies necessary for improvement in the classroom (Fishman et al., 2001), suggesting that professional development is but one aspect that constitutes teacher learning and is therefore comparatively narrower in focus. Furthermore, within the context of professional development teachers receive information from „experts' on how to improve, through centralised workshops, courses, programmes and related activities, with very little (if any) support at school level (Craig, Richard & du Plessis, 1998).

Traditional professional development practices have been criticised as undermining the professionalism of the teachers involved, in that such initiatives tend to be prescriptive in nature and promote externally imposed knowledge (McCullough et al., 2000). They also tend to deny teachers the opportunity to make decisions regarding the goals and methods of such initiatives, which forces teachers to succumb to someone else's designs (McCullough et al., 2000).

To this end, Cole (2004) suggests that the belief that external ideas alone will result in changes in the classroom and school is problematic, for a variety of reasons. The rationale for this is that historically professional development has failed to be powerful enough or sustained enough to alter the culture of the classroom or school (Cole, 2004; Elmore, 2004; Fullan, 2007). Furthermore, since professional development does not allow for practice and sustained learning at the workplace itself, it does not take cognizance of the work setting (Elmore, 2004; Cole, 2004).

While there may be instances where teachers benefit from traditional professional development initiatives, such as becoming acquainted with new policy objectives, Melville (2005) asserts that the notion of professional learning, where teachers become involved in work and activities for the purpose of learning itself rather than merely assuming the role of naive and passive recipients of the ideas of others (Randi & Zeichner, 2004), is far more effective. The inadequacies associated with simply telling teachers about change, without developing their understanding or capacities for change, has been duly documented (Van Harmelen & Kuiper, 1996; Wilmot, 1998, 1999, 2000). Evidence of the dire consequences of imposing external initiatives, such as those alluded to above, manifested itself in the research of Caishun and Zongjie (2004), who conducted a snapshot case study to investigate three middle school teachers' experiences of professional development in China. The findings reflected a deficiency in professional knowledge, teachers' commitment and community support, which undermined these teachers' professional practice for the purpose of professional development. Conditions were far from being conducive to teachers' professional development. Instead, authorised versions of knowledge prevailed, teachers' voice and understanding were stifled, opportunities for fostering collegiality were limited, and individual teachers were alienated at work (Caishun & Zongjie, 2004).

The findings of Caishun and Zongjie (2004) suggest that the theory-practice divide becomes wider when official knowledge tends to dominate over other knowledge forms. To this end Dyer et al. (2004) argue that the teaching methods and approaches advocated by official knowledge forms have been proved inadequate in terms of their application to teachers' practical contexts. They contend that teachers' needs can only be addressed through their own understanding in practice or local knowledge, suggesting that teachers themselves are creators of professional knowledge (Dyer et al., 2004). To this end, Dyer et al. (2004) suggest that school-based, in-service training provides a platform for teachers to reflect on their daily practice, as well as to engage in dialogue with their colleagues about their teaching practices. This makes sense if we consider Allwright's (2003) conception of teacher development as a process of negotiation between educational theories, teachers' own authentic (local) understanding and authentic (local) practice.

However, traditional notions of professional development fall short in this regard since they fail to consider the different needs of the students, the experience of the teacher, and the various possibilities for engaging students in learning, (Lieberman & Mace, 2008). Furthermore, Randi and Zeichner (2004) suggest that there is an increasing awareness that traditional forms of teacher professional development have the capacity to confine teachers' access to knowledge, irrespective of where they teach. At the extreme end of the spectrum of criticisms levelled against professional development, Fullan (2007) goes so far as to assert that professional development can be a major hurdle to progress in teacher learning. The reason is that professional development somewhat reduces the pressure for change, diverts people's energy into thinking they are doing something valuable, and depletes energy that should be targeted at the mammoth task of changing school cultures that are still deeply embedded in the past.

The above discussion alluded to issues associated with implementing teacher professional development in the traditional sense of the word. The implications of slavishly adhering to externally sourced reform efforts were highlighted. The inability of such initiatives to actively involve teachers in the process has served to widen the theory-practice divide. Furthermore, the failure of traditional professional development initiatives to consider the workplace and school setting in the learning process has contributed to the ineffectiveness of these initiatives. Having explored what the literature is saying about conditions that give rise to the characteristics of professional development, it becomes apparent that such conditions relate to objectifications outside the self, suggesting that the teacher is excluded from the analysis of these conditions. This has resulted in the subsequent re-conceptualisation of professional development and professional learning, as well as a review of the relationships that teachers and schools have with these conceptualisations, suggesting that these dynamic relationships have given rise to tensions within the field of teacher professional learning (Melville & Yaxley, 2009). The ensuing section attempts to highlight some of these tensions.

3.3 Challenges Associated with Seeking and Implementing Suitable Alternatives: The struggle for teacher learning to maintain its footing

Teacher learning challenges the traditional transmission-oriented approach where teachers are regarded as dispensers of knowledge (Lewis, 2002) Instead, the role of teachers has been expanded to include teachers as active learners who are engaged in the concrete tasks of teaching, assessment, observation and reflection (Guskey, 1995).

This is supported by the belief that knowledgeable, strategic, adaptive and reflective teachers make a difference in student learning (Schwille & Dembele, 2007). Furthermore, Wilson and Berne (1999) identify three significant characteristics of professional learning: the involvement of teachers in shaping their teaching practice, the initiating of their own learning by teachers, and the importance of teacher discourses. Taking into account the multi-faceted nature of the scholarship, as alluded to above, teacher learning can be considered as a process of increasing participation in the practice of teaching, and through this participation a process of becoming knowledgeable in and about teaching (Adler, 2000). Du Plessis et al. (2002) advocate an iterative approach to teacher learning that takes place at school level and provides for strong follow-up and continued support. To this end, Anderson (2002) found that in his case studies of teachers in East Africa, exploring factors that contribute to teacher professional development, the in-service learning that proved most effective involved access to teacher-centred and school-based workshops; in-class coaching by consultants, supervisors or peers; team planning and problem-solving by collegial work groups; action research; teacher inter-visitation; and professional study groups.

The findings of Anderson (2002) suggest that strengthening teachers' ability to decide independently how to apply instructional strategies to selected subject matter, content, and learner needs is pivotal in fostering teacher empowerment. This concept is supported by scholars of teacher learning both nationally and internationally, who contend that effective school reform can best be achieved through development of the capacity of teachers and schools as inquiring, collaborative organisations as opposed to through enforcement of a State sanctioned curriculum from above (Craig et al., 1998; Darling-Hammond, 1993; Lieberman & Miller, 1991). Moreover, since the responsibility for learning predominantly rests with the teacher rather than the school or employing organisation, professional learning is seen to transcend the confines of a delivered professional development programme (Randi & Zeichner, 2004). Both the theoretical and practical components of learning are regarded as being equally important in promoting learning (Adler, 2000).

While the need for professional development has been acknowledged by the Organisation for Economic Co-operation and Development (OECD, 2004), various studies have alluded to the existence of considerable gaps between desirable conditions for professional learning and those that are actually provided (Ingvarson, Meiers & Beavis, 2005).

Furthermore, Halliday (1998) highlights the fact that most of teacher learning activities are grounded in institutional and educational systems, such as a unified curriculum, which serves to support and strengthen traditional „technical practice'. In addition, despite research alluding to the inadequacies of traditional notions of teacher learning, the majority of professional development activities remain unchanged in that they still present a variety of short-term, specific activities geared to introducing teachers to new curricular practices (Randi & Zeichner, 2004). To exacerbate matters, despite arguments to support otherwise, professional development and professional learning continue to be used synonymously (Melville, 2005). The problematic nature of using the two terms interchangeably has various implications for practice, in that it perpetuates the continued use of traditional forms of teacher development that have been subject to various forms of scrutiny, as presented in section 3.2 above (Randi & Zeichner, 2004). Thinking of teacher learning as merely amounting to professional development is, in fact, actually marginalising the full potential of teacher learning, as detailed in the introductory segment of this section.

A few crucial matters emerge from the discussion presented, the first being a shift from professional development that predominantly involved attending seminars and external training programmes, to professional learning that is central to teachers' work, where teachers construct meaning based on their own classroom experience, reflection and active collaboration with peers to create a learning community (Bell & Gilbert, 1996; Hill et al., 1995, Retallick, 1997; Cuttance, 2001). The shift in emphasis from what teachers do to what they know, what their sources of knowledge are and how those sources influence their work in classrooms, has spurred a rethink on the way teacher learning has traditionally been viewed (Lewis, 2002). Teaching and learning are now both viewed as processes in which participants deeply engage with ideas in order to create meaning (Wenger, 1998; Biggs, 1999). In addition, the discussion bears testimony to the complex, multifaceted nature of teacher learning. It would follow that it is for this very reason that Siemens' (2005) assertion that no one model is able to attend to the entire scope of learning, holds true. Consequently, this study draws on the various theoretical constructs that inform the literature pertaining to teacher learning. These theoretical constructs are detailed in the ensuing sections of this chapter.

3.4 Demystifying Teacher Learning: Developing expertise through acquisition of horizontal and vertical forms of learning

The discussion below offers a description of what the learning process entails, in an attempt to provide the reader with a conceptual understanding of the parameters of teacher learning. The discussion provides the reader with insight into the nature and forms of learning that teachers embark upon in the process of learning, and in this way attempts to highlight the implications of these different ways of learning to enhance expertise in teacher professional development.

Wakefield (1996) describes learning in the following manner:

> "*A relatively permanent change in the behaviour of an individual based on his/her experiences or discoveries. Thus, the processes of experience and discovery lead to a new understanding of the world and ourselves, and enable us to apply the acquired knowledge in new situations. Knowledge acquisition, then, involves processes that transform data from experience into organised information"* (Wakefield, 1996, p. 364)

The above sentiment reflects a sense that the knowledge acquired need not be new for any learning to ensue. Perhaps the way in which we begin to use knowledge, to address novel situations or challenges with which we are confronted, then becomes the platform for learning to transpire. Viewed in this way, the new ways in which we begin to engage with knowledge then become the space for new learning to emerge. This line of thinking, that learning need not necessarily imply new knowledge, was further developed by Bubb (2005) through his research among 300 teachers using a longitudinal study design. The findings of this study suggest that teachers engaging in on-going learning activities generally demonstrated two foci of learning dimensions – one focusing internally and the other contextually. Bubb (2005) contends that teacher learning that is focused internally within the self is about laddering – the search for incremental learning, which he called vertical learning. Teacher learning that focuses contextually refers to how the newly acquired learning can be used in varying frameworks, which means that while circumstances change, the core learning remains constant – this he termed horizontal learning.

The findings of Bubb (2005) challenge traditional notions of what the term „expertise' implies. The notion of expertise typically reflects a body of specialised knowledge, held by teachers, that boasts supremacy over all other forms of knowledge (Colucchi-Gray & Fraser, 2008).

The danger associated with such a conception of knowledge is that existing practices tend to be based on predetermined sets of values that remain unquestioned as these are passed down the generations of teachers. Consequently, issues pertaining to who produces the knowledge and what knowledge counts as being significant become critical to exploring the potential of teacher learning for the purpose of advancing learning among educator professionals (Gardner, 1989). To this end, Colicci-Gray and Fraser (2008) report that in academia there has been a strong tendency to highly prize knowledge that relates to "knowing that", which is more product oriented and tends to value vertical learning. This stance has typically been adopted at the expense of undervaluing experiential knowledge or „knowing how", which is more process oriented. Such a situation has given rise to conflict between learning as acquisition and learning as engagement and transformation (Colicci-Gray & Fraser, 2008). Acknowledging the merits of both these conceptions of knowledge is critical to promoting deep learning (Cochran Smith Lytle, 1999; Colicci-Gray & Fraser, 2008).

Traditional notions of what the term "expertise" implies have recently expanded to include teacher beliefs about learning and teaching within the context of teachers' own learning (Forde et. al, 2006). Developing expertise in a particular area is now seen to incorporate the ability to construct and reconstruct professional knowledge to satisfy a personal goal, as well as endowing teachers with the skills to cope with the challenges of teaching in different contexts through the acquisition of horizontal learning (Kelly, 2002). The implication in this new line of thinking is that teachers will constantly be involved in a process of examining and re-examining their knowledge as they aspire to develop their expertise in a given area. In short, the process of learning becomes an ongoing journey. It would follow that the term „expert' becomes relative, as while one may be knowledgeable in one area, one may still require development in other critical areas of teaching. In light of this facet of the learning process, the phrase "Sometimes a novice and sometimes an expert" (Barack & Yinon, 2005) proves to be most apt.

The previous discussion has alluded to the notion that learning can assume different forms, which may result in acquisition of not only new content knowledge but could also constitute using existing knowledge in novel and different ways. Furthermore, both content knowledge (knowing that) and experiential knowledge (knowing how) are significant in fostering teacher learning, alluding to an important association between knowledge and practice. The ensuing section explores this crucial relationship.

3.5 The Theory-Practice Divide: Exploring relationships of knowledge and practice

The following discussion attempts to present a case for the complexities and challenges associated with the relationships of knowledge and practice that permeate the scholarship of teacher learning. The intention is to highlight the significance of exploring these relationships in-depth to enhance understanding of their implications for teacher learning.

In a broad sense, practice can be described as:

> *"the enactment of the role of a profession or occupational group in servicing or contributing to society"* (Higgs, McAllister & Whiteford; 2009).

In the context of this study the broad description of practice implies enactment of the role of instruction and all the activities associated with the act of teaching. Higgs and Titchen (2001) believe that one way of interpreting practice is to characterise it as "doing, knowing, being and becoming", where the context of contextual practice is of major importance in shaping and structuring this practice. The significance of the context of practice is also echoed in the sentiment that while professional development must especially focus on a learning area or subject knowledge, this should not be at the expense of pedagogical knowledge and skills in a variety of social contexts (DoE, 2006). The implication is that teachers would have to possess forms of knowledge other than content knowledge to be developing professionally.

To this end, Grossman, Smagorinsky & Valencia (1999) assert that when exploring the relationship between knowledge and practice, it needs to be borne in mind that teachers require both conceptual and practical tools to assist them in their teaching. Conceptual tools relate to the principles, frameworks or guidelines that teachers use to guide their decisions about teaching and learning, and in this way facilitate teachers in their framing and interpretations of practice (Grossman et al., 1999). In addition, conceptual tools are used to identify and interpret relevant experiences while teaching, and therefore play an essential role in workplace learning (Van Veen et. al, 2009). While conceptual tools are useful in framing practice, these are general in nature and do not offer specific solutions for negotiating the dilemmas that arise in interactions with learners (Grossman et al., 1999). Practical tools are practical, specific and concrete in nature, and designed to be utilised in the classroom context (Van Veen et al., 2009). Drawing on the thinking of Grossman et al. (1999) and Van Veen et al., (2009), one gains a sense that the utilisation of both conceptual and practical tools is critical in fostering teacher learning, suggesting that knowledge and practice are inextricably linked.

The significance of this association between knowledge and practice is further emphasised in *The National Policy Framework for Teacher Education and Development in South Africa* (DoE, 2006):

> *"Both conceptual and content knowledge are necessary for effective teaching, together with the teacher's willingness and ability to reflect on practice and learn from the learners' own experience of being taught. These attributes need to be integrated, so that teachers can confidently apply conceptual knowledge-in-practice."* (DoE, 2006, p. 16)

The sentiments above reflect a sense that a complex blend of different forms of knowledge (conceptual knowledge, content knowledge, experiential and practical knowledge) would prove valuable in facilitating learning. Further, the success of learning would be dependent on integration of these different knowledge forms in such a manner so as to enable the effective application of these forms of knowledge to the context in which implementation is expected to take place. Moreover, attributes such as a willingness to learn from experience could serve to enhance the learning process.

The complex links between theory and practice suggested above are reflected in Yaman's study (2004). In his case study of an English language teacher to explore conceptual changes and their relation to changes in behaviour, Yaman (2004) utilised observation and interviews. The findings of the study indicated that the teacher's conceptual changes were consistent with her behavioural changes (Yaman, 2004). Insights from Yaman's (2004) study resonate with the thinking that "conceptions can be inferred from practice (actions) and practice can derive conceptions" (Gorodetsky et al., 1997, p. 425). Furthermore, the findings of this study are in synch with those of Kynashlahti et al. (2006), who add that conceptualisation involves continuous interaction between theory and practice. The implication is that learning involves a constant interplay between theory and practice. Consequently the distinction between theory and practice becomes hazy, making the creation of boundaries between the two areas of learning problematic. In this regard, Eraut (2000) alludes to the problematic nature of bridging the gap between theory and practice. His argument includes the fact that it is fallacious to assume that the simplistic adaptation of espoused theory (professional knowledge taught and developed at universities) and/or theory in use (teachers' tacit knowledge that is developed and transmitted in schools and classrooms) to attain compatibility between the two will necessarily result in bridging the gap between theory in

practice (Eraut, 2000). The rationale for this is that the relationship between these two varied bodies of knowledge is immersed in epistemology (the study of the nature of knowledge) and politics (Eraut, 2000). Further, the context of application of these methods tends to largely influence the success of implementing them (Eraut, 2000). In addition, a consideration of the relationship between theory and practice implies that if one can pose questions about learning then questions about teaching can also be raised, as teaching and learning are inextricably linked since the two processes take place almost concurrently (Eraut, 2000). The intricacies associated with the links between theory and practice are also highlighted by Ball and McDiamid (1990), who assert that skills cannot exist independently of knowledge, since what teachers do and think depends on what they know, and what they are able to do as well as what they are disposed to do. This suggests that the implications of this relationship between what teachers know and what they do and think then become crucial, especially when exploring how teachers learn.

The above discussion alludes to the problematic nature of intentionally or unintentionally attempting to divide theory from practice. The literature reviewed suggests that the complex association between theory and practice does not allow for such a clear-cut distinction between the two. Having explored the literature, it would appear that the role of the context of application, politics and epistemology all exercise a pervasive influence on the nature of the relationship between theory and practice (Willis, 2007). The discussion presented alludes to the multi-faceted nature of teacher learning as encompassing a complex blend of relationships and interrelationships between theory and practice and its various components, with each component having a significant role to play in facilitating the journey of learning. The ensuing section attempts to further explore the relationships of knowledge and practice through understanding the various conceptions of knowledge that permeate the literature on teacher learning.

3.6 Conceptions of knowledge: Intricacies of the relationship between knowledge and practice

If we consider the thinking that the manner in which one approaches the world influences ideas, definitions, identity, practice or environment and community (Sessums, 2006), then it follows that learning how our environment is organised influences teacher practice. This would imply that a consideration of the context (environment) in which learning takes place, in terms of its influence on the learning process, is imperative in order to understand how teachers think and learn, and more importantly how this influences their classroom practices

(Sessums, 2006). Hence, exploring the relationships between teacher thinking, teacher knowledge and teacher practice in context is central to understanding teacher learning. Cochran-Smith and Lytle (1999) identify three conceptions of knowledge that inform teacher learning knowledge for practice, knowledge in practice and knowledge of practice. While each of these lead to varied ideas on how to promote learning among teacher professionals, they are unified by the fact that they all recognise the significance of prior knowledge and learning acquired over time (Cochran-Smith & Lytle, 1999). The following discussion draws attention to the three conceptions of knowledge and their implications for teacher learning.

3.6.1 Knowledge for Practice

This conception perpetuates the thinking that teachers should be receivers of knowledge that is generated by others for teachers to use (Cochran-Smith & Lytle, 1999). Issues pertaining to the kinds of knowledge teachers may need to depend on in developing their practice, such as knowledge of subject matter content, content pedagogy, theories of learning and development, and research about the effects of the various teaching strategies, falls within the realm of knowledge of practice (Cochran-Smith & Lytle, 1999). The notion of practical or informal knowledge that is a large part of everyday practice is discounted (McKay & Kember, 1997; Stoll, 1999). This conception suggests that knowing more leads to more effective practice (Stoll, 1999). In effect, the implications of such a conception of knowledge would imply that quantity of knowledge supersedes quality of that knowledge, especially with regard to its application in enhancing learning within the classroom context (Cochran-Smith & Lytle, 1999).

Teacher preparation and continuous professional development are seen to be the basis of teacher knowledge, and in these sessions of professional development knowledge is typically transmitted to teachers (McKay & Kember, 1997). The idea of „best practice' is seen as generalisable behaviours and techniques that are verified and acknowledged as effective, and is actively promoted (Cochran-Smith & Lytle, 1999). By implication, adopting such a stance would imply that the solutions to addressing challenges that may present themselves in the teaching and learning situation rest in the hands of an external source, usually policy makers who have no direct association with that particular context (McKay & Kember, 1997).

Consequently, the possibility for exploring contextual factors in relation to how these may impact on the implementation of policy initiatives is marginalised. In this regard, Stoll (1999) asserts that although this approach was traditionally favoured and still dominates in

many teacher learning initiatives, it is flawed in that the specific context in which the above prescribed and „best' practices are rooted are not taken cognizance off. They may be context-specific and therefore not be applicable to another situation where the contextual factors may be somewhat different (McKay & Kember, 1997). Pearson (2002) highlights the problems associated with knowledge for practice in a study of two experienced primary school teachers involved in a year-long implementation of a new science programme. The lack of subject knowledge hindered the abilities of the teachers to use supporting documentation effectively. It was the transfer of their knowledge from other subjects that assisted them in addressing some of these challenges. Furthermore, their prior experiences helped shape their beliefs about the nature of science, suggesting that reflecting on experience could very well be an activity that is crucial to fostering learning. Such issues and challenges associated with the conception of knowledge for practice provides the rationale for considering alternate conceptions, which consider the role of practical knowledge and experience as being the basis for facilitating learning. The possibility for exploring knowledge acquisition in this way is realised through the knowledge in practice conception (Cochran-Smith & Lytle, 1999), discussed next.

3.6.2 Knowledge in Practice

Within this conception of knowledge, the belief is that knowledge is largely acquired by teachers situated in practice, where the site of learning becomes the place where teachers practise their profession. This refers to the school context and in particular the classroom (McKay & Kember, 1997). Since the notion of „knowledge in action' is encouraged within this conception of knowledge (McKay & Kember, 1999; Stoll, 1999; Cochran- Smith & Lytle, 1999), teachers are encouraged to inquire about their practice, as well as reflect on and articulate the tacit knowledge rooted in their experiences. Collaboration and facilitation among peers and research professionals is actively encouraged within the practice conception of knowledge (McKay & Kember, 1997).

Proponents of „knowledge in practice' stress the fact that knowledge is context-specific (McKay & Kember, 1997). This has enormous implications for teacher learning initiatives in that predetermined ideas that are external to a particular learning environment do not necessarily lend themselves to generalisation to all learning institutions (McKay & Kember, 1997; Cochran-Smith & Lytle, 1999, Stoll, 1999). This theory challenges the notion of „best practice' as advocated by the knowledge for practice conception.

If one subscribes to the knowledge in practice conception, then it follows that the formal/ informal divide becomes problematic, especially if practical knowledge is seen as being totally separate from theoretical and evidence-based research and knowledge (Cochran-Smith & Lytle, 1999). The belief that theory is distinct from practice ignores the meaningfulness and depth of the ways in which "abstract principles are interwoven in world experience" (Smargorinsky, 2003, p. 1399). In simple terms, it sidelines the theoretical components of knowledge and its possible contribution to informing and shaping practice (Smargorinsky, 2003).An approach that embraces both theory and practice would encompass all elements of the teaching and learning process. In this regard, the knowledge of practice conception provides a holistic approach that fulfils the social and intellectual components of teacher inquiry, and that embraces learning throughout the teaching career (Cochran-Smith & Lytle, 1999). It is to this conception of knowledge that we now turn.

3.6.3 Knowledge of Practice

Within this conception of knowledge the role of the teacher is extended to include constructing knowledge and learning, while adopting critical perspectives of their own assumptions as well as the theory and research of others (Cochran-Smith & Lytle, 1999). Broader social and political issues are inextricably linked to work in schools, raising the notion of the status quo (McKay & Kember, 1997). In light of this association, raising basic questions about knowledge and teaching that are pertinent to the educative process would prove most necessary. According to McKay and Kember (1997) such questions include:

- "What does it mean to generate knowledge?;
- Who generates knowledge?;
- What counts as knowledge, and to whom?; and
- How is knowledge used and evaluated in particular contexts?"

Paying attention to the answers to these questions is critical to understanding what constitutes knowledge in that particular setting; this inevitably shapes the manner in which teachers approach their teaching and learning (McKay & Kember, 1997). Since teaching and learning can be equated with action and problem-posing to local and larger socio-political situations (Stoll, 1999), it would make sense to link the answers to the above questions to both the context to which they apply as well as to wide-scale social and political factors. In addition,

such questions should always be open to discussion, implying that knowledge is emergent where the local contexts of teaching and learning are important (Stoll, 1999). Hence, within this conception knowledge is not necessarily received but is constructed (Cochran-Smith & Lytle, 1999). It follows that knowledge can be interrogated, elaborated, applied, reflected upon, and critiqued (McKay & Kember, 1997; Stoll, 1999; Cochran-Smith & Lytle, 1999). Such notions challenge opposing traditional notions of knowledge being fixed or static (Cochran-Smith & Lytle, 1999). Consequently, to accommodate the aspects of teacher learning mentioned above, Cochran- Smith and Lytle (1999) believe that the role of the teacher should be enlarged to include that of decision maker, consultant, curriculum developer, analyst, activist, and school leader. These roles appear to resonate conspicuously with those advocated by the Norms and Standards for Educators (DoE, 2002). Further, teachers should be afforded the opportunity to take an active stance in defining their practice (Stoll, 1999). By implication, it would follow that teachers would assume an active role in their own learning.

The implications of the conceptions of knowledge, presented above are enormous, especially if we acknowledge Cochran-Smith and Lytle's (1999) sentiments that the conception of knowledge adopted by the relevant constituencies (Government, DoE, relevant educational bodies and educator professionals) influences the stance and approach adopted with regard to teacher learning. It therefore becomes crucial to explore how the conceptions of knowledge influence the current thinking on teacher learning. While the recent thinking on teacher learning tends to favour the practice conception of knowledge, the traditional notions of knowledge for practices tends to still dominate much of the discourse surrounding teacher learning (Colucci-Gray & Fraser, 2008), raising questions as to where and why the inconsistencies lie with regard to teacher conceptions of knowledge. Such inconsistencies have given rise to different types of learning among teacher professionals. The different types of learning that teachers engage in are now addressed.

3.7 Blurring the distinction: Potential for surface learning and deep learning to promote meaningful and sustained teacher learning

The discussion below attempts to explore the nature of two types of learning that dominate scholarship on teacher learning: surface and deep learning (McKay & Kember 1997). While surface and deep learning may be presented as two distinct and separate types of learning, the discussion serves to illuminate the fact that they may actually complement each other,

making a clear-cut distinction between the two problematic. Surface learning implies an efficiency approach to learning, where actions to implement change, driven by external factors such as a new curriculum initiatives, occurs with minimal effort (Hay, 2007; McAllister et al., 1997). In short, such learning involves the unquestioning acceptance of information and memorisation as isolated and unlinked facts, where there is a conspicuous absence of reflection (McAllister et al., 1997). Since this type of learning is more results-oriented and does not necessarily lead to long-term and meaningful learning, learning takes place at a superficial level and often without understanding (Hay, 2007; Meyer, 2000). In addition, there is a distinct absence of deep, coherent explanations that assist in the organising of superficial knowledge and in the enriching of individuals in terms of enhancing their ability to draw conclusions, exercise reasoning and apply the newly acquired knowledge to practical situations (Graesser et al., 2002).

While the criticisms levelled against surface learning are substantive, as the above discussion has alluded to, one needs to be circumspect about disregarding such learning as futile. Interestingly enough, research points to instances that may require this kind of learning (McAllister et al., 1997; Meyer, 2000). An example would be where the process of learning is undertaken merely to implement policy changes within the curriculum (Meyer, 2000). Nevertheless, the criticisms presented above have inspired scholars in the field of teacher learning to seek a suitable alternative action research approach to professional development that would promote long-term learning (McKay & Kember, 1997).

Such an approach, termed ‚deep learning', aims to gain understanding in substantial and more meaningful ways, thereby allowing for more creative ways of applying this learning to the classroom context and in this way modifying practice and underlying values (McKay & Kember, 1997). Through the integration of new knowledge with pre-existing knowledge, deep learning embraces an enquiring and analytical approach to information and interpretations (Meyer, 2000). Furthermore, this form of learning is preoccupied with the quality of learning, where greater time is taken for in-depth study of a limited number of topics and subjects (Meyer, 2000).

While the literature reviewed above reflects a sense of preference for deep learning over surface learning, research indicates that the two types of learning may actually complement each other, as opposed to being at odds (Hay, 2007). In research encompassing a set of case studies conducted to explore the incidence of deep learning and surface learning among a

group of 12 postgraduate master's students in a teaching course in research methods, it was found that different people learning different things at different times, do so in ways that are meaningfully understood, have different levels of endurance and are transferable to differing degrees (Hay, 2007). The findings of this study allude to the notion of threshold concepts (Meyer & Land, 2003; Clement, Zeitsman & Brown, 1998). Basically, threshold concepts relate to an overarching understanding of principle, and can be „troublesome' to learn, but once grasped give rise to new opportunities for the understanding of a topic not previously possible (Meyer & Land, 2003). The implication of this is that learning is likely to proceed by increment, not continuous progression, in the acquisition of „threshold concepts' (Hay, 2007). The findings of Hay (2007) conjure up two essential issues. Firstly, viewing deep learning as being superior to surface learning is problematic. The rationale for this is that surface learning may be necessary in instances where it is required to grasp new key concepts that serve as important building blocks for developing more complex levels of understanding. By implication, surface learning may be a significant initial step in fostering meaningful and deep learning. Secondly, the distinction between these two types of learning is not always easy to identify, as surface learning can often be masked as deep learning (Hay, 2007). The implication is that the potential for authentic deep learning to ensue is not without complications. The challenge then becomes one of unravelling the conditions that would promote experiences for truly deep learning to occur.

From the discussion above it has emerged that merely disregarding surface learning as inadequate is a shallow way of thinking due to the possible benefits that such a form of learning can have alongside and in conjunction with deep learning. In addition, if one pays close attention to theories surrounding teacher learning, one gains a firm sense that both forms of learning have a crucial role to play in fostering learning among teachers. The next section addresses theories surrounding teacher learning.

3.8 Theories Within Which Teacher Learning can be Located

The following discussion serves to provide an overview of the theories that dominate current discourses on teacher learning. The intention is to provide the reader with a sense of how the form, process and content elements of teacher learning manifest in relation to conceptualising teacher learning within the theories that inform the scholarship. Teacher learning within schools may be framed within situated theories, learning communities and communities of practice (Richardson, 1998; Wenger, 2004). All three of these are focused on the socialisation of members into a community (Wenger, 2004).

While the theories are presented as separate sub-sections, it must be borne in mind that they do not necessarily exist as distinct and isolated from one another. In fact, these theories tend to complement one another, as elements of each theory overlap with one another and they have all come to influence and shape current thinking on teacher learning.

3.8.1 Situated Learning: A special consideration of contextual issues in teacher learning

Within situated learning theories the emphasis is on learning that takes place within a particular social environment. The important consideration of the context in which learning occurs is emphasised by Guskey (1995), who asserts that the appropriate selection and planning of professional development processes can be made possible through paying attention to the context of learning. In addition, the experiences that occur in the natural course of events, as teachers gain experience, are critical in influencing the course and nature of learning, among teachers (Ball & Cohen, 1999).Within situated conceptions of learning, group discussion, shared understanding and input as well as practical activities to work with new ideas, are highly valued (Billet, 2001). In this way learning is reinforced when others on-site share and develop ideas together, as happens in the broader social context of communities of practice (Borko, 2004). However, the ongoing debate between on-site and off-site learning is far from being resolved, as the ensuing discussion will indicate.

3.8.1.1 On-site learning versus off-site-learning: Far from a simple matter of choice

Traditional notions of professional development typically entail off-site learning that takes place away from the site of work or school situation and more specifically away from the context of the classroom (Bell & Gilbert 1996; Hill, Petit & Dawson, 1995; Retallick, 1997; Cuttance, 2001). Off-site learning includes workshops, conference sessions, seminars, lectures, and other short-term external training programmes and events on subject matter issues and topics such as cooperative learning and classroom management (Van Veen et al., 2009). In recent years an increasing amount of attention has been directed towards teacher learning and teacher professional development programmes situated in the workplace, as opposed to off-site programmes (Van Veen et al., 2009). This has marked the emergence of situated learning, where learning involves "changing the culture of schools so that teaching is a more public practice open to regular discussion among peers" (Lohman & Woof, 2001). Stemming from the fact that there is currently a gap present between theory and practice in teacher professional development, as has already been presented (section 3.4.3), workplace learning is directed towards bridging this gap (Van Veen et al., 2009).

On-site or workplace learning, as it is popularly known, tends to be of a longer duration, and the learning that transpires within this forum bears a striking connection with the work context of teachers (Smith & Gillespie, 2007). Moreover, workplace learning relates to changes in teaching practices in classrooms and schools that are achieved through individual teacher learning and problem-solving processes in the school (Ellström, 2001). In addition, there is a strong focus on subject matter and a preoccupation with encouraging analysis and reflection of learning activities (Ellström, 2001). Methods employed within the realm of on-site learning include training within the school or local context, and the formation of ongoing professional communities such as study circles and inquiry groups (Smith & Gillespie, 2007).

Coupled with the tendency to promote on-site learning is a shift in thinking with regard to the focus and nature of such learning. Van Veen et al.(2009) highlight these significant shifts as follows:

- from a focus on individual teacher knowledge, skills and teaching competencies, including new instructional methods, to a focus on student learning and specific teacher problems;
- from single sessions or a short series to long-term and ongoing; and
- from a focus on change as something that is done to teachers and programmes which change teachers as passive participants, to change as a complex process that involves learning and teachers as active learners.

While the above discussion may have alluded to the possible benefits of workplace learning, Bredeson (2003) argues that not all on-site learning is good either, as research points to instances where existing biases were reinforced and where poor practices consequently continued to exist. Hence, the possibility of redirecting all learning to the workplace needs to be considered with caution. Instead, Van Veen et al. (2009) suggest adopting a healthy balance between flexible and creative varieties of individual and collective learning and between on-site and off-site learning. These sentiments are echoed by others (Little, 2006; Smith & Gillespie, 2007), who assert that combining features of off-site and on-site activities in professional development programmes appear to be highly effective.

Wenzlaff and Wieseman (2004) concur with the sentiments of Little (2006) and Smith and Gillepsie (2007) that effective teacher learning should encompass elements of both on-site

learning and off-site learning. They (Wenzlaff and Wieseman, 2004) conducted a study to examine the nature of teacher learning in a cohort-based master's degree programme in curriculum and pedagogy that was purposefully designed to be responsive to teachers' personal needs and preferences. The study employed qualitative and quantitative means of collecting data, through the use of document analysis, participant observation and surveys. Teacher needs and preferences were identified through an initial survey that was carried out and included a preference for being afforded opportunities that promote learning in a socially mediated context, where teachers themselves decide what and how to learn; and relate what was learned to their respective classrooms through a reflective teaching orientation. It was found that teachers recognised that the cohort model helped to create a community of learners and in this way created a collaborative culture. Such an opportunity allowed teachers to increase their awareness and appreciation of listening to and seeing perspectives other than their own.

Furthermore, the study revealed that teachers preferred to learn by doing through trial and error methods, and in this way connect theory to practice. In addition, teachers wished to have input in their learning activities, which they believed should be authentic and connected to their classroom practices. Teachers viewed themselves as being self-directed, preferring to decide what and how to learn and in this way being active and involved. The study highlighted learning as socially mediated. Furthermore, the study suggested that learning cannot be done to teachers or for teachers.

Following on from these findings, Wenzlaff and Wieseman (2004) assert that teacher learning need not be restrictive as teachers can learn in a variety of different contexts and situations, including learning reflectively while teaching and from students while learning. In addition, opportunities for learning may also present themselves in the form of workshops, structured courses, faculty and district meetings and school-based professional conversations (Wenzlaff and Wieseman, 2004). The changes in teaching practices requires convincing teachers of the merits of the new approach, providing opportunities for learning by experience and the incorporation of journeys that are highly personalised for individual teachers in teacher development programmes (McKenzie, 2001; Wenzlaff and Wieseman, 2004).

An acknowledgement of the above sentiments would imply that the scope for teacher learning is expansive, and consequently necessitates a multi-modal or multi-channel

approach. The discussion above highlights the prominent role that the context of learning plays in influencing the nature of the learning that one engages in. To this end, the potential for exploring on-site learning as a form of situated learning was highlighted. However, the belief that on-site learning should replace off-site learning altogether is flawed in that solely employing on-site learning runs the risk of perpetuating bias and poor practice (Bredeson, 2003). Such flawed beliefs create a sense that mere dispensing with off-site initiatives altogether could be problematic (Wenzlaff and Wieseman, 2004). Yet despite criticisms levelled against traditional off-site learning initiatives, one gains a sense that there could be a place for such learning forms in teacher learning. The challenge then becomes to skilfully include off-site learning initiatives in a manner that compliments on-site learning, which suggests that exploring the way in which both forms of learning can be included requires further engagement (Wenzlaff and Wieseman, 2004). Nevertheless, the literature reviewed suggests that situated learning provides a meaningful avenue for teacher learning to be enhanced. It is within this context of situated learning that emergence of learning communities becomes possible; as Kynashlathi et al. (2006) assert, sharing knowledge with the school community and colleagues is invaluable in promoting learning.

The increasing notion that learning is intertwined with the human need to feel a sense of belonging and making a contribution to a community, where experience and knowledge function as part of community property, is central to teacher learning (Lieberman & Mace, 2008). This has sparked the rise of the notion of learning communities. The potential for learning communities to enhance learning among teacher professionals is explored in the ensuing discussion.

3.8.2 Interactive Professionalism: Potential for learning communities to enhance learning among teachers

This discussion serves to highlight the potential for learning to be promoted within the context of teacher learning. Learning communities encompass groups of education practitioners who meet to inquire systematically about aspects of their own work in schools and classrooms, with the intention of improving practice and enhancing students' learning in educational settings (Richardson, 1998). Within the context of such communities the reconstruction of previous knowledge and beliefs becomes possible as teachers gain new information and in this way build on their own ideas and experiences, as well as those of others, in order to work on a specific agenda (Wenger, 2004). Through collectively developed understandings, mutual engagement and a shared repertoire of resources, learning within the

context of learning communities is fundamentally a social and constructive activity that depends on the collective and cumulative input of the community to disseminate ideas, stimulate discussion, and widen the oral and written discourse about schools and schooling (Richardson, 1998; Wenger, 2004). In fact, Fullan (2004) has coined the term „interactive professionalism' to describe this crucial component of collaboration within the context of learning communities.

The effective nature of learning communities in fostering learning among teacher professionals has been widely documented (Louis, Kruse & Marks, 1996; Schomoker, 1996; Fogarty & Pete, 2007; Judson & Lawson, 2007; Vescio et al., 2008). Louis et al. (1996) believe that the success of learning communities can be attributed to the existence of shared norms and values among teachers, the focus on student learning, teachers' engagement with reflective dialogue, their tendency to challenge the previously private and isolated nature of classroom practice, as well as their preoccupation with promoting collaboration between teachers. Furthermore, the flexible and informal yet highly effective nature of learning communities serves to enrich learning opportunities among educators (Schomoker, 1996). In addition, once a community of learners is set up, it has the capacity to grow into meaningful professional development experiences where teachers are presented with numerous opportunities for renewal of their knowledge (Fogarty & Pete, 2007). Driven by learning conversations that enable teachers to co-create the understanding of issues and strengthen their skills in making sense of these issues collectively, learning communities afford teachers the platform to develop and strengthen their expertise (Judson & Lawson, 2007). In research encompassing 11 case studies it was reported that learning communities proved highly successful in improving teaching practice and enhancing student achievement (Vescio et al., 2008). Clearly the potential for interactions of this nature for advancing learning becomes heightened through the forum afforded by learning communities.

The discussion above suggests that learning communities have the potential to facilitate learning among teachers. However, these communities cannot be separated from the work context of teachers; that is, the context of practice. Research spanning the last 20 years has highlighted that teachers' learning and creativity in practice are significantly enhanced by professional communities of practice (Cochran-Smith & Lytle, 1999; Little, 1990, 1999; McLaughlin & Talbert 2001; Talbert 1995; Westheimer 1998). Exploring issues associated with communities of practice is the focus of the ensuing section.

3.8.3 Conceptualising How Practices Become Habituated Through Communities of Practice

The cornerstone of the community of practice theory is formed by the fundamental belief that learning, thinking and knowing refer to relations among people engaged in activity arising from a socially and culturally structured world, where the meaning of learning can be negotiated within this social context (Wenger, 2004). Wenzlaff and Wieseman (2004) believe that interactions with the people in one's environment are major determinants of what is learned and how learning takes place. Arising from this trajectory of thinking, Wenger (1998) defines communities of practice as:

> *"groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis"* (Wenger, 1998: 4).

The notion that participating in certain practices and processes of learning will result in the formation of identities, in particular the identification associated with a particular community, is central to the community of practice theory (Wenger, 1998). Furthermore, communities of practice organised around a common goal are the site for participants to learn new roles connected to new knowledge and skills (Cochran-Smith & Lytle, 1999). In addition, since there is a shared vocabulary that tends to exist within such forums the potential for meaningful learning to unfold is increased (Richardson, 1998).

The communities of practice theory highlights a useful way of understanding and conceptualising processes of how particular practices become habituated; that is, how a social grouping develops, perpetuates and changes its habits (Wenger, 1998). Further, Wengers' (1998) assertion that people are part of multiple communities (families, workplace communities, schools, informal groups, and any other grouping that exist over time) is an important point. By implication, people can belong to various different communities, each with their own set of values and norms (Wenger, 1998). These may not necessarily mirror each other, creating a situation where variation in meaning becomes a strong possibility (Richardson, 1998). Such competing notions may in turn provide a useful platform for enhancing further learning (Wenger, 2004).

As the above discussion has alluded to, despite the potential for teacher learning to be enhanced within the context of communities of practice, traditional approaches to teacher learning continue to exist (Scribner, 2003). In a qualitative study of 20 teachers across three case study schools that explored the relationship between teacher learning and teacher work

in rural high schools, Scribner (2003) found that teachers defined their work context more in terms of relationships (and the nature of those relationships) and less in terms of physical plant, resources, pace of work and so on. Furthermore, the teacher-learner relationship shaped the teacher learning of subject matter, and the teacher-subject matter relationship influenced the teacher's approach to their learners. In addition, teachers rated learning from experience as the most important form of learning. They explained why learning spurred by learners occurred through experience, specifically through trial and error methods. Furthermore, the multiple contexts of teachers' work and their relationship to teacher learning are complex and interwoven, particularly where each school context is unique. Left to their own defences, teachers have no alternative but to learn reactively, guided by their own experience and the immediate needs of their learners.

The findings of Scribner's (2003) study suggest that that while teachers might very well be aware of the benefits of learning within communities of practice, their preference for learning from experience and through trial and error methods, still largely an isolated activity, perpetuates reactive learning measures; in this way it serves to inhibit the full potential of exploring communities of practice as an effective approach to fostering teacher learning. The question which then rises is: despite being aware of the reported success of learning within communities of practice, why then are teachers continuing to opt for employment of traditional approaches to teacher learning? The issues and challenges associated with answering this question highlight the fact that a greater level of engagement might still be needed in conceptualising teacher learning.

In addition since the teacher learning is often associated with the implementation of a specific curriculum, or policy, it would prove most necessary to embark on a discussion as to how the theory of curriculum implementation relates to teacher learning. The ensuing section attempts to do just this.

3.9 The Theory of Curriculum Implementation in Relation to Teacher Learning

Implementation can be viewed as a process of professional development and growth involving ongoing interactions, feedback and assistance (Sowell 2000). The pivotal role of teachers, in the successful implementation of a new curriculum, has been emphasized by Coleman et al. (2003) and Fullan (2001), necessitating that teachers be presented with opportunities to become familiar with the philosophy underpinning the new policy, the content of the policy, the policy's pedagogical approach and the components of the programme (Sowell, 2000).

Moreover, since new policies entail content, some of which teachers may be unfamiliar with or which seems unfamiliar due to the manner in which it is presented in policy documents, teachers need to engage in development activities that result in them becoming well-versed with the contents of the curriculum (Miller, 2002). In short, this would imply that the professional development of teachers is an important factor contributing to the success of curriculum implementation. To this end, Coleman et al. (2003) asserts that curriculum implementation can be facilitated by workshops on using material resources and the development of assessment plans.

However, Oloruntegbe et al. (2010) assert that there is often a gap between the curriculum that is developed and its implementation. Associated with this gap is the thinking that it is fundamentally flawed to expect teachers to receive new instructional approaches with open arms, if they are insufficiently trained or informed as to why such change is necessary, resulting in the inadequate adoption of the new curriculum mandate (Cohen & Hills, 2001). These concerns suggest that exploring the reasons behind these pronounced gaps between the intended curriculum and that which is implemented, is crucial to understanding the relationship between teachers' knowledge, skills and dispositions and the implementation process. Fullan (2001) contends that one way of understanding this relationship, is to explore the experiences that teachers encounter as they begin to engage with the new policy documents and endeavour to implement the policy within the context of the classroom, as it is through this process of implementation, that teachers are developed and empowered.

3.10 Chapter Summary

This chapter highlighted the short-sightedness associated with conceptualising teacher learning in a simplistic, narrow and one-track manner, suggesting that teacher learning does not fit neatly into a water-tight category where it complies with a set of definitive criteria or characteristics. Rather, the literature reviewed suggests that teacher learning is an elusive, multi-faceted scholarship, immersed in issues and challenges that far supersede a simplistic and superficial understanding of teacher learning. The level of complexity associated with teacher learning suggests that a deeper level of engagement with the issues surrounding it would prove useful.

This chapter has detailed how traditional notions of professional development have engendered considerable criticism in terms of the search for suitable alternatives within the context of teacher learning. While the literature reviewed provides evidence for the criticisms levelled against traditional options of professional development, research points to their strong dominance in the scholarship of teacher learning. Such a stance alludes to an uphill

battle for teacher learning as it strives to achieve its ideals. Moving beyond historical views on teacher learning, the current trends in thinking suggest that teacher learning is far more complex than one would imagine. In this regard, the chapter also explored how teacher learning is conceptualised within the framework of the body of literature surrounding it. Furthermore, the conceptions of knowledge that serve to illustrate the pivotal relationship between theory and practice, in so far as they apply to teacher learning, were detailed. The forms of learning and types of knowledge that influence teacher learning were also highlighted with respect to their implications for teacher learning. Finally, the chapter concluded with a discussion of the theories surrounding teacher learning, paying particular attention to issues associated with the process and content of teacher learning. The ensuing chapter details the methodology used in collection and analysis of data in the study.

Chapter 4 - Mapping Out the Methodology

4.1 Introduction

In this chapter the research method and design receive attention. A detailed description of the mode of inquiry, paradigmatic assumptions, selection of the sample and sampling procedures, as well an elaboration of the instruments used in the study, are offered. The procedure for data collection and methods employed in the analysis of data are presented next. Finally, attempts to address the methodological constraints of the study and ethical issues form the concluding segments of the chapter.

4.2 Research Design

According to Denzin and Lincoln (2000), research design refers to the plan and structure of the investigation used to obtain evidence to answer research questions. In this section of the chapter the research design is presented within the lens as articulated by Denzin and Lincoln (2000). This design will include a description of the methodological choices made in this study and the rationale supporting these choices. In summary, the design includes a qualitative research approach which seeks to establish how teachers make sense of their learning activities within an interpretivist framework, located within a case study methodology.

4.2.1 A Qualitative mode of enquiry

In this study the issue under investigation is teacher learning. Due to its complex nature this phenomenon needs to be comprehended on a detailed level. According to Bowen (2005) and Tavallaei and Talib (2010), it is through the mode of qualitative research that such a possibility (exploring a complex issue on a detailed level) can be realised. These sentiments are echoed by Hoepfl (1997), who adds qualitative inquiry to teacher learning through his acknowledgment of the complex and dynamic nature of the social world.

Employing a holistic approach with a view to understanding teacher learning through the lens of assessment was what this study set out to do. Consequently the author chooses to adopt a qualitative mode of inquiry. This preference enabled the author to illuminate and explore complex issues surrounding the scholarship of teacher learning, while simultaneously acknowledging the dynamic nature of these issues.

In an attempt to understand the problem from the participants' perspective, an essential goal of qualitative research (McMillan & Schumacher, 2001), the author made use of intense interviewing sessions. In these sessions participants were probed to detail their notions on assessment and learning, enabling the author in her capacity as researcher to explore their angle or slant on the issues at hand. In this way the author was able to build a complex, holistic picture of teacher learning through reporting and analysing detailed views of the participants, which forms a critical component of qualitative research (Creswell, 2007).

If we accept Higgs and Cherry's (2009) assertion that qualitative research assumes that there are multiple construed realities (that is, different people have different perceptions of reality through their attribution of meaning to events, meaning being part of the event, not separate from it), the issue of the context in which the data were generated needs to be borne in mind. In an attempt to gain a deep sense of where participants were coming from, the author presents a detailed account of the context in which the data were collected and analysed by way of introduction to the data analysis chapters. Furthermore, since the emphasis is on studying and understanding phenomena in their natural settings in qualitative research (Creswell, 2007), the author also presents a detailed description of the research site at which the study was undertaken.

In the research conducted, initial themes that were apparent and recurring through the extensive study of the literature in the area of assessment served as a basis for the pre-observation interview questions. Upon entering the research field, and as data collection commenced, the themes that began to emerge were supplemented, refined and revisited for clarity and understanding. This took place subsequent to the interviews and observations as new insights were unearthed. Hence, the manifestation of an emergent design, which is characteristic of qualitative research (Trochim, 2001), was such that as themes became apparent in the data collection and analysis processes, these were explored to the extent that they held significance for the study.

Since I was primarily concerned with how teachers acquire learning, an interpretivist paradigm proved most compatible with the scope of this study due to its emphasis on the ability of the individual to construct meaning, as becomes evident in the following discussion.

4.2.2 An Interpretivist Paradigm

Essentially the researcher working within an interpretivist paradigm seeks to understand, explain and demystify the phenomenon under study through the eyes of the participants, as this is seen as critical to obtaining an insider perspective on key issues pertaining to the area of study (Cohen et al., 2007). This study sought to explore how teachers learn about assessment through attempting to unpack and understand the experiences and insights that they bring to the learning experience.

Furthermore, interpretivism acknowledges that individuals bring different perspectives to an event and consequently ascribe their own meaning to that event (Punch, 2009). Hence the possibility of the existence of multiple meanings becomes an important consideration when working within an interpretivist paradigm. This study sought to explore the various perspectives of the participants with regard to the assessment practices they employed and through the deep insights revealed during the data collection process.

Interpretivists acknowledge that meaning is constructed based on individual interpretation and is therefore subjective (Mack, 2010). By contextualising the study through a detailed depiction of the research site and participants, it was envisaged that a holistic picture of the study would be presented. A case study would offer the avenue to achieving this, as discussed in the following section.

4.2.3 A Case Study Methodology

Case studies are:

> "*detailed investigations of individuals, groups, institutions or social units, with the focus being on understanding the particulars of that case in its complexity"* (Bachor, 2000)

Cohen, Manion and Morrison (2000) believe that the intention of a case study is to portray, analyse and interpret the uniqueness of real individuals and situations through accessible accounts and to present and represent reality. A case study is anchored in real-life situations and results in a rich and holistic account of phenomena and thus offers insights and illuminates meanings that expand the reader's experience (Stake, 2005). Teacher learning is a multifaceted area and since a case study offers a means of investigating complex social units

consisting of multiple variables of potential importance in understanding the phenomenon under study (Yin, 2009), it would afford an avenue to explore these various facets.

A case study focuses on a bounded system, usually under natural conditions so that the system can be understood in its own habitat (Denzin & Lincoln, 2000). The context of a teacher's work is the school, and in particular the classroom. This is the site where the study was conducted. Finally, through case studies and educational processes, problems and programmes can be examined to bring about understanding that in turn can affect and perhaps even improve practice (Willig, 2001) The theoretical framework employed in this study examined the various issues surrounding the scholarship of teacher learning and therefore necessitated an in-depth understanding of these issues. A case study would facilitate this process. The school under study was purposively chosen to provide for a richness of exploration. The procedure used for selecting the research site and the participants will now be detailed.

4.3 Selection of Participants and Sampling Procedures

Purposeful sampling, which involves selecting a sample based on the researcher's experience or knowledge of the group to be sampled (Lunenburg & Irby, 2008) was used to select participants for this study. The intention is to select information-rich cases for in-depth study which entails intentionally choosing the informants for the particular perspectives they offer. Since the investigator sets out to discover, understand, and gain insight about a particular phenomenon, he or she must therefore select a sample from which the maximum amount can be learned (Merriam, 1998).

In this study, purposive sampling was achieved through network sampling (participant referral) as advocated by McMillan and Schumacher (2001), where each respondent or group was suggested by the previous group or individual. The study focus provided the criteria for selection of the case study school and included, by means of an established network of teachers for identification, a primary school where teacher professional development in assessment had been completed and where teachers were engaged with new forms of assessment practices as prescribed by the assessment policies for schools.

After having met and spoken to a group of Natural Science educators at various learning area workshops (see section 6.2) that the researcher had attended, a few concerned educators were identified who, albeit having attended training workshops on assessment, were still grappling

with implementing the various new forms of assessment at classroom level. Through further interactions the researcher soon established that one of these concerned educators taught at Sterling Primary (the school at which the study was conducted) and was keen to openly speak about the various challenges that she was facing with regard to learner assessment. In subsequent conversations this educator revealed that her colleagues at school were also grappling with issues surrounding assessment and were passionate about giving voice to their concerns. After the researcher had explained to her what the study entailed, the contact details of the individual teachers that she had mentioned were requested and contact was initiated with them. These individuals expressed interest in becoming involved in the study, after the researcher explained the purpose of the study to them.

Having received verbal acceptance to participate in the study from all three prospective participants, the researcher contacted the principal to secure his permission to conduct a study at his school. He willingly gave permission and the researcher proceeded to obtain the necessary permission to conduct the study at the school in writing from the DoE and University Ethical Clearance Committee. At this stage a letter seeking permission to conduct the study at Sterling Primary School was drafted and given to the principal to sign. Letters of consent to participate in the study were also drafted and given to the participants to sign.

Since the emphasis in qualitative research is on quality and not quantity, the objective is to become saturated with information on the topic rather than maximising the number of participants in the study (Padgett, 1998). In addition, Ritchie and Lewis (2003) add that qualitative samples are usually small because a phenomenon has only to appear once to be part of an analytical map. Furthermore, case studies emphasise detailed contextual analysis of a limited number of events or conditions and their relationships (Shen Qi, 2009).

In short, the above discussion points to the fact that the sample in a qualitative study need not be a large one for important issues surrounding the demarcated area of study to be illuminated, and consequently for meaningful insights to be revealed. Stemming from this line of thinking, the sample for this study consisted of three Intermediate phases for Natural Science educators: from Grade 4, Grade 5 and Grade 6. The rationale for this selection and categorisation was that the study was demarcated within the intermediate phase of schooling, which constitutes Grades 4 - 6.

In addition, by using three as opposed to one educator it was envisaged that the themes that emerged from individual interview sessions would allow for a comparative inter-case

analysis, although this was not primarily a comparative study. The intention was to maximise the utility of the data to their full potential and to provide every opportunity to exploit the research context for context-rich information that may reside in more than one person experiencing the same kinds of activities (receiving training and implementing a new assessment process in a school across the three grades of the intermediate phase of schooling).

By employing more than one instrument to collect data it was envisaged that the quality of data obtained would be enhanced. The manner in which these instruments were used will now be highlighted.

4.4 Instrumentation

Denzin and Lincoln (2000) view instrumentation as referring to data-sourcing tools which are used to address the research questions. In this study multi-method strategies were used to collect data, including semi-structured interviews, non-participant observation and document analysis. A brief explanation of how each method was used in the study follows.

4.4.1 Semi-structured Interviews

In-depth, face-to-face, semi-structured interviews were conducted with the three intermediate phase educators in an attempt to address the critical questions in the study. These interviews were conducted after document analysis had taken place (see section 4.4.3). Since semi-structured interviews allow ideas to emerge that have not been predetermined by the researcher, questions can be revised accordingly if needed during collection of data (Berg, 2009). While a pre-observation interview schedule (refer to Appendix 1) was devised to guide the interview process, the list of questions was flexible so as to accommodate and explore themes and issues that might not have been considered in the construction of the interview schedule. Questions were open-ended, with the intention of generating discussion with participants. Some questions were constructed during the interviews, presenting the opportunity for participants to be probed for details or to elaborate on issues as they emerged. This served to increase the possibility of yielding rich and detailed feedback, thereby providing greater breadth of coverage. Probing also helped to gain clarity with regard to the understanding and interpretation of participant responses.

The interviews were iterative in nature, as the study necessitated a constant back and forth interaction between the researcher and the participants. According to Berkowitz (1997), the

role of iteration serves a reflexive process in that it is instrumental in gaining insight and developing meaning in qualitative research. Visiting and revisiting the data and connecting them with emerging insights gives rise to progressive unfolding of refined foci and understandings. Pre-observation interviews were conducted upon entering the field to explore the participants' understanding of assessment and to ascertain how they had acquired this knowledge. Post-observation interview sessions afforded the opportunity for in-depth analysis of insights brought to the fore during the observation of lessons. These also enabled clarification, of interpretation of what had been observed in the classroom, as well as of insights gleaned from the documents. The interviews were audio-taped and transcribed. Interviews ceased when data saturation began to occur; that is, when conversations with participants failed to yield any additional and new insights into the area of study (Strauss & Corbin, 1990).

A problem often encountered is that since interviews are contrived, artificial situations, interviewees often respond to them in a manner that reflects this fact (Denzin & Lincoln, 2000). The tendency is for participants to give socially desirable responses, which may not be a reflection of their honest responses; this may not actually be the manner in which they operate within the classroom context. In an attempt to curb the effects arising from such a situation, this study also used observation as a research tool to obtain data. A concise description of how this instrument was used in this study follows.

4.4.2 Observation

The value of using observation as a research instrument can best be encapsulated in the following quote:

> *"The essence of observation is the creation of insight of what might seem initially to be routine and commonplace. Hidden, beneath the surface, of what the observation of lessons may reveal, are alternate beliefs, values and practices."* (Walker & Adelman, 1975, p. 18)

Dewault and Dewault (2002) view observation as encompassing the systematic noting and recording of events, behaviours and artefacts (objects) in the social setting chosen for study, with the purpose being to discover complex interactions in natural settings. In this study, teachers' assessment practices were observed and noted within the context of the classroom in an attempt to explore how these relate to their understanding of assessment. The use of an

observation schedule (see Appendix 2) guided the observation of lessons. In addition, field notes were taken by the researcher and these supplemented the data collected. The added value of observation is noted by Patton (1990), who asserts that when combined with interviews, observations provide knowledge of the context in which events occur, and this may enable the researcher to see things that participants themselves may not be aware of, or that they are unwilling to discuss. This line of thinking is supported by Merriam (1998), who believes that by conducting observations the researcher is able to provide some knowledge of the context or highlight specific incidents and behaviours that can be used as reference points for subsequent interviews. In this study phenomena that were observed and noted during the observation of lessons formed the basis of the post-observation interview sessions. At this forum teachers were afforded the opportunity to provide the rationale behind their assessment practices, and to elaborate upon these.

According to Trochim (2001), another advantage of using observation as a data collection instrument is that it is strong in validity because the researcher is able to collect a depth of information about a particular behaviour. By sitting in on the Natural Science lessons, I was able to extrapolate a variety of information, including but not limited to the kinds of assessment that were used, the ways in which these assessment forms were used, as well as the kinds of assessment that were not used. This set the scene for discussion in post-observation interview sessions, where participants would be allowed to offer explanations as to why they employed the assessment practices observed and noted. While the merits of using observation as a research tool are undeniable, as noted above, the limitations of observation need to be borne in mind so as to minimise their effects on the quality of data obtained. To this end, Malderez (2003) cautions that the researcher can wear different observer „hats', alluding to the notion that the purpose of observation be made clear right from the outset and thereafter every time the researcher conducts an observation. My position was declared at the outset, and I was also consistently conscious of the need to be detached from the personal position of being a teacher of Natural Science.

When employing observation as a research tool, Waxman (2003) cautions against the notion of „observer effects', implying that the participant's behaviour may be somewhat altered due to the presence of the observer. To reduce the effects of the phenomena of observer effects on this study, the researcher would sit at the back of the classroom so as not to be conspicuous to learners. The intention was to minimise the effects of the researcher's presence on the learners' normal flow of activity during progression of that particular lesson. With regard to

teachers, they were asked where they would like me to sit during the observations and they all preferred for me to sit at the back. It was hoped that this would make them more comfortable with the presence of the researcher in „their territory'. Observations were undertaken over a period of time, which in fact amounted to an entire term. This allowed for easing into a normal flow of activities of the teacher and the learners, enabling both the participants and learners to get used to the idea of the presence of the researcher.

In addition, after the lessons this researcher would revisit field-notes and comments made on the observation schedules and make key notes on phenomena observed to highlight interpretations and understanding of these. The issues raised here were further explored in the post-observation interviews to enable participants to explain their practices and clarify issues that emerged. It was envisaged that this would enable this researcher to rethink through personal interpretations of what had been observed and implications of these for the study, thereby enhancing validity of the data produced. While it is acknowledged that the complete submergence of „observer effects' is virtually unattainable, the measures above were attempts to minimise them.

The observation of lessons was followed by post-observation interviews in an attempt to provide an in-depth rich understanding of what was actually observed. Hence observations were used to complement and obtain perspective on the data generated in the pre-observation interview sessions. Post-observation interviews were used to explain and clarify practices observed and to explore the participants' understanding of assessment in context. This is in line with the thinking of Malderez (2003), who asserts that a key focus in observation is on generating descriptions and plausible explanations of educational phenomena.

Interviews and observations were supplemented by document analysis as a means of data collection. An explanation of how document analysis was used to enhance the data collection process in this study is discussed in the next section.

4.4.3 Document Analysis

According to McCulloch (2004), document analysis takes place when the researcher studies documents and records not gathered or developed specifically for the study being undertaken. Essentially what this implies is that the documents analysed were not generated for the purpose of the study, but were created to serve some other purpose related to the area of study. They were analysed in an attempt to shed more light on the study being undertaken. In

the context of the located study, documents (learning reference materials, teacher lesson plans, samples of assessment activities, teacher records and reports on assessments, as well as policy documents pertaining to assessment, namely *The National Protocol on Recording and Reporting* (DoE, 2005) *and Assessment Policy Guidelines in Natural Science for The Intermediate Phase* (DoE, 2002) were corroborated with interviews and observations to increase the trustworthiness of the research. The document analysis schedule (refer to Appendix 3) guided the process of document analysis.

After a detailed study of the policy documents on assessment, the questions for the pre-observation interviews were formulated. This was accomplished in conjunction with the preliminary literature consulted on assessment and teacher learning. Consequently the use of documents as a data source helped to shape, clarify and refine the questions for the interview schedule (refer to Appendix 1). The issues brought to the fore and the questions that arose as a result of interacting with the documents mentioned above also helped to shape the kinds of questions that would guide the observation of lessons (refer to Appendix 2 - Observation Schedule). Once again, this was not done in isolation, but rather in conjunction with feedback that was obtained from the participants in the pre-observation interviews, as well as in consultation with the literature consulted on assessment and teacher learning.

Engaging with the learning reference materials, teacher lesson plans, samples of assessment activities, teacher records and reports on assessments made available by the participants in the study enhanced the quality and depth of the analysis of data, by enabling this researcher to engage in meaningful discussions on issues that emerged with participants in subsequent interviews. In this way documents helped to shape and strengthen the direction of the study. By enriching what was observed and heard during the data collection phase of the study, the analysis of documents went on to expand and challenge the kind and quality of data that were being produced. This helped to expand portrayals and perceptions of the participants in the study and is in synch with the thinking that documentary research offers a number of different perspectives from which to view a given problem or topic (Ary et al., 2010).

The above discussion detailed the nature of and manner in which the instruments used in the study were employed. The following is a discussion of the procedures used to obtain the data for the study.

4.5 Procedure for Data Collection

The purpose of the initial pre-observation interviews was to gain insight as to what teachers knew about learner assessment and how they had acquired this knowledge. It was also intended to ascertain how participants were implementing assessment in the classroom context, as well as to gain an understanding of what shaped and informed their practices. Before entering the field, questions were piloted in the pre-observation interview of two colleagues, one of whom taught at the same school as the researcher. The other was a colleague from another school (not the school at which this study was conducted). This exercise was an attempt to assess and evaluate whether the data generated as a result of using this instrument were meaningful and relevant to the study. Another significant objective of this exercise was to afford the opportunity of being exposed to an interview situation where the researcher would be conducting the interview. This was envisaged as helping to sharpen and improve the researcher's skills as an interviewer and as a form of preparation for the actual interview sessions in the study. Input and suggestions from the participants were also encouraged to open the path for any changes that might have proved useful in enhancing the quality of the feedback received from the questions. The piloting of the interview schedule was useful in that it boosted this researcher's confidence as an interviewer. It also indicated certain minor adjustments that had to be made. These changes pertained mainly to the order in which questions could be posed, so as to allow for depth of discussion. In the final version of the interview schedule a few questions were reshuffled in terms of the order in which they featured. No question was left out as all were deemed valuable by the participants. This paved the way for the actual data collection process to begin in the field of inquiry.

Upon entering the field of data collection the pre-observation interviews were conducted on the school premises, in the privacy of the office of the head of department and in a vacant classroom with the remaining two participants. Each interview was a one-on-one scenario and was scheduled at a time convenient for the participants. The interviews were guided by the pre-observation interview schedule (Appendix 1), audio-taped and subsequently transcribed. The pre-observation interviews were followed by the observation of teachers in the classroom in an attempt to explore teacher assessment practices within the classroom context. The observation schedule generated (Appendix 2) guided this. A total of 22 lessons were observed, scattered over a period of one teaching term, that is, over approximately two and a half months. The observation of lessons occurred in the second term of schooling. To

supplement the observation schedule used in the observation process, extensive field notes were also taken to assist in obtaining data in this segment of the data collection process.

Finally, post-observation interview sessions (refer to Appendix 4) were conducted in an attempt to understand the events that unfolded in the classroom context. The feedback received from the pre-interview sessions, observations gleaned from the lessons and data gained from analysis of teacher assessment documents formed the basis of discussion in those interviews. However, those interviews were also semi-structured, and probes were used to generate further discussion. Those interviews were also audio-taped and then transcribed. The interviews were iterative in nature and initially involved formal interviews in the same venues used for the pre-observation interviews; thereafter subsequent interviews were undertaken informally at times and places that were opportunistic and according to need. The participants were highly co-operative and obliging in terms of subsequent meetings. These discussions took place informally, where I would speak to the participants briefly at common subject meetings, during casual meetings or telephonically to revisit issues that emerged from immersion in the process of data analysis. These meetings and interviews were always recorded and transcribed. During telephonic discussions notes were taken on the conversations. Issues that emerged telephonically were revisited with the participants. The idea was to clarify responses and negotiate meaning between the researcher and the participants.

The intention at this stage was to understand how teachers explained their practices of learner assessments, as well as to unpack the reasons why they offered the explanations they did. This would enable the study to push the boundaries of teacher learning and assessment and delve into how and why teachers assess the way they do, and what factors shape and inform their thinking. The analysis of documents featured throughout the data collection and data analysis processes (refer to section 4.4.3 for the detailed discussion how this was conducted). Since, according to McMillan and Schumacher (2001), the data collection and data analysis processes occur simultaneously in qualitative research, to build a coherent interpretation of the data it would seem a natural progression to provide a detailed description of how this process of analysing the data unfolded. This will now be discussed.

4.6. Procedure for Data Analysis

Very simply defined, data analysis refers to:

> *"the process of making sense and meaning from the data that constitute the findings of the study"* (Merriam, 1998, p. 178)

The discussion that follows details how the researcher attempted to interact, interpret and analyse the data collected during the course of this study. The analysis of data was begun immediately after the initial interaction with the participants, that being the pre-observation interviews. These interviews were transcribed after replaying the audio-recorded version of the interviews. These transcripts were then placed in a folder and labelled *Pre-observation Interviews*. Data reduction, which refers to the process of selecting, simplifying, abstracting and transforming data that appear in written-up field-notes or transcriptions into themes by coding (Miles & Huberman, 1994; Creswell, 2007), was the first attempt at analysis.

The interview transcripts were first read to obtain an overall sense of what was coming across in this study. Here data were compressed and linked together in a narrative that merely conveyed the meaning that had been derived from studying the interview transcripts. Participants were afforded ample opportunity to freely express their perceptions and views on assessment and learning in the interview sessions, as well as to reflect and expand on these perceptions and views in subsequent interviews. The intention was to enhance the authenticity of the data, and ultimately the study.

The initial attempt at coding, which can be described as "the process of identifying persistent words, phrases, themes or concepts within the data so that the underlying patterns can be identified and analysed" (Morse & Richards, 2002), was predominantly descriptive in nature. Personal notes were also used in the margins of the text, which were referred to as *‚Researcher's Reflections'*. At this first and very basic level of analysis, areas of concern were noted as well as issues that required further exploration and clarification. The intention was to revisit these issues in the subsequent interviews. In the interim, classroom observation visits were conducted and additional data in the form of extensive field notes were acquired. To this end the observation schedule served as a guide in pursuit of data. These notes were placed into a second folder labelled *‚Observation Field Notes.'*

A third file, entitled *‚Assessment Documents'* was also opened for the purpose of storing documents pertaining to assessment. These were documents that participants in the study had

made available to the researcher and included lesson plans, samples of assessment activities and resources pertaining to teaching and learning. At the same time, the researcher continued with the analysis of data (interview transcripts, observation field-notes and documents referred to above, as the data were being collected). The transcripts were read several times. Coding was begun on the transcripts of interviews by analysing the text word by word, phrase by phrase and sentence by sentence. A list of common themes or topics was compiled in the search for concepts that shared common characteristics or similar meanings. The various concepts were grouped into categories by using different coloured highlighter pens. The thinking behind this was to provide a dynamic framework so that potentially disassociated events became coherent and formed a sequence in the stories. This helped me to identify common characteristics and name the categories.

In analysing the categories, the researcher looked for what the participants said they did with regard to assessing learners in the classroom context. At this point any additional or new themes that may have emerged were also given consideration so as to refine the coding system, if this was seen as necessary. This is in line with the thinking of Miles and Huberman (1994), who assert that analysis in qualitative research involves revisiting the data as additional questions arise and new connections are unravelled, as well as when more complex formulations develop along with a deepening understanding of the material. Hence the analysis can be seen as essentially an iterative set of processes.

By referring to the interview transcripts, observation field-notes, lesson plans and assessment activities, the researcher began comparing how educators claimed they assessed learners with what was actually observed by way of their assessment practices. The researcher also compared and contrasted observations and analysis of interview transcripts with the lesson plans of teachers, as well as with the samples of assessment activities. In doing so, notes were made of any similarities or conversely any inconsistencies and contradictions that might have been observed. The researcher then proceeded to plot emerging insights in a comparative frame, where emerging issues were plotted side by side with evidence from the data that had been generated thus far. This assisted in identifying themes and issues to be pursued in the interviews to follow, where possible relationships between the various categories identified could be explored further by probing the participants.

Post-observation interviews were conducted in an attempt to explore the circumstances that might have accounted for any differences that were apparent. In other words, an exploration

of what might have influenced or contributed to the way in which teachers conducted the assessment of learners in the classroom was undertaken. A third folder entitled *„Post-observation Interviews'* was kept to store data retrieved from these sessions. In this way the researcher attempted to bring to the fore the thinking behind implementing such practices. The process of analysing the data obtained from the post-observation interviews was similar to that of analysing the data collected from the pre-observation interviews, with the added benefit of comparing and contrasting data obtained from the earlier interviews, observation sessions and analysis of documents. As a deeper level of analysis was broached, it was envisaged that breaking down the data into themes, sub-themes and categories and then attempting to creatively bring these together again in perhaps a different and new way would reveal different perspectives and insights on teacher learning. In the analysis of data an analytical framework was employed that constituted a combination of two approaches to data analysis. The following discussion serves to highlight the way in which this framework was employed in the study.

4. 7 Analytical Framework

Both *apriori* and grounded theory approaches were employed in the analysis of data and the process of theorisation. The discussion that follows details how these approaches were used in this study, as well as the extent to which these may have influenced each other.

Grounded theory is an inductive type of research. This implies that the analysis of data is based on the data from which emergent themes were generated (Patton, 2002). In this study, the grounded approach was sought as it relates to teacher learning, in that it attempts to theorise teacher learning from the data produced from the assessments of learners by teachers. By using the „constant comparative technique' adopted from Strauss and Corbin (1990), the researcher began to make inferences and theorise around the area of teacher learning from the themes that emerged as a result of the data that were collected and analysed. Similarities and differences were compared in the text of interview transcripts; a search for coherence and incoherence within categories was undertaken and attempts were made to identify the relevance and importance of these categories. In this way, the researcher began to build a theory that illuminated the area of teacher learning. This was not done in isolation, but rather in relation to existing theories within the field of teacher learning. In this way an apriori approach was also sought in the analysis of data, where the literature consulted

informed the data production process and the analysis and discussion of the research findings (Miles & Huberman, 1994).

In addition, the analysis of assessment may also have not necessarily incorporated an exclusively grounded approach, as it was guided by the theory and literature on assessment, including the new framework for learner assessment. Furthermore, themes that emerged from this extensive literature review on assessment were used to design the research instruments. In a deliberate attempt to supplement and extend the current understandings of the area of study, both the data generated from this study as well as the supporting literature on the related fields of assessment and teacher learning were used to support the discussion on the research findings. This are presented as narratives, in the analysis and discussion chapters. A discussion of how the narrative approach was used in the study will now be presented.

4.8 A Narrative Approach to Presenting the Data

A narrative can be described as:

> *"the making of meaning through personal experience by way of a process of reflection in which storytelling is a key element and in which metaphors and folk knowledge take their place"* (Clandinin & Connelly, 1996, p. 16)

According to Carter (1993), a story represents a way of knowing and thinking that is particularly suited to bringing issues that educators deal with to the fore, which makes it a favourable choice for exploring a complex issue such as teacher learning. Furthermore, storytelling allows the participants to translate the data into their own words and reveal the concealed „why' behind their assertions (Lyons & LaBoskey, 2002). In this way, getting to the crux of the issue at hand becomes possible through gaining new and deeper insights into the complexity of practice contexts. In this study narrative stories were constructed from the semi-structured interviews with a view to unpacking the raw data, thereby attempting to explore the meanings that participants ascribed to their experiences of learning about learner assessment. Usually in narrative analysis there is a main theme that steers the story, which in this study refers to understanding how teachers learn about assessment through exploring their classroom assessment practices. In this study commentaries follow each narrative as a way of adding meaning and insight to the experiences of participants in the study.

Selected quotations which represent direct statements made by participants in the study were used in the reporting of the research findings. The narratives were written using a

combination of first and third person voice. Since the questions posed in the interviews were open-ended, it was necessary to rearrange thoughts to allow for a smooth flow in the reading of the narratives. The respective analysis chapters, namely Chapter 5 and Chapter 6, detail the contents of my findings and present discussions on these categorically as themes and sub-themes. A combination of two techniques, namely discourse analysis and content analysis, were adopted to analyse the data generated. The ensuing discussion describes how these were employed in the study.

4.9 Techniques used in Analysis of Data

4.9.1 Discourse Analysis

The central role of language in creating our reality as opposed to merely reflecting reality in a certain way implies that the way we speak or write reveals a whole lot more than we may be willing to acknowledge (Bergquist & Szcepanska , 2002; Borch, 2000; Peskett, 2001). Furthermore, since the way we speak or write is purposeful and not arbitrary (Sheyholislami, 2001), the implication is that we choose to speak or write in a particular manner, whether we are conscious of this or not. By embarking on discourse analysis as a tool to analyse and interpret texts, the manner in which words are used in a particular social context are revealed (Huckin, 1997). It is for the reasons expressed above that discourse analysis has been chosen as a tool to make sense of the data generated in the course of this study.

Discourse analysis is concerned with how meaning is constructed and involves the study of both text and the context (Griffrin, 1994). This primarily involves studying and analysing the text, which basically is a record of an event where something was communicated (Fairclough, 2000). In terms of the present study this would refer to the interview transcripts, observation field notes and assessment planning documents. Through an analysis and interpretation of these sources, ideological facts and beliefs were presented to create identities for the participants. A deeper analysis was then embarked upon and this entailed looking at what angle or point of view was being presented. In other words, framing the details into a coherent whole by looking at teacher learning in context helped to subsequently construct the narratives.

Discourse can be viewed as language in use, and seeing that this process is socially situated, the context - be it historical, social, cultural or political - is of primary importance, especially with regard to how these may influence and shape discourse in context (Candlin, 1997). In

this study an entire chapter (Chapter 5) is dedicated to contextualising the study, so as to set the scene for an in-depth analysis of data. The social context, which constitutes the actual setting, was the school and in particular the classroom in the context of this study. By providing a rich description of the research site and through detailing the profiles of each of the participants in the study as well as by paying attention to background details such as their positions and rankings, their experience and qualifications, among others, it was envisaged that the role that these factors may have played in interpreting the data would have been highlighted. Furthermore, the extent to which these factors might have shaped the thinking of the participants as well as their assessment practices in the classroom context was explored.

By obtaining a detailed view of the issues surrounding learning about assessment, the researcher was in a position to constantly question personal assumptions as a fellow teacher and as a researcher, and to ascertain where she stood in relation to the issues that were emerging from the interaction with the data. The role that these reflections might have played in the production and analysis of data are duly noted. In this way, insights revealed were based on continuous debate and argumentation, which incidentally is a central feature of discourse analysis (Rogers, 2004).

While the merits of using discourse analysis are undeniable and far-reaching, as the above discussion has alluded to, content analysis was also employed as an analytical tool to supplement and enrich the strength and quality of the thesis. The following section deals with the way in which content analysis was employed in this study.

4.9.2 Content Analysis

Content analysis can be described as:

> *"an approach to documents that emphasizes the role of the investigator in the construction of the meaning of and in texts. There is an emphasis on allowing categories to emerge out of the data and on recognizing the significance for understanding the meaning of the context in which an item being analyzed (and the categories derived from it) appeared."* (Bryman, 2004, p. 542)

Kohlbacher (2005) is of the view that since content analysis assumes a holistic and comprehensive approach towards analysing data, it strives to almost completely grasp and cover the complexity of the issue under discussion. The elevated level of sophistication of the

discourses surrounding teacher learning necessitated an in-depth yet flexible approach to analysing the data. Content analysis was seen as being useful to facilitate this objective.

Furthermore, Eisenhard (1989) asserts that the researcher constantly compares theory and data, moving towards a theory which closely matches the data. The following analytical procedures, adopted from Mayring (2003) and Titscher et al. (2000), were used in this study:

- The researcher proceeded to summarise the data (interview transcripts, observation field-notes and documents) in a way that maintained the essential content and by extracting the concrete ideas coming across through paraphrasing the text in a manner that still reflected the original data.

- Subsequently, the researcher began explaining, clarifying and making notes on the data material purely at a superficial level by defining concepts. She subsequently moved on to a deeper level of analysis and began carefully selecting substantive statements or statements that appeared central to the crux of what the participants were saying.

- The data were screened again and segments of the text were selected that explicitly conveyed participant meanings. Full cognizance was taken of the narrow context which refers to the teaching and classroom situation of that particular participant, as well as the broader context of learning, and the implications of these contextual factors in terms of the meaning extrapolated from the data. In short, the data was analysed with references to the context of the total study.

- Finally, the researcher was faced with the task of seeking out a particular structure from the data material. She began to determine the units of analysis, through the careful construction of her themes for analysis. Thereafter categories were formulated as well as the format of the discussion, with evidence located from the data collected, supported by relevant literature. During the course of analysis categories were at times re-examined and revised, when deemed necessary. These included situations where new insights were revealed or when greater clarity was attained for enhanced meaning, especially following subsequent interviews. At this point, the reporting of research and the writing-up of the thesis was begun.

Any demarcated area of study has its shortcomings and limitations, which need to be acknowledged, and if possible addressed to some extent. This aspect is the focus of the following section

4.10 Methodological constraints and attempts to address these

Working within an intepretivist framework necessitates paying attention to two central issues, namely trustworthiness and authenticity. Measures sought to enhance credibility, transferability, dependability and conformability in relation to trustworthiness are detailed in the discussion below.

4.10.1 Trustworthiness and Credibility

Patton (2002) asserts that trustworthiness refers to the extent to which, the findings of a study can be trusted. Triangulation, which essentially involves the use of two or more methods of data collection (Trochim, 2001) was used in this study to enhance the trustworthiness of the research. The use of multiple methods of data collection namely interviews, observations and document analysis, contributed to exploring deeply how teachers learn. The insights gleaned from document analysis and the observation of lessons, were followed with interviews, to enhance the quality of the data that was collected. In this regard, Patton (2002) points to an important advantage of using triangulation of a multi-modal nature, in that the weakness of one data collection technique could be compensated for by the strengths of another technique. A detailed description of how document analysis, observations and interviews was employed in the study to, not only complement one another, but also to increase the trustworthiness of the study, is presented in the section on the procedure for data collection (Refer to section 4.5). Moreover, records were kept (interview transcripts, notes, memos, field-notes, samples of lesson plans and assessment activities and other forms of evidence) pertaining to study. These were systematically arranged and filed for safe-keeping, the procedures of which were explained in detail in the data collection and data analysis sections of this chapter.

According to Trochim (2001), credibility refers to the process of ascertaining whether the results of a study are believable or true from the participant's perspective. To establish credibility in this study member checks were used, as advocated by Patton (2002). Participants were handed transcripts of the recorded interviews as well as the researcher's initial notes on the emerging themes to obtain their feedback on the extent of the interpretation of what they had said. The follow-up interviews assisted to this end, where data

collected from the initial interviews and observation field notes were verified, affirmed, elaborated upon and modified, if it was found necessary to do so. In this sense, participants were afforded the opportunity to reflect on their views, reaffirm their stance or indicate where they felt their perspectives were inaccurately represented, which in turn enhanced the credibility of the study.

By thoroughly explaining the choice of methods to obtain data and the rationale behind these choices, this researcher attempted to increase the credibility of the study. By providing a detailed discussion on the data analysis process employed in the study an attempt was made to present a clear picture of the situation. In an attempt to establish better credibility and trustworthiness, the notion of reflexivity as advocated by Nightingale and Cromby (1999) was adopted in this study. According to Nightingale and Cromby (1999), reflexivity implies an active awareness of the researcher's contribution to the way in which meaning is constructed. Furthermore, reflexivity acknowledges that it is impossible to remain "outside of" one's subject matter while conducting research.

In this study, the researcher declared her position and perspectives in respect to the research at the very outset. In Chapter 1 a detailed description of, among other things, biographical details, teaching experience and background as well as areas of interest were outlined, thereby attempting to address any biases that might have jeopardised the authenticity of the study. Furthermore, this afforded the opportunity to clarify personal assumptions, worldview and theoretical orientation at the outset of the study. The study might have been influenced by personal perceptions and experiences as a teacher. By declaring a personal position and perspectives at the outset of the research, it was intended that the effects of this would be somewhat reduced. Written notes on personal reflections during the course of the study were also kept. These were constantly revisited, amended and modified as new insights were revealed and as the researcher began to interact with the data and ascribe meaning to what was being perceived. Comments were made on how personal interpretations of data began to evolve during the course of the study, a process which was continued throughout the thesis.

The study was conducted at a school at which this researcher was not part of the academic staff. It was hoped that by not having any previous contact or personal relationships with any of the participants before the study, any preconceived notions of these individuals would vary from non-existent to minimal, thereby also reducing the possible effects of such factors

on the study. An attempt was therefore made to be impartial and suspend passing any judgement on their opinions, beliefs and actions.

4.10.2 Transferabilty

According to Trochim (2001), transferabilty refers to the degree to which the results of a study can be generalised or transferred to another context or setting. However, it must be borne in mind that the aim of a case study is not to generalise, but rather to explore and understand events and issues in their natural settings (Flyvberg, 2006). Rather, qualitative researchers speak of the transferability of findings determined by the reader, based on the comparisons of the context of the study with that of their own knowledge (Mertens & McLaughlin, 2004). Hence, the study is explored in a particular context. The contextual factors need to be given full consideration. In this particular study an in-depth and rich description of the research site as well as that of the participants was offered. Furthermore, detailed information pertaining to the context of the study was provided so as to allow readers to decide for themselves whether or not the findings of this study relate to their own school situation or not. In fact, an entire chapter, namely Chapter 5, is dedicated to providing a detailed and rich description of the research site, participants in the study, as well as an exhaustive presentation of information pertinent to the area of study, thereby contextualising the study.

4.10.3 Dependability

Issues pertaining to dependability relate to how one can ascertain whether the findings of a study can be repeated with the same participants under the same circumstances (Veale, 2001). To strengthen the dependability of this study, the original audio-tape recordings of interviews as well as the transcripts of these interviews were stored in files for safe-keeping. Detailed records were kept of personal notes as well as the steps taken during the different stages of the research process, as well as the reasoning behind taking such measures. Furthermore, records of how the participants were selected for the study were also maintained. Notes reflecting the themes that informed the follow-up interviews, details of how data were analysed as well as the verification of findings and drawing up of conclusions, were also recorded and kept.

The purpose of embarking on the procedures detailed above was two-fold: firstly, it served to enhance the dependability of the study; secondly, it also helped this researcher to continuously check on personal biases.

4.10.4 Confirmability

The degree to which the results of the study could be confirmed or corroborated by the participants relates to the issue of confirmability (Seale, 2000; Trochim, 2001). By detailing the sampling procedures with regard to the selection of participants, as well as providing comprehensive coverage of data collection and data analysis procedures, this researcher was in a position to check and recheck the data throughout the study. This process facilitated the identification of potential bias, distortion of research findings and alternative explanations, all of which serve the purpose of further enhancing the confirmabilty of the research findings (Marshall & Rossman, 1999; Trochim, 2001).

When dealing with people, as in the case of this study, it becomes almost mandatory to take cognizance of their rights as individuals and also to respect and protect these rights. The following section discusses the ethics involved in the study.

4.11. Ethical considerations

Ethical issues relate to issues of rightness and justifiability, especially as they concern relations with others or consequences for others (Simons & Usher, 2000). In a nutshell, the researcher should act responsibly. Attempts to address ethical issues that were present within the study are outlined below.

4.11.1 Gaining Access

This study only commenced once ethical clearance was granted by the Ethics Committee of the University of KwaZulu-Natal. In addition, written permission was obtained from the DoE before entering the field of research. Following on from this, permission was obtained from the principal to conduct the study at the school under study. The principal was also presented with a copy of the permission letter and related documentation from the DoE, before the process of data collection was begun. This took care of issues pertaining to access and acceptance to the institution, as Cohen et al. (2001) term it.

4.11.2 Informed Consent, Anonymity and Confidentiality

Permission from participants was obtained by informed consent. According to Simons and Usher (2000), informed consent implies that participants are free from coercion or deception. They should also be provided with an understanding of the following: the process by which the data are to be collected, the intended outcomes of the research process and the uses of the research and, as individuals or groups, the capacity and competence to consent. These aspects were highlighted for the participants at the first meeting. At the end of this session, consent forms were handed out to the participants.

The participants in this study were requested to read and append their signature to the form, consenting to their participation. In the form, participants were made aware of the purpose of the study. Participation was voluntary and the participants were free to withdraw from the study at any given time. The anonymity of participants was ensured through the use of fictitious names and confidentiality of their identities was maintained throughout. All of the above information was present in the consent forms that the participants signed. Furthermore, the times and venues of interviews and observation of lessons were negotiated with the participants and scheduled at times that were convenient.

4.11.3 Power Relations and Negotiated Meaning

Another essential area to be considered with regard to ethics in research is an acknowledgement of power relations that may be present between the researcher and the participants in a study. More often than not, the researcher uses his or her position or status to give greater prominence to certain emergent themes and issues over others, thereby reducing the quality of the data generated (Mohr, 1996). The result is that certain information is privileged over others, thereby marginalising other information which may be equally, if not more, important (Kiegelmann, 1996). It therefore becomes necessary to adopt methods to curb the effects of such power relations that may be prevalent in the study. In this study the researcher was also a level one Natural Science teacher. Therefore, the only possible manifestation of power relations that would perhaps influence the study would be that between the researcher and the participants. To address this, the researcher conveyed the assurance to the participants that their views and concerns were always welcome and that they should not hesitate to let it be known if they were uncomfortable with anything pertaining to the study at any given time. The participants were also allowed to pose questions. The interviews were therefore conduced in a conversational and informal manner.

The study also adopted an approach of "negotiated meaning" between the researcher and the participants (Babbie, 2001). Essentially, the implication of this is that meaning is co-created between the researcher and the participants. An acknowledgement of the researcher's role in creating meaning was the first step to addressing issues associated with negotiating meaning. This was achieved during the post-observation interviews through probes and clarification of responses in an attempt to understand and formulate meaning. The researcher also took into account her own interpretations of these observations, as opposed to only taking cognizance of what teachers believe they actually do with regard to their assessment practices and the rationale of their behaviour. This approach was integral to enhancing the quality of data generated, for reasons discussed in the above paragraph.

4.12. Chapter Summary

In this chapter the methods utilised in the study and the rationale for employing these, were detailed. A discussion of the instruments used and how these were generated and employed, received attention. The actual process of data collection, coupled with the procedures used in the analysis of the data obtained, were also elaborated upon. In addition, methods sought to address the methodological constraints of the study were highlighted. The chapter concluded with a discussion on how ethical issues were addressed in the study.

The ensuing chapter focuses on contextualising the study, thereby setting the scene for the subsequent analysis and discussion chapters.

Chapter 5 – Contextualising the Study

5.1 Introduction

This chapter attempts to set the scene for the ensuing chapter on data presentation and analysis. The chapter commences with a diagrammatic representation of the helix framework, illustrating the confluence of assessment and teacher learning. This is supported by a discussion of how the analysis of assessment led to the analysis of teacher learning. Following on from this, the manner in which the data were presented and analysed is detailed. The chapter offers a rich, descriptive depiction of the research site by detailing information pertinent to gaining a sense of deep insight into the field of research inquiry. To supplement this description, comprehensive profiles of the research participants are presented. In addition, the factors that served to initiate learning about assessment among the participants are elaborated upon. Next, an overview of assessment in the Natural Science learning area and the school's assessment policy are detailed. A discussion pertaining to the potential for integrated assessment and details of the forms of assessment employed at the school in this study form the concluding segments of this chapter.

5.2 The Helix Framework

The scientific notion of the helix adopted from Biology will be used to depict how an analysis of assessment will lead to an analysis of teacher learning. The following discussion attempts to provide the reader with a description of how the relationship between teacher learning and assessment is paired in the helix structure, as diagrammatically represented in Figure 1.

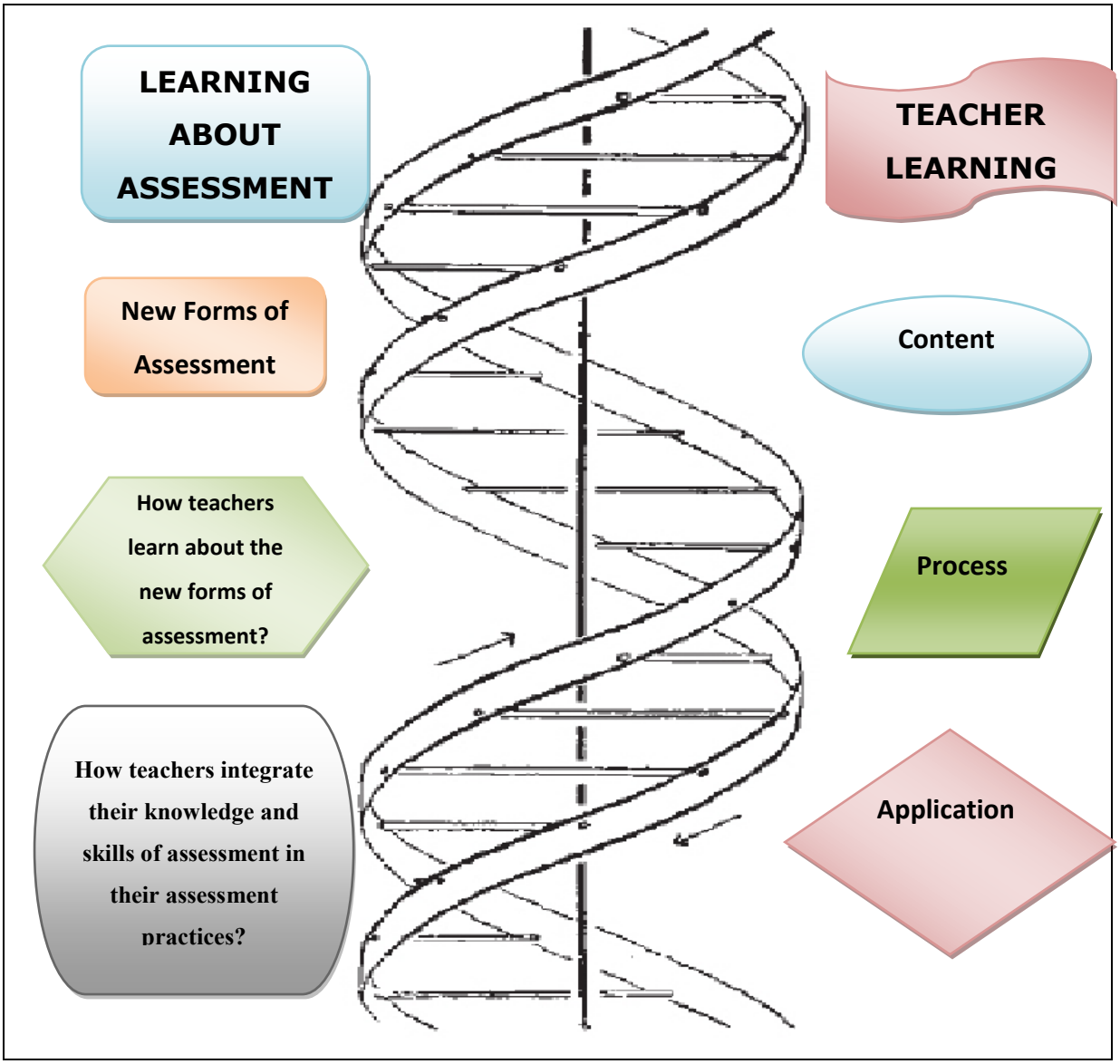

Figure 1 - The Helix Framework Showing the Confluence of Assessment and Teacher Learning

From a purely scientific perspective, the concise explanation that follows is based on information gathered from two sources, namely, Berry and Watson (2003) and Calladine et al. (2003).Deoxyribonucleic acid (DNA) is a nucleic acid that contains the genetic instructions used in the development and functioning of all known living organisms (Berry and Watson, 2003). DNA is one of three macromolecules that are essential for all known forms of life (Berry and Watson, 2003). In science, these large molecules do not simply exist as long straight chains but instead coil and fold into complex forms (Calladine et al., 2003). The helical structure helps to maintain the shape of the molecule and gives it a more stable

structure than when it is unwound (Berry and Watson, 2003). Similarly, teacher learning does not proceed in a linear fashion. Rather, it is an iterative process shaped and influenced by a multitude of factors, which suggests that teacher learning is a large and broad-based scholarship with various complex facets. These facets are detailed in Chapters 6 and 7. Through learning about assessment, this study attempts to explore how teachers learn. Assessment forms the vehicle or the lens through which teacher learning will be analysed. Therefore, the confluence of learning about assessment, and teacher learning is represented in the diagrammatical representation of the helix. Both assessment and teacher learning are informed by the other, and each one forms strands of this helix, as depicted in Figure 1.

Issues pertaining to the content of assessment are associated with issues relating to the content of teacher learning. Learning doesn't happen without learning about something. In the context of this study, that something refers to learning about assessment. In addition, through exploring issues relating to how teachers learn about assessment, the helix framework allowed for an analysis of issues relating to the process of teacher learning. Furthermore, learning does not occur in a vacuum but within a particular context. Paying attention to issues associated with context allowed for an exploration of the manner in which teachers integrate their knowledge and skill of assessment in their assessment practices. Moreover, aspects pertaining to this integration of knowledge and skills in teacher assessment practices are linked to issues associated with the application of knowledge in teacher learning.

Also, an interesting feature of the DNA molecule is its replication. If we apply this analogy to the current study, the possibility of exploring how good assessment practices might be replicated, or copied, emerges. In addition, the notion of a confluence suggests the existence of a unit, where each component of the helix has something to contribute. The helix framework allows teacher learning and assessment to come together towards the practice of assessment that becomes the outcome of the confluence – the choice and thinking that influence assessment practices. In this way, the strands of the helix represented by assessment and teacher learning support each other in a manner that strengthens the relationship between teacher learning and assessment, suggesting that learning about assessment and teacher learning operate side by side. They are mutually inclusive although they are on opposite ends of the DNA structure. In short, learning about assessment and teacher learning parallel one another. Just as interaction between complementary strands of the helix is crucial for all the functions of DNA in living organisms (Calladine et al. 2003), so assessment and teacher

learning interact with one another to provide an analysis of how teachers learn about assessment.

Whilst the above discussion points to the merits of adopting the helix framework to understand how learning about assessment might lead to learning about teacher learning, the framework might be limited in that it could somewhat marginalize the effects of more complex factors, such as individual choice and thinking, that may influence the learning process. Nevertheless, the helix framework offers a useful framework for exploring teacher learning through teachers learning about assessment, as has been highlighted earlier in this section.

5.3 Presentation of Data and Discussions of the Findings of the Study

The presentation of data assumed a thematic approach, where themes that emerged from the interview transcripts, observational field notes, researcher's memoranda and notes and documents analysed were discussed. I included verbatim quotations of the individual participants, as well as selected segments of written text extracted from interview transcripts to highlight and support the themes. Tables to highlight information such as participant profiles or to draw comparisons and enhance meaning are used to display data. The actual words of the participants are shown in italics, and extracts of participants' actual conversations with me are embedded in frames and boxes. The intention was to present the data in meaningful ways that highlight the key findings of the study. Further, in an attempt to contextualise the study, a detailed description of the research site and participants in the study is offered in the ensuing section.

5.4 Description of the Research Site

5.4.1 Locality and Composition of School

Sterling Primary was the name allocated to the school under study for reporting purposes. This is a primary co-educational school located within the North Durban region of KwaZulu-Natal, with a population of 421 learners of varied ethnic, religious, cultural and racial groups. The learners generally ranged from poor to average socio-economic backgrounds.

5.4.2 Resources, Facilities and Activities

The school was fairly well equipped with resources and facilities, such as a school hall, average-sized school grounds and a netball field. Wall paintings and slogans of historical significance were painted on the walls of the corridors and blocks that form the buildings of the school. Specialist rooms such as the art room, needlework room and science room were used as regular classrooms. A wide range of extra- and co-curricular activities, ranging from various codes of sport (soccer, netball, volleyball and athletics) to speeches, debates, quizzes and competitions, were offered at the school. The various fund-raising drives that were part of the school calendar at the time of the study consisted of a variety concert, debutante's ball and market day.

Due to the study being conducted in the Natural Science learning area, the researcher chose to single out and detail the functionality of the science room in order to provide a backdrop against which science was taught and assessed, thereby contextualising the study. The extent to which this would impinge on the way in which Natural Science was taught and assessed needs to be borne in mind. The science laboratory was referred to as the *"Science Room"* at Sterling Primary. Although there was a science room in existence, this was not used as such. Outdated equipment was stored in the back storeroom, and the science room was used as a base room for a Grade 7 class.A budget for purchasing materials required to conduct experiments was non-existent, as other more pressing issues such as funds for lights and water and telephone accounts, among others, received greater priority. The science room was therefore non-functional as a science specialist room.To make up for this deficit, teachers would ask learners to bring materials from home or the teachers themselves would bring these items to class. Alternatively, they would improvise by using materials from the natural environment. These included soil samples, parts of a plant and water, to mention but a few. Furthermore, the participants employed demonstrations that were mainly teacher-dominated, so that the potential for practical work would be explored to some extent.

5.4.3 Personnel

The school comprises 14 permanent level one staff members and two secretaries. Management comprises the principal, deputy principal, one senior primary head of department and one junior primary head of department. Two visiting educators teach minority languages twice-weekly.

5.4.4 Medium of Instruction

The medium of instruction at the school is English; for approximately 97% of the learners English was their first language.

5.4.5 Subject Allocation

Educators concurred that they were not given a choice with regard to the subjects they taught. Their subject allocation was predetermined and dependant on factors such as displacement of staff members, class sizes, notional times, and a number of other factors all outside of their control. The head of department added:

> *"I beg teachers at this school to teach certain subjects, even though they have no experience in teaching them. I tell them to just go and teach. I don't care what you teach."*

5.4.6 Learners

Due to the inclusive education system, educators were confronted with situations where there were learners who fell into the category of those with special needs. Teaching mixed-ability classes compounded this problem. These two factors made it difficult to choose assessment techniques that catered for all these different learners.

5.5 Profile of Participants in the Study

Priya

Priya was an Indian, female educator in her fifties. Her academic qualifications were a Bachelor of Arts Degree, a Higher Diploma in Education and a Bachelor of Education Degree (Honours), all obtained through the University of South Africa. She was a non-science specialist, meaning she had no formal training in the subject. Nevertheless, she taught Natural Science to Grade 4 learners at the school under study. Priya also offered instruction in Economic Management Sciences, English and Social Science from Grades 4-7. Her areas of expertise in terms of her qualifications were English, History and School Guidance and Counselling at high school level. However, she had been teaching at a primary school since the very beginning of her teaching career, meaning that although she was trained to teach in a secondary school (Grades 8 - 12), she taught in a primary school. The reason for Priya's

situation was that when she qualified with her initial teaching degree, the first available position that became vacant for her to occupy was in a primary school.

In total, she had 19 years of teaching experience. Priya was assigned the status of *"Senior Teacher"* as a result of being awarded an overall performance rating of three "goods" within a five-year period (within the departmental appraisal system of integrated quality management system) and for having more than 10 years of continuous service in the teaching fraternity. Although Priya had been teaching for 19 years she did have a break in service for about five years, spent bringing up her biological children in their infant years. Therefore her 19 years of service was not considered continuous by the DoE.

Priya was first exposed to forms of assessment other than tests in Comparative and International Education, which she had a completed during her postgraduate degree. It was here that she was made aware of the different forms of assessment used in different parts of the world. Furthermore, when outcomes-based education was introduced, she was called on to facilitate and pilot classroom activities pertaining to the intermediate phase of teaching. The focus of these sessions was on how to draw up work schedules and lesson plans, rather than on assessment per se.

Priya was enthusiastic about her teaching and this presented itself in various ways. Firstly, she showed an enormous level of interest in the subject. She also used every opportunity to learn more about Science through her own interaction with policy documents, textbooks and learning reference materials and through her engagement with fellow professionals in the field. She prided herself on the positive feedback she received from other teachers about her growing knowledge of the subject.

Priya referred to her learning as being "*self-initiated"*. She explained that this was a result of her not being a science specialist teacher. Priya was of the belief that through delving into the subject matter by herself she was better prepared to confront the challenges posed with regard to assessing learners in the classroom context.

Her lack of qualifications and training in the subject drove her to read and find out more about Science as a learning area. She claimed that she had to familiarise herself with basic scientific concepts and principles before she went on to teaching her Grade 4 learners

Priya added that her will to acquire scientific knowledge was what prompted her to increase

her knowledge base in Science. In this regard, she spoke of the notion of her knowledge of Science as being *"self-taught"*. Her knowledge base was increased through her own reading and research into the teaching of Science. Priya added that with the variation of activities advocated by the new assessment policy, she was still not sure if core knowledge was being covered. She used a variety of textbooks including older ones, as she believed that NCS textbooks were scanty in their coverage of content, especially in their coverage of scientific concepts. It was from these resources that she planned her lessons and compiled her assessment activities.

It was through this process of individual learning that she developed an interest in the subject. As she so enthusiastically asserted:

"It's amazing that how when one is thrown into the deep-end, they try to find their way, but you have to be interested in getting the maximum of that learning experience."

Kajil

Kajil was an Indian female in her late forties. She has been teaching for a period of 24 years. Her academic qualifications included a teaching diploma at senior primary level. She had specialised in General Science in the old order of education. This qualification was obtained at the Springfield College of Education. It was this qualification that had given her the status of a Science specialist teacher, seeing that she had majored in General Science at College. In addition, she completed a Bachelor of Arts Degree through the University of South Africa.

Kajil was assigned the status of „Master Teacher' as a result of being awarded an overall performance rating of three "goods" within a five-year period (within the appraisal system of integrated quality management system) and for teaching for more than 15. All of Kajil's teaching experience was in a primary school and more specifically in the senior primary (Grades 4-7). At the time of this study Natural Science was taught to Grade 5 learners by this educator. She also taught Social Science and Afrikaans to Grades 6 and 7 learners,

respectively.

Kajil was a teacher who believed in compliance. She was of the belief that if the policy and departmental heads stipulated that assessment had to be performed in a particular way, it should be done accordingly. Kajil was also keen to constantly receive the approval of her principal with regard to the way she taught and assessed her learners. She also feared being seen as lacking in any respect by DoE officials and therefore made every effort to present an image of strictly abiding by DoE requirements for that learning area. In short, Kajil appeared to submit to authority.

Kajil was thorough and meticulous with regard to her records, such as lesson plans, assessment activities and recording of learner progress. With reference to the consulting of resources, Kajil admitted that she also used older textbooks to supplement the new NCS ones. Furthermore, she would go through her old files and pull out activities that she deemed suitable for the learners for use in the classroom.

However, she added that she did so in conjunction with using the NCS planning and policy documents. She used the information given in policy documents as guidelines to draw up her assessment activities. Planning for questioning in her lessons was important to Kajil, as she believed that questioning her learners provided her with useful feedback with regard to her teaching. Also, questioning helped keep Kajil informed about the progress of her students and their learning.

Kajil was keen to learn from other more experienced teachers. In addition, she was more that obliging to assist other colleagues who required guidance. This was reflected in the following sentiment: *"We learn from each other all the time."*

Neel

Neel was an Indian male in his early fifties, who had belonged to the teaching fraternity for 27 years when the study was undertaken. He held the position of the Senior Primary Head of Department at the school. Neel had occupied this management position for the past 11 years. His formal qualifications included a teaching diploma obtained from Springfield College of Education. He had majored in Physical Education and History, and was in possession of a

Mathematics and Science diploma over and above his initial teacher training diploma.

This was supplemented with various intensive training sessions in these subjects, which took place on an ongoing basis in the 1980s. Upon entering the teaching profession he was assigned to teach Mathematics. He was recently called upon to teach Natural Science as well. At the time of the study he was teaching Natural Science in Grade 6 and Mathematics in Grade 7. By virtue of his training and experience in these two subjects, Neel was considered a subject specialist in both Mathematics and Natural Science.

Neel did not believe in "blind compliance". Rather, he believed in challenging authority through questioning and engaging in dialogue and debate as well as discussion. Furthermore, he actively resisted change - especially if he perceived this to be counter-productive to the development of the learners. His words: *"It's not about us, but what the learners can do",* bear testimony to this.

In addition, Neel continuously made reference to older planning documents to supplement his planning and was firm on his stance that old, tried and tested ways of assessing learners should still be used in the classroom.

Table: 1 - Profiles of the Participants

	Priya	**Kajil**	**Neel**
QUALIFICATIONS	▪ Bachelor of Education Degree ▪ Higher Diploma in Education ▪ Honours Degree in Education	▪ Teaching Diploma in Senior Primary Phase ▪ Bachelor of Arts Degree	▪ Teaching Diploma in Senior Primary Phase ▪ Diploma in Mathematics and Natural Science
TEACHING EXPERIENCE	19 years	24 years	27 years
PHASE OF SCHOOLING TRAINED TO TEACH	▪ Primary School: Intermediate Phase(Grades: 4-6) and Senior Phase (Grade: 7)	▪ Primary School: Intermediate Phase (Grades 4-6) and Senior Phase (Grade: 7)	▪ Primary School: Intermediate Phase (Grades 4-6) and Senior Phase (Grade 7)

	▪ Secondary School: Senior Phase (Grades 8 & 9) and Further Education and Training (Grades 10-12)		
SUBJECT DISCIPLINES TRAINED TO TEACH	▪ English ▪ History ▪ School Guidance & Counselling	▪ General Science ▪ History	▪ History ▪ Physical Education
SUBJECTS TAUGHT AT THE TIME OF STUDY	▪ Economic Management Sciences ▪ English ▪ Social Science ▪ Natural Science	▪ Social Science ▪ Afrikaans ▪ Natural Science	▪ Mathematics ▪ Natural Science
PROFESSIONAL DEVELOPMENT ACTIVITIES INVOLVED IN	▪ Facilitated pilot workshops in outcomes-based education upon its inception ▪ Attended learning area workshops on NCS in the subjects being taught at the time of study	▪ Attended learning area workshops on the NCS in the subjects being taught at the time of study	▪ Attended learning area workshops on the NCS in the subjects being taught at the time of study ▪ Attended additional, departmental workshops in Mathematics and General Science
DESIGNATION	Senior Teacher	Master Teacher	Head of Department

The learning of the participants in the study was precipitated by two key external initiators: the new policy initiatives and the challenge of being assigned a new subject discipline to teach. Consequently, a discussion of how these initiators influenced the form and contents of participants' learning and how these factors might have influenced the process of learning itself would prove useful in providing a backdrop against which the located study was set. The ensuing section sets out to do this.

5.6. Initiators of learning about new forms of assessment

Essentially there were two crucial factors that exerted a pervasive influence in initiating learning among the participants: the new policy initiatives and the challenge of being

assigned a new subject discipline to teach. The extent to which these two factors influenced the learning of the participants is detailed below.

5.6.1 New Policy Initiatives

With the advocacy of the NCS (DoE, 2002), educators were expected to comply with the expectation of integrating assessment into the process of teaching and learning. This meant that assessment would now form a critical component of the teaching and learning process. A move from summative assessment towards formative means of assessment was what the new assessment policy set out to achieve. This necessitated the employment of both formal and informal means of assessment as a tool to facilitate learning, where various new forms of assessment to assess student learning would be used (Appendix 6).

Adherence to these expectations necessitated the participants' familiarising themselves with the new ways of assessing and thereafter implementing these new forms of assessment in their teaching. The departmental expectations outlined above exerted a pervasive influence on teachers acquiring knowledge about and competence in assessment. The manner in which this learning took place and exuded itself in the assessment practices of the participants, were critical areas of focus within the located study.

Kajil felt a considerable amount of pressure in keeping abreast of curriculum reform initiatives. Furthermore, she was firm on adherence to DoE requirements, as evident in the following assertion:

> *"Changes in curriculum are too rapid to keep pace with, forcing us teachers to change everything we have learnt and knew about assessment and learning. The rule in primary school is pass one, pass all. We cannot fail anyone. Teachers know that they have to work towards preparing all learners to pass, so they are kept on their toes. I do my best to ensure that my assessment tasks are structured in such a way that most learners, if not all, would pass."*

This suggests that Kajil's learning about the new ways of assessment has been as a result of external factors; in particular, the introduction of the new assessment policy. Furthermore, it would appear that her assessment practices were largely influenced by the DoE expectations that all learners should pass at primary school level. This would allude to the fact that a

strong sense of compliance to DoE expectations seemed to influence the way Kajil assessed in the classroom. Kajil's views suggest that from her perspective change was something that is "done to teachers" and therefore to be feared. This created a sense of uneasiness within her with regard to embracing the new, which she viewed as achieved at the expense of discarding the old. By implication, there was a degree of "unlearning" to be done as older habits and procedures were abandoned (Cochran-Smith, 2003).

The feeling of being compelled to incorporate the new assessment forms in her teaching was also shared by Priya. She believed that since the NCS (2002) advocated the use of a variety of assessment forms, she had to incorporate as many forms of assessment that she could in her teaching:

"Well, for one if you look at the NCS documents, there is such a variety of assessment techniques. You have to read the assessment documents and make sense of what is expected. Then you have to try out these different assessment forms with your learners. It may not be possible to use all new forms of assessment with your class, but start with the ones you feel most comfortable with. You have to keep pace with the changes. It's difficult at times, but I do the best I can."

Neel, on the other hand, differed in that he believed that using assessment forms that he had used in the past still worked well for him, so he did not incorporate many of the new assessment forms in his teaching:

"*Documents have too much content to comprehend. These are also too prescriptive. Going through these are very frustrating and annoying. Principals often insist that teachers must work with the subject policy documents as inspectors will come and check. What are they going to check? When subject advisors visit school they give their own suggestions and they are gone. They can't force you to do things. I cross-question them, debate with them or throw back comments and suggestions of my own. This typically results in them justifying their expectations, by saying that these were coming from National level. Shortly thereafter they leave hurriedly never to return. It's like that. I proved that here in this office on more than one occasion."*

The above sentiments expressed by Neel reflect a sense that he would not be forced into doing anything that he felt to be uncomfortable. Furthermore, these sentiments allude to the notion of him challenging authority, suggesting an elevated status and a view that ' I am an expert in my field and I will do what I know works best'. Such a line of thinking cultivates a sense that one's position in the hierarchy of the institution influences to some extent the nature of learning which the particular individual pursues. In Neel's case he seemed to believe that his position of head of department, coupled with his long service in the field of education and his specialised training in the subject, rendered him an expert in his field. Consequently he felt that no one had a right to question his teaching practices, even if such questioning was in the name of promoting knowledge growth and in this way advancing his professional development.

As the discussion above has alluded to, learning informed by policy can precipitate a variety of chain reactions. It can force teachers into a situation where they merely do the necessary to fulfil policy obligations. Kajil and Priya are two cases in point. These two educators, in an effort to comply with policy regulations, embarked on a process of acquainting themselves with departmental requirements, regarding assessment for promotional purposes. Furthermore, they tried to incorporate as many of the new assessment forms as possible in their teaching. In this way their learning served the purpose of succumbing to external demands. The implications of adopting such a stance are highlighted in the following:

> *"... educators seem oblivious of the cultural bias of the present curriculum. They do not think critically about the concepts, aims, approaches, and resources it advocates. They merely try to transmit the curriculum ... They find themselves accomplices in the cultural genocide, albeit inadvertently."* (Manzini, 2000, p. 21)

Whilst the use of the term "cultural genocide" might be construed as extreme in that it appears to overstate the point that Kajil and Priya respond to external demands of administrators in a conformist manner, the term does serve to highlight the possible repercussions of adopting an unquestioning and blind compliance attitude towards external initiators of learning.

Alternatively, external initiators of learning could trigger an attitude of non-compliance, where the opposite effect is created. In the case of Neel, he appeared to be less bound by policy requirements and actively resisted the adoption of new assessment initiatives.

Furthermore he firmly held onto assessment practices that were still rooted in the past, continuously defending his stance:

"These guys don't know what they are doing. Every few years, they come out without something new. That idea doesn't work, so they scrap it and try something else, and this pattern continues. We as teachers have to do damage control, as a result of the aftermath of these so called ‚brilliant changes' being instituted. We are constantly being used as guinea-pigs to try out new ideas that don't pan out the way policy implementers had intended it to. We are caught in a vicious web. Quite frankly, I am tired of succumbing to such nonsense."

While policy initiatives may serve to initiate learning, as alluded to above, policies by themselves don't impart new knowledge but rather provide the platform for teachers to pursue additional learning and transform that learning into new practice (Elmore, 1997). In the case of the located study, the new policy initiatives served to trigger a process of learning among the participants as they began to engage with policy documents to make meaning of the new assessment forms that were being advocated. This set the scene for embarking on further learning, which is detailed in Chapter 6.

In addition to the new policy initiatives, being presented with the challenging task of teaching a new subject also served to initiate learning. Such was the case with Priya. An exploration of how such a situation served to initiate learning for this participant is detailed in the section that follows.

5.6.2 Challenge of Being Assigned a New Subject Discipline to Teach

While the complexities associated with being presented with a new subject to teach was unique to Priya in the study, presenting a case of how such a situation influenced her learning would prove essential in understanding how this participant embarked on her journey of learning. In this way, the learning of content and the process of learning itself would be contextualised in the light of Priya's circumstances. At first, the notion of treading new territory seemed daunting for Priya:

"When I was first appointed to teach science, I was a bit hesitant to do it. I was a little scared, actually. This fear challenged me to find out more. When I started reading around the subject matter, and attending workshops I found it to be quite interesting. Slowly, as I began

to become more involved with the subject, through my teaching, my knowledge of the subject started to increase. This is how I have come to know most of what I know, today. For me, this experience has been a learning curve during which I have gained a lot of new knowledge, especially considering that I did not have a science background at all."

It would appear that Priya's situation of being assigned a new subject to teach triggered her learning. For Priya, such a challenge of being assigned a new subject to teach, coupled with the new policy initiatives presented above (see section 5.6.1), served as initiators of her learning in two key areas simultaneously. This meant that Priya had to increase her knowledge of Natural Science and her competence in assessment at the same time. She proceeded to do this in the following way:

"Educators are often left to their own devices with regards to how to practically use the different modes of assessment in their lessons. Therefore, much of my own learning has been predominantly self-initiated and in most instances self-taught as well. My senior teacher status was really of little help in assisting me in increasing my knowledge in science. Rather, it was this drive inside of me, to increase my knowledge of the subject that led me to find out more. By reading and familiarising myself with the subject matter, through consulting a variety of textbooks, even older ones, I was able to learn more about Science.

In this way, I am able to plan my lessons and design my learning activities. This is done in line with the scope of work to be covered, the learning outcomes to be attained, and the assessment standards to be achieved. Next, I compile my worksheets and assessment tasks. Finally, I conduct the actual lessons with the learners. This is how I have come to learn to teach and assess the subject."

The description presented above served as an initial point of departure with regard to how Priya acquired her knowledge in the subject, as well as how she developed competency in teaching and assessing her learners.

Since the study was located within the Natural Science discipline, understanding the departmental expectations with regard to the teaching and assessing of this subject would

appear critical to contextualising the study. It is on this area that the following discussion will elaborate.

5.7 Overview of Assessment in Natural Science in the General Education and Training Phase of Schooling

Essentially, Natural Science has been grouped into the following four main content areas or knowledge strands termed Core Knowledge and Concepts. These are:

- *Life and Living* focuses on life processes and healthy living, on understanding balance and change in environments and on the importance of biodiversity;
- *Energy and Change* focuses on how energy is transferred in physical and biological systems and on the consequences that human needs and wants have for energy sources;
- *Planet Earth and Beyond* focuses on the structure of the planet and on the earth as a small planet in a vast universe; and
- *Matter and Materials* focuses on the properties and uses of materials and on understanding their structure, changes and reactions in order to promote desired changes (DoE, 2002, p. 5-6).

There are three learning outcomes that constitute the learning area of Natural Science. Within each of these outcomes there exists a set of assessment standards (refer to Appendix 5). Furthermore, the DoE (2002) recommends the use of various forms of assessment, depending on the purpose of the assessment (refer to Appendix 6). The assessment policy for the Natural Sciences stipulates that in Grades 4-6 a total of six formal assessment tasks per year are to be recorded. The breakdown of these tasks is represented below.

Table: 2 – Assessment Guidelines for Natural Science *(DoE, 2002, p. 6)*

Learning Area	**Term 1**	**Term 2**	**Term 3**	**Term 4**	**Total**
Natural Science	1	2	1	2	6

While the requirements presented above account for the DoE expectations with regard to assessment in the Natural Science discipline, the school under study also had expectations of its own with regard to the execution of assessment activities. These are detailed in the discussion that follows.

5.8 The School Assessment Policy

The school assessment policy was proposed by the intermediate phase head of department at the school, and enacted by the educators at the school. Two formal assessment tasks per term in Natural Science were required at the school. One test per term was compulsory. The choice of the other task was to be left to the discretion of the educator. Investigations involving practical work, assignments, projects and poster presentations were among the other possible choices of assessment forms that could be utilised (refer to Appendix 6).

There was no written policy on assessment in place, yet these requirements were strictly adhered to by the participants in the study. Educators were not involved in the process of formulating such a policy but were merely informed at the beginning of the year that these were the assessment requirements at the school.

According to the head of department, the rationale for adopting such a policy was to expose learners to a variety of assessment forms, but at the same time to equip them with the skills necessary for completing tests under stringent measures to prepare them for external tests and examinations that they may encounter in the future. Also, by completing two assessment tasks per term as opposed to one, Neel asserted that learners would be in a better position to pass at the end of each term, allowing them to be successfully promoted to the next grade in the following year. Both formal and informal assessment activities were planned for in the work schedule. The thinking behind this was to ascertain learners' understanding as they learn, so as to steer and guide the process as new learning unfolds.

In addition, the NCS (DoE, 2002) refers to integrated assessment as being something that educators should aspire to achieving. The potential for exploring integrated assessment is detailed in the ensuing discussion.

5.9 Potential for Integrated Assessment

According to the DoE (2002), integrated assessment entails making use of integrated tasks and activities and a variety of methods, tools, techniques and contexts in assessing learner's performance. A comprehensive discussion detailing the implications of integrated assessment for practice is discussed in section 2.6 of Chapter: 2.

It was apparent that the participants viewed assessment as being separate from the process of teaching and learning, hence the potential for integrating assessment into the learning process was somewhat limited.

This became evident in the following sentiments expressed by Neel:

> *"Now you have to teach too many different subjects. There is the thinking that if you are a primary school teacher, you should be able to teach all subjects. What garbage! There are too many learning areas to cover. Further, assessment seems to be the focus in all these learning areas. My personal view is that the primary goal should be to develop competency in these various subjects, rather than making assessment the central issue. That is why I have reverted to my old, yet normal ways of teaching."*

Clearly, assessment was viewed by Neel as a task additional to teaching and something that in fact took away from rather than contributed to the learning process. Kajil expressed similar sentiments, adding that the burden of completing the assessment standards for a particular learning area in a given year posed problems:

> *"We don't finish covering all our assessment standards for a given year, even if we do combine assessment standards. There are far too many. Time is a factor."*

Kajil's sentiments allude to the notion that assessment is something that has to be done and that it is activity that resides outside the realm of teaching and learning. For Priya, on the other hand, increasing her subject knowledge in science was of primary importance. This can be interpreted as fragmented learning, as the realisation that assessment should be seen as part of the teaching and learning process could be somewhat impaired. All three participants seemed to share the philosophy that assessment of learners is an activity that exists

independently of the teaching and learning process. Such a conception of assessment runs counter to the principles of AFL, which advocates assessment as part of the learning process (Kellough and Kellough, 2002; Chappius, 2005).

The nature of assessment activities used and manner in which these were implemented in the classroom served to explore what teachers had learnt about assessment and how this learning had translated into practice. It is this area relating to forms of assessment that the participants used in their teaching that now receives attention.

5.10 Forms of Assessment used in teaching

The utilisation of both formal and informal, means of assessment, were evident in the observation of lessons. This process of the observation of lessons was informed and guided by the use of the observation schedule (See Appendix 3).

5.10.1 Informal Assessments

In the context of this study, informal assessments refer to all those tasks and activities used to provide feedback to the participants about the learning progress of their students. Furthermore, these forms of assessment were not awarded marks or symbol but instead were more of a descriptive nature. The results of these assessment activities were not recorded in mark sheets nor were they reflected in the reports of learners.

Oral questioning, observation, self-assessment, group work, worksheet-based question and answer method and practical work formed the informal components of assessment at Sterling Primary. In the case of the latter two forms of assessment, the worksheet-based question and answer method and practical work, these also formed part of the formal assessment programme at the school. The ensuing discussion details how each of these assessment forms were used by participants in the study.

5.10.1.1 Oral Questioning

The discussion below is based on a combination of data obtained from the semi-structured interviews as well as from the observation of lessons. All three participants made extensive use of questioning as a means of informally assessing learners, as was evident in all of the lessons observed (refer to Appendices 7-9).

Priya believed that feedback was a critical tool in enhancing the learning process. She would acknowledge learners by praising their correct responses and with phrases such as "Good", and "Well done". In addition, she would encourage learners to try again if their answers were incorrect. Learners who did not attempt to answer at all were motivated to try to respond, as Priya directed specific questions to these learners by calling out their individual names.

If no learner response was given Priya would rephrase the question to include the everyday experiences of learners. This she believed would help clarify to the learners what she had meant in the first place. In turn, if this approach failed she would proceed to offer the correct response herself. According to Priya, this would be her last resort as she would rather have learners try to answer than not having tried at all. Furthermore, the entire exercise of questioning learners would help her to identify their areas of strength and weakness, which she believed would in turn signal areas of adjustment in her teaching.

Kajil expressed the significance of using questions in her lessons in the following manner:

"You need to use questions during the lesson to map the way forward. If learners are responding to questions favourably then you can proceed to the next stage."

In addition, Kajil stressed the need to plan for questioning in her lessons, reflected in the sentiment below:

"You have to plan your lesson before-hand. This includes planning for questioning. You must know what you are going to teach and what you are going to ask. Of course, some questions may be spontaneous but, you must go to class prepared at all times."

Kajil used a similar approach to Priya in the assessing of learners, where she would guide learners to the correct answers by using clues and leading questions. She would also praise appropriate responses and encourage learners to try again if they were incorrect in their responses:

"You can't kill a child's spirit or love for a subject by merely labelling their response as wrong. You have to encourage them to continue to try and never to give up."

Kajil's sentiment above indicates a deep knowledge of her learners' emotional status, which alludes to the fact that such knowledge was acquired through years of experience and consequently shows a strong sense of what motivates learners to learn. She also displayed an awareness of what serves to promote a disenchanted state among learners.

Both Kajil and Priya showed evidence of reflecting on their lessons. They would use learner responses to questions as a guide to their learning path. Clearly, analysing learner responses for meaningful feedback became an integral part of the reflection process. The above discussion creates a sense that for these educators to be skilful in analysing feedback from learners they must have possessed deep knowledge of their learners, as well as of the various aspects of the teaching and learning processes.

Neel's approach to obtaining feedback from learners was somewhat different. He would insist that learners should provide reasons for a particular response, irrespective of whether the response was correct or not:

"Learners have to understand ‚the why' behind what they are saying or doing. This will help to assist them in the application of the knowledge acquired to various situations and contexts, which is ultimately what we want to achieve. Knowledge is useless if we cannot access or use it. Very simply put, you cannot understand something if you do not attach any meaning to it.

By exploring the reasoning behind the learner's thinking, I am in a better position to ascertain whether or not learners are truly grasping concepts being taught. Subsequently, the necessary intervention measures can be sought to alleviate any deficiencies or weaknesses identified with regard to learners' understanding of aspects covered. Hence the benefits of such an approach are two-fold."

In addition, after Neel gave his class a written task he would go back and do a quick analysis of the number of learners who gave incorrect answers. He would record these figures on the chalkboard for the learners to view their progress (refer to Appendix 8). Taken at face value, such an approach would appear to be reverting to old assessment practices of grading learners and signal that Neel possessed a cut and dried, black and white, conception of knowledge, where there are either right or wrong answers. Consequently, according to this conception of knowledge there can be no middle ground where possible alternatives can be explored. .

However, to Neel this exercise served to indicate to him where he needed to go back and re-teach a lesson. Neel justified this exercise by asserting that it provided a useful indication of how the learners were performing, as well as how effective his teaching methods were. Neel's rationale for encouraging learners to give reasons for their response would serve to provide insight as to how the learners were thinking about a particular aspect. To this end, Kazemi and Hintz (2008) add that a teacher should be able to ascertain which learner responses are worth questioning or pursuing, as well as being able to help learners express their ideas so that a teacher can attempt to grasp the rationale behind the students thinking. This may also be taken a step further by asking learners to rephrase the idea in their own words, offering input with regard to that idea or suggesting alternative ways of thinking (Ghousseini, 2008).

Such an intense understanding of the use of questioning in the learning process would suggest that teachers need to possess a deep sense of how to skilfully incorporate questions in their teaching. The participants in this study displayed such ability through their continuous employment of a variety of questions in their lessons. It would appear that the nature and tone of lesson dictated when to question. Questions served to challenge the general knowledge of learners by encouraging them to investigate and discover, especially when ready-made answers were not given (Black & Williams, 1998). Furthermore, by examining learner responses evidence of what has been taught and how this has been translated into meaning for the learner can be ascertained (Davis, 1993). This can serve to concretise newly taught concepts and serve as a vehicle to facilitate meaningful learning (McKeachie et al., 2005). The predominant use of questions that can be answered quickly, if not by the students then by the teacher themselves, was evident in all cases. Such questions could be viewed as unproductive since they cater for the lowest level of thinking. In addition, teachers tend to not wait long enough to allow pupils to think out their answers (Black & Williams, 1998). In the located study this was evident when the participants proceeded to provide responses themselves when a learner was unable to answer a question posed (refer to Appendices 7-9). For all three participants repetition served as means of reinforcing key concepts that were viewed as critical throughout the duration of the lesson. This was evident in all of the lessons that were observed. The rationale that the participants used for this practice was that they believed that repetition would assist in facilitating understanding among learners with regards to the core content being covered.

The above discussion serves to highlight the significance of feedback from learners in facilitating teacher learning. From the informal exercise of questioning learners, teachers were able to ascertain the effectiveness of their teaching practices. Hence, in this way the informal assessment of learners provided critical feedback to teachers. This in turn served to advance teacher learning with respect to their classroom practices. In this way elements of Cochran –Smith and Lytle's (1999) notion of learning in practice manifested itself in assessment practices of the participants. While oral questioning was predominantly the vehicle by which the participants informally assessed their learners, various other forms of assessments were used in the informal assessment of learners. These are detailed below.

5.10.1.2. Observation

Observation of learners was highly favoured by Priya:

> *"I love observing children, as in this way I gain a sense of what learners know and what they don't know. In this way I am able to establish how my learners are coping with the tasks and activities that they are assigned. Observing learners with regards to how they carry out an assigned task and how they respond to questions provides useful feedback with regard to informally assessing where my students are at, and where I need to intervene."*

Neel and Kajil shared these sentiments, adding that they observed their learners continuously to look for cues which could indicate whether the learning was successful or not.

5.10.1.3 Self-assessment

Priya used ‚assess yourself' as a self- assessment tool, which she explained in the following way:

> *"Assess yourself questions are done after every lesson that is taught. They are based on the lesson that was just taught. Learners are given a few minutes to respond in their books. We then correct these together, accepting correct alternatives. This provides feedback to both the learners and me as to how they are performing. I then go back and do remedial work if necessary. This is done over and above the oral questions that I ask during the course of the lesson."*

Feedback from these activities provided directives to Priya as to whether or not she should progress to the next section; that is, the pace at which learners were progressing dictated the pace and progression of the lesson. However, Priya used self-assessment as an informal assessment task and never recorded these tasks towards a formal means of assessment or for promotional purposes.

Kajil and Neel did not use self-assessment among learners as they believed that learners were incapable of being fair in judging their own work. In fact, Kajil believed that learners had to constantly be supervised to ensure completion of a given task.

5.10.1.4. Group-work

The use of group work was not favoured by Priya and Kajil, as they believed it was too rowdy and therefore used it to a lesser extent than other assessment forms. When group work was employed it was felt that it had to be controlled and managed in a very stringent manner, as the following sentiment expressed by Priya reflects:

> *"With the new forms of assessment, group work is encouraged, which makes things a bit more interesting. But things can get a bit rowdy, so you have to be firm"*

However, group work was never used in any of the lessons that were observed. Neel admitted that he did not use group work at all as he felt it was too time-consuming.

5.10.1.5 Worksheet-based questions and answers

The worksheet-based question and answer method was used as both an informal and a formal means of assessment. With regard to the informal side of things, questions on a worksheet were given after a lesson was completed. The answers to these questions were reviewed and corrected and then pasted into the learners' workbooks. This was the practice of all three participants.

In addition, the worksheet-based question and answer method featured mostly in terms of formal written assessments. Worksheet-based assessments were typically given to learners after practical investigations and demonstrations were carried out. These were completed in class under the supervision of the teacher. All three participants were united in their belief

that this form of assessment produced good marks among learners and therefore made extensive use of this form of assessment in their teaching.

5.10.1.6 Practical Work

Neel was a firm advocate of practical work as a means of assessment and asserted that it gave every child an opportunity to complete the task in class under the supervision of the teacher, given the challenges with regards to getting learners to complete assignments and projects on their own (refer to section 5.10.2.3).

"You have to be mindful of what you can set and what learners can do. These two aspects are closely related, and if there is a mismatch between the two, the result is poor learner performance. This defeats the purpose of assessment and the assessment activity becomes a futile exercise.

In my experience, kids love doing things, getting their hands busy. They get bored when you only write on the board. They love doing their own thing. We got to beat them at this and make them see things that we want them to see.

Take for example, if I am teaching Volume of Liquids in Class, I would acquaint the learners with measuring jugs and cylinders and get them to pour water and other liquids into these. Thereafter, I would ask them to measure and calculate the volumes of the different liquids.

Since our laboratory is out of function, I would get learners to bring pickle jars and bottles, measuring jugs and baking utensils used for measuring from home to drive the concept home. I would assess the various practical skills being developed during such a task. Don't go straight into formulae and confuse them. Rather demonstrate and show them first."

Neel's positive attitude towards practical work in the classroom was also embraced by Priya. She believed that practical work stimulated interest among the learners, as well as gave a holistic assessment of the child's progress with regard to the development of skills in Natural

Science. Furthermore, assessing the implementation of practical work assisted her in catering for all the learners in her class, as is reflected in the following sentiments:

"You have to cater for those children who would not be able to answer your questions in a test format. So, that is where your practical work plays an important role. You make them do things.

For example, if you were to ask the learners to draw and label all parts of a plant, most would not be able to. But if you bring in a plant and then ask them to observe it, the response would be very different. They would be able to draw at least one or two parts of the plant, if not all. In this way, you can have a mark for even the weakest child, so all learners are given an opportunity to progress"

All three participants employed practical work that predominantly took the form of teacher-led demonstrations. Learners observed the demonstration and were then questioned about what they had just observed. Scientific explanations for phenomena observed were then offered by the teacher. Following on from this demonstration and whole class discussion, learners would be presented with a worksheet with questions resembling those that were posed orally in class. Learners had to complete the worksheet by providing answers to these questions. The mark obtained for this task would be recorded for formal assessment purposes. The lesson on Static Electricity observed and detailed (refer to Appendix 7) is a case in point. The discussion below is based on the lesson detailed in Appendix 7.

Kajil explained the manner in which she used practical work as a means of assessment in the following way:

"I improvise, by using demonstrations that are, more teacher- dominated. I then get learners to observe these and complete the answers to questions based on these demonstrations in the class. Although, I would love for learners to do experiments on their own, discover things for themselves, see how the thermometer rises, for example, but we can't do this because of the lack of equipment.

Let us take the example of yesterday's lesson on Static Electricity. The first thing you want them to understand is: What is Static Electricity? So, you have to do certain things, like rubbing the ruler on your hair and holding it over bits of paper and see what happens. So,

here we have to do our experiments first. We can use different kinds of objects as well like tissue paper, foil, hair and grass and whatever you can think of. The kids enjoy this. Once you have finished the experiments, you ask them what they saw, what happened?

They will start to explain this in their own words, such as rubbing, touching, etc. Already, they are starting to conceptualize Static Electricity. From this point on, your lesson takes off. Develop upon this. Ask them questions that arouse their curiosity, such as, is everything attractive? Why? This gets them thinking, and they start to reason.

From here you get them to draw up tables and compare objects. You go step by step. And then, you relate it to nature. Move to precautions. Why is static electricity dangerous? They know it is dangerous, but they don't know why. You explain to them and give them examples. Then you go on to measuring, recording and drawing up tables. So you are developing many skills concurrently."

While practical work assumed the form of being predominantly teacher-led demonstrations, as presented above, the potential for practical work was also explored to some minimal extent in the case of all three participants.

5.10.2 Formal Means of Assessment

Within the context of this study, formal assessment tasks referred to those tasks to which marks or symbols were awarded for promotional purposes. These marks and symbols were recorded in mark sheets and reflected in the term-end reports. Worksheet-based question and answer methods of assessment and practical work also formed part of the formal components of assessment as detailed in sections 5.10.1.5 and 5.10.1.6, respectively. In addition, posters, homework, assignments, projects and tests were used to formally assess learners. The following section details the nature of these tasks employed by the participants in the located study.

5.10.2.1 Posters

Kajil often used posters as a means to assess learning as she believed these were easier for the learners to identify answers. She added that posters encouraged creativity among her learners and it was an area where learners could easily score marks, thereby making up for any deficit

that might have been present as a result of poor test scores. These posters were proudly displayed on the walls of her classroom.

Priya's use of a poster as a form of assessment was limited to once a year, while Neel considered posters to offer no value in assessing learners and therefore did not use them in his lessons at all.

5.10.2.2 Homework

All three participants believed that assessment tasks given as homework did not yield the desired effect because these were returned incomplete or simply not attempted at all. The assessment tasks completed by a few learners were often done by their parents. This became problematic with regard to assessing the child's aptitude. A detailed discussion of the challenges associated with assigning homework tasks to learners as a form of assessment, is detailed in section 5.10.2.3, below. Consequently assessments were confined to class work involving participation of all learners.

5.10.2.3 Assignments and Projects

Neel added that projects and assignments involving the learners at Sterling Primary were not practical. He elaborated upon the reasons for this in the following manner:

> *"As much as I know projects and assignments are nice things to do, these are just not workable and practical. Many learners don't like to read. Others can't read. They don't have the necessary tools at their disposal to conduct the research. The bulk of the learners fall into one of these categories. Only brighter learners would actually complete a research assignment, given these factors."*

In light of the challenges presented above, Neel confined the use of assignments and projects in the formal assessment of learners to one project and two assignments for the year. These were conducted in class under his direct supervision.

Kajil, on the other hand, felt a little more confident in using assignments and projects in the class. In fact, at the time of the study Kajil had given her learners the task of making a water-wheel as a project for formal assessment purposes. However, the manner in which she used

these assessment forms was highly structured and very much teacher-regulated, as she explains below:

> *"I go step-by-step when I give a research assignment or project. I structure it so as to guide learners as to what information they should be looking for. If the assignment is given in a question format, the questions needed to be read and explained to learners, before they could be answered.*
>
> *Whilst we try to encourage independent work and promote the development of research skills among the learners, projects and assignments need to be guided by the teacher, from start to finish, for the successful completion of these. Therefore such tasks are always done in class under the supervision of the teacher"*

Priya used assignments and projects to assess her learners in a similar way, as is reflected in the following sentiments:

> *"I allocate time slots, usually my double periods, to complete assignments and projects given as formal assessment tasks. If it is an assignment, I usually use the school library to obtain reference materials for the learners and make these available to them for use in class. I take them through the whole process of completing the assignment in stages. This is done over a period of a few weeks until the task is completed. Therefore, I can only do one assignment or one project per term."*

All the participants agreed that projects and assignments helped them to gauge whether learners had understood their work or not. Consequently they all made attempts to incorporate these assessment forms in their teaching. However, these assessment forms were highly structured and teacher-regulated every step of the way, as the discussion above suggests.

5.10.2.4 Tests

All participants had to comply with the school assessment policy, which means they had to administer a test to the learners every school term, as Priya says:

"When it comes to tests, we have to do the controlled tests. We always did this .We have a first quarterly test and a third quarterly test. We also have the Mid-Year Test and the Final or Year-end test.

As for the other assessments, we have divided and varied these. For example, we give an assignment one term, a project another, and so on because we have to do it that way. These assessments supplement the tests, with regards to the formal side of assessment."

Since Priya viewed tests as being inadequate in that they don't test the processes and skills that learners have acquired and developed during the learning process, she also used posters, assignments and projects to formally assess learners.

When setting tests, Kajil would structure the questions in such a manner that would cater for the mixed-ability classes that educators at Sterling Primary were confronted with. She explained this in the following manner:

"Our tests have to be set at a very low level. You have to include different levels of testing in your paper. At least 60% of your paper should include questions that all learners can answer merely by recalling work covered in class. 30% of the test will require some thinking through and reasoning. The other 10% is designed for high flyers, where application is required. This allows for all children to pass, so no child should fail.

We teach the work for the term and then do revision in the form of written work. The questions asked in these exercises are similar to those that will be in the test. We mark and correct these revision exercises and then urge the children to learn these. We give the test, which half of the learners fail anyway. To make up for this deficit, I also use poster-making, assignments and projects to assess the learners to increase their chances of passing."

Neel's personal view on tests was that he believed there was a place for tests but that these should be used in conjunction with other modes of assessment. His reasoning was that utilising varied forms of assessment that would best suit the learners was a fair practice to afford all learners a chance to succeed:

"Our tests assess work covered for that specific term only. We cannot give a test that also covers work completed in previous terms as our learners are too young for this. They can't remember work covered in the first term, in the fourth term. Their level of capacity is such that they can only take in so much and no more. This is why I prefer using formative means of assessment in my teaching. Regularising assessments and tests is something that is also important."

Clearly all three participants used tests as the predominant means of formally assessing their learners. The fact that using a test to assess learners every term was an accepted normal practice bears testimony to the significance that participants attached to tests over other forms of assessment. The data presented in section 5.10 above are summarised in the following table in an attempt to offer a birds-eye view of the nature of assessment activities that the participants used in their teaching practices.

5.10.3 Summary of Forms of Assessment

Table: 3 - Forms of assessments used by participants

TYPES OF ASSESSMENT ACTIVITIES	Priya	Kajil	Neel
1. ORAL QUESTIONING	▪ Used as a tool to obtain feedback about the performance of learners. ▪ Featured as the most popular means of informally assessing learners.	▪ Used as a tool to obtain feedback about the performance of learners. ▪ Featured as the most popular means of informally assessing learners.	▪ Used as a tool to obtain feedback about the performance of learners. ▪ Featured as the most popular means of informally assessing learners.
2. OBSERVATION	▪ Used on a daily basis ▪ Informal means of	▪ Used on a daily basis ▪ Informal means of	▪ Used on a daily basis ▪ Informal means of

	feedback	feedback	feedback
3. SELF-ASSESSMENT	▪ Used as an informal means of assessment ▪ Employed this approach on a regular basis	▪ Did not use this approach at all	▪ Did not use this approach at all
4. GROUP WORK	▪ Used to a minimal extent ▪ Used as an informal means of assessment	▪ Used to a minimal extent ▪ Used as an informal means of assessment	▪ Did not use this method at all
5. HOMEWORK	▪ Tried and tested in the traditional sense, but did not prove effective ▪ Modified to include designated time-slots for the completion of tasks in class Used as part of the formal assessment programme	▪ Tried and tested in the traditional sense, but did not prove effective ▪ Modified to include designated time-slots for the completion of tasks in class ▪ Used as part of the formal assessment programme	▪ Tried and tested in the traditional sense, but did not prove effective ▪ Modified to include designated time-slots for the completion of tasks in class ▪ Used as part of the formal assessment programme
6. WORKSHEET-BASED QUESTION & ANSWER METHOD	▪ Used as both a formal and informal means of assessment ▪ Guided by the teacher ▪ Featured prominently in lessons	▪ Used as both a formal and informal means of assessment ▪ Guided by the teacher ▪ Featured prominently in lessons	▪ Used as both a formal and informal means of assessment ▪ Guided by the teacher ▪ Featured prominently in lessons

7. Practical work	▪ Used as both a formal and informal means of assessment ▪ Very much teacher-dominated and often presented itself as teacher-led demonstrat-ions	▪ Used as both a formal and informal means of assessment ▪ Very much teacher-dominated and often presented itself as teacher-led demonstrat-ions	▪ Used as both a formal and informal means of assessment ▪ Frequently used this approach in the execution of his lessons ▪ Afforded learners a degree of autonomy with regards to exploring practical work, but to a limited extent
8. Posters	▪ Utilised as a formal means of assessment. ▪ Limited to once a year	▪ Utilised as a formal means of assessment. ▪ Used twice a year	▪ Did not utilise this assessment activity at all
9. Assignments & projects	▪ Used as part of the formal assessment programme ▪ Completed in a highly structured manner, under the direct supervision of the teacher	▪ Used as part of the formal assessment programme ▪ Completed in a highly structured manner, under the direct supervision of the teacher	▪ Used as part of the formal assessment programme ▪ Completed in a highly structured manner, under the direct supervision of the teacher
10. Tests	▪ Compulsory test given every term (As per school assessment policy.) ▪ Recorded as part of a formal assessment	▪ Compulsory test given every term. (As per school assessment policy.) ▪ Recorded as part of a formal assessment	▪ Compulsory test given every term (As per school assessment policy.) ▪ Recorded as part of a formal assessment

	task	task	task

5.10.4 Concluding comments

It would appear from the above presentation of assessment practices used that participants in the study tended to gravitate towards assessment activities that they were familiar with, and that they were confident in using. These were predominantly oral questioning and the worksheet-based question and answer method. Furthermore, participants tended to steer away from using the other forms of assessment such as group work and homework, as they felt ill-equipped to facilitate such activities. With the exception of Kajil attempting poster-making and Priya using self-assessment in her teaching, it would appear that the participants felt more comfortable utilising assessment means that they had utilised in the past. These included assignments, projects and tests. In addition, the nature of the assessment tasks was still very teacher-dominated, where participants determined the assessment forms they would use in their teaching and where they were very much in charge of the execution of planned assessment activities within the classroom context. This is in line with the thinking that educators lack the confidence to expose learners to unrestricted and new experiences that are free of predetermined procedures (White, 1996).

Since teachers see introducing their learners to new forms of assessment as revealing their own shortcomings, they prefer to choose the safer option of using worksheets that tend to guide one to acceptable responses where textbook-held „truths' are expected (Fosnot, 1996). The possible repercussions of adopting such an approach are that it might fail to consider alternative options or explanations, with regards to assimilating and understanding newly presented concepts. Geelan (2000) and Yumuk (2002) argue that the adoption of such an approach to assessment often fails to develop and extend the learners' current conceptual schemes. The implications of this assertion is that adopting such a stance could run the risk of promoting a particular way of viewing the world, at the expense of exploring other possible conceptions or ideologies through which one might begin to contextualise, and conceptualise, newly acquired knowledge.

Furthermore, participants seemed to feel that by merely including some of the new forms of assessment in their teaching, they were in fact embracing the notion that assessment should form part of the teaching and learning process. This is in congruence with the notion that continuous assessment is sometimes misunderstood as continuous testing and project work

(Hein & Lee, 2000) The implication is that such narrow thinking could severely hamper the full potential for integrating assessment into the learning process, as part of continuous assessment.

5.11 Chapter Summary

This chapter provided a descriptive analysis of the research site, participants and the practices at Sterling Primary School. In this descriptive analysis of the research site, an elaboration of the analytical framework showing the relationship between assessment and teacher learning that guided the study process was presented. In addition, the manner in which the descriptive data were presented and analysed was explained. A detailed description of the research site as well as the research participants was presented. An account of the factors that initiated learning among the participants was also detailed. Furthermore, an overview of the Natural Science learning area was presented, as was the school's assessment policy. The latter segment of the chapter focused on the potential for integrated assessment and the forms of assessment that the participants in the study used. The ensuing chapter attempts to present a detailed account of how the participants in the study acquired their learning about assessment, and further, how this learning manifested itself in their classroom practices.

Chapter 6 – Valuable Insights Revealed: A presentation and analysis of the key findings of the study

6.1 Introduction

The focus of this chapter is on presenting the findings of this study and on exploring its implications for teacher learning. The previous chapter presented short biographies of the participants of the study that is intended to help us understand how each of the teachers responded to the learning of new forms of assessment alluding to issues of teacher learning. The previous chapter also detailed a helix model that explains the interrelations between learning about assessment and teacher learning, knowing that this study set out to explore the broader concept of teacher learning. The helix conception frames the way the data are presented and analysed. Briefly, the process and content of learning about assessment formed the basis of the data presentation and through this presentation issues of teacher learning are illuminated, analysed and discussed. Theoretical constructs of teacher learning as presented in Chapter 3 influenced the organisation and categorisation of the data and the analysis thereof within this chapter.

The present chapter begins with an elaboration of how the themes in this chapter were constructed from the data. This is followed by a detailed presentation of the nature of training that the participants had undergone, with regards to the new assessment strategies as advocated by the NCS (DoE, 2002). This section of the data presentation reveals the nature and extent of teacher development that teachers were exposed to during the training sessions. Following on from this, participants embarked on their own journey of learning about the process of assessment, which is detailed next. The manner in which such learning manifested itself in the assessment practices of the participants is also presented. This section of the chapter focuses on a deep analysis of the form and nature of learning that the participants engaged in, in their pursuit of learning about the process of assessment. The chapter concludes with a discussion surrounding the implications of the findings of the study for teacher learning.

6.2 A Description of the Construction of Themes from the Data

This section attempts to provide an elaboration of how the sections that form this chapter have come to be, through a detailed analysis of the data. The intention behind this section is

to provide the reader with an understanding of how the themes were constructed from the data. The themes that are presented, in this chapter, were constructed from a detailed analysis of the documents pertaining to assessment, and an in-depth study of the field- notes that highlighted the insights gleaned from the observation of lessons. Moreover, a detailed study of the tape-recordings and the transcripts of the pre and post-observation interviews, helped to identify the themes. I proceeded to construct the themes by initially reading through the interview transcripts, observation field-notes and documents, several times. I proceeded to summarise the main ideas that clearly presented themselves in the data, in a manner that predominantly maintained the essence of what the data was reflecting. I began to code the transcripts of interviews by analysing words, phrases and sentences within the text. This helped me to draw up a list of common categories, in the search for similarities in ideas. By using highlighters, I grouped common categories together, to form coherent, sequential narratives. This process helped me to identify common characteristics and name the themes.

As I moved onto the next level of analysis, I began to make notes, and attempt to superficially explain key concepts that were permeating in the analysis of the various forms of data. This progressed to me clarifying and exploring further what appeared to be crucial ideas that were coming through in subsequent follow-up interviews, as I attempted to ascribe meaning to the data that was emerging. As I moved onto a deeper level of analysis, the data was screened again, but this time for identifying parts of the text that were explicit in the manner in which these communicated what the participants were trying to say. Moreover, I analyzed the meanings in relation to their context of work and their context of learning, paying particular attention to the contextual factors that could have contributed to or shaped their understanding of the issues. Next, I attempted to construct categories of analysis, or themes whilst simultaneously seeking evidence from the data collected, as well as from the literature consulted. I finally proceeded to break down the data into themes, sub-themes and categories and then attempting to creatively reconstruct these in perhaps a different and new way would reveal different perspectives and insights on teacher learning.

An important consideration is that throughout the process of constructing themes, I continuously re-examined and revised the emerging themes, as I began to deeply engage with and immerse myself in the data. Through these processes of engagement and immersion in the data, I began to explore the meanings that participants attached to the issues that emerged during the data collection process, in relation to who, they were as individuals in terms of their, qualifications, levels of teaching experience, subject specialization, designation, the

nature and kind of professional development activities that they were involved in. Just to illustrate by way of example, the aspect of the nature and kind of professional development activities that participants were involved in, helped me to identify the theme on Training workshops as a Possible Avenue for Exploring Off-Site Learning (see section).

The above discussion served to highlight to the reader, the manner in which the themes that form the greater segment of this chapter, were constructed from the data. The ensuing section details the kind and nature of the training that the participants in the study had received on the new forms of assessment.

6.3 Training Received by Teachers on the New Forms of Assessment

6.3.1 A Presentation of the Training Sessions

6.3.1.1 Initial training received by the Department of Education (DoE)

With the advocacy of the various new forms of assessment, as spelt out in the NCS (DoE, 2002), educators were expected to attend departmental workshops with regard to implementing these forms of assessment. The events of the training depicted below were constructed from interviews with the participants. In this way key elements of the training sessions were established through these interviews. Furthermore, all three participants in the study were from the same school and they all attended the same initial training session on assessment.

The three participants in the study had received training in assessment in a once-off two-hour session at a single workshop, delivered at the local district teacher's centre. The training commenced at half past twelve and terminated at half past two in the afternoon; the workshop took place in the third term of the previous academic year. The workshop was conducted by facilitators who were educators from different schools that were called upon by the DoE to cascade the information pertaining to assessment.

At these sessions participants were advised to refer to the policy documents for that specific learning area, when planning for assessment. Furthermore, participants were asked to ensure that they covered all the learning outcomes and assessment standards for that particular grade, as stipulated in the policy statement. At this forum it was emphasised that acquiring these learning outcomes and assessment standards was non-negotiable.

Other areas of content that were covered at these training workshops, included:

- What is meant by assessment?
- The purpose of assessment
- Assessment in the GET (General Education and Training) band (Grades R-9)
- Assessment Planning Documents
- Assessment Strategies
- Formal and Informal Assessment
- Keeping Assessment Records.

The above aspects were explained through the aid of transparencies by the facilitator. Information was cascaded through a verbal transmission mode. The workshop concluded with participants being handed booklets containing notes on each of the above aspects.

Teachers were then handed evaluation forms to assess the quality of the workshop they had just attended. Participants were informed of follow-up workshops on assessment that would be learning area-specific, scheduled to take place at the beginning of the following year.

6.3.1.2 Follow-up training workshops by the Department of Education (DoE)

The follow-up workshops took place in the first term of the following year, where teachers were called to learning area workshops, dependant on the learning areas they taught. Once again these workshops were hosted by the DoE, but this time it was the subject advisor for that specific learning area who conducted the training in that particular workshop. Each learning area workshop was of one day's duration, from nine o'clock in the morning to three o'clock in the afternoon.

Consequently Priya attended four workshops in total; one for Natural Science, one for Economic management Science, one for Social Science and one for English, as these were the learning areas that she was teaching at school. Kajil attended three workshops, in Natural Science, Social Science and Afrikaans. Neel attended two workshops, one in Natural Science and one in Mathematics. Aspects covered at the Natural Science training workshops included:

- Unpacking the assessment standards for Natural Science
- Core knowledge to be covered in Natural Science
- Recording assessment
- Types of assessment used in Natural Science

- The requirements for progression
- Designing assessment activities
- A suggested learning programme and work schedule
- Moderation of assessment tasks
- The formation of Cluster Committees.

These aspects were also covered at the training workshops in the other learning areas as well. However, these aspects were applied to that specific learning area. The morning session was predominantly facilitator-dominated, where the facilitator jotted down key points on a whiteboard to aid his presentation. During the course of the morning participants were given handouts to refer to as the presentation progressed, containing information on aspects being presented.

After the tea break teachers were put into four groups of six each, where each group was assigned one of the four strands that constitute core knowledge in Natural Science. The themes were:

- Matter and Material;
- Energy and Change;
- Life and Living; and
- Planet Earth and Beyond.

Educators were handed an A3 white sheet of paper with black marker pens. In addition, they were asked to make reference to the learning area policy documents, which they were requested to bring along to the workshop. The subject advisor then proceeded to explain the nature of the task to be completed.

Educators were asked to choose one topic that fell under the domain of their assigned strand. Each group had to then design an assessment activity for any grade from 4 to 6 that they would use with the learners in their classroom. Firstly, participants would have to state the assessment standards that the activity designed would cover. Secondly, they were also requested to detail how they would use that assessment task in their teaching. Furthermore, they would have to explain the criteria that they would use to assess that task. Each group was given 45 minutes for this task, during which they would have to prepare a poster presentation for the rest of the group.

After lunch presentations took place. At the end of each presentation the rest of the group was afforded the opportunity to pose questions or alternatively to offer their input and suggestions. To consolidate the activity, the facilitator offered his input with regard to the presentations as a whole. At the end of the day educators were handed additional assessment documents to read and understand on their own. These included exemplars of work-schedules and learning plans for that learning area. The teachers were then asked to develop their own learning assessment activities for the year when they returned to school.

The subject advisor informed the teachers that he would be visiting the various schools for moderation purposes and to check if assessment was being implemented in a way that complied with the policy pertaining to that learning area. In addition, teachers were handed the contact numbers of the subject advisor for that learning area should they encounter any difficulties or have any enquiries. At the conclusion of the workshop teachers were expected to complete an evaluation form to assess the success of the day's training workshop.

6.3.1.3 The Impending Formation of Cluster Committees

At the time of the study participants were awaiting the formation of learning area cluster committees, which was scheduled to take place the following year. Mention was made of this at training workshops but it had not materialized at grassroots level. The subject advisor for Natural Science, who also facilitated the follow-up workshop presented above, highlighted the expectations and role functions of cluster committees, which were expected to commence the following year. Basically, clusters were to be formed for each subject where groups of four to six neighboring schools were expected to join forces to meet frequently in order to exchange ideas about their teaching and assessing in that subject. In addition, through this forum assessment tasks set by individual schools were expected to be moderated and monitored to ensure uniformity, while concurrently enhancing the quality of assessment tasks. It was expected that the subject advisor would select the various schools that would make up a cluster committee, based on locality. This would result in a list of the various clusters of a district being compiled by the subject advisor and being made available to the different schools.

Each cluster committee was then expected to nominate a coordinator. The subject advisor would have to communicate with the coordinator about issues pertaining to that learning area. Such information would then be cascaded to the teachers. Hence the cluster coordinators

would be expected to serve as the link between curriculum officials and teachers. The coordinator would be tasked with setting up meetings for development and support in that particular area. Furthermore, he or she would be responsible for pairing of schools within a cluster that were in close proximity to one another. This was for the purpose and convenience of the moderation process. The coordinator was also expected to draw up a roster of when schools in a particular cluster would meet to moderate neighbouring school's assessment tasks and vice versa.

The process of introducing the new forms of assessment to teachers as enunciated in the new assessment policy document suggests a five-tier approach to teacher learning. The first tier is largely broad-based, used primarily for the purpose of initiating teacher development through a cascading approach and attempting to reach the masses of teachers. The aim appears to be transmission of information, hence the use of facilitators who were also educators and who may have received some form of training at a national or provincial level. The second tier of teacher development is more focused on subject specialization learning and led by subject advisors. The learning area clusters are largely formed by teachers teaching the same learning area, hence the training is more focused on initiating integrated learning, aligning process and forms of assessment with subject content knowledge. The third tier of engagement is driven by contextual learning, where teachers of neighbouring schools who teach the same subject learning area are brought together to develop common approaches to assessment, taking cognizance of the contextual realities of the school, the learner population and the available school resources in designing and implementing the new forms of assessment. In this tier of teacher development, contextual learning is promoted through the interpretation and sharing of ideas, as well as experiences among teachers teaching in the similar context, and is led by a co-ordinator chosen from among them.

The fouth tier of engagement pertains to the learning that unfolds at school level. In this tier of teacher learning, site-based learning guides the learning process through a consideration of contextual realities that teachers within a particular school environment are confronted with. Furthermore, as teachers within that particular school context become involved in learning conversations and interactions that allow for the exchange of ideas and experiences with colleagues from the same staff of teachers, so their learning is enhanced. The fifth tier narrows the engagement in teacher learning to that of the individual teacher, as he or she makes sense of the new assessment forms and process in his or her daily work. The five-tier

approach to learning suggests an all-inclusive, sustained approach to teacher learning, spanning advocacy to individual learning initiatives.

The fact that participants were alerted to future learning support in the form of cluster committees could be intentional. Perhaps it was a way of setting the scene for learning to be sustained so that teachers could maintain the momentum with regard to learning. Alternatively, one could view this as a deliberate attempt on the part of curriculum developers to send a clear message to teachers which would indicate that the learning that transpired at the workshop training sessions was limited in scope and therefore needed to be developed further. In this way teachers would be encouraged to extend this learning in the pursuit of deep learning, as they began to relate what they had learnt to their own individual circumstances. In short, this initial learning could be viewed as having sowed the seeds for further learning to take place within the context of teachers' work. In either case, the learning that did transpire at the training workshops would have contributed to promoting learning among teachers.

Priya and Kajil both viewed the possibility of forming cluster committees as "a ray of hope" and as being helpful to them in their teaching. They believed that through this forum they would get the much-needed guidance and support that they professed was not forthcoming from the DoE. While Neel seemed optimistic at the prospect of forming cluster committees in the near future, he was suspicious of the intention behind the idea:

> *"Teachers view clusters as problematic, as many see these as the department's way of passing the buck onto teachers. Personally, I see these as a way out, by providing an avenue to get something meaningful done. We can learn from our colleagues. Now, we can do what we need to do for learners in our schools. My principal is also positive about the clusters. I can't wait for these to filter down to our schools."*

While Neel displayed skepticism about the functional value of cluster committees, he also seemed to feel that such committees could provide the platform for meaningful learning to transpire among teacher professionals. The apparent contradiction in these sentiments almost reflects the view that he did not want to credit curriculum developers for providing such a forum for the benefit of teachers. Rather, he felt that it was a way of departmental officials getting teachers to do the DoE's work, implying that the rationale behind the formation of these cluster committees was purely selfish on the part of the department; this suggests that

the rationale rather than learning itself becomes the focal issue in initiating teacher development activities. The value of learning is sidelined while the true motives become the issue of intellectualism.

Nevertheless, Neel did acknowledge the possible contributions of such a forum to both the teacher's individual and collective learning experiences.

Clearly the participants welcomed the idea of learning from their colleagues through cluster committees. This suggests the possibility that teachers were willing to extend their learning through networking with other teacher professionals. This alludes to the notion that the possibility of forming learning communities among teacher professionals could be yet another viable avenue for teachers enhancing their learning. Attempts at forming such communities were clearly apparent in the training that took place at school level, which is detailed in section 6.2.3

6.3.2 A Discussion on Training workshops as a Possible Avenue for Exploring Off-Site Learning

The above discussion offered a possible input framework for teacher learning. This framework, far from being narrow and one-track in approach, showed itself to be more multifaceted in nature and served to emphasize the complexity of teacher learning. Drawing on the principles that inform the current thinking on teacher learning, the discussion below serves to explore possibilities offered by the training the participants had received.

The potential for training workshops as a form of off-site learning, and a possible forum for promoting learning among teachers, was illuminated. In this respect, Boyle et al.(2003) point out that one should not underestimate the value of training workshops, as even the weakest courses can give one something to think about and develop. Furthermore, the nature of the training sessions that the participants attended constituted elements of various theories of learning. The content of the initial training workshops were informed by policy guidelines and highly structured initially through the presentation of associated concepts and definitions, where the sessions were more a case of sitting and listening on the part of participants.

However, follow-up sessions also drew on constructivist notions of social activity (Richardson, 1998). This was evident when the participants were presented with activities to work within a collaborative context, allowing for co-operative learning to ensue as educators

engaged in dialogue and discussion with one another in the process of creating meaning. This set the scene for peer support, as the participants interacted with one another in a group context to advance their learning. Seen within the context of constructivist notions of social activity, co-operative learning involves interaction among learners about learning tasks and is based on the belief that this interaction in itself will lead learners to construct knowledge (Damon, 1984; Murray, 1982; Wadsworth, 1984). As the learners learn from one another through discussions, differences in thinking emerge, providing the platform for flawed reasoning to be brought to the fore and explored so that new ideas, understandings and insights can be developed (Slavin, 1995).

While the merits of off-site training and learning involve providing teachers with access to new ideas in an attempt to stimulate new instructional practices, it is widely acknowledged that the resultant changes are unlikely to occur, especially in the absence of support and assistance in the classroom (Elmore, 1997). In the case of the training workshops that the participants attended, the presence of a learning facilitator afforded support to the learning experience.

In addition, the resource materials issued to participants could also be viewed as playing a supportive role in fostering learning among teachers Opportunities for on-the-spot or immediate support were presented in the form of subject advisors being available for telephonic contact, thereby providing additional support for learning. In this sense the departmental training workshops could be seen as setting the scene for teachers to embark upon further learning. Moreover, by advancing learning in this way, departmental training initiatives could be viewed as „initiators of further learning', rather than actual learning. This is an important consideration in the teacher learning process.

While from an outsider perspective looking in, one could perhaps see the value of the workshops conducted, as the above discussion alluded to, yet the ability of the participants to consider the possible benefits of off-site learning initiatives appeared to have been blurred by their criticisms of the departmental workshops. This is highlighted in Neel's sentiments below:

"The problem with current workshops, run by the department, is that facilitators just want to run through them. There are no practical activities to keep teachers gripped. Also, these workshops are often run by people who never taught a day in their life. They

are not aware of the practical realities of the classroom. They are merely concerned with following policy."

Neel's criticisms of the DoE workshops were fuelled by his own preconceived notions of what learning entails. His sentiments allude to practical learning as a form of learning (activity-based learning) to the exclusion of other possibilities, including other forms of learning and initiators of learning. This highlights his bias toward such an approach. However, empirical evidence to support the claim that learning by doing enhances learning is limited (Mayer, 2004). In fact, there is a significant amount of evidence to show that discovery-based practice is not as effective as guided discovery (Mayer, 2004).

Clearly, traditional notions of teacher learning through activities as being the only "real learning" influenced Neel's thinking. The implication is that learning must be made explicit for teachers to believe that it has any value to offer. In view of this line of thinking, the possibility exists that teachers may be unaware or even unwilling to recognise the value of internal learning outside the confines of practical activities. Inevitability the dominance of these traditional notions of learning could perhaps serve to filter out the possibility of other forms of learning as having anything meaningful to offer to the growth and development of educators. This is a dangerous stance to adopt, as one's preferred learning style does not imply that what one finds preferable is the best or the only way to learn (Horri, 2007).

While the tendency of educators is to respond favourably to learning styles that they prefer, it is possible for learning preferences to change based on context and time (Svinicki, 1998; Evans, Forney & Guido-DiBrio, 1998; Flemming & Mills, 1992). In short, acquiring deep learning implies the use of multiple learning styles (Zull, 2002; Halpern & Hakel, 2003).

The potential for learning to transpire through face-value learning episodes, while being obscured by teacher's critiques of these learning episodes, was also reflected in Kajil's sentiments:

"We were called to workshops, where the different forms of assessment were explained. They gave us documents at these workshops to read and understand for ourselves, but all in all, it's our own thing. We have to find out for ourselves what is suitable for our own situation. We have to be selective and sift out things for ourselves and take it from there. Although we go and we

listen, the workshops are not so beneficial because most of the things we do know."

Given the multi-faceted nature of the way in which the learning process unfolds, perhaps a multi-channel learning approach as advocated by Siemens (2005) might be a more favourable stance to adopt with regard to teacher learning. Off-site initiatives would essentially constitute only one avenue for promoting teacher learning.

Basically, this would entail people learning from outside influences and using the opportunities presented in a constructive way. By viewing off-site initiatives in this way the possibility that teachers would begin to see the value of these learning opportunities in paving the way for the development of existing knowledge structures and for additional learning to transpire, would be increased. In this respect, Elmore (1997) suggests that while off-site training does provide teachers with access to new ideas and inspires teachers to attempt new instructional practices, it does not necessarily result in radical changes with regard to teacher practices, especially if not supported by direct assistance in the classroom and the school.

Such support was encountered and experienced, as training at school level at Sterling Primary, the details of which are detailed below.

6.3.3 Training at School Level

At Sterling Primary professional development initiatives were conducted by fellow teachers on the staff, but to a limited extent. Assessment was one area that received attention in a single afternoon's session. At this session the educator conducting the workshop merely re-iterated the policy with regards to assessment in the general education and training phase. At the end of the session teachers were issued with a handout that merely constituted copies of extracts from *The National Protocol on Assessment for Schools in the General and Further Education Training Band (Grades R -12)* (DoE, 2005*)*. Subsequent to this session, the form that learning by participants took was more a case of reading and acquiring knowledge through self-learning.

The scanty coverage of assessment at training sessions at school was attributed to the fact that colleagues on the staff were also grappling with implementing new assessment techniques, as Kajil added:

"Although, there are subject specialists among us, they are also finding it difficult to cope with the changes. We are all sailing in the same boat."

The above sentiments expressed by Kajil reflect a sense that, while educators may be considered as experts in certain areas, they may still be amateurs in others. The implications of these sentiments for the novice/expert divide become problematic, in that the distinction between these two terms becomes blurred. Furthermore, simply categorising teachers as either a novice or an expert seems far too simplistic, since the data above reflect that even so-called expert teachers require development in certain key areas, with assessment being one of them.

To this end, Horii (2007) asserts that it is a fallacy for teachers to believe that they have attained the status as experts in their field, by simply having acquired a certain amount of knowledge. Kajil is a case in point. While she was a subject specialist in Natural Science, her admission of experiencing challenges in implementing the new assessment forms suggests that she needed to (like her colleagues) extend her knowledge of assessment, as well as develop her competence in the assessment of learners. Furthermore, the complexities associated with the notion that learning more changes the way we know has serious implications for the way teachers learn. The advantage that experts have over novices in the profession is that the former have extensive prior knowledge and experience, in practical contexts, which guides them towards a way of organising their knowledge, in a deep and insightful manner (National Research Council, 2000). This ability to organise knowledge in a deep and insightful manner is evident in the following sentiments from Neel:

"The language in new assessment policy documents seems like Greek. If you are not a teacher experienced in that subject, you are going to get cooked. I have tried to sit down and translate this Greek to English. When NCS was first introduced, I spent the first six months going through the fancy documents to understand them. Then I put these away and taught according to what I know works well. My approach to incorporating the new assessment principles in my teaching has been to start with translating policy documents into terms and concepts that were easily identifiable with those that I had previously used in my teaching."

While Neel alluded to the complex nature of learning about the new assessment forms, the fact that he did try to interpret what was being conveyed in policy documents suggests that the ability to derive meaning through translating the policy documents into familiar terms was something that was within the capability of an experienced teacher. Through interacting with policy documents in this way, Neel was in fact extending his knowledge by making meaningful links with the new and old ways of assessing learners. This would suggest that Neel was in fact developing deep knowledge about issues pertaining to assessment.

In addition, the thinking that experts tend to have a less difficult time accessing and using their knowledge by virtue of their intuition (National Research Council, 2000) is evident in Priya's sentiments:

> *"We as teachers know our subject matter and we know our learners. We use this knowledge of our learners and subject matter, along with our discretion, as well as the information that we are given in policy implementation guidelines, to draw up our own assessments accordingly."*

Priya was in a position to use a combination of her subject knowledge, experiential knowledge and content knowledge of assessment to design her own assessment activities. Priya's assertion that she used her discretion to align assessment tasks to suit the calibre of her learners, while simultaneously attempting to fulfil policy requirements, suggests that she was in a position to organise her subject knowledge as well as her knowledge of assessment, and to access concepts and skills needed to implement the new assessment forms. This suggests that she was in fact developing her expertise in assessment.

However, the acknowledgement that no one is a permanent expert is a significant one (Hori, 2007), as Neel asserts:

> *"There is always lots of learning to be done as a teacher. We do increase our knowledge over time."*

Neel's sentiments allude to the notion that teachers are continuously engaged in a process of learning, suggesting that learning is indeed an ongoing process for members of the teaching fraternity. This makes sense if we consider the fact that we live in a complex world characterised by constant change which suggests that knowledge is tentative (Barnett, 1999/2002). Consequently, teachers are constantly involved in improving their skills and knowledge to cope with challenges in different contexts (Kelly, 2002), with the implication that they are novices throughout their careers. If we accept that a professional teacher's capability to cope with change requires the capacity to learn, (Visser, 1997) then it follows that teachers should constantly be developing their expertise, as Kajil suggests:

"I realise things have changed, therefore we have to change. You have to keep pace with the changes. With the new forms of assessment, we are now bombarded with too much information, so we try to cope and do the best we can."

Being aware of the impermanence of expert status is critical in advancing one's learning. In addition, the realisation that intellectual change need not, proceed smoothly in one direction, necessitates an acceptance of the fact that change is not a linear process. Neel's constant back and forth engagement with assessment policies and practices that he used in the past and with those advocated by the new assessment policy, bears testimony to the fact that rather than being a linear process, change is in fact an iterative process. Hence, adopting the notion that an educator may be considered an expert at times and yet still a novice at others (Barack & Yinon, 2005) seems an apt one.

To this end, Horri (2007) speaks of cognitive dissonance, which refers to a situation when one realises the limitations of the current ways of learning and knowing in a particular context. Such a stance can be equated to experiencing a detour, whereby immense support is required. This manifested itself in the participants in the study seeking support from peers at their school, as well as colleagues from other schools. This will be detailed in section 6.3.2. Furthermore, dissonance provides the platform for teachable moments when something has to change and before one can proceed with learning. However, dissonance alone is inadequate in the promotion of deep and permanent learning (Horri, 2007). This refers to the necessity for further measures to be taken to facilitate deep and sustained learning. The manner in which participants attempted to acquire such learning about the process of assessment is detailed in section 6.3.

While school-based teacher learning presents a meaningful platform for exploring practices through building support networks, thus allowing for discussion as a suitable knowledge base of teaching, the tendency for such discussions to narrowly equate teaching with the act of merely transmitting knowledge as well as the best means of achieving this still tends to dominate much site-based learning (Shoonmaker, 2002). This situation continues to prevail, despite research that highlights the fact that learning occurs not only through content exposure but also through interaction, reflection and cognition (Siemens, 2005). The manner in which on-site development was conducted at Sterling Primary, where information in the policy documents, was merely cascaded to the teachers present, bears testimony to the above.

6.3.4 Concluding Comments

The above presentation of the nature of training that participants received in assessment clearly revealed a sense that the participants were disenchanted with the way these initiatives were conducted. This disenchantment served to filter out the value of the training workshops. However, aside from serving as a stimulus for learning, the workshops presented opportunities for learning. This became evident when the participants began to engage with the new assessment forms, through their engagement with policy documents and through collaborative interaction with colleagues at the sessions. In this way training workshops sowed the seeds for co-operative learning. While the learning acquired was not recognised nor acknowledged by the participants themselves, they had in fact acquired learning.

The above discussion suggests that learning did occur among the participants through their participation in the training workshops. This alludes to the value of off-site initiatives in fostering teacher learning. In addition, while the training sessions at school were more a case of cascading information about assessment, followed by reading and self-study, teachers acquired learning through the process of being part of these sessions. The training received by the participants suggests that the process of teacher learning can assume the form of offsite and on-site initiatives; both of which have the potential to add meaning to the learning experience of teachers.

However, the participants felt somewhat differently. They felt that the principles of the new assessment forms, along with departmental initiatives to inspire teachers to implement these, did not necessarily equip teachers with the skills to apply these aspects to the classroom context. This view is reflected in Priya's comments below:

"With the exception of the two training sessions on assessment that the department offered, assessments are not covered at workshops. Yet, assessment is now like this gospel, 'magical word' in education. We are constantly reminded that assessment is part of the learning process. Despite this, department officials and subject advisors don't even touch on assessment at workshops. Other aspects such as drawing up learning programmes, work-schedules, lesson plans and activities are covered, instead."

The inability of the departmental workshops and school-based workshops to meet the expectations of teachers led to the participants adopting coping mechanisms. Issues associated with giving expression to the new learning which participants were exposed to, in terms of it's applicability to the classroom context, necessitated teachers embarking on their own journey of learning, which manifested itself in various different forms as the discussion below highlights.

6.4 The Types of Learning Teachers Embark Upon

The preceding section focused on how the participants learnt about the content of assessment through the training they received with regard to the new assessment strategies. This section represents a shift in focus, from the content of learning to how teachers learn about assessment and in this way draws attention to the process of learning about assessment. In the context of this study, learning about assessment forms the content aspect of learning and is related to an analysis of teacher learning through the helix framework that is depicted and explained in Chapter 5 (section 5.2). In this way an analysis of the assessment leads to an analysis of teacher learning.

The present section focuses on three crucial aspects of the processes involved in learning about assessment: learning by doing and learning through networking and situated learning. The section commences with exploring how the participants learn by doing, through trying and testing the new assessment strategies in the context of their practice. Insights about adaptive learning, by utilising knowledge from practice, form the basis of this discussion. Next, the potential for networking within the context of the study is explored. Attention is afforded to both formal and informal mechanisms of networking as possible avenues for facilitating teacher learning. Finally, situated learning as a potential forum for fostering meaningful learning among teachers is discussed, in so far as the participants in the study

were able to learn about the process of assessment through learning that was immersed in the contextual realities they were confronted with.

6.4.1 Learning By Doing: Revealing accomodatory positions through engagement

Arising from the workshops detailed in section 6.2 above, project work was discussed as one strategy of assessment and participants were asked to try this out with their learners in the classroom. The ensuing discussion attempts to explore teacher learning about assessment types, and in particular how teachers learn to use project work as an assessment strategy.

All three participants had initially attempted to assign project work to learners in the form of a homework task. The outcomes of these attempts appeared futile, as Neel asserted:

> *"People say kids don't get homework. We are failing with that. Very often, this does not get done, or alternatively it is done by the parents. The child is not honest enough to admit that the parent did the task. Who do I assess now, the child or the parent? Either way, the purpose of assessing is being defeated.*
>
> *When I chatted with my colleagues, Kajil and Priya, I found that they were experiencing similar problems with regard to projects not been completed by the learners."*

Kajil expressed similar concerns with regard to the use of project work:

> *"When we give the learners a research assignment, or project for example, and ask them to go to the library to complete it so as to encourage independent work, we find that most of the time, it is not done."*

Priya, like her colleagues, experienced various challenges with the use of projects as an assessment strategy:

> *"Very often, the department fails to take into account the practical classroom situation. This is very different from just giving us fancy types of assessments to implement. Take projects for example, these are often done by parents and passed off as the child's work. This becomes far too problematic. How can you assess the*

child's actual worth in a case like this?"

Project work as an assessment task is not unfamiliar to teachers. However, as part of the new approaches to assessment, project work remained as a preferred form of assessment. What was new about this assessment strategy? The focus of learning here was about form and process. What form should project work take, and how are teachers expected to implement this form of assessment? Participating teachers revealed their thought and action processes with respect to project work as an assessment strategy. Due to this pattern of behaviour, where learners tended to submit their parents' efforts as their own or where they failed to submit the task altogether, the teachers decided to look into suitable alternatives to employing project work as an assessment strategy. Subsequently they decided to meet as a learning area committee and explore some of the different ways in which they could incorporate project work in the assessment of their learners. Neel's sentiments suggest how this was achieved:

"Having realised that assigning projects as homework was ineffective, we had to move away from giving projects as a homework task. I met with my learning area committee at school. We decided to try something which works. We had to be mindful of what we could set and what we could do.

We spoke about the issues we were experiencing and then proceeded to draw up a list of these. My colleagues Kajil and Priya offered their input with regards to suggesting what they taught would work, given the fact that many learners did not submit their projects, and those that did, submitted the efforts of their parents."

Through intensive discussion on the issues at hand, as reflected in Neel's sentiments above, the participants began to explore different ways of incorporating project work as an assessment strategy. In this regard Kajil expressed how project work as an assessment strategy was modified to curb the effects of the challenges associated with the use of projects, as advocated in policy and as suggested at the training workshops:

"As a committee, we decided to explore the possibility of assessing project work in class. We decided to give learners time to complete the task, under the supervision of the teacher. Furthermore, resource materials (pictures, reference books, materials and stationery) to aid

in the completion of the task were provided, thereby affording all learners equal opportunities for successful completion of the project."

Priya reflects on the success of modifying the use of project work as an assessment strategy:

"I use my double-periods in class for assessing learners through project work. I start by explaining the project and then move on to handing out the resources learners need for the completion of the task. I walk around and guide learners in the completion of the task. Throughout the next few weeks, or until the project is complete, I follow this procedure. I find that most if not all learners tend to hand in a project that is reflective of their own initiative. In this way, I am able to assess the learners' true potential. This method of allocating time to complete and assess projects in class, under the direct supervision of the teacher, has certainly proved effective with my learners."

Priya's sentiments suggest that teachers have to see significant results to be inspired to continue with implementing new ideas. Since Priya actually experienced positive results with using projects as an assessment strategy in class, she was keen to continue in the use of projects in the assessment of her learners. Priya's sentiments resonate with the thinking that learning needs to be translated into observable outcomes for teachers for them to consider the learning worthwhile or recognise that they have in fact learnt something new (Wang, Frechtling & Sanders, 1999; Guskey, 2000). In addition, Guskey (2002) asserts that attitude change and an adjustment in belief systems among teachers only follows once evidence of positive results of reform or change explicitly presents itself. Evidence of Guskey's (2002) assertion was evident when the participants began to exhibit a more positive response to using project work. This was after having modified its use to suit their contextual realities. This in turn suggests that teachers consider worthwhile learning as something tangible and observable. Things that are not observable or tangible are considered as not being learning (by teachers), when in fact it is implicit learning. A case in point would be the inability of the participants to see the value of the training workshops (see section 6.2).

In addition, while the participants clearly preferred to learn through practical experiences, as opposed to being presented with far-fetched abstract theories and policy documents, the value of the implicit learning acquired through such forums should not be sidelined. In this sense,

the formal learning acquired through the participant's engagement with policy documents and their participation in the training workshops could be viewed as a springboard for making learning relevant to situations, experiences and outcomes. This could be achieved by adapting the formal learning through changes made in the assessment process. Furthermore, the kind of knowledge being developed within the context of practical experiences would appear to have been acquired unreflectively and seems to equate with procedural (how to) knowledge (Brunning et al., 1995). This makes sense seeing that teachers are more in a ‚doing' environment than in a ‚knowing' environment, and consequently tend to rely on procedural knowledge (Eraut, 1994).

The discussion above alludes to the application of Cochran-Smith and Lytle's (1999) conception of knowledge for practice. This refers to the situation where the formal learning acquired through engaging with policy documents and through participating in the training workshops, served as the initial form of learning that set the scene for participants to implement the new forms of assessment in their teaching practice. The formal learning acquired was then transformed into adaptive learning as participants began to learn from experience through trying and testing the new assessment strategies in the context of their respective classrooms. This process signalled knowledge in practice or knowledge in action (McKay & Kember, 1999; Stoll, 1999; Cochran- Smith & Lytle, 1999).

The above was evident as the participants began to reflect on their use of projects as an assessment strategy in the classroom. They shared their experiences of implementing these projects with their colleagues. The subsequent learning that transpired as a result of being involved in such activities led to the participants' search for suitable alternatives to the new assessment strategies. This took into account the issues and challenges that they were confronted with in implementing the new assessment forms. This ultimately led to participants modifying the use of the new assessment strategies to suit their contextual realities. Learning by doing reveals the complexities associated with the learning process, as the influences for learning are multi-fold. They include formal learning (learning through the workshops), contextual learning (being influenced by the realities of schooling, the learners and the availability of resources), experiential learning (learning from past experiences and reflections) and collaborative learning (learning in and with others). Any one of these learning strands may not be as effective as the confluence of all of these strands, and one cannot attribute their learning to any single strand or influence.

6.4.2 Learning from Networking

Teacher learning within the context of networking implies that knowledge from both outside (expert) and inside (networks' own teachers) sources guide the learning process (Lieberman & Grolnick, 1996). Within the context of this study, the scene was set for networking through encouraging teachers to work collaboratively with one another at the training workshops on assessment. Furthermore, networking was an extension of the learning clusters that was a part of the subject advisor's brief, as detailed in section 6.2.1.3. Following on from the brief of the subject advisor, the participants networked with each other and with colleagues from other schools. In addition, opportunities for networking presented themselves in both a informal and formal manner at Sterling Primary, as is highlighted in the following discussion.

6.4.2.1 Informal Mechanisms of Networking

If we accept that most human learning occurs incidentally, and that such learning has the potential to lead to a vast spectrum of knowledge acquisition that is informal but deliberate and sustained (Smaller et al., 2000), then it would make sense to explore how such learning contributes to teacher learning. The ensuing discussion is an attempt to explore how learning within the context of informal networking contributes to teachers learning about assessment. Further, the discussion adopts Livingstone's (1999), definition of learning in the informal context, which entails learning that takes place outside the formal structures of classes, courses, instructors and regulations. Networking with educators of science from both her school and schools in surrounding areas had increased Priya's confidence in the subject and in her assessment of learners. The educators that she networked with were subject specialists with a wealth of experience (10 years and more) in teaching Natural Science. Priya believed that the purpose of networking had served a dual purpose for her. Firstly, through sharing and exchanging ideas about her teaching and assessment in science with colleagues she was able gain a sense of affirmation as to whether or not her assessment practices were in keeping with the expectations of the new policy initiatives. Secondly, the feedback that Priya received through this networking process helped to inform and shape her assessment practices in the context of the classroom, as suggested in the sentiments below:

> *"I think I have gained a lot of knowledge, through my own reading. This has given me the confidence to try out the new assessment strategies in class. Throughout the process of implementing the new assessment strategies in*

class, I have consulted with other qualified science teachers in the area about the way I was designing my assessment activities, as well as how the implementation of these activities were panning out with my learners.

When I meet these teachers at meetings and workshops, I feel comfortable to talk to them and to the workshop facilitators about how I assess my learners in class. I speak about the kinds of assessments that I have tried in class, about which assessment forms have worked well and about which ones have not worked so well. Similarly, my colleagues speak about the assessment strategies they are employing in class. From these discussions we learn from each others' experiences, through talking about our assessment practices. In fact, I learn about ways that I could possibly modify my assessment practices to include those that I have was not experiencing much success in implementing. Take project work, for example. I was experiencing difficulty in implementing project work as an assessment strategy, as learners would simply fail to submit a project that I would set. My colleagues suggested that I try getting the learners to complete the project in class, in an allocated time slot over a period of time. Further, they added that when they provided their learners with the materials and resources to complete the project, the majority if not all the learners would complete and hand in the project. After having acted on the suggestions of my colleagues about project work I found that my learners were also responding favourably to this new approach of completing projects in class. Also, some of my colleagues take my ideas and use them, so I feel confident about using these ideas in class myself. An example would be the use of practical work and investigations as forms of assessment. Many of my colleagues indicated to me that they were experiencing a problem similar to the one that I initially had, in that they did not have the resources to implement practical work. So I indicated to them what had worked for me in this regard.

I shared with them the fact that I had kept my practical tasks simple, and that I used materials from the environment that were readily available, or that I brought items from home to explore the potential of practical work. The fact that adopting such an approach, proved effective in addressing the problems

associated with implementing practical work as an assessment strategy, inspired my colleagues to try out this method for themselves. They subsequently reported positive feedback, finding my suggestions helpful.

In fact, samples of the assessment tasks and activities that I use with my learners have been seen by the group co-ordinator, and these have gone through the normal channels of observation and moderation. It has been reassuring that the co-ordinator and many of my colleagues, have complimented my work."

The above sentiments reflect a sense that, through both self-study and her liaisons with subject specialists and experienced teachers, Priya was able to increase her content knowledge of assessment. Through listening to the experiences her colleagues had in implementing the new assessment strategies in class, Priya was able to learn more about the process of assessment.

In addition, by taking Priya's ideas and using them in their teaching, her networking colleagues provided her with a sense of being valued and knowledgeable and being able to comprehend and influence others, all of which served to reinforce the learning process. This kind of affirmation is an importance facet of learning to promote and sustain teacher learning, and leads to confidence building. Perhaps the sharing and exchange of ideas is an important self-confidence building activity, as the feeling of being listened to and acknowledged within a small, closed interaction space could very well serve to enhance the process of learning, as evident in the case of Priya.

The notion of networking as contributing to the process of learning among teachers was also evident in the case of Kajil:

"After setting an assessment task, especially a test that I deem suitable for my learners, I would ask a colleague from staff to look over the task and offer his or her input, with regards to whether or not the task would be appropriate for the learners that it was targeted at. I would listen to the suggestions offered and take these into consideration before I actually carried out this assessment task in class. Such suggestions would often include the comments on the format of the test and the levels of questioning. I would review the comments from my

colleagues and re-examine my assessment task in line with these comments. Often, I would even modify my assessment task to incorporate the suggestions of my colleagues."

Kajil's sentiments allude to learning about the assessment process, where assessment tasks are designed and shared with colleagues to explore issues of credibility, appropriateness, gaps and coherence. This suggests that learning includes a methodology of implementation as well as new forms and processes of assessment. Furthermore, Kajil believed that the input from educators who were more experienced than herself would contribute to her knowledge of assessment. She was therefore willing to learn from them:

"There is no such thing as we are too experienced to learn. I certainly don't know it all. Assessment is far more complex than one would think. Therefore, I need to consult with others who may be more experienced, than myself, especially if I want to incorporate the new assessment strategies in my teaching practice. There is no shame in asking for help. We learn from each other all the time."

Kajil's sentiments reflect an important component of teacher learning - the human aspect, where learning is intertwined with the human need to feel a sense of belonging. In this respect, Wright (1998) adds that teaching is fundamentally a human encounter, where personal involvement and choice on the part of teachers are critical in the pursuit of meaningful change. In addition, Kajil's assertion "We learn from each other all the time" is in congruence with the thinking that making a contribution to a community where experience and knowledge function as part of community property and is central to promoting teacher learning (Lieberman & Mace, 2008).

The fact that Kajil showed a preparedness to learn from others points to what Grossman, et al.(2009) refer to as a necessary shift in perspective that educators need to embrace if they are to succeed in their professional learning within the context of a learning community. The important construct of suspending what one knows to open up the possibility of being influenced by others and in this way enable a shift to new learning, is pivotal in learning through networks. This refers to the view put forward by Cochran-Smith (2003):

> *"Engagement in learning communities involves both learning new knowledge, questions and practices, and at the same time, unlearning some long-held ideas, beliefs and practices, which are often difficult to uproot"* (Cochran-Smith, 2003, p. 9)

Similarly, the sentiments expressed by Neel allude to the usefulness of input from peers. Due to the scarcity of experts and heads in the field of assessment to assist in the interpretation and implementation of the new assessment policy, Neel asserted that educators looked to one another for support. Furthermore, due to limited experienced and subject-based specialists among the school personnel, Neel believed there was increased pressure on him as head of department to provide additional support and guidance to teachers at his school:

"At this school, I meet unofficially with teachers to discuss ideas on assessing learners. Teachers come to me for advice all the time. Sometimes they come to my office for assistance. However, most of the time, we have informal chats in the corridors and in the staff-room. If I am unsure of something, I contact my colleagues from other schools. I frequently have telephonic conversations with colleagues from other schools. Talking about problems that we may be experiencing and asking for help where it is needed is an important part of growth. We are able to have such discussions with our colleagues as we all speak the same language within the teaching group."

The discussion above suggests that learning through networking provides a meaningful avenue to advance teacher learning. Engaging in discussions relating to their assessment practices with their peers proved effective in generating meaningful learning among the participants, despite the predominantly informal manner in which these conversations took place. To this end, Day (1999) highlights the advantage that informal mechanisms have over more formal ones, as the former are more in synch with the goals of teachers. Neel's sentiment "We all speak the same language, within the teaching group" bears testimony to this. In addition, even casual encounters that result in discussions of teaching practice can help develop competence among educators, hence meaningful learning can be facilitated (Borko, 2004). Through engaging with the ideas and the innovations and experiences of others, teachers begin to explore ways of improving their teaching and supporting one another as they work to change their practice (Moll, 2003).This was evident in the case of

Kajil, when she admitted she took the input from her colleagues into consideration before carrying out her assessment tasks in class.

The notion of shared learning within the context of networking implies a deeper level of engagement that involves more than merely acquiring new information and extracting this information when required (Colucci-Gray & Fraser, 2008). Moreover, it involves effective dialogue that leads to shared understanding, where the platform for working collaboratively to solve problems and find workable solutions to common issues and concerns can be established (Palmer, 1998). Priya, through networking with her colleagues, found that they had experienced similar challenges regarding the implementation of the new assessment strategies. Through exchanging ideas about their various assessment practices, the educators within the group were able to gain one another's support in order to incorporate the new assessment strategies in their respective classrooms. The discussion presented suggests that the sharing of thoughts, ideas, strategies and knowledge within networks provides for a deeper level of engagement that reinforces and promotes learning.

Networking for learning, as alluded to, in the above section, reveals a space outside of the content of learning. By this I mean that teachers do not necessarily learn from others in the network by sharing their experiences, thoughts and insights, but that the context of networking provides a platform to learn. The platform in this instance refers to attributes that promote learning. These attributes include confidence building, affirmation by and from others, esteem and modelling. The idea here is that learning is not out there and that one must receive learning. Rather the idea is that learning is internal, complex, and can happen as a result of a confluence of thought processes stimulated by reflections on, for example, networking with others or serendipity.

6.4.2.2 Formal Mechanisms of Networking

Learning through networks was also evident in the formal structures of learning area committees that were formed to support educators in learning about the new forms of assessment. The engagement of educators within these learning committees revealed that forced top-down instructions to form learning committees are useful in stimulating learning and forming networks, despite its regulatory concerns.

Neel offered a brief description of these committees in the following way:

"On a more formal note, we have learning area committees at this school. Each learning area has its own committee. These committees meet twice a term to monitor what work has been covered in each area and also to establish what assessments are been given for that particular term. I show my colleagues examples of the kinds of assessments that I am using. We conclude these meetings with a quick discussion on any problems that educators may be experiencing with regards to their teaching and assessing in a particular learning area. I compile a written list of these problems, and we speak about possible ways of addressing such problems in subsequent meetings. Teachers feel more comfortable to voice their concerns and opinions within such a forum, as teachers within the group can relate to the practical realities on the ground."

It is interesting to note that Neel saw the primary purpose of establishing such committees as a form of regulating control over curriculum issues, such as the scope of work covered, and the nature of assessment activities used within the classroom. His views about what happens in these learning committees are largely centred on equivalence of offering and common approaches related to the realities of the school context. However, the opportunities offered to educators within these formal structures are reviews of their work by others, sharing of ideas and practices and dealing with problems. This suggests that practical realities become the common ground that provides the confidence for teachers to voice their concerns and opinions.

While on the surface these are common expectations of formal engagement within a formal structure, the opportunities for learning are great. Educators have the opportunity of developing their reflective capacities, their articulation of competence and their introspection capabilities, leading to further learning. Each educator is expected to tell the committee what he or she is doing through reflections as well as articulating problems through reviews of his/her practices and to contribute to discussions through intellectualising. Hence, the teacher learning within formal networking groups includes higher-order intellectualism as well as content learning, as is evident from the extracts of the participants.

Priya valued the input she received from members of the learning area committee:

"The honest admission that I was experiencing difficulty with regards to learner assessment opened up the door to guidance and assistance from my colleagues. I have been

determined to gain the maximum from the learning experience of networking with colleagues. Teachers in the learning area committee refer me to resource materials, such as useful textbooks that I could consult to help me plan for assessment in my teaching. I have found this useful as being a non-science specialist- teacher I sometimes find difficulty in selecting appropriate content to match the relevant learning outcomes and assessment standards. Further, colleagues from the committee have sat down with me and helped me match the learning outcomes and assessment standards with suitable assessment activities. In addition, my colleagues also give me ideas and suggestions about the kinds of assessment activities I could use in the classroom.

If I am trying to design an activity to assess a particular learning outcome, I would use the assessment policy documents to guide me. Thereafter, I would set an assessment task accordingly. In pursuit of meaningful feedback, I would ask members of the learning area committee to look over the assessment activity and offer their input with regard to the suitability of the task. The feedback that I received through this forum has been instrumental in developing my competence in the assessment of learners, and I feel that I have grown as a professional as a result of such interactions with my colleagues."

Clearly Priya viewed networking with colleagues as a meaningful learning experience, which has served to contribute to her growth in knowledge of assessment, as well as help shape her assessment practices. This suggests that the nature and kinds of learning that do transpire within the context of networking are far more in-depth than it would appear to be. Furthermore, the fact that Priya was able to exercise a degree of comfort in admitting her areas of weakness, as a result requesting for help from colleagues, suggests that interacting with colleagues within the context of networks provides teachers with a platform to openly voice their concerns. This also serves to invite the input of their colleagues and in this way affords educators the opportunity for professional growth.

Similarly, Kajil's reflections on learning area committees suggest that learning within the context of formal networks offers educators a meaningful avenue for extending their knowledge and competence:

"*Learning area committees do offer some support to me. By listening to my colleagues speak about the difficulties they have been experiencing with regards to learner*

assessment, I have realised that the challenges I have been experiencing are not so far-fetched. I don't feel so alone anymore.

We are all grappling with issues associated with implementing the new assessment strategies as advocated by policy. However, through listening to how teachers within the group have attempted to address these issues, I have learnt how I could possibly deal with similar concerns. Take for example, the issue of employing practical work as an assessment strategy. Through listening to how teachers have improvised by using materials from nature to compensate for the lack of resources to perform practical work, I have been inspired to try out some of their suggestions myself. The results have been quite astonishing, especially considering that I previously excluded practical work as a form of assessment altogether because of the absence of resources. I now include practical work as part of my regular assessment programme. I feel I have come a long way."

The learning area committee helped Kajil in the sense that she no longer felt so alienated. Formal mechanisms of networking have served to give Kajil the confidence to try out the new assessment strategies which she previously had tended to exclude altogether. This suggests that networks, through their spirit of sharing common concerns, offer teachers a comfortable space where they articulate their challenges, reflect on their experiences of such challenges, and learn from the pitfalls and successes of their colleagues. Consequently, being part of a collective with common ideals enables teachers to muster up the confidence to try out new ideas, to reflect on the implementation of such ideas and in this way advance learning.

All three participants acknowledged that talking about their teaching practices with colleagues helped to enhance and promote their individual learning. The ability of the participants to converse eloquently about what they know and do suggests a sense of deep learning and expert knowledge, and possible inspiration for the process of teacher learning and content learning. While on the surface teacher learning appears to be minimal in formal networking structures, deep learning does in fact occur and the deep learning may not be about assessment of teaching (content issues) but about engagement (a higher form of learning leading to becoming an expert). These include developing listening skills, reflexive skills, transferring skills and adaptation skills; all of which constitute characteristics of being an expert (Horii, 2007). Perhaps a different way of viewing the value of formal networks

would be to see these networks as being created to allow for their extension into informal structures of networks and connections with individuals, and in this sense having snowballing effects. In short, rather than seeing formal and informal mechanisms as two mutually exclusive forums, one should view the two as complementing one another in pursuit of learning.

6.4.2.3 Concluding Comments

The discussion above suggests that a culture of co-learning, where educators are afforded opportunities to connect with one another (McLaughlin & Talbert, 1993), did manifest itself in both formal and informal contexts of networking among the participants. Moreover, networking within the context of informal structures assumed the form of casual conversations, where participants looked to one another for support in their implementation of the new assessment strategies. The view that collaborative inquiry allows for learning conversations that take place among participants in learning circles at their sites of work (Le Cornu et al., 2003) was clearly evident among the participants as they grappled with issues that they were facing with regard to implementing the new assessment strategies.

Through debating these issues with their colleagues, participants were in a position to reflect on, understand, articulate and develop as well as modify their assessment practices to suit their school contexts. This in turn manifested itself in significant positive changes in their assessment practices within the classroom context.

In addition, learning conversations within the formal context of networking afforded participants the opportunity to make sense of their learning about assessment, through a deep engagement with different ideas about assessment. This resonates with the thinking that learning conversations are invaluable in contributing to higher levels of intellectualising and enhancing learning (Feldman, 1999).

There is a considerable volume of literature supporting the merits of learning groups in providing a context for the teacher's professional growth, where the professional learning of teachers is shared and problematised (McLaughlin, 1997; Cochran-Smith & Lytle, 1993, 1999; Warren-Little, 2002; Groundwater-Smith & Mockler, 2003). Through verbalising their concerns with their peers, the participants were in a position to move away from feeling isolated in dealing with their problems. Rather, they used the opportunities that were readily made available through networking to expand on their learning. Moreover, networking also enabled teachers to share their knowledge of assessment with their colleagues. This allowed

them to feel acknowledged, in that they were making a contribution to the process of learning within the group.

This is in congruence with the sentiment that learning networks provide an opportunity for its members to create as well as receive knowledge (Lieberman, 2000). Clearly the participants in the study, through their experience, were involved in creating learning opportunities and designing learning experiences to suit their own individual circumstances. In this way, formal and informal mechanisms of networking served to complement one another in fostering learning among the participants.

6.4.3 Situated Learning: learning through practicalities

Situated or workplace learning entails changes in teaching practices in classrooms and schools that are mediated through individual teacher learning and problem-solving processes in the school (Ellström, 2001). The notion of adapting the learning acquired at the training workshops, through the engagement with policy guidelines pertaining to assessment to suit the contextual realities that teachers were confronted with, necessitated further and deeper levels of engagement with the new assessment strategies by implementing these in the classroom. The following discussion attempts to explore the nature of learning that transpired among the participants through situated learning.

Neel, realising that the potential for exploring practical work as an assessment strategy was somewhat limited as a result of the practical realities with which he was confronted, decided to modify the use of practical work to suit the contextual factors:

"While the new assessment policy advocates the use of practical work as an assessment strategy, the potential for exploring practical work at this school has been somewhat limited, as we don't have an operational science room, nor do we have the resources and materials to conduct practical work. Further, learners have not been exposed to practical work in their previous grades, as a result of the absence of a science room, as well as the absence of materials and equipment to conduct the experiments. Although, I would love for learners to do experiments on their own, discover things for themselves, see how the thermometer rises, for example, we can't do this because of the lack of equipment.

However, seeing that science is a practically oriented subject, I improvise

by bringing materials from home. Since such materials are inadequate in quantity and in view of the fact that learners have had no previous experience in conducting practical work themselves, I use demonstrations that are more teacher-dominated. I then get learners to observe these and complete the answers to questions based on the demonstrations in the class. These are normally done in the form of a work-sheet. Teacher-led demonstrations afford me an avenue to explore the potential for practical work as an assessment strategy.

In this way, everyone wins. The child is assigned a task based on the demonstration that he or she just observed and which he or she can complete in class, under the supervision of the teacher. In turn, the teacher is able to gain an accurate assessment of the child's progress. These tasks are simple to do."

The sentiments expressed above suggest that Neel used his knowledge of his learners to adapt and modify his assessment practices accordingly. Acknowledging that his learners were not previously exposed to practical work, and therefore perhaps lacked the skills to conduct practical work independently, Neel adjusted the use of practical work as an assessment strategy to include teacher-led demonstrations. Such knowledge, which emanated from Neel's interactions with his learners and through experience, suggests that such experiences equipped the participant with the ability to reflect on his assessment practices and to make the necessary adjustments to his practices. Such adjustments would not only suit the capabilities of his learners but also take into account the contextual realities with which Neel was confronted. In this instance, inadequate resources and facilities to conduct scientific experiments necessitated that Neel improvise by bringing materials from home to explore the potential for utilising practical work as an assessment strategy within the context of the classroom.

Along similar lines, Kajil undertook an individual reflective exercise to assist her in learning about the process of learner assessment. Such an exercise was situated in her practice of assessment in the classroom context, and in this way contextualised against the backdrop of the various practical realities with which she was confronted, as is evident:

"I use an exercise called, „Teachers Reflection', at the end of every assessment task. This is something I do in my individual capacity by answering the following questions on a sheet of paper:

- *How did the assessment task pan out?*
- *Did the assessment task achieve what it set out to achieve?*
- *What were the strengths of the task?*
- *What were the shortcomings in the execution of the assessment task?*
- *What are some of the ways the assessment task can be improved upon?*

In answering these five questions, here, I am able to keep track of what works and why, so I can improve myself, by making necessary adjustments in future assessment activities. Also by constantly questioning which learners I am getting through and which ones I am not, as well as why this is the case, I am in a position to make the necessary modifications in my assessing of learners. In this way I am constantly trying to improve myself."

From the above discussion one gains a strong sense that Kajil's learning about the process of assessment was more an isolated activity, acquired through self knowledge and reflection and suggesting that there may be instances where learning may need to be an individual activity, highly specific to suit that educator and his or her learners in a particular learning environment.

Kajil's sentiments allude to the important aspect of self-reflection in teacher learning, a pivotal activity that precedes understanding (Von Glaserfed, 2005). Through an in-depth and critical examination of her own practice, and thinking about how it might be improved, Kajil engaged in a process of deep reflection which enabled her to become aware of her knowledge of assessment and how this knowledge relates to her practice of assessment activities. This is indicative of self-reflection (Osterman & Kottamp, 2004; Day & Kington, 2008)

Similarly, through her implementation of the new assessment strategies in the classroom context, Priya was able to modify and adjust her assessment practices to suit the contextual realities with which she was confronted:

"Many of the methods spoken about in the assessment policy documents cannot be

used in our classrooms. We have large class sizes. We have children with language barriers. We are actually teaching in an inclusive education system, where we have to cater for learners with special educational needs. So the very flowery methods that we have read about, or have been told about, cannot be used as is in our classrooms.

Take the assessment of group work, for example. Our classes are far too big for teachers to use group work as an assessment strategy. When I have tried group work in class, I found that learners were far too noisy. Further, it became difficult for me to walk around and assess all learners due to the large number of learners to assess in a given time slot. Realising that group work, as I was using it, was not working, I carefully thought about how I could adjust the way I was using this assessment strategy to effectively curb the problems I was experiencing. In addition, I spoke to my colleagues from other schools and listened to how they used group work in their classrooms. After reflecting on their experiences and thinking about my previous experiences of group work, I managed to come up with an idea as to how I could incorporate group work as an assessment strategy in my teaching.

Now, when I use group-work in class, I break up the one big assessment task into smaller or mini-tasks, which I carry over into a series of lessons, extending over a period of time depending on the nature of the task. In each individual session I focus on a particular mini-task, which than becomes more manageable to assess. Also, I assess only two or three groups at a time and follow through the remaining groups in the next lesson.

In this way, rather than excluding group work altogether, I have come up with a way, through reflecting on the problems I previously encountered, and through my interactions with my colleagues, to modify the use of group work as an assessment strategy to suit the practical realities that I am confronted with. In this sense, I have adapted how I assess to suit my circumstances."

The complexities associated with the contextual realities that Priya was confronted with compelled her to seek measures to adapt assessment principles advocated in policy guidelines to suit her own unique set of circumstances. The benefits of taking the contextual factors into

consideration are emphasised by Ellis (2007), when he contends that having an overview of pedagogical context knowledge affords teachers the opportunity to look around the knowledge arena, to look inward for reflection, and to look outward for other sources of knowledge and criticism. This was evident when Priya embarked on an exercise of self-reflection with regard to the way she was using group work as an assessment strategy. Following on from this, she sought the assistance of colleagues from other schools, which helped to modify her assessment practices.

The fact that the participants engaged in reflecting on their experiences, in line with the potential for the transferability of their existing knowledge about assessment through their own learning, suggests that deep learning was ensuing (Hay, 2007; McAllister et al., 1997). Such a scenario would bear testimony to the notion that expertise lies in the ability to construct and reconstruct professional knowledge to address a personal quest and the challenges of teaching in different contexts (Kelly, 2002). In their search for personal meaning and understanding, the participants began to develop a holistic perspective of learner assessment by drawing on their personal experience to make sense of new ideas and experiences (McAlister et al., 1997).

6.4.4 Concluding comments

The above section served to highlight the manner in which the participants embarked on their journey of learning about the process of assessment. The data revealed valuable insights about the different avenues that teachers explored in their pursuit of knowledge and competence in assessment. The data suggest the teachers need to be inspired to continue with their learning. Such inspiration emanates from the visible, positive results of implementing new innovations. This was evident in the case of Priya, when she continued to use project work as an assessment strategy and by seeing that it was working in the context of her modifying it to suit the practical realities with which she was faced. It was through learning by doing (actually assessing in the context of the classroom) that the participants actually acquired a significant proportion of their learning. By reflecting on their experiences of trying and testing the new ways of assessing in the classroom, the participants were in a better position to modify their assessment practices to suit the practical realities with which they were confronted. In this way contextual factors exerted a significant influence on the ways in which participants assessed their learners in the context of the classroom, providing the rationale for teachers to embark on adaptive learning.

Learning within a group context also served to enhance learning among the participants. Networking through informal structures was, seemingly, more preferable to participants than more formal means. It seems that affirmation from members within such learning circles also impacted on the assessment practices that the participants had adopted. The preparedness to learn from and with others exuded itself in various forms and suggested that interaction and collaboration with colleagues served to advance learning amongst the participants. Through intellectualising, elements of deep learning surfaced (McAlister et al., 1997) as the participants began to articulate, reflect and offer viable solutions to the problems they were encountering with regard to implementing the new assessment strategies within the context of networks.

In addition, issues associated with the transferability of the knowledge of assessment to the context of the classroom, where the new assessment strategies were implemented, pointed to the significance of situated learning. Through deep learning and being embedded in the practical realities with which they were confronted, participants were in a position to modify their learning acquired through participating in the training workshops and their interactions with policy documents on assessment to suit the context of application of these new assessment initiatives.

The implications the above discussion for teacher learning is that teachers learn in a variety of different ways and through a plethora of learning experiences, making a simplistic and superficial understanding of teacher learning inadequate. Consequently, adopting a multi-focus approach to teacher learning that acknowledges the vast kaleidoscope of ways in which teacher learning manifests itself, would seem most appropriate. Such an approach would also have to recognise that how teachers learn is influenced and shaped by a number of factors.

6.5 Chapter Summary

The key findings of the study were presented and analysed in this chapter. The chapter began with a detailed discussion on the nature of training workshops that the participants had attended with regard to the new forms of assessment. The types of learning that teachers embarked upon in terms of acquiring competence in assessment were then detailed. This was explored alongside the assessment practices that teachers used in the context of their classrooms. Issues surrounding the transition from the old to the new ways of assessing learners, as the participants acquired learning, were also presented and discussed. Alongside

the presentation of data, the implications of these findings were explored to the extent that they held significance for teacher learning.

The ensuing chapter focuses on a discussion of the key insights that emerged from the study, with a view to theorising the critical research question: “How do teachers learn?”

Chapter 7 – Putting Things in Perspective: Towards a Theory for Teacher Learning

7.1 Introduction

A useful point of departure, aimed at serving as a reminder to the reader and reiterating the purpose, focus and research questions that guided the study, would seem necessary at this juncture. The purpose of this study was to explore how teachers learn through employing the lens of learning about new forms of assessment and their practice of assessment. The critical questions that guided the study were:

- What do teachers know about learner assessment;
- How do teachers acquire knowledge on learner assessment?;
- How do teachers explain their practice of learner assessment?; and
- Why do teachers offer the explanations they do?

In addition, three key areas formed the focus of the study: the content, form and process that learning among the participants assumed. By paying attention to what the participants had learnt, their knowledge of assessment and issues relating to content were addressed. The manner in which participants had acquired their knowledge of assessment and the nature of that knowledge constituted the form and process elements of their learning. Moving beyond these three foci, the study also attempted to explore yet another crucial aspect of teacher learning, namely how the participants attempted to translate their learning into practice through carefully examining the ways in which they assessed their learners in the classroom context. In other words, the manner in which participant learning manifested itself in the practical context of teaching and learning was also an area of focus within the demarcated study.

In an attempt to address the research questions and issues presented above, the study employed a qualitative mode of inquiry. Furthermore, a case study design within an intepretivist paradigm was utilised. The study was conducted at a co-educational primary school in the North Durban region. Three Intermediate Phase Natural Science educators constituted the participants in the study. They were indentified through network sampling, the procedures of which are detailed in Chapter 4. The culmination of the key findings of the

study, were presented with a fine-grained analysis of the major themes identified from the data collected in the preceding two chapters (Chapter 5 and Chapter 6). These themes were discussed and analysed in relation to the various constructs of teacher learning that pervade the current literature (see Chapter 3).

The present chapter sets out to attend to four critical areas. Firstly, it attempts to summarise the main findings of the study. Secondly, the chapter attempts to theorise around these findings with regard to the implications of these findings for teacher learning. Thirdly, the possible limitations of the study are brought to the fore in an attempt to alert the reader to the scope and potential of the demarcated area of research. Finally, the chapter sets out to explore how the findings of the study contribute to different and perhaps new notions of teacher learning.

7.2 Findings and Emerging Theory

Through examining the participants' understandings about assessment as a whole, the key findings of the study provided some useful revelations and insights about teacher learning. The study also revealed valuable insights about some of the factors that could possibly serve to initiate learning among teacher professionals. A crucial finding was that content can be viewed as an external force that initiates learning, giving rise to and facilitating the process of learning. In this study the new policy initiatives regarding new ways of assessment formed the backdrop, and in this way created the inspiration for learning.

To this end, Parker and Adler (2005) assert that access to the criteria for attaining the outcomes set out in the curriculum documents implies the creation of pedagogic discourses for teachers and teaching that would allow for recognition of the meaning and translation of these new policy aims into practice. It is within the realm of such forums that opportunities to construct official pedagogic discourses for teachers to internalise new criteria for teaching, as well as for the foundations of that knowledge to be explored, are optimised. In this way the space for productive selection and transmission of knowledge and practices for teachers and for the work of teaching is opened up (Parker & Adler, 2005).

From the analysis of the data it emerged that there were deep links between knowledge and practice. Analysis of the data explored deep thoughts between practice, theory and learning. In addition, what the participants knew was connected with what they should know, enabling exploration of the attributes that could possibly increase teacher learning. Through an

analysis and interpretation of the findings, the study suggested that the participants tended to privelege certain types of learning. The significance that teachers in the study attached to content knowledge over other forms of knowledge was clearly evident. The emphasis on content over process in learning also permeated the data that were collected. Further, learning that had immediate effects or where the results were apparent instantly seemed to be considered worthwhile, to the exclusion of the possible benefits of latent learning.

While the study highlighted the fact that external factors tended to elicit a sense of resistance among the participants, those factors also tended to serve as an impetus to reflect on one's existing knowledge, and to make the necessary modifications to challenge existing ideas and ways of assessing. In this sense, resistance to learning imposed by external forces could be viewed as a learning activity, resulting in the participants reflecting on what they knew and what they did not know. From the findings of the study it emerged that the ‚resistance learning mode' as a possible form of learning could be viewed as a resourceful tool in promoting learning among teacher professionals. In putting up a strong resistance to implementing the new ways of assessing, teachers could in fact be redirected into a situation that enables them to review and reflect on their current practices, in this way enhancing their individual learning.

Through charting his or her territory in this manner, participants were in fact acquiring new knowledge of assessment, and in most instances new ways of using their existing knowledge of assessment to modify their assessment practices to suit the contextual realities with which they were confronted. Consequently, the potential for horizontal learning (Sayed, 2002) was enhanced. As a result, external initiators of learning, in the form of assessment policy documents and departmental training workshops, served as a stimulus for learning, although this was not recognised by the participants themselves.

Furthermore, while the initial training workshops were more promotional, in that they served as a form of initiating teacher learning rather than getting teachers to become involved in learning activities, the value of such efforts was evident since these set the wheels in motion for teachers to embark on further learning. To this end, Morrow (2005) asserts that while training can be regarded as a "means to an end", the value of training in facilitating teacher learning should not be undermined. Granted, the participants' criticisms of the training workshops obscured their possible consideration of the value of such initiatives. Nevertheless, they did in fact benefit from these sessions. This was evident when all three

participants were inspired to embark upon their own journey of learning as a result of their attending and participating in the training workshops on assessment. In this way the potential for off-site learning as a vehicle for promoting further learning was clearly evident. Opportunities for on the spot, immediate support served as initiators of further learning.

In the located study the potential for on-site learning and practical knowledge was also explored. Fenstermacher (1994) refers to practical knowledge as that which teachers develop as a result of their experiences, often equated with knowledge learnt or acquired "on the job" (Meijer et al., 1999; Zanting, 2001). Participants did not actually realise that they were acquiring new knowledge and insight about assessment through the intricate interplay between theory and practice. Context-embedded learning or situated learning (Guskey, 1995; Billet, 2001) appeared to be the most fruitful form of learning, since the participants attempted to incorporate those assessment forms that were most practical, given the nature of their learners' potential and resources. Through modifying assessment practices, the participants displayed an acquisition of deep knowledge and reflection about their assessment practices.

Through engaging in reflections on their experiences teachers were in a position to evaluate the extent to which they used their learning in practice. Both within the context of off-site and on-site learning, participants tended to prefer activity- based learning over being presented with learning where information was merely cascaded. It emerged that learning by doing presented an enriching forum for acquiring learning. It would appear that teachers learn by doing through trial and through practice. This is in synch with Wertenbosch & Nabeth's (2000) notion that people learn by experiences that enable them to absorb (read, hear, feel), do (activity), and interact (socialise).

To this end, Regleski, in Gholami (2007) believes that praxial knowledge is learnt by actually engaging in the act of teaching and reflecting on that teaching and in this way, is predominantly linked to how knowledge is acquired. Further, such knowledge is learnt on the job. In developing new skills for use in the classroom, teachers go through an important back and forth process of learning, experimenting and reflecting (Joyce & Showers, 2002).

In addition, co-operative learning through both informal and formal mechanisms served to provide yet another avenue for exploring learning. It seemed that networking in both informal and formal contexts proved fruitful in terms of facilitating learning among the participants. This alludes to the notion that learning is considered worthwhile if it is valued by peers. The notion of shared learning suggests a human element in the process of teacher

learning. This clearly presented itself in the case of participants learning and making every effort to collaborate with their colleagues with regard to the assessment of their learners. In this regard, recent views of teacher learning see identity and (inter)personal skills development as critical components of planned processes for teacher learning (Malderez & Weddell, 2007).

The participants exuded a preparedness to learn from and with others. Such interactions and collaborations typically took the form of learning conversations, where teachers engaged in dialogue and discussions about their assessment practices. To this end, Freeman and Richards (1996) speaks of local language being the vehicle through which teachers explain what goes on in their teaching on a daily basis; this provides them with a means of expressing to themselves and their peers, the conceptions of practice they bring to teaching as well as those which they are socialised on in the job. Local language has the potential to develop into professional language within the context of mentoring (Freeman and Richards, 1996). Further, through their interaction with colleagues, teachers began to form reflective learning circles where they also acquired knowledge.

Black (2000) believes that professional development programmes which are in sync with the ability of teachers to take ownership of change, and concurrently rethink and reconstruct their theories of learning and assessment in a manner that supports and adds meaning to practice, will place teachers in a better position to translate theory into practice. The findings of this study suggest that networking through forming learning communities with other teachers provides the platform to do just this.

By the same token, there were instances where learning also occurred on an individual scale, suggesting that perhaps adopting a multi-channel approach to teacher learning may serve as a viable option with regard to providing a plethora of learning opportunities for teacher professionals. This suggests that there may be instances where learning may be purely an isolated activity; where self-knowledge and reflection on classroom and practical experiences result in learning. If we accept that introducing change often involves teachers rethinking existing routines, ideas, practices and theories, then the role of teachers should be extended to include them scrutinising the manner in which they acquire and convey their knowledge through continuous analysis, reflection, and evaluation (Wooldridge, 2001)

Such a situation, as was evident in the located study, can be likened to the notion of a mature teacher learning community where teachers engage in “honest talk” that fosters development

of reflective practice and adaptive expertise (Lieberman & Miller, 2008). Adaptive expertise implies an understanding of the evolving nature of teaching and learning to develop a different kind of knowledge for teaching that entails knowledge of how to interpret and reflect on classroom practice (Sherin, 2004, p. 14). Furthermore, since teacher learning communities utilise adaptive expertise from internal and external sources, such learning can be shared across different learning contexts, thereby providing expanded opportunities for teachers to critically assess shared pedagogical and content knowledge in context (Hatano & Oura, 2003).

In addition, learning that was validated in the form of praise by moderators and departmental officials was highly prized by the participants. This suggests that those in positions of authority do play an instrumental role in what and how teachers learn. In this respect the notion of image-building and maintaining this image presented itself as a stimulus for learning among the participants. The finding that validation from moderators and departmental officials was regarded in high esteem among the participants creates a sense that the form and content of teacher learning is vulnerable to external factors, such as succumbing to authority in the form of compliance to departmental regulations and policy expectations. In addition, the forms of knowledge that were privileged by those in a position of power and authority played a pivotal role in the kinds of knowledge that were valued and considered worthwhile. This was evident in that while the notion of informal learning tended to dominate the manner in which teacher professionals learnt, the dominant school culture and expectations of the curriculum and assessment policies tended to exert an undeniable and powerful force on the manner in which teachers assessed in class.

The position and ranking of the teachers in the profession seemed to influence the manner in which learning transpired among the participants. All three educators were senior teachers who had served in the teaching fraternity for a considerable length of time. This fact equipped them with an abundance of practical knowledge and experience to acquire learning more readily and effectively, as they were aware of the pitfalls of previously tried and tested ways of assessing learners. Consequently, their ability to construct and design their own assessment activities, whereby they possessed the necessary and relevant skills to modify their teaching and assessment practices to suit the contextual realities with which they were confronted, was evident. It would appear that this key finding of the study resonates with Sennett's (2008) notion that acquisition of adaptive expertise rests within the capabilities of the experienced teacher who has an intuitive understanding of the act of teaching, defined in

terms of its context and processes, and who draws on this aspect when smoothly and efficiently performing complex tasks.

By the same token, the dangerous declaration of being in a position of „all knowing' was evident in the insistence in certain cases of sticking to old familiar practices. By emulating the kinds of knowledge and learning as well as teaching practices that they were previously exposed to, modelling such behaviours also became a common practice among the participants. In this respect, Angelo and Cross (1993) believe that teachers find it more difficult to unlearn incorrect knowledge than to learn something new. Further, misconceptions tend to misrepresent new information to such an extent that it becomes incumbent on one to search for their true meaning. To assist towards this end, Reeves (2005) speaks of a temporal or physical space that teachers need, where they can work out how to implement the new things they have learnt.

While it may be beneficial to take contextual realities into account, it must be borne in mind that every day and academic knowledge are produced in different social contexts, and are therefore fundamentally different knowledge forms (Muller, 2000). Consequently, the assumption that the everyday experiences of all learners are the same across different social groups is dangerous (Ensor & Galant, 2005). The result is that learners who do not have access to the „right type' of experiences may be disadvantaged in that they lack exposure to those experiences that would allow for re-contextualisation across the academic and everyday spheres for meaningful learning to occur. The end result could lead to the opposite of what policy had intended - even less rather than more access to powerful knowledge (Harley & Wedekind, 2004). To this end, the notion of practicality (Regleski, in Gholami, 2007), was given much consideration, and adjusting one's teaching and assessment practices appeared to be within the realm of these seasoned teacher professionals. In this way, participants did in fact have a significant role to play in influencing the path and nature of their own learning. Such a scenario, where participants were able to amend their assessment practices to suit the contextual realities, alludes to the notion that they were indeed engaging in deep learning.

In this sense, the ever-pervasive debate over expert status versus novice status was highlighted. In light of the located study it emerged that there may be areas where a teacher professional may have the necessary knowledge, skills and competence to carry out their job effectively, yet at the same time there may be areas requiring further development of

knowledge, skills and competence to improve upon their teaching skills. In this regard the status of an expert in terms of having 'perfect' knowledge becomes debatable.

The notion of ‚practicability', which implies capability (Gholami, 2007), exerts a significant influence on the practices teachers employed within the classroom context, as evident in this study. Furthermore, in answering the question "What should I as a teacher do in a particular situation?", one is using practical knowledge. In short, a teacher's practical knowledge is that which guides teachers in conducting the act of teaching, and is synonymous with knowledge in action (Schön, 1983; Cochran-Smith & Lytle, 1999) the notion of knowledge in practice.

The complexities associated with the new assessment policy presented themselves in the new language within the discourse of assessment and raised various challenges. This caused the participants to examine their attitudes towards change and to look critically at their own conceptions of teaching and learning. In this way language served as a vehicle for learning by recasting assessment in new and different ways. Learning by association, where meaningful links were established between the old and new ways of assessing, highlighted the potential for these forms of learning to promote learning among the participants. In this way, participant understanding of the new forms of assessment could be viewed in relation to their previous experiences and prior understanding of assessment.

The study also suggests that what the participants knew had a bearing on how they assessed in the classroom. Experience and maturity in teaching provided the context of learning through self-study. In the case of participants in this study, their experience served as a rich source of their learning. Tried and tested ways of assessing served as a basis of adapting new assessment forms to suit the contextual realities which confronted participants. Through experimenting with new assessment techniques, and through trial and error, participants became aware of what worked and what did not work in the context of their individual classes. Learning also occurred through use of methods and strategies devised by participants themselves.

While the sources of this knowledge might have varied, ranging from their own reading and self-study to networking and engaging in discourses with colleagues through networking, or simply through learning by doing or reflections on experience, the manner in which the participants assessed in the classroom and ways in which they rationalised these practices were largely influenced and shaped by a number of factors. These included their personal

predispostions and backgrounds, their relections on experience, and tried and tested ways of assessing their learners in the classroom. This is in congruence with the sentiment that learning not only occurs through content exposure but also through interaction, reflection and cognition (Siemens, 2005).

In addition, since practical knowledge for teachers refers to all informative and influential cognitions about various educational elements that teachers see as ‚good' as well as having the capability of being done in such way that ‚guides' teachers to conduct the job of teaching, then such knowledge need not necessarily be acquired through experience alone (Zanting, 2001). Sources of practical knowledge may also be constituted by reflection, self-study, training and interaction with others in the school community and other social and academic contexts relevant to teaching (Fenstermacher, 1994).To this end, the findings of this study suggest that learning emanates from various sources and presents itself in numerous forms.

The findings of the study allude to the notion that teacher learning is at the mercy of a vast kaleidoscope of forces or influences pulling and propelling its aims, objectives and resultant outcomes in several different directions. This view gives rise to a theory of teacher learning that will be detailed next.

7.3 Towards a theory of teacher learning: The agility of learning

Within the context of this study, it emerged that, a vast kaleidoscope of factors influence the manner in which teachers learn. I therefore chose to draw an analogy between the amoeba (depicted in Figure 2 below) and teacher learning. The rationale for drawing such an analogy will be detailed in the ensuing discussion.

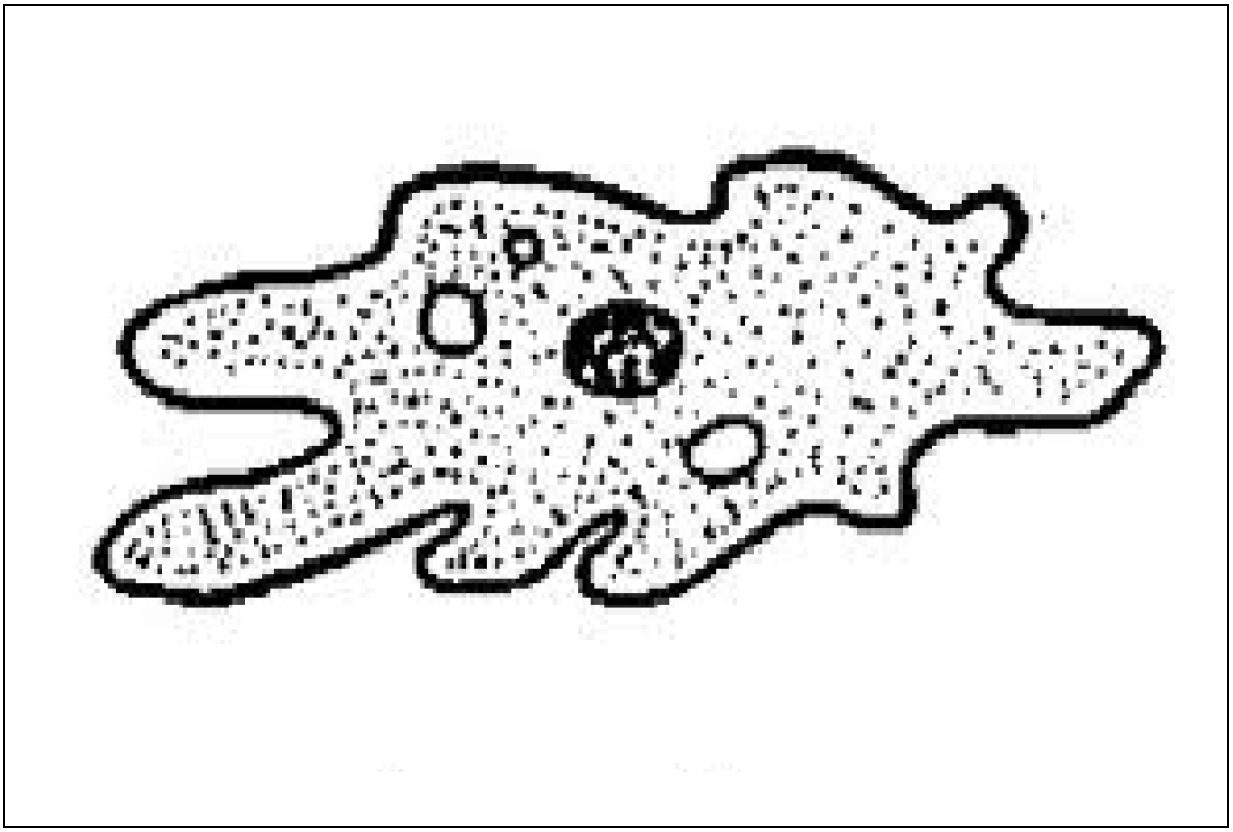

Figure 2- The Amoeba Representation of the Agility of Learning

(Image taken from photobucket.com/images/amoeba)

The amoeba is a very important life form as it is the basis of other living forms, such as tissues and organs (Solomon et al., 2004). Without the amoeba, evolution of other organisms would not be possible (McGrath and Blachford, 2001)). Similarly, learning is something that is fundamental to developing teachers professionally. Without teachers embarking on a continuous journey of learning, the advancement of self-knowledge as well as knowledge of their learners and ultimately society at large would be severely hampered. This suggests a parallel between the significance of the amoeba for other life forms and the relationship between teacher learning and the advancement of teacher knowledge and its contribution to society.

Furthermore, teacher learning is a complex and multifaceted area, which is propelled and influenced by a number of factors. These include succumbing to those in a position of authority in the sense of blind compliance, or in other cases total resistance against new ways of assessment. Both instances served as a stimulus for learning. In this sense, the irregular shape of the amoeba provides a useful way of viewing teacher learning. Learning is not a simple process, and nor is it fixed.

Rather, learning is influenced by a range of factors, suggesting the agility of the learning process. The agility of the amoeba allows for consideration of the fact that the learning process is tentative and could change and move in different directions, but which ultimately moves towards a learning trajectory. Teacher learning is multi-dimensional in content and knowledge, and is therefore pushed in different directions and ways. There is no set pattern or definitive structure in the way teachers learn. As such learning is shaped by a multitude of factors, such as experience and reflections on experience, the ability to process new information in light of existing knowledge structures, and skilful ability to apply learning to classroom praxis. In addition, the process of how teachers learn constitutes a multitude of activities leading to and emanating from a core, central learning attitude of the individual teacher, which is influenced by a multitude of forces and sub-forces from all directions (top-down, lateral and bottom-up). These factors include external motivators of learning.

Moreover, teacher learning is a product of a number of interacting factors. This begins with what teachers know, which is the result of prior knowledge, experience and background, teacher identity, teacher conceptions of teacher learning, and attitudes of teachers towards change, just to mention those that prominently featured in the course of this study. Therefore, attention to and reflection on teaching practice is an impetus for new knowledge to develop over time. This suggests that there are various forces, both external and internal, that influence how teachers learn. With regard to the internal forces, the study also alluded to the notion that who a person is influences how they make sense and create meaning of their learning. Since the notion of identity pertains to being and becoming, it would follow that issues relating to teacher identity are inextricably linked to the process of teacher learning (Clarke, 2008). In addition, the identities of teachers are based on knowledge and skills and influenced by their engagement in the experience of teaching and interaction with their students and peers. Furthermore, if we accept Kotze's (2002) assertion that learning is a personal interpretation of knowledge, than it becomes of paramount significance that the concept of teacher identity should be explored in relation to teacher learning.

The nucleus of the amoeba, which represents the centre of activity in the cell from a biological stance, (McGrath and Blachford, 2001) could be viewed as the person. The membranes and boundaries represent the points of learning for the individual teacher. This approach to viewing teacher learning can be explained by the fact that the various factors influencing teacher learning are analogous to the fluid-filled membrane that constitutes the amoeba, signifying that it is far from the centre and is therefore not static but rather

constantly evolving and redefining itself. Due to the various forces propelling it in different directions and ways, teacher learning could indeed be viewed as a dynamic, complex, broad-based scholarship that is influenced by a multitude of factors. Furthermore, an interesting characteristic of the amoeba is that complete isolation of the amoeba is difficult as there is no single medium for it; the medium changes with the species since each species preys on different organisms, so the medium must be able to support both the amoeba and its prey (Solomon et al., 2004). Similarly, teacher learning cannot be viewed in isolation. In light of the fact that learning is influenced by a range of factors, the agility of the learning process can be likened to the agility of the amoeba.

Consequently, it would appear that no single learning theory can attend to the entire subject of teacher learning. The findings of this study support this view and point to adopting a multi-channel approach to teacher learning. The discussion below is based on Malderez and Weddell's (2007) notions of the theories informing teacher learning. The socio-cultural perspective of teacher learning, which propagates the belief that learning occurs through increasing the degrees of participation in and membership of a culture of teachers in a given context, came across clearly through the participants networking with their colleagues. In addition, the importance of engaging the learner in personal meaning-making also came through in instances where educators needed to attach personal meaning to the learning process. This also emerged through individual self-reflection, signalling a cognitive stance to teacher learning.

Social constructivism, which emphasises the important role of interaction with others in the process of learning, was also evident in the learning conversations that participants engaged in. Through deep reflections, the constructivist view emphasises that the goal of the reflective practitioner should be on focusing on the thinking and concepts that lie behind the action. This view presented itself as participants reflected on their experiences.

The skill theory, which advocates intelligent action as being developed through cyclical processes of supported trial and error, exuded itself as the participants attempted to include the new forms of assessment in their teaching through modifying and adapting these to suit their contextual realities. Based on these findings, the advocacy of a multi-channel approach that entails a fusion of theories surrounding the scholarship of teacher learning would seem most apt.

Since a prominent theme that emerged during the course of the study was that of the notion of the expert versus the novice, exploring the territory of what an expert is was undertaken at length in the analysis chapter. Suffice to say that the recent interpretation of the term is one that challenges the traditional use of the term expert. To this end, Darling-Hammond and Bransford (2005) advocate the use of the term "adaptive experts" to refer to the teacher's ability to learn from other teachers through the sharing of experiences. Furthermore, adaptive expertise involves viewing learning as a continuous aspect of teaching and through recognising the need to change by letting go of previously learned ideas or incorporating new information into their practice and choosing what to abandon and what to keep or modify (Darling-Hammond & Bransford, 2005). In this respect, Schudel et al. (2008) highlight the significance of integrating contextual, substantive and personal knowledge into the focus of teacher learning and curriculum implementation.

The following sentiment reflects the change in the role of teachers, from being providers of knowledge to becoming experts on learning.

> *"Being able to do something and knowing how to do it are two different aspects of being a professional ...Understanding what it is one does and how one does it, involves a different aspect of professionalism: it is a matter of being intellectually expert about expert practice."* (Tripp, 1993)

Furthermore, since, teacher learning is both a personal and a social endeavour, learning and evolving in teaching necessitates the reconstruction of practical theories and personal practical knowledge (Clandinin, 1986; Sanders & McCutcheon, 1986). If we consider the assertion that an essential goal of teacher learning is to promote the favourable transformation from intuitive to formal ways of knowing, and that such a transformation includes both behavioural (practical) changes as well as a paradigm shift in how teachers think about knowing and coming to know (Simon, 2006), then it becomes imperative that we explore epistemological implications of the findings of this study.

While issues relating to practicability and practical knowledge are central to facilitating learning among teachers, one needs to exercise caution when applying practical knowledge in educational research. This is due to the fact that critical questions pertaining to epistemology arise and consequently need, to be addressed (Gholami, 2007). Such questions include:

- How teachers know to know?;

- What evidence and proof do they suggest for justifying their so-called practical knowledge?;
- What basis do teachers have for knowing what is appropriate and true in matters they face in their work? (Tirr et al., 1999); and
- What is the nature of this evidence and these justifications? (Gholami, 2007).

Kansanen et al. (2000) assert that these questions present numerous perspectives on epistemology in such a manner as to explore teacher's knowledge claims in relation to what they perceive to be „true'. Such an approach involves progressing from a perception- to a conception-based perspective (Simon et al., 2000). Reformed practices can become the „material' for teacher epistemological-oriented reflection, as it can cause teachers to question and reflect on their hidden epistemological assumptions (Simon et al., 2000).

Whilst the discussion above advocates the amoeba framework of teacher learning as a plausible way of viewing teacher learning, the one draw-back of using the analogy of the amoeba to explore teacher learning, could be the fact that the framework does not allow for exploring the extent to which the various factors that influence teacher learning, relate to one another, if they do at all, bear relation to one another. However, exploring such interrelations was not within the scope of this study. Nonetheless, the amoeba framework of teacher learning makes a case for the agility of the learning process. Learning is not fixed but is influenced by a range of factors, as the discussion above has alluded to. Hence teacher learning, like the amoeba, is propelled by a kaleidoscope of factors. These factors result in the process of learning constantly evolving as the journey of learning forges ahead, making the analogy between the amoeba and teacher learning an apt one. Moreover, the conception of the process of learning as being agile suggests that teacher learning is complex and multi-faceted, necessitating the adoption of a multi-modal approach to teacher learning.

7.4 Limitations of the study

The participants in the study were all seasoned teachers with a wealth of experience and knowledge, placing them at the cutting-edge with regard to having a fairly comprehensive and insightful understanding of who they were and where their strengths and weaknesses lay, as well as possessing extensive knowledge based on the pitfalls of tried and tested ways of assessing learners. The experiences of novices might be somewhat different.

Further, while the study was limited to a single school, it was felt that the detailed and rich description of the research site, participants, data collection and analysis methods provided would enable the study to be contextualised for a deeper understanding of the issues surrounding the scholarship of teacher learning. The intention was not to generalise, but to provide a comprehensive landscape of how the participants embarked on their journey of learning, with the intention of extending the valuable insights revealed to the scholarship of teacher learning and its implication for practice. In this way, it was envisaged that the study would contribute to the body of theory within the field of teacher learning.

7.5 Contribution of this study

The contribution of this study extends itself to methodological, theoretical, and practical arenas. Methodologically, by conceptualising the helix framework as a way of analysing teacher learning through the lens of assessment, the confluence of assessment and teacher learning provided a useful platform to illustrate how the analysis of assessment led to analysis of teacher learning (refer to Chapter 5).

From a theoretical perspective, the ameoba framework of teacher learning proposed a new and different approach to viewing the multifaceted nature of teacher learning. By exposing teacher learning in this way, it became possibile to crystallise the complexities associated with such a broad-based discipline. This could be seen to be analogous to viewing the issues „under the microscope'.

Finally, the practical contribution of the study relates to the implications of the findings of the study. It was envisaged that the insights revealed from the study would assist the various stakeholders in education to better understand the plethora of factors that influence the manner in which teachers learn. Such an understanding would also assist policy makers and educators to understand the factors that promote teacher learning and which are conducive to promoting learning among teachers, therby attempting to bridge the gap between what was intended in policy and teachers' intepretations of policy, and assisting in the successful implemenation of policy through informing teacher practices.

7.6 Conclusion

If we acknowledge the sentiment that "Teachers should be examples of how learning works" (Kaplan, 1998), then it becomes imperative that we undertake to explore how teachers learn. This was what the located study set out to do.

The focus of this chapter was to distill the key findings of the study in line with current trends on teacher learning. The chapter commenced with an overview of the aims and purpose of the study, a reiteration of the research questions guiding the study, and a summary of the research methodolgy used in the data collection process. Next the key findings of the study were presented, leading to an emerging theory that emanated from these findings. Furthermore, this emerging theory, that presents a new and different way of viewing teacher learning, was detailed in light of the research findings. The limitations of the study were addressed next. The final segment of the chapter focused on the contributions of the located study to the academic arena.

It is envisaged that the findings of this study and its implications for the scholarship of teacher learning and for practice provide a useful framework for enriching the learning experience for teacher professionals.

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APPENDIX: 1

PRE-OBSERVATION INTERVIEW SCHEDULE

1. What are the forms of assessment you use in your teaching?
2. Which forms of assessment do you feel that you are comfortable and competent in?
3. How have you acquired competence in this/these form/s of assessment?
4. How do you know that you are competent in this form or these forms of assessment?
5. Which forms of assessment do you feel that you are not comfortable with implementing? Why?
6. You have been introduced to various new forms of assessment. Did you have prior knowledge of these forms of assessment?
7. What training did you have with regard to these new forms of assessment?
8. The notion of *"integrated assessment"* permeates much of the discussion on assessment in policy documents. What is your understanding of this concept and how do you incorporate this in your teaching?
9. How do you feel about implementing these new forms of assessment?

APPENDIX: 2

DOCUMENT ANALYSIS SCHEDULE

A. *National Policies*

1. What National Policies pertaining to assessment are in place?
2. What knowledge is privileged here?
3. How are teachers expected to acquire this knowledge?
4. How are teachers expected to translate this policy into action within the classroom context?
5. What documents or policies are in place, with regard to guidelines on how to implement these policies?
6. Is there sufficient guidance and exemplars provided for effective implementation of these assessment policies at classroom level? Describe the nature of this guidance.
7. What other support materials and documents are forthcoming from the Department of Education, for the successful execution of The National Policy on Assessment?

B. *School Policy*

1. Does the school have its' own internal policy on assessment?
2. What is the school policy with regards to assessment?
3. Who was involved in the formulation of this policy?
4. What knowledge or information, is coming through?
5. Are there supporting documents to provide guidance for the successful implementation of this policy?

C. ***Classroom-Planning Documents***

1. What classroom planning documents are there? What form do these take? (For example, Learning Programmes, Work Schedules, Lesson Plans, Assessment Plan, Samples of Assessment Tasks, Assessment Record or Marks Sheets, Rubrics, Memoranda, Rating Scales and Other Criteria for assessing learner performance)?
2. What are the nature and content of these?
3. What assessments have been planned for? What is privileged?
4. Are these in line with National Curriculum Statement (NCS) principles? Do they fulfil policy requirements? How so?
5. What other resource materials have educators consulted when planning the assessment of learning activities? (For example, they may have consulted learning journals, attended workshops of their own accord during holidays and weekends, consulted experts in the field of assessment or networked with colleagues from other schools to obtain additional resource-materials on assessment). What is forthcoming in these documents?

OBSERVATION SCHEDULE

LESSON TOPIC: _____

GRADE: _____

DATE: _____

A. INSTRUCTIONAL METHODS

	Whole Class	**Group**	**Individual**	**Additional/ Other**
Does the lesson use any of these forms of instructional methods?				

B. SCAFFOLDING AND UNFOLDING OF LEARNING

	Not at all	**To a limited extent**	**Too the maximum**	**Additional/ Other**
Is learners' prior knowledge of content and skills explored and built upon? Is there an attempt to link the new content to the existing knowledge-base?				

C. KINDS OF QUESTIONS POSED BY TEACHER

	LOWER-ORDER QUESTIONS: Content Questions	**HIGHER-ORDER QUESTIONS:** Processing Questions	**OPEN-ENDED QUESTIONS:** Questions that require learners to think creatively solve problems - Various responses are possible	**CLARIFYING QUESTIONS:** Questions that require an explanation or justification	**MIX OF QUESTIONS** Uses a variety of questioning techniques	**ADDITIONAL/ OTHER QUESTIONS**
PURPOSE: Why is this question being used?						
WHEN?: Beginning /During/ Towards the end						

HOW OFTEN? Sometimes / Frequently /Too a limited extent/ Not at all						

D. ASSESSMENT ACTIVITIES AND TASKS USED TO ASCERTAIN LEARNER UNDERSTANDING

DESCRIPTION OF KINDS OF ASSESSMENT ACTIVITIES/TASKS USED TO FACILITATE LEARNER UNDERSTANDING?	**FORMAL**	**INFORMAL**	**COMBINATION**	**HOW ARE THESE ACTIVITIES USED?**	**ADDITIONAL NOTES/COMMENTS**

	NOT AT ALL	SOME OR VERY LITTLE COMMUNICATION ABOUT TASK	EXPECTATIONS ARE CLEARLY COMMUNICATED AND MADE EXPLICIT AT THE OUTSET	ADDITIONAL NOTES/COMMENTS
EXPLANATION OF EXPECTATIONS OF TASK TO LEARNERS				

	NONE	VERY LITTLE GUIDANCE,SUPPORT AND SUPERVISION	FAIR AMOUNT OF GUIDANCE, SUPPORT AND SUPERVISION	CONSTANT GUIDANCE, SUPPORT AND SUPERVISION	ADDITIONAL NOTES/COMMENTS
FACILITATION OF TASK BY TEACHER					

E. FEEDBACK FROM EDUCATOR

	NOT AT ALL	SOMETIMES	CONTINUOUSLY	ONLY AT THE END	ADDITIONAL NOTES/COMMENTS
FREQUENCY OF FEEDBACK FROM EDUCATOR					

	ACTIVELY ENCOURAGES IT	ALLOWS FOR A FAIR AMOUNT OF INPUT	PROVIDES VERY LITTLE OPPORTUNITY FOR INPUT	DOES NOT ALLOW FOR ANY INPUT	ADDITIONAL NOTES/COMMENTS
RESPONSE TO LEARNER INPUT					

	NOT AT ALL	SOMETIMES	OFTEN	ADDITIONAL NOTES/COMMENTS
ARE LEARNERS AFFORDED THE OPPORTUNITY TO REFLECT ON THEIR LEARNING?				

	SUPPORTIVE, ENCOURAGING AND DEVELOPMENTAL	FAIR AND ADEQUATE	DISCOURAGING AND DESTRUCTIVE	ADDITIONAL NOTES/COMMENTS
NATURE OF FEEDBACK:				

	SCANTY/VAGUE	ADEQUATE/SUFFICIENT	COMPREHENSIVE/ THOROUGH/DETAILED	ADDITIONAL NOTES/COMMENTS
QUALITY OF FEEDBACK				

	REPEAT QUESTION	REPHRASE QUESTION	GET ANOTHER LEARNER TO RESPOND	GIVE THE ANSWER HIM/HERSELF	ADOPTS OTHER MEANS TO ELICIT CORRECT RESPONSE-DESCRIBE THESE	ADDITIONAL NOTES/COMMENTS
RESPONSE TO INCORRECT OR INAPPROPRIATE ANSWERS						

	RE-VISIT PROBLEMATIC ASPECTS ONLY	RE-TEACH ENTIRE LESSON	SUPPLEMENT WITH ADDITIONAL NOTES AND ACTIVITIES	ADDITIONAL NOTES/COMMENTS
REMEDIATION MEASURES				

	NONE	TOO A LIMITED EXTEND	MANY AND VARIED	ADDITIONAL NOTES/COMMENTS
ENRICHMENT ACTIVITIES TO EXTEND LEARNERS				

OTHER OBSERVATIONS GLEANED:

APPENDIX: 4

POST-OBSERVATION INTERVIEW SCHEDULE: 1

1. How do you assess whether learners have grasped what you have taught?
2. What role do you see questioning, to play in learner assessment?
3. Do you plan the kinds of questions that you would ask in your lessons, or are they spontaneous? Why is this, the case?
4. Take me through some of the kinds of questions that you use in your lessons. Why do you use these kinds of questions?
5. I notice that you use questions at different stages in your lesson. What are some of the reasons for this?
6. What are your views on providing feedback to learners?
7. What type of feedback do you give with regard to learner performance?
8. How do you view your role in the completion of assessment tasks by learners?

APPENDIX: 5-The Seven Roles of Educators

SEVEN ROLES OF AN EDUCATOR

1. Learning Mediator

The educator will mediate learning in a manner which is sensitive to the diverse needs of learners, including those with barriers to learning; construct learning environments that are appropriately contextualised and inspirational; communicate effectively showing recognition of and respect for the differences of others. In addition an educator will demonstrate sound knowledge of subject content and various principles, strategies and resources appropriate to teaching in a South African context.

2. Interpreter and Designer of Learning Programmes and Material

The educators will understand and interpret provided learning programmes, design original learning programmes, identify the requirements for a specific context of learning and select and prepare suitable textual and visual resources for learning. The educator will also select, sequence and pace the learning in a manner sensitive to the differing needs of the subject/learning areas and learners.

3. Leader Administrator and Manager

The educator will make decisions appropriate to the level, manage learning in the classroom, carry out classroom administrative duties efficiently and participate in school decision making structures. These competences will be performed in ways which are democratic, which support learners and colleagues, and which demonstrate responsiveness to changing circumstances and needs.

4. Scholar, Researcher and Lifelong Learner

The educator will achieve ongoing personal, academic, occupational and professional growth through pursuing reflective study and research in their learning area, in broader professional and educational matters, and other related fields

5. Community, Citizenship, and Pastoral Role

The educator will practice and promote a critical, committed and ethical attitude towards developing a sense of respect and responsibility to others. The educator will uphold the constitution and promote democratic values and practices in schools and society. Within the school, the educator will demonstrate an ability to develop a supportive and empowering environment for the learner and respond to the educational and other needs of learners and fellow educators.

Furthermore, the educator will develop supportive relations with parents and other key persons and organisations based on a critical understanding of community and environmental development issues.

6. Assessor

The educator will understand that assessment is an essential feature of the teaching and learning process and know how to integrate it into this process. The educator will have an understanding of the purposes, methods and effects of assessment and be able to provide helpful feedback to learners. The educator will design and manage both formative and summative assessment in ways that are appropriate to the level and purpose of the learning and meeting requirements of accrediting bodies. The educator will keep detailed and diagnostic records of assessment. The educator will understand how to interpret and use assessment results to feed into processes for the improvement of learning areas.

7. Learning Area/Subject/Discipline/Phase Specialist

The Educator will be well ground in the knowledge, skills, values, principles, methods, and procedures relevant to the discipline, subject, learning area, phase of study, or professional occupation practice. The educator will know about different approaches to teaching and learning (and, where appropriate, research and management), and how these may be used in ways which are appropriate to the learners and context. The educator will have a well developed understanding of the knowledge appropriate to the specialism.

APPENDIX: 6 - Forms of Assessment in NCS

Forms of Assessment

Assessment can be done using different forms or types. These forms of assessment are really different kinds of activities that we can ask the learners to do, in order to show us their competence. Thereafter we must decide whether the activity will serve a formative or summative purpose. Teachers should select the form of assessment depending on the purpose of the assessment. The chosen forms must provide a range of opportunities for learners to demonstrate attainment of knowledge, skills, values and attitudes. The following forms of assessment are recommended, to support the development of assessment tasks specifically in the Natural Sciences Learning Area;

- Investigation activities
- Projects
- Research
- Assignments
- Performance based assessments
- Practical demonstration
- Tests
- Case studies
- Simulations
- Role-play
- Translation tasks
- Interviews
- Questionnaires
- Structured questions
- Mind mapping
- Concept mapping
- Brainstorming tasks
- Functional writing
- Presentations

There are other forms of assessment that can be useful in the assessment process as listed here but are not generally used in science:

- Spoken language (oral presentations)
- Creative writing

It is of utmost importance that the form of assessment used should match the outcomes being assessed. Otherwise the assessment may not be valid (i.e. it may not measure what it is supposed to measure). For example, teachers should not try to measure scientific practical skills solely with a written paper and pencil test. The form of assessment should suit the purpose of the assessment. By answering the following questions, a teacher can decide what type of activity best suits the assessment at hand.

- What type of knowledge (reasoning, memory or process) or skill am I actually trying to assess?
- What should my learners know?
- At what level should my students be performing?
- Which form of assessment will best allow my learners to demonstrate their abilities in the skills/knowledge?

Appendix: 7

Example of Lesson Observation Notes

Theme: Energy and Change **Grade:** 4

Topic: Dangers of the Sun

Priya introduces the lesson by re-iterating the uses of the sun that were covered in the previous lesson. This is done in the form of questioning as follows:

"Can you list some of the ways that the sun is useful to us?"[Teacher]

It keeps us warm. **[Learner: 1]**

Yes, that's right, it gives us heat. Anything else? [Teacher]

It gives us light. **[Learner: 2]**

Good. It's because of the sun that we have day and night.

What else? [Teacher]

Maam, plants also use the energy from the sun to make food. **[Learner: 3]**

Well done, and who remembers the name we give to this process where plants make their own food? [Teacher pauses and there is no learner response]

Okay, nobody. Well do you remember this word: Photosynthesis? [She writes the word on the chalkboard]. Right, although the sun is very useful to us, it can also be harmful, if we spend too much of time in the sun and that is what we are going to talk about today. [Teacher]

Can anyone tell me what they think will happen to them if they spend too many hours in the sun. [Teacher]

You can get sunburnt. **[Learner: 4]**

True, but what can we do to prevent this? [Teacher]

We can use sun-block. **[Learner: 5]**

Good, is there anything else that we can use to protect ourselves from the sun? [Teacher]

We can use a hat or sunglasses. **[Learner: 6]**

Anyone else? Yes you, Nivi? [Teacher]

You can sit in a shady spot. **[Learner: 7]**

Okay, well done, let us move on to other dangers of the sun. Too much exposure to the sun can also cause skin cancer, or even a sun-stroke. Can anyone think of something else? [Teacher]

You can become very thirsty. **[Learner: 8]**

Aha, good why do you think this happens?

No one. Okay, what happens is that the body loses too much water, mainly in the form of perspiration. If we don't drink enough water to replace this water lost by the body, we become dehydrated, causing us to feel very thirsty. In fact, people can die as a result of intense dehydration. [Teacher]

Okay, children, let us recap what we learnt today. What are some of the dangers of spending too my much of time in the sun? [Teacher]

At this stage of the lesson, learners repeated the responses given above, plus recalled the teachers explanations of concepts that were newly introduced to learners. This appeared easy for the learners to do as all of the new words introduced during the course of the lesson, were written on the chalkboard. Repetition of new concepts taught, featured prominently throughout the lesson.

Whilst many learners raised their hands to respond to questions, Priya was cautious not to ask the same learners to respond to her questions. Questions were used throughout the lesson to extrapolate what the learners have grasped.

The lesson concluded with the self-assessment task, called *Assess Yourself.* These questions were written on the chalkboard for learners to work individually on, as Priya supervised the completion of the task.

Assess Yourself

1. Mention five ways in which spending too much of time in the sun, can be dangerous?
2. List five ways in which we can protect ourselves from sun-damage.

After allocating a period of five minutes to learners to quickly jot down the answers to these questions, the responses were written by the teacher on the chalkboard and learners were asked to check these against their written responses. A tick was used to indicate an answer that resembled the teachers answer. A cross was used to show that the answer was different from that on the chalkboard, and learners were asked to give themselves a mark out of ten in the margin. The teacher proceeded to ask learners how many of them had all right and commended these learners. She asked the rest of the learners to correct their incorrect responses, by copying down her correct answers from the chalkboard. On this note, the lesson concluded.

End of Lesson

Researchers Reflections: Priya used questioning throughout the lesson. Repetition was central to emphasizing new terms and concepts. Learners were keen to respond, as the teacher praised correct responses, and guided learners to the correct answers. Further, she encouraged learners to try again, if their response was inappropriate. Clearly, questioning was used as a form of informally assessing learners' understanding of new work covered. Further, self-assessment of learners work proved useful as learners began sharing responsibility for their own learning. Learners were expected to complete a written assignment task the following week. This, together with the term-end test would constitute the formal components of assessment for the term and would be reflected in the report to be issued at the end of that term.

Appendix: 8

Example of Lesson Observation Notes

Theme: Energy and Change **Grade:** 5

Topic: Energy in Nature

The lesson is introduced by the teacher asking learners to respond to the question:

What are the different forms of energy that we have learnt about, class?

Kajil records the learners' responses to this question on the board. At this stage, she has the following responses recorded:

Heat Energy

Sound Energy

Electrical Energy

Movement Energy

Light Energy

Chemical Energy

Stored Energy

The teacher moves on to asking learners to give examples in their daily lives where the forms of energy above, can be illustrated. Learners respond by giving appropriate responses, which are then recorded in the form of a table as shown below.

Type of Energy	Example where this type of Energy is used (as reflected in learner responses)
Heat	Heater, toaster
Sound	Radio, c.d. Player
Electrical	Stove, Microwave
Movement	Fan, Boy running
Light	Lampshade, Light Switch turned on
Chemical	Food
Stored	Boy sitting at desk, Girl standing in line

"Good, I see that you know the different forms of energy and where these are used. Now children, today we are going to learn about energy from nature, that is, energy that is not man-made.

She asks learners to rub their hands together and then asks them to place their hands on their face. Kajil asks the learners to explain what they notice.

"It feels warm", responds a learner.

"Good, why do you think this happens?" [Class is quiet] *Well, think about what happens when you rub your hands together?*

"You are making energy", responds another learner.

"You are quite correct in saying you are creating energy in this way. By rubbing you hands, you are creating friction, which occurs when you rub two things together. This energy is then transferred to your face as heat energy, which is why your face feels warm when you touch it.

Now, in the old days, people were not so blessed to have modern technology, like we do today. They had to rely on things from the environment to create energy. So they used to rub sticks and stones together to create heat energy. If these were rubbed hard and long enough, people could even create a fire. What do you think they used a fire for?

To keep warm. [Learner Response]

What else? [Teacher]

To cook their food. [Learner Response]

Anything else?[Teacher]

For light at night. [Learner Response]

Anyone else? [Teacher]

To warm water for bathing. [Learner Response]

Good, look at the table on the board. [She refers to the one on the different forms of energy]

Now, who can tell me what forms of energy from the table are used in our example of making a fire with rubbing two sticks or stones together.[Teacher]

Heat Energy [Learner Response]

What else? [Teacher]

Light Energy[Learner Response]

Good class. Now I have some questions that I would like you to answer in your work-books. You can start these in class and complete them as homework. We will review these in class tomorrow.

HOMEWORK QUESTIONS

1. Name three sources of heat energy from our environment.
2. Name three sources of stored energy from our environment.
3. Name three sources of movement energy from our environment

End of Lesson

Researchers Reflections:

The teacher uses knowledge that learners are familiar with as a point of departure. Further, she uses oral and written questions as a way of assessing learning among students during the lesson. The use of practical examples appeared to be a way of making the experience of learning seem more „real' to the learners. She also uses cues and clues to encourage learners to respond to questions. If however, there is still no response from the class, she goes on to explain the answers to the questions herself. The lesson is teacher dominated, with the teacher explaining new terms and concepts, as opposed to encouraging learners to attempt to offer scientific reasoning and explanations for themselves. Oral and written questions appear to be the way in which Kajil assesses her learners, informally.

At the time of observation, learners were also involved in a project, where they had to make a water-wheel as a formal assessment task for the term. This would be added to their term-test to be written at the end of the term. Together, these two formal assessment marks would make up the mark that would be reflected in the report at the end of the term.

Appendix: 9

Example of Lesson Observation Notes

Grade: 6

Topic: Static Electricity

Neel begins the lesson with asking learners who can recall what is meant by Static Electricity. He then proceeds to ask learners if they can give an example of static electricity in their daily lives.

Lightning is an example, sir, responds one learner.

Would you say that lightning is dangerous? Why? [Teacher]

Yes, people can be killed [Learner 2]

How can we protect ourselves against lightning? [Teacher]

By not swimming[Learner 3]

By not standing under a tree[Learner 4]

By not lying flat or sitting in an open area. [Learner 5]

Good. I see some of you went over what we did in class yesterday. Well, class today, we are going to further investigate why static electricity can be a nuisance, or even dangerous, like with the case of lightning.

Who has remembered to bring in the baking tray and the large plastic bag that I asked for, yesterday?

Okay, the three of you. Well done! I will use Siva's tray and Jiya's bag. Next time, we can use the things that Clive will bring in. It is a good thing that the pre-primary school teacher has given me plasticine. Oh, and yes I remembered to bring the tin lid and the wooden peg.

Okay, Clive since you have been so enthusiastic about bringing in your things for today's lesson, you can come to the front and help me with the demonstration.

The teacher conducts the demonstration with the help of Clive. He rubs a lump of pasticine on the tray, making sure it sticks fast. The tray is then placed onto the black bag, making sure that the bag covers the whole tray. After continuing to rub the plastcine lump back and forth over, the plastic bag, the teacher picks up the tray, by holding onto the plasticine.

Now, he holds the tin lid, using the peg, close to the corner of the tray. The teacher asks the class to raise their hands in response to the following question:

"What do you notice?" [Teacher]

"I see bright lights, like sparks, sir? [Learner]

"Yes, why?' [Teacher]

"*Static Electricity, sir?"* [Learner]

"Yes, what about static electricity? Anyone cares to help Sean? [Teacher]

"I think it has to do with the rubbing, sir?' [Learner]

"What about the rubbing? No one knows. Okay, what happens is that by rubbing the tray on the plastic, you are making electricity. When there is enough, it makes a spark. That is static electricity. The same thing happens when static electricity builds up in clouds before a storm and flashes of lightning are the giant sparks of electricity. [Teacher]

Now I have a quick exercise for you to do. I want you to quickly jot down the answers to the questions that I am about to put up on the board.

Questions to Re-Cap

1. What is static electricity?
2. Give 3 examples of cases where static electricity can be a nuisance or dangerous.
3. Mention 3 ways in which we can stay safe during lightning.

Neel gives the learners approximately seven minutes to complete the above task, and thereafter proceeds to reviewing the answers. He calls out individuals to record their responses on the board. He then checks theses for correctness and assigns a tick next to the

correct answer. If the answer is incorrect, he asks another learn to come forward to correct it. For each question, Neel completes the following table on the chalkboard.

Question	Number of learners who got it right	Number of Learners who got it wrong
1.		
2		
3.		

The lesson concludes with the teacher handing out notes in the form of a worksheet, which learners have to paste in their workbooks.

End of Lesson

Researchers Reflections: Neel provides feedback to learners so that they are aware of their progress. Further, they are involved in assessing their own work, by coming forward to respond to questions posed. This educator frequently makes use of the „why question", to ascertain learners reasoning and thinking behind their responses. However, demonstrations are teacher led, with learners observing. Questions are the chief means of assessing learners informally. This is done both orally and in writing. Neel was to use a practical investigation similar to the one he used in this lesson as a means of a formal assessment task. After the learners were exposed to a demonstration, they would be given a worksheet to fill in, based on what they observed. The second formal assessment task would be the term-end test that was compulsory at the school. The combination of the two sets of marks from these tasks would constitute the mark reflected in the term-end report.