CHAPTER ONE

ORIENTATING THE RESEARCH

"For the things we have to learn before we can do them, we learn by doing them" (Ross 1980, p. 1).

1.1. Introduction

In 2005, the Department of Education in the Western Cape hosted a two-day conference. The purpose of this conference involved an honest introspection of itself and challenged "those whose professional tasks are the conduct of schooling on a daily basis" (Morrow, 2007, p. 199). Participants in this conference discussed how schooling should be carried forward and reflected critically on what had been achieved (or not achieved) in education since 1994, the period that marked the beginning of democracy in South Africa (Morrow, 2007). Morrow highlighted the following about the conference: "Perhaps the most striking comment made was that from Premier Rasool: 'We come here not to celebrate (our achievements) but to consider whether we should change course …This conference has been called to issue a wake-up call to government" (2007, p. 199). The need for change of course seem to suggest that current policies, for example, lack vision, hope for, and a sense of a better future that many youth in, South Africa, experience (Morrow, 2007). Such a change in course is therefore and should be about ways in which South African youth are schooled – and subsequently how South African teachers should be educated to provide this schooling.

In the context of my study, motivation for changing the course is provided by the results of two major international research studies, namely: the performance of Grade 8 learners in the Trends in International Mathematics and Science Study (TIMMS) of 1995, 1999 and 2003 (Howie, 2001, 2004; Reddy, 2006) and Grade 4 learners' performance in the Progress in International Reading Literacy Study (PIRLS) in 2006 (Mullis, Martin, Kennedy and Foy, 2007), where South African learners had the lowest scores amongst 40 and 50 countries, respectively. Although there might have been criticism against some of the procedures followed in these studies (Dempster & Reddy, 2007; Vithal, 2008), the results remain a serious concern and the concerns regarding this state of affairs seem to be around one primary factor: education quality (Howie, 2004).

1.2. Internal challenges to South African education

The adoption of a plethora of new education policies and legislation by the South African National Department of Education since 1994, heralded in the intended changes in education. These changes were seen as part of the processes designed to bring about *quality* education. Such changes main focus was on addressing the subservient, irrelevant, unrealistic, impersonal education that the majority of learners received under the apartheid rule (Department of Education, 1998). As one of the manifestations of such changes, the new education dispensation policy document explicitly states: "OBE encourages a learner-centered and activity-based approach to education, while high knowledge and skills require the empowerment of those sectors of the population who were previously disempowered by a lack of knowledge and skills" (Department of Education, 2003, p 2-4). Sadly, however,

policies and curriculum statements do not necessarily bring about changes and improvements in education.

In Mr Surty's words during the conference hosted by the Western Cape Department of Education: "transformation has to do …with mindsets and attitudes … [and] how [we] transform institutions so that they can take account of the modern world" (Morrow, 2007, p. 204). He further argued that: "one central purpose of schooling is to enable access to the modern world" (*ibid*). I want to argue in this study, however, that the low performance in literacy of South African learners (Department of Education, 2003), indicate the fact that such access is denied. The fact that "only 1 in 29 Black children entering the school system emerge with matric certificates (Hoffman, 2008, p. 2) which provide them with access to further their education and their training and employment in a poor economy, represents a classical example of the denial of access. If we have the courage to recognise that many of our universities and schools across the political spectrum are "close to a point of breakdown" (Morrow, 2007, p. 184), then we have to also acknowledge that our education system is in "serious trouble" (*ibid*).

As with the poor achievement of South African learners as revealed by international studies referred to earlier, national concerns identify "[P]oor quality teaching [as] the key reason why the education system is failing so many schools" (Paton, 2006, p. 1). Soudien's (2007, p. 188) statement reveals the counterpart (teaching) as the problem when he says that "the impact it [the country] is making on the *quality* of the learning experience of young children is questionable." Morrow (2007, p. 184) concludes by a "widespread conviction that we urgently need to improve the quality of teaching and learning in our schooling system".

1.3. External challenges to South African Education

In addition to the internal collapse of the South African education system, the world community is adding more pressure on authorities to improve the quality in education. These education demands are linked to the rapid changes that the world is undergoing. Given the fact that we have long surpassed the modern world and now live in a post-modern world: "qualitatively different from former worlds" (Barnett, 2004, p. 248), more than before, urgent solutions are needed. Technological advancements represented by such innovations as computers, cell phones, television and satellite phones impose specific demands upon us as these technological advancements have penetrated deep rural areas and made available abundant knowledge to everyone who has access to them. This means the availability of a wealth of information that extends far beyond current school curricula is at our disposal. This accumulation of knowledge furthermore, has increased the complexity of the world that we have come to know. The concern with this form of knowledge, however, is that it carries no tag regarding its validity, reliability and trustworthiness. Further concerns with this knowledge involve the fact that it does not provide any clues about the future. This means we are left with a sense of uncertainty of this unknown future (Barnett, 2004).

Such uncertainties inhibit us from acting "with assuredness" (Barnett, 2004, p. 250) in the world and creates discomfort, anxiety and fear in what Hargreaves (2003, p. 27-35) calls "the age of insecurity." In Drucker's (2000, p. 8) words, "society is totally unprepared for it." Not only is society unprepared for this dramatic change, but the extent of this change compels us to "rethink everything we've ever understood about learning, education, schooling, business, economics and government" (Dryden & Vos, 1999, p. 21). It is within

this context that education needs to focus on developing certain kinds of human qualities. While Barnett (2004) emphasises the qualities of flexibility, courage, humility, thoughtfulness and resilience, Grulke (2000) emphasises the qualities of autonomy, independence, flexibility and self-reliance for empowering individuals in a world of uncertainty. Possessing these qualities is not just a luxury, but a fundamental requirement of the world we are living in and what is subsequently required by learning for an unknown future. These qualities, furthermore, are indications of the learning quality required. Basic numeracy and literacy - skills to be *actually* acquired during progress through the first 4 grades - and functional literacy - to be *actually* acquired during the subsequent 4 years of schooling - are only prerequisites for the possibility of quality education.

Knowledge and skills by themselves, however, cannot prepare individuals for the future. Instead, an acquisition of human qualities is also required. Knowledge and skills which defined and empowered individuals during the Information Age are necessary, yet insufficient because they only provide the entrance ticket to the new playing field of learning (Pink, 2006). According to Pink (2006, p. 3), “who flourishes and who flounders” in this age will be determined by the acquisition of fundamental human qualities that empower moral character. Unfortunately, education practices do not seem to take responsibility for this requirement although the implicit assumption is that this is the responsibility of education. This is despite the fact that today’s education “requires personal development of the highest order” (Alexander & Potter, 2005, p. 178). It is within this context that I argue that our education is in dire need of serious transformation and any such renewal should “start and end with the teacher” (Morrow, 2007, p. 209). Teachers remain the crucial interface between education policy that demand quality education and the execution of this quality (Fullan, 1982). Hargreaves (2003, p. 136) suggests that changes

required from policies (or any other relevant authority for that matter) “should be inherent in teacher professional development.” In addition, the quality of teacher education itself has to emulate the quality education expected from teachers as a trademark of its professional development. The important question to ask in terms of the South African context regarding these issues is:

> What is the pedagogical content knowledge of professional development in current teacher education revealing?

1.4. The flaw of the traditional (conventional) pedagogical content knowledge of teacher education programmes

Different types of experiences have contributed to my development as both a teacher and teacher educator. My role as a Biology teacher in a Secondary School, for three years however, remains the most profound experience in my career. After obtaining a BSc degree, with Biology and Psychology as my majors, and a BSc Honours in Psychology, I decided to teach. This decision was in spite of the fact that I did not have a teaching qualification. Even though I had no teacher education and therefore no pedagogical content knowledge, I was able to teach. My development as a teacher entailed planning for and teaching Biology. This involved practice and having discussions with Biology colleagues (teachers) on how I could teach particular sections of Biology during my lessons. These discussions were a kind of reflection on my practice and not pedagogical in content. Rather, they were experiences of practice. I only acquired pedagogical content knowledge when I was studying for my teaching diploma. This knowledge, however had a minimal influence on my practice. In

fact, my knowledge constructed from practice informed my responses to my teaching diploma assignments. After obtaining a teaching diploma and teaching for many years, I was appointed as a teacher educator at a college of education.

As a teacher educator, I challenged my colleagues on the expectation of student teachers to use a mechanistic 'one size fits all' approach when teaching learners and to learn Secondary school Biology content. But this is not required for future Primary school teachers. The student teachers at the time were frustrated with the teacher education programme. Firstly, they regarded the subject content as "valueless theory" and felt that the knowledge did not match the subject content knowledge that they taught during their teaching practice at schools. Overall, the entire experience was viewed as a waste of time. Secondly, they were frustrated when they found that the pedagogical content knowledge (education theory on how to teach), with all its exciting ideas, could not be applied in the school context (teaching practice) due to the rigid persistence of a dominant traditional knowledge transmission mode of education. It is under these circumstances that student teachers regarded the theory as "worthless" (student teachers', personal communication, September 1998). To illustrate these sentiments, the student teachers' frustrations are expressed in the following comment:

> We try to use the teaching strategies that we learnt at college while teaching at the school. Our teaching attempts have met with not much success and the teachers told us that we would lose all these fancy teaching ideas when we are full-time teachers (Student teachers, personal communication, September 5, 1998).

These comments suggest the failure of implementing theory on the part of students to current education practice. Another student expressed her frustration when she referred to theory that she had learnt:

> Very little of what we learn at the college helps us to cope with the challenges of learner discipline, teaching in under resourced contexts and working with relevant material (Student teachers, personal communication, September 5, 1998).

Clearly, the student teachers experienced immense frustration with transferring the knowledge and skills that they learnt at college to the school context. This evidence raises the theory-practice divide that still plagues teacher education today (Hughes, 2006). This persistence in the theory-practice divide in teacher education is based on the false perception that the knowledge (theory) to be learned sits somewhere, outside of a person, and that it is there for the taking (Slabbert & Hattingh, 2006). The assumption within this thinking is that knowledge can simply be learned or memorised and applied successfully in practice. Recent research (Claxton, 1999; 2000) in cognitive science, neuroscience, artificial science and experimental psychology, however provides evidence that these assumptions are false.

In the global teacher education arena, the traditional aim is to have student teachers learn knowledge constructed by experts (resulting from psychological, sociological, and educational research), and then using this expertise in their practice (Slabbert, 2003). However, this "technical-rationality approach" (Schon, 1983, p. 21) to student teacher education cause "teacher educators to make *a priori* choices about the theory that should be transmitted to student teachers" (Korthagen, 2001c, p. 255, Slabbert, 2003). Unfortunately "research has shown that this approach has very limited effect on practice" (Korthagen,

2001c, p. 255, Hughes, 2006). It instead perpetuates the ever-increasing theory–practice divide that teacher education has been plagued with from its outset. Examples of these plagues include the fact, that firstly, many student teachers did not apply the new theory learnt, they instead, practiced what was happening at the schools (Brouwer, 1989); secondly, there was a lack of success in student teachers developing critical reflective skills (Penny, Harley & Tansy, 1996) and; finally, student teachers were not equipped to address current education needs and classroom environments (Hughes, 2006).

1.5 The search for appropriate professional development

Even though there may be a realisation that the technical rationality model does not resolve the theory practice divide, there seems to be little clarity and/or agreement as to how teachers should be professionally developed to ensure the quality education that is required from them. What is clear is that we need to undergo a paradigm shift in our thinking about education and teacher education (Dryden and Vos, 1999).

In my search for a different teacher education programme, I inadvertently came across what was proposed as a contemporary radically innovative one. This was the one year Post Graduate Certificate in Education (PGCE) of the University of Pretoria. The format in which I was exposed to was through Table 1. It depicts a comparison with the more traditional teacher education programmes with which I could easily identify.

Table 1: A comparison between the more traditional teacher education programme and the radically innovative teacher education programme (PGCE) at the University of Pretoria

ELEMENT	TRADITIONAL	PGCE @ UP: RADICAL INNOVATION
AIM	Systematic learning for knowledge and skills acquisition	Maximizing human potential through facilitating authentic lifelong learning to create a safe, sustainable and prosperous universe for all
Target	Secondary school	All grades R-12: ECD, Foundation, Intermediate, Senior, and FET phases
Content	Pedagogic discipline theory (episteme) Teaching methods	Students construct their own practice theory (phronesis) of and for facilitating learning
Delivery Theory: Model: Mode:	 Behaviourist Transmission Lectures	 Authentic learning (Holistic, Experiential, Reflexive, Radically socio-constructivist, Action, Flexible, Contextual, Situated, Contingent) Transcendence Learningshops
Site % University: % School: Relationship: Purpose:	 80 20 Provides site Teaching Practice	 40 60 Mentor partnership Professional development through: Facilitating learning Reflection Action research
Assessment	Assessment of critique/model lessons Theory tests and exams	Continuous professional development Professional development portfolio defense

This comparison immediately attracted my attention because I am familiar with many of these concepts. I had not observed some of them in a teacher education programme though. I was compelled to satisfy my curiosity because this presentation portrayed a paradigm shift in thinking about education on face value. While I am aware that there is a range of teacher education programmes, I am also aware that there are many differences in their structure and implementation (Darling-Hammond, 2006; Kruss, 2008). Teacher education programmes also differ with regard to the nature and duration of the students' practice and experience in schools: "a capstone experience of student teaching" in some United States

institutions (Leavy, Mc Sorley, Bote, 2007, p. 1218); service-learning activities or school-based or a defined period with reflective practice activities at respective South African universities (Kruss, 2008).

Although this teacher education programme certainly may not be the only one that is featuring these unique concepts, its attractiveness is situated in its explicit emphasis on professional development. In close association with this is the comparison of what in essence constitutes the technical-rationality model. In the traditional (conventional) teacher education programmes it is indicated as pedagogical theory and teaching methods as pedagogical content knowledge (episteme) with which I could easily identify. However, the unique concept of phronesis as the pedagogical content knowledge, with its other closely associated concepts, aroused my curiosity and prompted a preliminary clarification.

1.5.1 Professional development

Education practices at schools presently and in the past reveal that the professionalism expected of teachers is that of being a source of information and knowledge and be able to adopt the teaching methods through which such knowledge could be transmitted (Leavy *et al*, 2007; Morrow, 2007; Bullough & Gitlin, 1994; Zeichner & Tabachnick, 1981). This thinking positions teachers in a professionalism that could be regarded as humanly detached, cognitive in nature and inappropriate in these post-modern times. The professionalism required of teachers is that of a personally engaged holistic nature, where the intellect is still necessary, and the emotional, personal and cognitive development of learners is viewed as primary. Much more fundamentally, professional development has an inherent ethical demand of maintaining the highest possible quality of professional practice. However,

current professional practice seems to be limited to "how to organise *systematic learn*ing" (Morrow, 2007, p. 70). Morrow uses this phrase in a manner that includes learning:

> academic knowledge or traditional 'school knowledge', [and] … also learning anything that takes time and is normally assisted by someone who knows. We might think of learning how to swim, or how to repair a motor car, in addition to learning how to read or to do mathematics (Morrow, 2007, p. 70).

Teacher education programmes with this as their definitive professional function "are inadequate" (Leavy, *et al*, 2007, p. 1218) in preparing student teachers for educating for the 21st century, to acquire the necessary fundamental human qualities indicated before. Hargreaves (2003, p. xi) is clear on this aspect: "…we require a qualitatively different approach to teaching in the 21st century …" not only in what we teach, but especially how we teach. In addition, the kind of pedagogy needed for educating for the 21st century "is much more demanding than that needed to impart routine skills" (Darling-Hammond, 1999, p. 221). The outcomes of this demanding pedagogy characteristically "lie neither in knowledge nor in skills: neither domain can carry a day in a world of uncertainty" (Barnett, 2004, p. 258).

It requires the teacher to adopt teaching methods through which the potential of all learners could be maximised and fully utilised. A teacher could do this through cultivating "practical, creative wisdom" (Slabbert, 2006, p. 1) to live and prosper amidst the uncertainties of real life. For learners to survive this uncertain and unknown future, they need to become problem-solvers and risk-takers in the process of constructing knowledge and teachers need to become facilitators of learning. This is no doubt a daunting task for

teacher education because what these competences should entail could best be described as the demanding challenges of a unique kind of teacher professionalism (Slabbert, 2006).

1.5.2. Phronesis

It is nowadays generally accepted that "people construct their own knowledge on the basis of their experiences" (Korthagen, 2005, p. 108; Van Huizen, Van Oers & Wubbels, 2005; Lombardi, 2007). This therefore leads to a focus on the question: "how one can help students to develop their own knowledge and skills" (Cochran-Smith, 2003, p. 17) and develop this expertise as the dialectic of scholarship and practice (Buchberger, Campas, Kallos & Stephenson, 2000). Hoban (2004) relates this constructivist notion of teacher education to the quality of its professionalism. Thus, an approach to teacher professionalism could focus on student teachers constructing their own knowledge about how to teach through the notion of phronesis which Kessels and Korthagen (2001, p. 27) define as "perceptual knowledge, the practical wisdom based on the perception of a situation". The major paradigm in teaching education is the focus on episteme knowledge. This type of knowledge is distinguished from knowledge as phronesis as follows:

- episteme knowledge is abstract and theoretical, while phronesis is concerned with particulars, concrete situations and theory (Kessels & Korthagen, 2001);
- episteme is linked to conceptual knowledge and phronesis is linked to perceptual knowledge. Conceptual knowledge is essentially governed by principles and theorems (Kessels & Korthagen, 2001) and can be used to explain how student teachers should teach. Perceptual knowledge has an appeal to perception where the student teacher "must be able to perceive and discriminate the relevant details" (Kessels & Korthagen, 2001, p. 25) of a concrete situation (the classroom).

Clearly, the focus on phronesis in teacher education may be a solution to the preparation of student teachers as flexible, individuals who have assuredness of being. But, the challenge that we are faced with – is how could student teachers construct it and utilise it?

1.5.3. Paradigm shift

The challenge of constructing such knowledge requires a paradigm shift that would entail a change in thinking and actions in teacher education – from knowledge as episteme to knowledge as phronesis. This change could see teacher educators losing their hold on making choices about theory and then using these chosen theories to inform student teachers on how to teach. Student teachers at the beginning of the programme would not be given any educational theory on how to facilitate learning. Instead, they would be expected to construct theory from their observation and critique of teachers teaching and their own beliefs about how to facilitate learning. As the programme proceeds, student teachers further construct their theories from the many experiences that they are engaged in, including discussions on educational theories. This theory construction is their own theory about facilitating learning and they construct a phronesis of facilitating learning. The internal and external challenges to education in South Africa can only be addressed effectively if a paradigm shift such as this one is implemented in the education system. For learners to be regarded as successful in the national and international arena and, more importantly, for them to survive the uncertain and unknown future, they need to have the necessary capacities for accessing the post-modern world, to be problem-solvers and risk-takers, and to have developed the human qualities previously discussed. Learners in South Africa could only achieve this if the education system and, ultimately, teachers, provide quality education. This expectation could be possible if teachers are facilitators of learning who

construct a phronesis of facilitating learning – with facilitating learning being identified as distinctively different from teaching (Mohanan, 2005, p. 2; Rooth, 2000, p. 35).

We would have to look to teacher education to fulfil this requirement. Here student teachers would be expected to construct a phronesis of facilitating learning. This experience of constructing a phronesis of facilitating learning would be an all new one for them. A great pitfall with this new paradigm is that since many student teachers would have experienced the old paradigm, this could create resistance to change and acceptance of the new paradigm. A further pitfall is that, in order for the student teachers to construct a phronesis of facilitating learning, they need to be facilitated by teacher educators who understand and can work in this new paradigm.

1.5.4. Construction of Theory

Essentially, for student teachers to be able to construct a phronesis of facilitating learning of school learners, they would need to experience facilitating learning. This construction of theory would have to be a personal activity as each individual's conceptual structures are not the same (Von Glaserfeld, 2001). In addition, student teachers are social beings and, in that sense, could construct a phronesis of facilitating learning collaboratively (Burr, 1995). Since each student teacher is not given a recipe on how to facilitate learning by an external other, he/she is expected to construct it. In constructing a phronesis of facilitating learning, each student teacher is expected to use his/her experiences of teaching and learning and, most importantly, to integrate these with educational theory. The challenge therefore is for us to respond to how student teachers construct this theory.

1.5.5. Authentic learning

Student teachers could construct this theory if they experience authentic learning, which is concerned with experiential, active, professional and contingency learning. The focus of this learning is on student teachers learning in real-life contexts and situations where they are expected to construct a phronesis of facilitating learning in practice. This can only occur if they "use the real world as [their] classroom" (Dryden & Vos, 1999, p. 26) to facilitate learning.

This view is supported on three premises: neuroscientifically, psychologically and practically (Slabbert, 2007). The first premise is that practical know-how (how/practice) and rational knowledge (what/theory) are located in completely different areas of the brain. It is only through direct immersion in authentic experience that practical know-how is developed to construct meaningful rational knowledge, which is specific to particular contexts (Slabbert, 2007; Claxton, 1999). The second premise focuses on the crucial importance of the learning environment to enable the learner to utilise what he/she has constructed to create something new (Slabbert, 2007). If the learning environment is so remote from the real context, then Claxton (1999, p. 209) concludes that, "no transfer will take place". The third premise focuses on the holistic nature of the problems that we experience in real life, which itself is a holistic practice. To solve these problems and thereby achieve our wholeness, we would require the use of human abilities (Slabbert, 2007; Clark, 1997; Flake, 2002).

The challenge in teacher education therefore is to provide authentic learning for all student teachers. However, the decision about what is authentic learning for student teachers and how this authentic learning could be managed is a greater challenge.

1.5.6. Belief system

The provision of authentic learning is a requirement for the student teachers construction of a phronesis of facilitating learning but it does not presuppose that they will do this. A factor that could impede on this process is the student teachers' "own preconceptions about learning and teaching." (Korthagen, 2001b, p. 255). If we, like many researchers (Peterson, Fennema, Carpenter & Loef, 1989; Pajares, 1992; Kagan, 1992, Richardson, 1996; Levy et al, 2007), accept that student teachers' beliefs about teaching and learning can influence how they will teach, then surely student teachers' beliefs about teaching and learning will influence their thinking and actions of facilitating learning. Currently, many South African student teachers, it may be argued, believe that the transmission style of teaching and learning is acceptable, for this probably has been their own experience of education. In order for student teachers to construct their phronesis of facilitating learning, their belief systems would have to be challenged and changed.

De Kock & Slabbert (2003) conducted research on challenging the belief system of student teachers at the University of Pretoria. Student teachers in a PGCE programme were expected to develop a new mental model about how teaching should take place, culminating into a new belief system (Korthagen, 2001). Teaching within this new mental model was viewed as "the facilitation of a process of learning based on the principles of constructivism" (de Kock & Slabbert, 2003, p. 1). Teachers, due to the inception of the new education dispensation in South Africa, were expected to implement changes in their teaching: from teacher-centeredness to learner-centeredness and traditional to constructivist philosophy. Student teachers were expected to observe this changed teaching in schools. Sadly, this was not the case because the new policies and philosophies were not implemented in practice in the way intended (Jansen, 1999; James, 2000). This resulted in a

collision between the student teachers' experiences in schools and the new education approach that they were exposed to in their programme. Because of this, problematic student teachers beliefs' were not changed (de Kock & Slabbert, 2003). The challenge therefore is to consider what actions are required to 'persuade' student teachers to change their beliefs.

1.5.7. Reflective practice

A possible action would be for student teachers to reflect on their experiences and, in the process, become aware of changes in their belief systems. The basis of reflecting is for student teachers to construct meaning (Leavy *et al*, 2007) of their existing beliefs and constructed theories of facilitating learning. In the process of constructing meaning, the student teachers could be "trying to (re)structure an experience, a problem, or existing knowledge or insights." (Kessels & Korthagen, 2001, p. 68). However, this process of reflecting does not take place automatically. The question then is how could student teachers be motivated to reflect and to use these reflections to inform their learning?

1.5.8. Facilitating learning

If we accept that good teaching is concerned with facilitating learning (Lombardi, 2007), then student teachers should facilitate the learning of learners through learning task design and operation, and reflect on the process. In the process of facilitating learning and reflecting, the student teachers could be provided with an opportunity to construct and re-construct their own practice theory.

Each student teacher constructs his/her own phronesis of facilitating learning in authentic contexts. Evidence of this is from a pilot study that I conducted in 2003 on the radically

innovative PGCE programme at the University of Pretoria. The purpose of this study was to examine the underlying assumption that the construction of a phronesis of facilitating learning could take place in practice. I interviewed 3 Life Sciences student teachers whose professional development time comprised 60% at a school facilitating learning and 40% at the university attending specialisation subject sessions. A statement made by one of the student teachers during the interview was: “95% about facilitating learning was obtained at the school during my school-based experience and five percent from the university” (Student teacher, personal communication, September, 2003). All three student teachers concurred with this statement. It has therefore become clear to me that this new teacher education programme is providing the opportunity for phronesis/practice theory to be constructed from practice.

These experiences as a teacher educator led me to question the existing practice of professional development of student teachers. Recognising that the quality of learning is so poor in South Africa and that the world is changing rapidly, the professional development of student teachers should be focused on constructing a phronesis of facilitating learning.

1.6 The research problem

Although it was tempting to consider the evaluation of the programme as a whole, it is the novel concept of phronesis and its related key concepts as a possible alternative to the technical rationality concept of pedagogical content knowledge that became the focus of my interest. In addition, the indication that phronesis has to be constructed by the student teacher proposes a significantly different paradigm. This construction, in turn, represents a

practice theory of and for – not teaching – but facilitating learning. This indicates the existence of a significant difference between teaching and facilitating learning, as mentioned before. Additionally, the focus on learning rather than teaching, as it relates to the explicit aim of education, proposes an emphasis on the development of the highest possible level of learning quality. Finally, and perhaps fundamentally, the construction of phronesis seems to be imbedded in continual professional development. Although the preliminary clarification of these concepts need a more in depth exposition, the accumulative relationship between these concepts prompted my interest in how student teachers construct and use phronesis to enhance their professional development.

1.7 The research questions

The primary research question in this study is: *How do student teachers construct and use phronesis to enhance their professional development?* This research question was explored by addressing the following secondary research questions:

a. What is the student teachers' baseline phronesis when they enter the programme?
b. How do student teachers utilise the contribution of the mentor teacher to construct and use phronesis to enhance their professional development?
c. How do student teachers utilise the contribution of the specialisation programme to construct and use phronesis to enhance their professional development?

1.8. Importance of the research

The findings of this research could be useful to:

a. **Expanding** our knowledge on student teacher professional development. Firstly, on how student teachers' professional development may be enhanced by the particular experiences that they are exposed to during the teacher education programme. Secondly, on the extent, depth and importance of the structure and manner in which a teacher educator engages student teachers in a teacher development programme. Thirdly, on the extent and depth of the role that mentor teachers could/should play in enhancing the student teachers' professional development;

b. **Curriculum development** specialists in teacher education. To inform teacher education curricula on the impact of a particular approach for enhancing teacher professional development, the focus will be on how student teachers' construct and use phronesis in a particular PGCE programme. This could be useful to defining a knowledge base for teaching where phronesis is considered to complement existing theories about teaching (Meijer, 1999). It could also serve a useful purpose in educating new teachers (Bennet & Carrè, 1993; Reynolds, 1989);

c. **Curriculum development** specialists in mentorship for information about the most effective process for maximising the student teachers' construction and use of phronesis;

d. **Policy makers** in teacher education. To inform the development of policies on the structure and implementation of student teacher professional development programmes.

1.9 Plan of the research chapters

The report consists of eight chapters. The purpose of this chapter is to place the study in context by providing some background. As indicated, the rationale for the research study includes personal reasons for wishing to conduct this research based on experience of teacher education as well as upon the importance of this research in the context of global teacher education reform. The research questions provide the framework for this study.

Chapter 2 is organised into a conceptual framework, literature review and a theoretical framework. The literature review focuses on exploring the meaning of phronesis used in this research; research in the field of phronesis and student teacher professional development and constructing and using phronesis for professional development.

As this research will be located in the field of student teacher professional development, the theoretical framework to be used, focuses on the learning and development of student teachers – The Vygotskian perspective on learning and development and sociocultural practice. This theory will be used to inform the research design and how data will be analysed.

Chapter 3 sets out the methodological framework applied in this research. This chapter sets out the selected research design (case study participatory action research) and the chosen methods (interviews – biographic, semi-structured and group; visual media – student teachers' drawings, observations, and document analysis - reflective journals, professional portfolio, concept maps and learning task design documents). Various issues related to the

methodology, such as limitations, research rigour, ethical considerations and limitations will be discussed.

Chapter 4 presents an analytical discussion of the student teachers' construction of a phronesis of and for facilitating learning in the first action research cycle. This cycle will occur during the first three weeks of the programme. The purpose of this cycle will be to explore the student teachers' baseline phronesis and to expose them to an intervention. The student teachers will be expected to explore and construct their personal and professional identity linked to developing as a facilitator of learning and their theory of facilitating learning.

Chapter 5 presents an analytical discussion of the student teachers' construction of a phronesis for facilitating learning in the second action research cycle. Cycle two will occur during weeks four to six of the programme. During this cycle, the student teachers' understanding of a facilitator of learning and facilitating learning in practice will be explored and challenged.

Chapter 6 presents an analytical discussion of the student teachers' construction and use of phronesis to facilitate learning in the third action research cycle. During this cycle, the student teachers' understanding of a facilitator of learning and facilitating learning in practice will be explored and challenged.

Chapter 7 presents an analytical discussion of the student teachers' construction and use of phronesis to facilitate learning and the preparation and presentation of a Professional Portfolio during the fourth action research cycle. During this cycle, the student teachers'

understanding of a facilitator of learning and facilitating learning in practice will be explored and challenged and their Professional Portfolio assessed.

In Chapter 8 the findings from the action research cycles are brought together to explore the student teachers' construction and use of phronesis to enhance their professional development and conclusions are reached in this regard. The implications of this research for student teacher professional development will be discussed in the light of the findings. Suggestions for further research will be made.

In the context and purpose of my study, I choose to sequence the chapters in this way in order to reflect the student teachers' baseline phronesis at the beginning of the professional development programme. I also want to reflect how the student teachers at different phases in their professional development, utilise the contribution of the mentor teacher and the specialisation programme to construct and use phronesis to enhance their professional development.

Chapter 1 focused on stating the problem of the research and the research questions, while Chapter 2 focuses on the research literature linked to the research problem raised and the theoretical underpinnings of the research.

CHAPTER TWO

LITERATURE REVIEW

"There is a need of forming a theory of experiences in order that education may be intelligently conducted upon the basis of experience." John Dewey

2.1. Introduction

The preceding chapter served to orientate the reader to the central issues of this study: the need to improve the quality of learning and teaching in our schooling system; and a possible solution to this need could be in the provision of a student teacher professional development programme that is focused on student teachers' construction and use of phronesis. This suggested solution raises a question of how student teachers construct and use phronesis to enhance their professional development.

As discussed in chapter one, the failure of the Department of Education to provide quality education and ultimately quality learning for all South African youth has led to a situation where education in South Africa is experiencing internal and external challenges. To deal with such challenges, the Department of Education introduced a plethora of policies to provide quality teaching and learning. Such policies, however, are not sufficient to ensure the provision of quality teaching and learning and could not achieve the intended changes in education on their own. The dismal performance of South African youth in national and international studies in numeracy and literacy competence referred to in chapter one and the youths' lack of a vision for the future are just a few examples that illustrate the failure of

these policies. The dilemma for South Africa is that if the youth do not receive quality education, their performance and ability to act with assuredness in this rapidly changing world, which has an uncertain future (Barnett 2004), may be severely compromised.

These issues indicate that it is not the adoption of policy alone that is required to deal with these challenges, but, in Morrow's (2007, p. 184) words, it is also an urgent improvement in the "quality of teaching and learning in our schooling system." However this improvement depends crucially on the collective efforts of individuals who are *au fait* with what it involves and what its "cultural and political significance is" (Morrow, 2007, p. 29).

The most crucial question in this context is: Who are the individuals at the interface between policy implementation and the provision of quality education and learning? Teachers, it seems to me are the individuals who occupy this position and who could possibly fulfill the requirements for providing quality learning. This response is supported by researchers (Hargreaves, 1994; Van Huizen, van Oers & Wubbels, 2005; Morrow, 2007; Samuel, 2008), who argue that teachers play a key role in providing quality learning and the transformation within an education system, for the ultimate success of any schooling system. If we view the provision of quality learning as a teacher's responsibility, then we must explore how teachers and, especially, student teachers, are prepared and developed as professionals to provide such learning.

Student teacher professional development is not an instantaneous, *de novo* process that occurs in a vacuum. Student teachers in student teacher education programmes, it may be argued, have particular paradigms of teaching and learning. Examples of these are presented in chapter 1. The provision of quality learning, however is impossible if student teacher

professional development does not focus on the nature and content of their pedagogic content knowledge that student teachers experience and, more importantly, on exploring and challenging each student teacher's paradigm of teaching and learning. Any changes that student teachers experience in their paradigms of teaching and learning should be rooted in the experiences that the student teachers are exposed to during their professional development (Elbaz, 1983; Richardson, 1989; Elliot, 1991; Korthagen, 2001; van Huizen *et al*, 2005; Zeichner, 2005; Morrow, 2007). There is little clarity, however regarding how student teachers could or should be prepared to ensure their fulfillment of this paradigmatically different and significant role (Zeichner, 2005; Hughes, 2006). It is therefore crucial that we explore how student teachers develop professionally within a particular professional development programme in order to provide a framework for such development.

In relation to these issues, the question to ask is: how are student teachers prepared to provide quality learning for these contexts and post-modern times? A response to this would demand "a critical reflection on the professionalism of teachers" (Van Huizen, *et al*, 2005, p. 267). Reflections on the pedagogic content knowledge and approaches used in traditional teacher professional development have revealed flaws. It is on these bases that I argue in this study that a new approach with different pedagogic content knowledge in student teacher professional development programmes is required for student teachers to acquire the essential human qualities and the understanding of quality learning in the schooling system. This would entail a paradigm shift from knowledge as entirely epistemic to knowledge that is strongly focused on phronesis, on the one hand, and a shift from the assumption that children have to be taught in order to know to one that they have to "be facilitated to develop their unique potential" (Holdstock, 1987, p. 49) on the other hand. Facilitating

learning, in turn, requires the construction of phronesis, the practical wisdom which is acquired when experience of education practice is transformed into dynamic knowledge of, and for, facilitating learning (Slabbert, 2003).

It is within the context of these observations that this chapter firstly explores the meanings of phronesis and related concepts to present clarity and declare the meaning used in this research. Secondly, I move to presenting a critique of research literature in the field of phronesis and student teacher professional development. Thirdly, the chapter discusses major concepts that have been identified in this radically innovative teacher education programme and foregrounds the impact of these on student teacher professional development. Fourthly, and finally, the chapter presents the theoretical framework that I will use to analyse the data – the Vygotskian perspective on learning and development and sociocultural practice as espoused by van Huizen, van Oers and Wubbels (2005).

2.2. Meaning of phronesis and related concepts

Various theorists have used the concept phronesis and have ascribed particular meanings to it. In addition to discussing its original meaning as used by Aristotle, I analyse it in terms of its philosophical basis. It is after these deliberations that I further discuss the meaning of phronesis as ascribed by other theorists (Jonsen & Toulmin, 1988; Kessels & Korthagen, 2001; Halverson & Gomez, 2002). The meaning of the concepts practical knowledge and practical theory are also discussed. The purpose is to clarify their relationship with phronesis. My intention is to lead the reader to the focal concept of this research - phronesis

as practice theory, and serve to position and distinguish practice theory from the other concepts.

2.2.1. The meaning of phronesis

In his *Nichomachean Ethics* (in Ross, 1980) Aristotle distinguishes three kinds of knowledge associated with wisdom: techne, episteme and phronesis. *Techne* refers to the knowledge of making, ranging from the arts of construction to the creation of states of affairs (Dunne, 1993) and as craft-knowledge (Kessels & Korthagen, 2001). For Halverson (2004), it is expressed through routines and procedures. This type of knowledge however, in not the focus of my discussion at this stage because episteme and phronesis are the knowledge types I intend to focus on. Episteme, a concept coined by Plato, refers to purely intellectual forms of knowledge. It is both necessary and universal, and it may be connected to a scientific understanding of knowledge (Kessels & Korthagen, 2001). Episteme can be represented apart from the knower, codified into systems of thought, and leads to reproducible effects under similar circumstances (Kessels & Korthagen, 2001).

Phronesis, also referred to as practical wisdom, was first described by Aristotle in his book the Nichomachean Ethics (in Ross 1980). Ross (1980, p. 1) translates phronesis in the following way:

> For the things we have to learn before we can do them, we learn by doing them, e.g. men become builders by building and lyre players by playing the lyre; so too we become just by doing just acts, temperate by doing temperate acts, brave by doing brave acts (Ross 1980, p. 1).

The emphasis on the individual's action as an essential feature in the learning process. However, this action is focused on the "capacity [of an individual] to act with regard to human good" (Aristotle, *Nich. Eth., Book VI, Book* 1140, p. 25) (in Ross, 1980).

This notion of 'good' is the concept that Aristotle focused on extensively (Roca, 2007). Good is considered the ultimate driving force behind moral action in Aristotelian ethics. Good inspires human inclinations, virtues and, therefore, prudential deliberation because, as Aristotle points out: "The good for man turns out to be activity of soul in accordance with virtue" (*Nicomachean Ethics* I 7, 1098a, p. 15) (in Ross, 1980). Aristotle regarded good as the ultimate end, and the compass that guides the uncertain exercise of judgment. This uncertainty is due to the actions being specific to particular situations and they do not have reproducible effects. Any individual possessing phronesis is to know what is "good for human beings in general and will have the ability to apply such knowledge to particular situations" (*Nicomachean Ethics* VI 5, 1140b, p. 6) (in Ross, 1980). This means that individuals will have a general awareness of right values and should be able to act appropriately in specific instances, including situations where there is no established formula.

The practical wisdom that individuals have may be viewed as harmonizing rather than clashing with the nature of the practical matters which includes interpretation, ambiguity, and indetermination (Roca, 2007). It is within the context of this understanding that an individual's individuality during the process of deciding on an action to take in a particular situation is important. Furthermore, in doing an action, individuals develop the capacity to discern solvable features of a situation. This focus on the good and the solution to the problem suggests a duality of reason and emotion. This duality is evident in Aristotle's work

"it is impossible to be practically wise without being good" (*Nicomachean Ethics* VI 12, 1144a, p. 18) (in Ross, 1980). Finally, the decision-making action is considered by Aristotle as praxis: an action that changes behaviour and develops an individual (Roca, 2007). I turn to a discussion of the meaning of phronesis by other theorists in the next section. .

As part of their work in the field of moral arguments and ethics, Jonsen and Toulmin (1988) used the term 'casuistry' and linked it to phronesis. For them the term deals with the ultimate particular and this is [seen as] the object of perception. They referred to this perception of each individual as an "individual-particularistic-perception" (Jonsen & Toulmin, 1988, p. 66). They highlight the importance of specifics in an individual's experience of perceiving. Kessels and Korthagen (2001) who worked in the field of realistic mathematics teacher education, furthermore, extended the meaning of phronesis to include a particular type of knowledge. According to them, the individual develops knowledge which focuses on the "understanding of specific concrete cases and complex or ambiguous situations" (Kessels & Korthagen, 2001, p. 24). The essential feature for this development of knowledge, however, is that an individual should have appropriate experiences as "particulars only become familiar with experience" (Kessels & Korthagen, 2001, p. 27). It is during this experience that individuals perceive, judge and assess situations, choose the actions to take and become aware of their consequences (Kessels & Korthagen, 2001). Individuals generate a "sort of insight that is altogether different from scientific knowledge (*ibid*, p. 27) as a result of these experiences. Kessels and Korthagen (2001, p. 29) concluded that what a person needs is "perceptual instead of conceptual" knowledge. They view an understanding of particular situations as more important than the understanding of general situations and experiences as an essential component to developing phronesis.

Halverson & Gomez (2002) also viewed experience as essential to the development of a particular type of knowledge. This experience entailed the processes of "judgment, understanding, and insight" (Halverson & Gomez, 2002, p. 21) resulting in appropriate action. According to them, "wisdom, a capacity acquired through experience" assists individuals to ask questions and provides them with the capacity to ask questions, provide intuitive understanding and consequence of actions, to inform possible action (*ibid*). Of significance is the fact that the action decided on should take "account of the particular … [and] how knowledge and experience" are used within particular contexts *(ibid*).

The concept 'phronesis' was used in the business world by, amongst others, Mc Kenna, Rooney and Liesch (2006) and Roca (2007). Mc Kenna *et al* (2006, p. 284) showed how "wise practices can be used effectively by managers in a knowledge economy." Their reason for using the concept was that it is directed to moral (good) outcomes and is rational, with a focus on the contingency nature of knowledge (Mc Kenna *et al*, 2006). Roca (2007) re-conceptualised phronesis so as to emphasise its intuitive and emotional components. According to Roca (2007, p. 206), the emotional components "are often devalued by business ethicists". I argue in this thesis that they need to be included so as to avoid a too intellectual interpretation of Aristotle. This concurs with Roca (2007, p. 206) who concluded that practical wisdom appears to be "an appropriate sense" with which to understand and manage organisations.

In the context of my study, a comparison between episteme (expert, scientific knowledge) and phronesis (individual practical wisdom) will provide additional clarity as depicted in Table 2. This table, however, need not be read as a declaration that there is a divide between scientific knowledge and practical wisdom, nor that practical wisdom is the only one that

has a place in teaching and learning. Instead, my position is that a student teacher, in a student teacher professional development programme, will generate a sort of insight or perception that is different from scientific knowledge. In this context the student will use the rules (scientific knowledge) to further inform, enrich and strengthen their insight or perception. This insight, however, can only be constructed by the student within conditions that allow for extended periods of proper experience. It cannot be transferred or induced through the use of conceptual knowledge. It is on these bases that conceptual knowledge is used as a guide to explore the student teacher's insight or perceptions. The focus of my research thus is on theory with a small t (phronesis) and not on theory with a capital T (conceptual knowledge).

Table 2: Comparison between knowledge as "episteme" and as phronesis (Kessels & Korthagen, 2001, pp. 20-31)

KNOWLEDGE AS EPISTEME	**KNOWLEDGE AS PHRONESIS**
Expert, scientific knowledge (theory)	Individual practical knowledge
Needs scientific understanding	Needs practical wisdom
Knowledge of universal principles	Knowledge of concrete particulars
Locus of certitude: Principles	Locus of certitude: Particulars
Knowledge is conceptual	Knowledge is perceptual
Knowledge is rigid	Knowledge is flexible
The principle (concept) dictates the practice	Uses the practice to discover a guiding rule/principle/procedure/method
Knowledge learned (memorized) and "applied"	Knowledge acquired through enough, appropriate and proper experience (perceiving, assessing, judging, choosing actions, execute them, be confronted with its consequences and learn from them)
Provides principle	Provides holistic insight
Teach the student concepts – avoid will, emotions, etc they disturb	Help the student see – celebrate will, emotions, etc they provide insight

Phronesis is also closely related to what may be called practical knowledge. A discussion on the various meanings of practical knowledge is the focus of the next sections.

2.2.2. The meaning of practical knowledge

Just like phronesis practical knowledge also focuses on an individual's action in a real context. According to Nussbaum (1986, p. 314), a person with practical knowledge "inhabit[s] the human world and does not attempt to rise above it". This assertion suggests the importance of knowledge of a particular context and action as dictated by that context.

This knowledge is “for responsiveness and yielding flexibility … [but] could not adequately be captured in general description” (Nussbaum, 1986, p. 304) and it is unconstrained by prior theories of education. Carter (1990) however, locates practical knowledge within the context of teachers’ work. In this context practical knowledge refers to the knowledge that teachers have of “classroom situations and the practical dilemmas” (Carter, 1990, p. 10) that they encounter in carrying out decisive action, in particular settings. Thus, practical knowledge may be viewed as conceptual and particular in nature. It can thus be argued that an exploration and analysis of the teachers’ actions could be used to reveal the conceptual knowledge that underlies the teachers’ actions (Carter, 1990).

Fenstermacher (1994) and Meijer (1999) also situated practical knowledge in teachers’ work. Fenstermacher (1994, p. 58) viewed it as knowledge that “teachers themselves generate” from their experience of teaching and reflecting on these experiences, while Meijer (1999, p. 20) focused on the “cognitions that underlie teachers’ actions.” Meijer (1999, p. 20) also viewed practical knowledge as “personal and tacit” and related to the content, context and reflections on experiences. Both theorists seem to adopt the view that student teachers could use these reflections to learn from them. In the words of Fenstermacher (1994, p. 24), teachers seek solutions from “concrete details rather than from some theoretical domain.” The view that teachers generate knowledge advances the understanding about practical knowledge. This view, however, fails to provide a description of how teachers generate this knowledge. A possible solution to this is suggested by the work of Bigelow (1992) in managerial wisdom. In this work, Bigelow (1992) designed a model of wisdom development representing two types of changes in a person. At one level he views practical knowledge as important for individuals to develop over the short term and, at another level, metacognitive processes as developing higher levels of insight

(Bigelow, 1992). Although the model presents a possibility of how an individual develops wisdom, it also fails to provide a description of how this knowledge is generated.

2.2.3. The meaning of practical theory

The use of practical theory could be a response to this lack of clarity and can essentially be viewed as knowledge that is developed and used to guide practitioners' actions (Brookfield, 1987; Handal & Lauvas, 1987; Duignan &.Macpherson, 1993; Cronen, 2001; Cunliffe, 2002; Barge, 2004). The proviso for this knowledge development is that all practitioners should have the experience of a phenomenon in order for them to be able to assign meaning to it. This meaning is regarded as particular in that it is linked to particular contexts and is used to inform further action within that context. While Brookfield (1987) and Handal and Lauvas (1987) view practical theory as extending the teachers' baseline theory, Duignan and Macpherson (1993) view it as a theory to inform leadership in educational settings. Social theorists, furthermore, have used the term practical theory in a variety of ways. Cunliffe's (2002) usages focus on the "localized description [that] individuals create" and the collective abilities that professionals bring to a situation. These abilities are "informed by a coherent way of going on—the practical theory" (Cronen, 1995, p. 233). Barge (2004, p. 188) also supports and extends this view by stating that "practical theory evolves through its reflexive relationship with practice". The focus on this reflexive relationship is vitally important as a person's practical theory informs their practice and the "consequences of our practice should yield new insights for revising our theories" (Barge, 2004, p. 188). Barge (2004) concludes that these practical theories "are intended to inform patterns of practice that make life better and are judged according to the pragmatic criterion of utility as opposed to an epistemic criterion of truth." (p. 190). The use of the term practical theory and

the meanings given to it as discussed above lead to the development of the meaning for practice theory.

2.2.4. The meaning of practice theory

Practice theory is derived from the Aristotelian use of phronesis with its focus on particulars and the action for common good. Practice theory focuses on particular practice, reflection on the practice, social learning of the practice of learning and the inclusion of existing theories of education (Furlong, 2000; Korthagen, 2005; Slabbert, 2003, 2007). Each student teacher during his/her professional development, for example, is expected to construct his/her own practice theory from all the experiences throughout the programme. According to Slabbert (2003, p. 3), the practice in practice theory focuses on each student teacher's education practice which "relates to transformative learning design and action of facilitating learning in the classroom". In this context, the focus is on what each student teacher does when preparing to facilitate learning and when he/she is actually facilitating learning. Slabbert (2007) views the theory in practice theory as the knowledge constructed during the interaction between theory and practice as the student practices and reflects on the practice. Each individual student teacher therefore, will have his/her own practice theory as it will be constructed from their experiences and continuously enriched by each individual student's practice from reflecting on his or her practice and also the "practices of other facilitators of learning, as well as other already existing theories (research) in education (Slabbert, 2007, p. 22).

Hence, the role of a student teacher is that of a facilitator of learning who "generate[s] knowledge [during] the process of facilitating learning" (Slabbert, 2007, p. 22).What is significant here is the action of the individual in the generation of theory and the context in

which this experience is embedded. The crucial aspect within this context, is that during this process, while the needs of any individual student teacher is met, the students teachers are also challenged to transcend their immediate level of learning continually in order to achieve the highest possible quality of learning they can. This is what facilitating learning has as it's focus (Mohanan, 2005). So in facilitating learning student teachers are constructing their theory of their facilitating learning practice.

2.3. Phronesis and student teacher professional development

It would be amiss to discuss phronesis and student teacher professional development without presenting perspectives on the concept of professional development.

2.3.1. Student teacher professional development

The focus of this section is to contextualise the meaning of being a professional teacher and professional development in teacher education. My purpose is to discuss the particular meaning embraced in this study.

2.3.1.1. Professional teacher

The meaning of the terms professional and professional teacher are politically, socially and culturally influenced, and this is evident in the way theorists assign meaning to them. In Morrow's (2007) terms, for example, a profession has two characteristics: "theoretical nature of professional practice and the ethical dimensions of a profession" (p. 78). Within the South African context, this meaning cuts to the core of the characteristics that professional teachers should possess as many lack appropriate content knowledge,

pedagogic content knowledge and an effective work ethic. Researchers essentially agree that the teacher as a professional should possess "competence in and be committed to the practice of professional teaching" (Morrow, 2007, p. 75); make decisions about teaching and learning for particular learning environments with "confidence and commitment" to teach learners (Samuel, 2008, p. 15); "standard of competence" and also commitment (Van Huizen *et al*, 2005, p. 274).

Teachers may be regarded as members of a profession (Morrow, 2007) whose 'actions' and work are shaped by many different demands made on teachers' work in general (Samuel, 2008; Morrow, 2007; James, 2000) and the internal and external challenges for quality learning (Hoffman, 2008; Soudien, 2007; Morrow, 2007). It is for this reason that a critical view of how student teachers learn and develop as professionals is important. Such learning does not happen as a *de novo* process, nor is it "invented by individuals" (Morrow, 2007, p. 101). Student teacher professional development does not occur in a vacuum and as student teachers are expected to learn and develop in particular educational institutions. These use particular models and methods for them to develop pedagogic content knowledge.

2.3.1.2. Developing a student teacher as a professional

Professional development is "generated" within the institutions and the profession committed to teaching (Morrow, 2007, p. 74). It is a process where student teachers, over an extended period of time, learn and develop within a sociocultural context. This learning and development entails evolving participation in a social practice where the sociocultural context is recognized (Van Huizen *et al*, 2005).

2.3.2. Perspectives on the professional development of student teachers

Research literature (Vonk, 1995; Hargreaves, 1994; Calderhead & Shorrock, 1997; Korthagen, 2001; Morrow, 2007; Samuels, 2008) on how student teachers should be professionally developed, suggest various strategies. The perspective that has dominated such literature for many years is that "learning to teach is a two-step process of knowledge acquisition and application or transfer" (Feiman-Nemser & Remillard, 1996, p. 79; Hughes. 2006; Morrow, 2007). This view infers a mutually exclusive relationship between the teacher educator, the student teacher and the acquisition of knowledge about teaching. The roles of the teacher educator and the student teacher are clearly defined in terms of what content and pedagogic content knowledge will be the focus, who knows best in terms of what must be done when you teach, and how you should teach. The teacher educator is the specialist provider of knowledge and the student teacher applies this knowledge when teaching. This 'one size fits all', theory driven process, where the teacher is expected to perform as a technician (Zeichner, 2005), is currently not suitable as a model for student teacher professional development. One fundamental reason for this position is that it is far removed from the actual experiences that student teachers will have when they are teaching. This view implies that this approach will not even equip them for the challenges of the uncertain future.

Globally, student teacher professional development programmes differ with regard to their content i.e. curriculum components and the allocated time for each component (Villegas-Reimers, 2003; Darling-Hammond, 2006; Kruss, 2008). The debates about whether the professional development programmes should focus exclusively on content or pedagogy, or both, are abundant. In many countries the tendency is to emphasise the teaching of "content in the initial preparation and the pedagogy in the practicum" (Villegas-Reimers, 2003, p.

48). In some African and Latin-American countries the focus is on "content without pedagogy and/or practice" (Villegas-Reimers, 2003, p. 48). In such instances, student teachers do not receive any school-based experience during their professional development. In other parts of the world, furthermore, the professional design is such that there is an increase in the time that the student teachers spend in schools for the practicum period (Villegas-Reimers, 2003). The length of this period varies quite remarkably from country to country: "a capstone experience of student teaching" in some United States institutions (Leavy, Mc Sorley & Bote., 2007, p. 1218); two weeks for Japanese secondary school student teachers; four weeks for New Zealand elementary teachers and Japanese primary teachers, and for a full year in Germany, France, India and Belgium (Villegas-Reimers, 2003); sixteen weeks in a some South African universities and twelve weeks in others. In some countries such as Japan, this practicum experience is coupled with the expectation that novice teachers also complete a further practicum session. The professional development programmes may also differ with regard to their composition and nature: service-learning activities (Callahan & Root, 2003); school-based with minimal university theory (Slabbert, 2003; Korthagen, 2001) and project-based (Vithal, 2008). In these programmes it is evident that a teacher educator is not regarded as the provider and transmitter of knowledge, instead he/she facilitates learning (Stacey, Rice and Langer, 2001). The role of the student teacher therefore is fixed: he/she is actively involved in his/her own professional development as a teacher.

Student teacher professional development occurs in a sociocultural context (Van Huizen, van Oers & Wubbels, 2005; Hughes, 2006; Morrow, 2007; Samuel, 2008) and is influenced by a number of factors (Samuel, 2008; Morrow, 2007; Hughes, 2006). These factors include, amongst others: biographical, contextual, institutional setting and programmatic

forces (Samuel, 2008); conception of teacher's work (Morrow, 2007; Hargreaves, 2003; Fullan, 1982) and conceptions of the places where the teachers will teach e.g. schools (Morrow, 2007; Hargreaves, 2003); the professional requirements (Hughes, 2006); demands for quality learning (Dryden & Vos, 1999; Alexander & Potter, 2005; Soudien, 2007; Morrow, 2007). Knowing this, however, should not detract us from the main proviso that student teachers should be professionally developed to provide learning of the highest quality.

2.3.3. Phronesis and professional development

Research on phronesis and practical knowledge has been the focus of professional development research for several years (Elbaz, 1983; Fenstermacher, 1994; Calderhead, 1996; Korthagen, 2001; de Kock & Slabbert, 2003; Marsh, 2003; van Huizen et al, 2005; Hughes, 2006). This has mainly been on the nature of teachers' practical knowledge (Elbaz, 1983, Connelly and Clandinin, 1990, Schon, 1987, Polanyi, 1967, Anderson, 1987; Brown et al, 1989, Carter, 1990; Fenstermacher, 1994; Meijer, 1999); contents (Van Driel, Verloop & DeVos, 1998); use of practical knowledge to guide teacher's decisions (Calderhead, 1996; Black & Halliwell, 2000), and the types of instruments used to capture and represent this knowledge (Kagan, 1990; Meijer, 1999); teaching reading comprehension in secondary education (Meijer 1999); in mathematics education and realistic teacher education (Korthagen, 2001); and successful instructional leadership (Halverson, 2002). It is within this context that the personal dimension of teacher thinking was explored with a focus on their emotional, moral and aesthetic components (Marsh, 2003, Hargreaves, 2005; Leavy *et al*, 2007). Several researchers (Hargreaves, 1998, 2001; Nias, 1996; van Veen, Sleegers & van de Ven, 2005; O' Connor, 2006) have explored emotions in teaching and teacher's professional lives. Other researchers (Mattson & Harley, 2003; Marsh 2003; Lasky, 2005)

have explored teacher identities in professional development and (Connelly & Clandinin, 1987; Fenstermacher, 1994; Marsh, 2003) focused on teacher's implicit theories and personal knowledge.

The focus on teacher professional development in the research literature has changed from developing research knowledge of the nature of the content and the teaching of this content to the subjective experiences of student teachers (Leavy *et al*, 2007; Hargreaves, 2001; Zeichner, 2005). This research, however, still needs to fully embrace a professionalism focused on enabling people to live and prosper amidst the uncertainties of the future. A different student teacher professional development that focuses on the complexity of facilitating learning (where the facilitator of learning facilitates learning and the learners construct meaning) should be planned and implemented.

Researchers, such as Meijer, Zanting and Verloop (2002) re-directed the field of research on phronesis and practical knowledge to research not just on teachers, but also student teachers. They used student teachers to elicit experienced teachers' practical knowledge (Meijer, Zanting and Verloop, 2002). Research that focused directly on student teachers focused on their development of mental models in a sociocultural context (de Kock & Slabbert, 2003); their use of field work to aid in their process of meaningful reflection and construction of practical knowledge (Perry & Power, 2004); personal learning in a realistic teacher education programme (Korthagen, 2001). Korthagen (2001b, p. 71) concluded that student teachers' professional learning will be "effective when: directed by an internal need", in the learner, rooted in the learner's experiences and the learner's reflection. Carr's (2007) research findings on student teachers implied that the use of phronesis in the student teacher professional development programme was essential for the cultivation of their

character. Research on phronesis and student teacher professional development is minimal and there is a silence on how each student teacher constructs and uses phronesis to enhance their professional development.

Research on phronesis and professional development is, however, not new in the field of education. Halverson (2004) presented a case for the development of wisdom in management development programmes. He (2004) used phronetic narratives to recognize the missing knowledge in the knowledge base of instructional leaders: what its component 'parts' are and how it operates as a form of reasoning and deciding (p. 4). The narratives were used to illustrate how these leaders negotiated problem situations to achieve their outcomes (Halverson, 2004). Korthagen (2001), furthermore, explored phronesis by focusing on realistic teacher education in mathematics. He proposed an approach for teacher professional development that has its roots "in a wish to bridge the gap between theory and practice" (Korthagen, 2001c, p. 254). This approach was based on realistic tenets: concrete practical problems; systematic reflections of student teachers; personal interaction between student teachers and teacher educators; levels of professional learning and a strongly integrated character (Korthagen, 2001). Research on post-graduate student teachers' observations of the reality of change in school classrooms and the impact of this on the development of mental models was conducted by de Kock and Slabbert (2003). This research is further later in this thesis.

2.4. Constructing and using phronesis for professional development

A critique of research literature on student teachers' perceptions of teaching and learning, understanding of their role as facilitators of learning, and their experience of the teacher development process, are necessary to give meaning to how student teachers construct and use phronesis to enhance their professional development. Furthermore, an in-depth and critical inquiry into the literature on student teachers' feelings and emotions during their professional development is imperative because feelings and emotions play an essential role (Hargreaves, 1998, 2001) in professional development.

Research in the construction and use of phronesis in student teacher professional development may be available, but it does not explore how student teachers actually construct and use it. The concepts used in this research focus on a paradigm shift in student teachers' beliefs about teaching and learning; authentic learning and reflective practice.

2.4.1. Paradigmatic shift

An exploration of the paradigm shift in student teachers' beliefs about teaching and learning is linked with the fact that phronesis, as it is conceptualised in this research, is the individually, self constructed practice theory of facilitating learning, as opposed to solely receiving the theory of teaching and learning from a teacher educator.

2.4.1.1. Self constructed practice theory

According to the constructivist theory, student teachers who are educated to become facilitators of learning should be constructors of knowledge (Von Glaserfeld, 1984). This knowledge, according to Von Glaserfeld (1984, p. 37) cannot be transferred and

"communication not a conveyance." It is within this context that student teachers should not passively receive knowledge, either through the senses or by way of communication. They should actively perceive and construct knowledge by interacting with their environment (Heyligen, 1997). This knowledge construction is possible for, the function of cognition is to observe phenomena in the world and to interpret them (Von Glaserfeld, 1995). Piaget (1945, p. 113) explains that this interpretation is due to the understanding of the interaction between the self and the phenomena. It is possible that student teachers could use these interactions to construct models of reality. These models could then serve as a basis for then to interact with their environment. Since conceptual structures in different heads are not the same (Von Glaserfeld, 2001), consensus between different cognitive structures of individuals has to be activated. This is necessary since knowledge is constructed in a social context (Wortham, 2001). It is for this reason that this knowledge construction process is perceived to be radically socio-constructivist.

This view of how knowledge is constructed is linked to the type of learning expected of student teachers. Learning is the construction of meaning which is "unique and specific" (Frankl, 1984, p. 121) and it can be developed by a facilitator of learning. This facilitator of learning is then able to use the meaning developed to do something "creatively new" (Slabbert, 2007, p. 3). This is possible if the facilitator of learning's understanding comes from experience and not explanations. Such an experience can only be facilitated by others (Claxton, 1999, p. 17). In this instance the others refers to teacher educators. The roles of the student teacher and the teacher educator are such that the former constructs meaning in the process of facilitating learning and the latter facilitates this learning. Most significantly, in this process is that the student teachers are expected to take control of, and responsibility for, their learning about facilitating the learning of learners.

2.4.1.2. Facilitating learning

This experience needs to be facilitated by teacher educators who are highly professional facilitator[s] of learning and who are extremely well-educated (Slabbert, 2006). Smith and Blake (2005, p. 3) add further requirements for a student teacher when they say that they should be aware that good 'teaching' "involve(s) a process of facilitating learning" and not a conveyance of knowledge from the teacher to the learner. Slabbert (2007, p. 3) provides the conditions for this facilitation of learning when he says that knowledge and "understanding does not come through explanation, but through experience." In this frame of experience, student teachers are seen as facilitating learning and learners are constructors of meaning (Slabbert, 2007).

a. The role of a facilitator of learning

The label facilitator of learning is used in this research as the most appropriate replacement for teacher or educator. Samuel (2008) reminds us that in the South African context, the label educator was chosen by teachers themselves. This choice was not for educative purposes, but for political reasons, designed "to flatten the levels of hierarchies that characterised the apartheid system" (Samuel, 2008, p. 5). The choice of facilitator of learning as a label in this research is based on a psychosociocultural one. This choice is based on the view that learning is the most fundamental concept in all education. The role of the facilitator of learning in this context is to operationalise learning (Slabbert, 2003), for they are expected to do this.

The concept facilitator of learning, is not a new one (Biehler, 1974). A clear and distinctive meaning of this concept is linked to teaching, instruction, teaching methods or techniques and skills. For Rooth (1995), facilitating learning is "not teaching, not telling, not lecturing,

not preaching, and not directing or guiding" (p. 5). She indicates that it is something distinctively different. A teacher and teaching are concerned with developing learners to know, whereas a facilitator of learning and facilitating learning are concerned with developing learners' "unique potential" (Holdstock, 1987, p. 49) to learn. This qualitative difference is further explored by Alexander and Potter (2005, p. 179) who assert that facilitators of learning are in "the business of making themselves redundant" due to the expectation that the learners take control of, and responsibility for, their learning. Facilitating learning, in that sense, is indeed "new pedagogy" (Alexander & Potter, 2005, p. 179) that ensures quality learning, not only on the level of knowing, but indeed on the highest possible quality level of being fully human.

This shift in focus from teaching to facilitating learning begs a recognition that learning can be recognized to be taking place. Facilitating learning is linked to the concept of phronesis discussed in this thesis. As pointed out, phronesis incorporates the student's personal practice experience. Facilitation enables continuous enhancement of these experiences by each practice, reflection on these and those of other facilitators of learning and the integration of already existing theories (research) in education (Slabbert, 2007). A student teacher's practical experience of facilitating learning is therefore in a continuous process of development and improvement throughout the period of facilitating learning in the classrooms.

In facilitating learning, three purposes must be considered. The first has to do with getting learners involved in experiencing a challenge that would create in them a need to learn through searching for meaning, which is generally referred to as initiating learning. The second focuses on the learning process that learners engage in for them to construct meaning. The third is concerned with maintaining learning by ensuring that the learner remains engaged

with the learning process until the highest possible quality of learning is achieved through them experiencing an enhancement of the meaning constructed.

It is therefore essential that in facilitating learning, the facilitator of learning engages learners in authentic learning experiences. This can only occur if "The real teacher …lets nothing else be learned than – learning" (Armstrong, 1991, p. 48). A critical feature of this 'real teacher' is that he often produces the perception that learners "learn nothing from him" (*ibid*, p. 48). This 'real teacher' will work with the belief that learners have to learn for themselves and that no one can learn for them (Slabbert, 2007).

This learning requires learners to experience learning tasks which may be characterised as "authentic and meaningful real-life experiences" (Van Merrienboer & Paas, 2003, p. 9) designed by the facilitator of learning. These learning tasks should have the features of authenticity, interviewing, articulation and reflection (Van Merrienboer & Paas, 2003) within them. For them to contain these features, these learning tasks have to be designed by student teachers who will have to learn how to do this. These student teachers will be expected to develop an understanding of the features and the principles of designing learning tasks. Designing features of authenticity is linked to tasks that reflect the real world, while interviewing, articulation and reflection focuses on the role of the learner. The role of the learner is one in which they are actively engaged in "learning the ways of knowing of an expert" (Van Merrienboer & Paas, 2003, p. 5). Claxton (1999, p. 307-311) extends this view by stating that "learning to learn (metalearning through metacognition) includes the self-discovery of the tools (algorithms) to solve problems." So, learning focuses on the role of the learner and the type of tasks that need to be given to learners. If learners are given simple tasks with no relevant problem to solve, this would be meaningless in

developing the learners' ability to learn. For a learning task to be meaningful and succeed in developing learners' ability to learn, it would have to have a challenging real-life problem (Van Merrienboer & Paas, 2003). In designing these learning tasks the facilitator of learning needs to consult "curriculum planning documents (official resources); … find the real-life challenge; … design the authentic learning context; … determine the end product outcomes; … design the presentation and … prepare the learning environment" (Slabbert, 2007, p. 7-14). The implication here is that the designing of learning tasks demands that student teachers be knowledgeable, not just in terms of content of the Life Sciences, but also the essential features and principles of a learning task.

Once the learning task has been designed according to the features and principles, the student teacher will then be expected to operate the learning task. This in Slabbert's (2007) view challenges student teachers to use artistic and creative skills. The focus here is on the student teacher's professionalism and uniqueness in creating a learning environment and then initiating learning. Since initiating learning is the only aspect of facilitating learning that can be designed (Slabbert, 2007), a student teacher will need to plan carefully. Herrington, Oliver & Reeves (2002) suggest that it is necessary for the facilitator of learning to create an authentic environment for meaningful learning to be achieved. This environment is then used when learners engage with learning tasks, as it (environment) can "provide [extensive] … meaning to otherwise decontextualised facts and skills, and can enhance the transfer of deep and lifelong learning" (Herrington et al, 2002, p. 4). It is during this phase, the maintaining learning phase, that the learners' actions cannot be planned as they are dependent on what happens during the initiating learning phase (Slabbert, 2007). The Life Sciences student teachers are therefore expected to construct the required knowledge of the essentials and practice of operating a learning task.

b. Facilitating Learning in the Life Sciences

Effective facilitation of learning of learners in the Life Sciences focuses on the facilitator providing space and means for learners to construct knowledge, skills and attitudes in authentic contexts. For this reason, Life Sciences learning tasks may be one of four types (Heathcote, 1991; Wagner, 1999; Slabbert, 2007): (1) focuses on learners operating in *real life*, such as maintaining a door-sized vegetable garden; (2) learners portray characters involved in or associated with particular jobs, for example, operate as researchers presenting their findings at a "scientific" conference; (3) focuses on learners' thinking about and creating the future, for instance, projects about the food that future people will eat and (4) learners to construct and or play games according to rules that they have constructed, such as, games on life processes, environmental issues or any other appropriate content, skill and, attitude and value aspect of this field of study.

Life Sciences, the field that "involves the systematic study of life in the changing natural and human-made environment" (Department of Education, 2003, p. 9) is offered to Grade 10-12 learners. These learners are expected to develop processes of "critical inquiry; reflection and an understanding of concepts and processes and their application in society" (*ibid*) as well as dissect and identify botanical and zoological material; make and identify material on a microscope slide; observe material using a microscope and manipulate laboratory instruments while conducting investigations (Department of Education, 2003). Learners are also expected to design, conduct and present the findings for investigations conducted.

Learners' competence in the science processes is assessed by executing the learning task and this integrates dissections of material in order to assess learners' competence to use a

wide variety of dissecting instruments for a specific purpose. This involves an expectation that student teachers would choose appropriate material to be dissected and activities where learners are expected to use a wide variety of instruments. Learning tasks may integrate the formulation of problems and hypothesis about natural phenomena. Here, learners are being assessed on their competence to make acute, nuanced observations and to identify problems in a natural environment. To achieve this, learners need to be confronted with real natural phenomena as opposed to models, videos and pictures. More specifically, a Life Sciences facilitator of learning needs to be knowledgeable, skilful and creative about the nature of Life Sciences and, the type and nature of the learning tasks, the ways of learning of learners, and the socio-cultural context of learners, when designing learning tasks

c. Developing Perceptual Knowledge

In addition to developing conceptual learning as a result of getting involved in the process of facilitating learning, student teachers develop perceptual knowledge (Kessles & Korthagen, 2001; Slabbert & Hattingh, 2006). These types of knowledge are created as a result of the student teachers facilitating learning in the actual school classrooms and discussing and reflecting on these experiences. They are focused on: intuitive and perceptual aspects and works through imagination to "reveal what is real" (Slabbert & Hattingh, 2006, p. 16) and "concrete particulars" (Kessels & Korthagen, 2001, p. 25) and subjective experiences. The second type of knowledge is "conceptual and logical and draws on the intellect and [constructs] the knowledge" (Slabbert & Hattingh, 2006, p. 16). This would serve as the interplay between the student teacher's theory with a *t* and the educational theories (T) that inform educational practice.

Essential features for the development of perceptual knowledge are real contexts to be "perceived, experiences to be had, persons to be met, plans to be executed, and their consequences to be reflected on (Kessels & Korthagen, 2001, p. 29). The central importance of the student teachers development of perceptual knowledge can be seen in the view that the technical-rationality approach, which focuses on developing conceptual knowledge, only "has a very limited effect on practice" (Korthagen, 2001c, p. 255; Hughes, 2006; Morrow, 2007). This development of perceptual knowledge to improve practice is essential for it "helps the [student] teacher, within the practical situation, to quickly perceive" (Korthagen, 2001c, p. 255) what is appropriate in the particular context and to make decisions and execute suitable actions. The construction of this knowledge requires experience within authentic learning, experiential learning, an explorations of their knowledge, beliefs and interactive cognitions of facilitating learning, facilitating learning, and to reflect in and on the facilitating learning experiences in social learning settings.

2.4.2. Authentic and experiential learning

This section enlightens the reader on the importance of authentic learning for the construction of phronesis. It is for this reason that discussion on the concepts of learning, authentic and experiential learning are presented. These concepts are central to the construction of phronesis.

2.4.2.1. Learning

If we accept that learning "is about change, and it is change" (Zull, 2002, p. xiv), then we need to recognise that it is "a change in understanding and a change in one's relationship to the world" (Barnett, 2004, p. 248). This change could be due to the learning process of interaction, analysis and reinterpretation of new information (Mims, 2003; Brown, Collins

& Duguid, 1989). Learning therefore may be viewed as a "messy process; [as] it is never simply linear or logical" (Abbot, 1999, p. 23). It is a complex, dynamic process. Furthermore, it is an active social and sensory process that occurs effectively in authentic contexts (Van Huizen *et al*, 2005). Lombardi (2007, p. 2) reminds us that it is "learning by doing [action] that is the most effective way to learn." It is in learning, furthermore, that learners increase their capacity to act effectively in the world (Senge, 1990; Mims, 2003; Lombardi, 2007; Slabbert, 2007; Morrow, 2007).

This is possible because during the learning process, people perceive their environment as their "cerebral cortex is engaged in sensing, integrating and motor activity" (Zull, 2002, p. 15) acting and, as a result, deep learning should emerge. Zull further states that "our brain has the capacity to reflect, develop ideas, and take actions continually" (*ibid*, p. 25). This indicates that our brains are active in the learning process: solving real life problems. This means "we are always in the middle of a multitude of learning cycles, getting new sensory information, thinking about different experiences, getting new ideas about their meaning, and testing those ideas" (*ibid*, p. 25) in real contexts. It is during this process that we develop authentic learning.

Such authentic learning and its importance is also provided, among other things, by research in learning. Three principles align authentic learning and learning research to each other. Principle one views learners as looking for connections between new pieces of information and their existing knowledge structures (Lombardi, 2007). Inherent in this principle is the view that if learners cannot make connections i.e. there are no links, then the new knowledge is rejected (Lombardi, 2007). So the assimilation of the unfamiliar will be easier if a learner receives "more encouragement" (Lombardi, 2007, p. 8) and, in the process, they

develop personally and emotionally. This would call for support for student teachers who would be experiencing new, different and challenging experiences to construct knowledge and integrate educational theories for explanations and learning in the process. The second principle focuses on the practice (Lombardi, 2007, p. 8) of airing concepts "repeatedly and regularly … and associated with new settings, activities, and people" for the attachment to be made and to prevent the loss of information. This principle links with the practice of the student teachers facilitating learning, and this leads to a situation where the new experience, with all its complexities and expectations, the student teachers construct new knowledge. This knowledge could be used to change the student teacher's thinking and practice of facilitating learning. The third principle views new information as part of a "learning event and [is] directly linked to the learner's mind with social circumstances" (*ibid*, p. 8). These could be linked to the repeated facilitating learning practices that student teachers will experience and the socio-constructivist and social learning that they will encounter.

2.4.2.2. Authentic learning

This type of learning is concerned with real aspects as the term authentic is defined as "genuine, true, and real" (Webster's Revised Unabridged Dictionary, 1998). Rule (2006) uses the term authentic learning to describe the learning of individuals in real-life contexts and situations. Mims (2003, p. 2) provides a more comprehensive view for he states that students should be "engaged in genuine learning problems" for them to be able to make connections between the material being learned and their previous knowledge. He extends this view further to include an approach to teaching that allows students to discuss and "meaningfully construct concepts and relationships in contexts" (Mims, 2003, p. 2) that are concerned with real-life problems that are relevant to learners. Lombardi's (2007, p. 2) view of authentic learning also captures the real aspect of learning and it provides specifics about

the nature of the problem and the strategies of "role-play exercises, problem-based activities [and] case studies" which are used for effective learning to occur. Authentic learning therefore requires real life problems; active learners, the achievement of an outcome and experiential learning in a real context.

Some scholars (Slabbert & Hattingh, 2006, p. 15) argue that real life problems serve as a "trigger for the use of creative problem-solving skills" and the skills and urgency to search for meaning and appropriate actions to solve the problems. When learners are exposed to these problems they will have to, in Slabberts' (2007) view, develop and display courage and wisdom. This is critically important, as for these problems do not have pre-defined solutions or patterns for solving them (Lombardi, 2007). The challenge for solving these real-life problems should awaken learners' intuition described by Noddings and Shore (1984, p. xiv) as "engagement of the will, involvement of the senses, receptivity, a quest for understanding" and forces between certainty and uncertainty. It is at this point that if an individual makes choices during facilitating learning, these will be based on his/her practical wisdom/phronesis.

Authentic learning, furthermore, incorporates the emotional aspect of learning and student teachers bring their experiences, beliefs, knowledge, neuro-psychological functioning, identities and curiosities to the classroom where "authentic learning provides a means of bridging those elements with classroom learning" (Mims, 2003, p. 2; Hargreaves 2001). According to Mims (2003, p. 2), authentic learning "will increase student motivation". This motivation will enable learners to "persevere despite initial disorientation or frustration, as long as the exercise stimulates what really counts" (Lombardi, 2007, p. 4) in facilitating learning of Life Sciences.

The importance of the context in a student teacher's construction of a phronesis of facilitating learning should not be underestimated. Korthagen (2001c, p. 255) reminds us that one of the main causes for student teachers' "failure to transfer theory to practice are the socializing influences" of the school context. The beliefs and thinking about teaching and learning that student teachers are exposed to, and the support provided by the mentor teacher, represent examples of such influences. Van Huizen *et al* (2005, p. 270) directs this cause to the "contextualized support" offered to student teachers during their construction of phronesis. If this context and support is such that they provide student teachers with space and opportunities to challenge and learn from their facilitating learning practices, this could serve as the springboard for the further construction of the student teacher's phronesis (practice theory). The importance of the self with regard to perception and the development of a student teacher as an authentic being (Barnett, 2004) during his/her construction of phronesis in the particular contexts have a great impact on the practice theory to be constructed, and more specifically, on the intricacies of the theory. Due to student teachers' experiencing facilitation of learning, they could be able to evaluate and use past and present experiences to "plan how to act in the future" (Aspin & Chapman, 1994, p. 17). Such an action by the student teacher is critical, for it contributes in the development of an understanding of the process of facilitating learning.

Authentic learning plays a critical role in a student teacher's construction of phronesis, for this learning enables student teachers to experience activities where the following features are present (Lombardi, 2007, p. 3):

- "*Real-world relevance:* Authentic activities match the real-world tasks of professionals in practice as nearly as possible. …

- *Ill-defined problem:* …students to identify for themselves the tasks and subtasks needed to complete the major task.
- *Sustained investigation:* … tasks to be investigated by students over a sustained period of time …
- *Multiple sources and perspectives:* … students to examine the task from a variety of theoretical and practical perspectives, using a variety of resources, distinguish relevant from irrelevant information n the process.
- *Collaboration:* collaboration integral to the task ….
- *Reflection (metacognition):* … learners to make choices and reflect on their learning, both individually and as a team or community.
- *Integrated assessment:* Assessment is not merely summative… but is woven seamlessly into the major task in a manner that reflects real-world evaluation processes.
- *Polished products:* …culminate in the creation of a whole product…
- *Multiple interpretations and outcomes:* …allow for diverse interpretations and competing solutions. (Lombardi, 2007, pp. 3-4).

Student teachers need to be immersed in authentic learning contexts and not just to be engaging with authentic learning experiences. As a result of this immersion, they develop different kinds of transferable skills of judgment, patience, synthetic ability and flexibility to "generate innovative solutions" (Lombardi, 2007, p. 3) which are necessary for "learning and development" (Van Huizen *et al*, 2005, p. 274). Student teachers immersed in these learning experiences are expected to be active, reflecting people who perceive their contexts and assign meaning to these contexts, ultimately developing perceptual knowledge. Within particular contexts student teachers may have diverse interpretations and competing

solutions where they may be required to make decisions and choices about what to do next (Claxton, 1999). Barnett (2004, p. 259), however, is of the opinion that neither knowledge nor skills will enable student teachers to make appropriate choices and decisions, but "certain kinds of human qualities." He (2004, p. 259) views the human qualities such as "thoughtfulness, humility, resilience, flexibility and courage" as essential for the development of an authentic being.

2.4.2.3. Experiential learning

In order to attain a certain level of experience, the action of the student teacher in authentic learning is critical. This experience could serve as the foundation for an lifelong education process that is based "in the intellectual traditions of social psychology, philosophy, and cognitive psychology" (Kolb, 1984, p. 2). Kolb (1984, p. 18) extends this view further by stating that it is the "philosophical rationale for the primary role of personal experience in experiential learning". This suggests that the actions of individuals are pertinent for an experience to be lived out. Experiential learning, furthermore, focuses on "the process of learning as opposed to the behavioural outcomes" (*ibid*, p. 26; Beaudin & Quick, 1995) and the learner's learning and development is within a sociocultural context (Van Huizen *et al*, 2005).

According to Stenhouse (1979, p. 1), we have "to learn the wisdom that we do not possess". This learning could be possible if student teachers are expected to facilitate learning in authentic learning contexts, and are provided with emotional support. What is crucially important within this endeavour is that the student teacher himself/herself is expected to construct his/her own phronesis (practice theory). The construction of phronesis is the learning or construction of the wisdom of, and the wisdom necessary for, facilitating

learning in practice and this is a never-ending process of improvement. In facilitating learning over an extended period of time student teachers will be designing and operating learning tasks, and this facilitates learning and improvement as part of doing it.

The student teachers' construction of phronesis is concerned with the questions how, why, and more particularly, in what contexts it is constructed. Their experiences of particular contexts are significant for the construction of their phronesis as the nature, depth and duration of this experience and their personal perceptions and identities are intertwined in the process. Student teacher's experiences would be operating on a meta-cognitive level where deep analysis and critique with a focus on what action they could take as facilitators of learning and the justifications and impacts of these are experienced, reflected on, and understood. A possible further essentiality for constructing phronesis is for student teachers to practice (what they do) to inform theory (what they think about what they do), and the constructed practice theory (what they think) informs their practice (what they are doing) (McNiff & Whitehead, 2005). McNiff and Whitehead state that "theory is located in teachers' professional experience" *(ibid*, p.6). This supports the view that theory is inherent in each developing student teacher, and that it is further constructed from experience. The connection between the experience of facilitating learning and the development of expertise in facilitating learning is made in the practice theory that the student teachers construct. It is for this reason that phronesis construction is essentially based on experience, but more particularly on using the theory that is already constructed by the student teachers themselves.

The student teacher's construction and use of phronesis must be experienced in an authentic context over an extended period of time. Studies (Zeichner, 1983; Villegas-Reimers, 2003)

and as valuable and real learning (Amarel & Feiman – Nemser, 1988; Korthagen, 2001; Morrow, 2007) in teacher education report that student teachers view their experience at the schools as the central part of their education What my study wishes to challenge is the commonly held belief that there is a relationship between the "quantity of field experience and the amount of learning" (Doyle, 1997, p. 2; Hughes, 2006) that student teachers experience. Johnston (1994) is of the view that the more classroom experience one has, the more one will learn about teaching. This view is supported by Villegas-Reimers (2003, p. 49) who, after reviewing studies on the effectiveness of the teaching practicum stated that "an increase in the number of hours" that a student teacher spends in the lesson is very valuable. Some researchers (Griffin, 1986; Zeichner, 1990; Hughes, 2006) report however, that the quantity of field experience in a teacher education programme does not necessarily result in teacher learning. They argue that experience may be the best teacher, but only if student teachers use the full range of their experiences as contributors to their learning process. This learning process should be one where the student teacher is active in seeking particular experiences from which to develop and learn, and then to actively process their development and learning from these experiences (Zeichner, 1990).

There is no doubt that fieldwork plays a role in preparing better teachers, but "there is persistent concern that such [fieldwork] experiences do not reach their full potential value" (Bowman & McCormick, 2000, p. 256). Several reasons are suggested for this, among which is limited resources to conduct field work (Goodlad, 1990; Darling Hammond, 1999) and nature of fieldwork (Goodlad, 1994). According to Hughes (2006, p. 115) it is "faculty currency" that is critical to the professional development of student teachers. The challenge is to question and provide the relevance of the faculty work to the real-life experiences that

student teachers will encounter in the schools. It is therefore necessary for student teachers to experience facilitation of learning in real classrooms over an extended period of time.

Senge (2006, p. 23) reminds us that the core learning dilemma is that "we learn best from experience but we never directly experience the consequences of many of our most important decisions." This is where the construction of phronesis expects student teachers to be intimately involved in both the experience of facilitating learning and most importantly, **also** the consequences of their decisions about facilitating learning. In constructing and using phronesis student teachers may integrate these consequences into their phronesis (practice theory) and use it in subsequent experiences. The student teachers' knowledge construction will be possible if they are engaged in activity, reflection and collaboration for these are essential for experiential learning to occur.

2.4.3. Student teachers' beliefs and construction of phronesis

Student teachers' beliefs and construction of phronesis is concerned with their beliefs about teaching and learning and their knowledge, beliefs and interactive cognitions. A discussion on each of these follows in the next section.

2.4.3.1. Student teachers' beliefs about teaching and learning

Teacher educators have become increasingly aware of the fact that preservice teachers on entry to teacher education programmes bring with them a multitude of experiences, assumptions, and beliefs about teaching and learning (Feiman-Nemser & Remillard, 1996; Leavy, Mc Sorley & Bote, 2007). In constructing and using phronesis, student teachers' beliefs about teaching and learning must be elicited, explored, challenged and changed. It is accepted in the research literature, for example, that the beliefs teachers hold strongly influence their perceptions and judgments, which in turn, affect their behaviour in the

classroom (Peterson, Fennema, Carpenter, & Loef, 1989; Pajares, 1992; Richardson, 1996; Bullough and Gitlin, 1995; Leavy *et al*, 2007). What we need to recognise though is that student teachers' beliefs are developed and informed over an extended period of time. These beliefs could be informed by their experience of being taught at school and at tertiary education institution. According to Korthagen (2001b, p. 255), the main cause of the "failure to transfer theory to practice are…student teachers' own preconceptions about learning and teaching." In the context of South Africa, these beliefs would mainly consist of teachers as a source of information and the transmission of knowledge. These beliefs are in contrast to what is expected of teachers - to adopt teaching methods through which the potential of all learners could be maximised and fully utilised (Slabbert, 2006).

Such radical changes in one's belief system will only be feasible if student teachers' beliefs are challenged. It is on these bases that Kagan (1992, p. 85) concludes that teacher beliefs, which he regards as personal knowledge, "lies at the very heart of teaching." It is imperative therefore that this personal knowledge should be changed. Furthermore, a general assertion held by many researchers (Hollingsworth, 1989; Holt- Reynolds, 1992; Resnick, 1987; Richardson, 1996; Leavy *et a*l, 2007) in teacher professional development is that what prospective teachers learn during their preparation is strongly influenced by their existing perspectives and understandings about teaching and leaning. As many student teachers enter their teacher education programme with "preconceptions about teaching and learning that are rooted in their experience as students" (Korthagen, 2001b, p. 69) they must be exposed to different experiences and thinking about what it ought to be. It is for this reason that student teacher professional development should aim to create the interactions between student teacher's new and existing conceptions of teaching and learning (see Duckworth, 1986; Feiman-Nemser & Featherstone, 1992, Richardson, 1996). Korthagen (2001, p. 71)

argues teacher educators will help student teachers in their professional development if they try to understand "the way these students view teaching and learning, and how they have come to construct these views". This view is supported by Bullough and Gitlin (1995) who suggest that these beliefs and preconceptions must first be identified; sources examined and establish legitimacy of them. This should be conducted when the student teachers enter the professional development programme. Leavy *et al* (2007, p. 1230) extend this further in that the student teachers should use these explored beliefs and attitudes to "plot and monitor their own professional growth." This has great implications in this research, for student teachers taking responsibility for their own learning and development is the central tenet.

If we accept that student teachers' preexisting beliefs about teaching and learning are difficult to change not just due to their experiences as learners in school but also from their visits to schools, then the challenge for changing their beliefs is even greater. This challenge is further heightened by the view that the student teachers' belief systems affect perception and strongly influence how they will process information (Pajares, 1992). It is therefore important that any change should be directed at their perceptions about education in general and to teaching and learning in particular. The requirement for student teachers to have substantial experience in practice, from which the (educational) theory is constructed makes it possible. It is during this immersion in experience that student teachers could and should develop the need to change. This need is strengthened by their experience of being faced with the challenges of teaching in real contexts. And it is in facing these challenges that they are forced to make decisions about the actions they need to take. If we accept the assertion that there is a relationship between beliefs and actions, and that these are interactive in nature (Richardson, 1996), then it is in performing the act that the student teachers will start changing their beliefs. This is the reason I argue that beliefs are not fixed but they may be

extended, modified and changed within particular contexts in order for new beliefs to be developed.

The study on the evolution of preservice teachers' beliefs about teaching and learning conducted by Leavy *et al* (2007) illustrates this view. They used metaphors constructed by the student teachers as a tool to gain access to, and promote the development of, student teachers' beliefs through the incorporation of reflective activities of both academic and field-based experiences (Leavy *et al*, 2007). Their research, furthermore, revealed the change in belief that the student teachers had experienced from the metaphors constructed at the beginning and at the end of a semester long micro-teaching course. These changes in beliefs at the beginning and the end of the module are indicated as percentages for the four categories established: [1]behaviourist 49% - 42%; [2]constructivist 24% - 44%; [3]situative 9% - 6% and [4]self-referential 18% - 8% (Leavy *et al*, 2007). Some of the reasons they offer for these changes are: an increase in the student teacher's awareness of the "central role played by the child in the classroom as a result of field based experiences" … "[p]articipants found themselves ill-equipped to deal with the unpredictable and dynamic realism of the classroom" … " did not have the opportunity to draw on experiences of teaching and modifying metaphors" in the case of the self-referential group (Leavy *et al*, 2007, p. 1227-1228). These changes and reasons given for the change in belief indicate the importance for prospective student teachers to experience a revelation and a challenge to their beliefs about teaching and learning, both in their professional identity and their facilitation of learning.

[1] Behaviourist view reflect the belief that the learner is passive recipient; teachers as transmitters of information;
[2] Constructivist view knowledge as actively constructed by the learner,- active agent and the teacher as a facilitator
[3] Situative view learning as situated in the context in which it is constructed. Knowledge is situated, a by-product of the activity, context and culture in which it used
[4] Self-referential view did not refer to learners, classroom teaching and assessment, but were egocentric and focused on what teaching represented for them as individuals. (Leavy, et al, 2007).

When facilitating learning, student teachers are continually challenged to think and to make decisions about the appropriate action to take. This enhances change to their beliefs. But very minimal change, if any, would take place if methods of teaching are taught to beginner educators (Korthagen, 2001c; de Kock & Slabbert, 2003; Leavy, *et al*, 2007). However, when student teachers are faced with, and experience, challenges in facilitating learning, they are forced to question and re-structure their beliefs about teaching (Zeichner, & Tabachnick, 1981; Korthagen, 2001c; Leavy, *et al*, 2007). Research conducted by de Kock & Slabbert (2003. p i) on challenging student teacher's belief system "exposed the illusiveness of change in teaching and learning in the classroom." In their study, student teachers were engaged with learner-centeredness and socio-constructivism in their teacher professional development and they were expected to observe these in the schools where they conducted their observation assignments. Prior to the student teachers being sent out to the schools, they were introduced "in very broad terms to the paradigmatic change envisaged for global future education" (de Kock & Slabbert, 2003, p. 12). The student teachers were expected to adopt a belief system where:

- "recipes and models for good teaching are not available;
- questions seldom have straight answers and;
- little support, opportunity or encouragement can be detected in the existing school culture" (de Kock & Slabbert, 2003, p. 13).

After their observation period in the schools, however, the student teachers' perception of the traditional mental model were re-enforced (de Kock & Slabbert, 2003), for they still taught in traditional ways. Their initial beliefs of teaching were entrenched. Ultimately what the student teachers observed informed their beliefs about teaching and and to change these

beliefs, it is imperative that this "perceived-practice mental model" (de Kock & Slabbert, 2003, p. 20) is replaced with a "belief initiated mental model" *(ibid*, p. 21). Here believing is required "as a prerequisite to seeing the belief coming to fruition" (*ibid*, p. 20). This model according to Ray (1999, p. 3), includes "dependence on inner wisdom and authority rather than on the senses and outer proof." For this to be achieved, student teachers would have to experience a paradigmatic shift in their beliefs, and this experience that could be powerful in promoting such a shift. The disadvantage, however, is how to get the student teachers to have these beliefs as prerequisites to facilitating learning. This disadvantage could be reduced if "student teachers have to be challenged to risk the unknown and create the reality of their newly adopted belief (or perhaps the lack thereof) in practice" (de Kock & Slabbert, 2003, p. 20). It is likely that a new mental model could be constructed if student teachers are exposed, and even encouraged, to engage in many different but appropriate experiences (Korthagen, 2001).

2.4.3.2. Knowledge, beliefs and interactive cognitions

Meijer (1999, p. 22) suggests that a teacher's interactive cognitions are "closely related to a teacher's actual behaviour." This view is supported by other researchers (So, 2006; Schepens, Aelterman & Van Keer, 2007). So (2006), for example, asserts that it is in uncovering a teacher's thinking process that we can get a more holistic view of the complexity of teaching. Schepens *et al* (2007, p. 27) further state that in the field of teacher education, the student teacher's interactive cognitions evolve during their professional development and these can be used as "indicators for learning and professional development". In developing a holistic understanding of student teachers' construction and use of phronesis, we need to explore the interactive cognitions that underlie the student teachers' construction of a phronesis of and for facilitating learning.

It is generally accepted in the literature that there is a relationship between cognition and behaviour. The relationship accepted is that actions (behaviours) and cognitions (thinking) influence each other (Clark & Petersen, 1986). In the field of teacher education the relationship is that "teachers' cognitions and their classroom behaviour mutually affect each other" (Meijer, 1999, p. 5, 2001). Meijer (1999, p. 20) viewed teacher's practical knowledge as "knowledge and beliefs, on the one hand, and interactive cognition on the other." Teachers' knowledge and beliefs were viewed as "[a] huge body of personal theories, values, factual propositions… [which] are important determinants of a teachers' action" (*ibid*, p. 22). These beliefs do not develop *de novo*. Meijer (1999, p. 22) pertinently suggests that "teachers interpret experiences through the filters of their existing knowledge and beliefs and make sense of classroom practice only through" existing knowledge and belief lenses. Other studies (examples) revealed that: science teachers and general teachers differ in the structural complexity in their thinking process (So, 2006); student teachers' varied more in how they thought than in how they instructed (Kwo, 1994); student teacher' interactive cognitions evolve during their professional development and these are dependent on the situation (placement schools) that student teachers are placed in for their practicum sessions (Schepens *et al*., 2007). Student teachers who were placed in schools where they received guidance and support to reflect upon their experiences "developed more towards a pupil learning and understanding orientation" (Schepens *et a*l., 2007, p. 29) than one that just focussed on themselves and their teaching.

Research (Shavelson, Webb & Burnstein, 1986; Clark & Peterson, 1986; Meijer, 1999) on teachers' interactive cognitions is not new. This research has focused on aspects like the process, content and content related to educational theories. There are also many research reports of the teachers' interactive thoughts which were "concerned with the learner" (Clark

& Peterson, 1986, p. 269). These studies, however, did not provide a clear picture on what was on the "teacher's minds" while he/she was teaching (Meijer, 1999, p. 23). Meijer (1999) declares that without this picture we cannot get a full "understanding of the cognitive aspects of teaching" (p. 23). She suggests that these aspects of teaching could be obtained if we studied student teachers' interactive cognitions by focusing on "their practical knowledge" (Meijer, 1999, p. 23). When teachers are teaching they "activate appropriate and familiar elements from their long-term memory into their working memory" *(ibid,* 1999, p. 25) and they use these to make decisions about their actions when teaching. It is on these basics that changes in the practical knowledge will indicate learning (Meijer, 1999). These changes in practical knowledge and interactive cognitions can also be used to examine the learning and professional development of student teachers and to explore the effects of the quality of teacher education on student teachers' interactive cognitions (Schepens, Aelterman & Van Keer, 2007).

Research investigating the relationship between teachers' cognitions and their behaviour (actions) has experienced difficulty in demonstrating these relationships (Calderhead, 1996). These difficulties were due mainly to behaviour and cognitions being studied separately (Brown *et al*, 1989, Yinger, 1986). It is thus important that teachers' cognitions and actions be investigated while they are teaching (Leinhardt, 1988; Meijer, 2001; Schepens *et al*, 2007), because it is at that time that their thinking and actions are inseparable. Moreover, we need to accept that the student teacher's knowledge, according to Leinhardt (1988, p. 148), is "embedded in the artefacts of a context." This view is shared and extended by Meijer, Beijaard and Verloop, (2001, p. 162) who argue that any similarities and differences in teacher's interactive cognitions could be explained in terms of "the differences in teacher's approaches to students and their approaches to the content of the lesson." This research

paves the way for providing an understanding of how to research the student teachers' cognitions and actions of constructing and using phronesis in the particular contexts that they experienced.

2.4.4. Reflective practice theory

This theory is used to provide the lens to give meaning to the student teachers' reflections, their practice of reflecting, and their learning about how to reflect by reflecting in practice. This learning about how to reflect in practice has an evolving nature resulting in student teachers improving their practice of reflecting.

2.4.4.1. Meaning and use of reflections

Reflective practice is a process that many student teachers have not experienced before. It is therefore necessary for them to develop their reflective practice and to use these to formulate their practice theories. Researchers (Kubler LaBoskey, 1993; Van Manen, 1995; Zeichner & Tabachnick, 2001; Leavy *et al*, 2007) suggest that student teachers' reflections should be analytical, not just descriptive. This is important in that such reflections will impact on influencing the student teachers' professional image. Metaphors, reflective journals, diaries and portfolios have been used by student teachers to record their experiences of constructing a professional identity (Pollard & Tann, 1997; Leavy *et al*, 2007). The information obtained from using these data collection methods reveal and "synthesise" large data sets about teachers' understanding of their professional identity, and this could inform their practice (Calderhead & Robson, 1991). This is the reason for a more detailed discussion of reflective practice is presented in the next section, which focuses on facilitating learning in practice.

Reflective practice is an integral feature of this research is. According to Ferraro (2000, p. 1), “Schon recommended reflective practice” for novice student teachers to make connections between their own practices and those of successful practitioners. An exploration of what reflections are is essential for the development of a different meaning and use for reflective practice. There are different meanings for reflection. Some meanings focus on the process while others focus on the importance of reflections. Descriptive meanings of the process of reflection are about how learners “engage to recapture, notice and re-evaluate” their experience and to develop meaning (Boud, Cohen & Walker, 1993); looking back at an experience to establish the meaning, with a view to planning further action (Kolb, 1984; Raelin, 2000); and how both cognition and feelings are closely interconnected and interactive (Boud et al., 1985). The importance of reflections is viewed by Coghlan & Brannick (2001, p. 31) as a “critical link between the concrete experience, the interpretation and taking new action”, while Day (1993 p. 84) views it as “an essential part of learning.” Each of the meanings is concerned with the actions and/or the development that a student experiences when reflecting on action. What is even more significant is the central role that the student teacher plays in reflecting. Student teachers’ process an awareness of reflecting, and also the process of coming to learn about how to reflect, is crucial for them to reflect effectively. Kessles & Korthagen (2001, p. 68) view reflection as “the mental process of trying to (re)structure” a problem, an experience, knowledge or insights. This reflection can take place after an action (reflection on action) or during an action (reflection in action).

2.4.4.2. Meaning and purpose of reflecting in professional development

Reflections could be used by student teachers to make phronesis visible for both the student teacher and the teacher educator. They may also be viewed as tools student teachers use to

develop their awareness (Leavy *et al*, 2007; Pollard & Tann, 1997) about facilitating learning. This awareness could be due to student teachers developing a "deeper understanding of their own teaching style and ultimately [having] greater effectiveness" (Ferraro, 2000, p. 4) as student teachers. This suggests not only awareness, but definitely construction, use and change that a student teacher may experience from reflecting on their experiences of facilitating learning. Researchers (Schon, 1987; Carr and Kemmis, 1986; Van Manen, 1995; Zeichner & Tabachnick, 2001; Leavy et al, 2007) in the field of reflective practice have focused on how student teachers are encouraged to reflect on their own development as professionals. Such research, however, is not enough for we need to recognise that reflecting may be a private and social constructive process where theory about facilitating learning is informed by practice. If we accept that reflecting on experiences informs the construction and use of phronesis and could shape and accelerate change in self and interested others (Zeichner & Liston, 1996), then we can view reflective practice as a solitary and social constructive process where practice shared during these sessions could inform theory. This can only happen if the student teacher's reflections are critically focused on, and analysed (Zeichner & Liston, 1996), and they are linked to the theories about teaching and learning.

An essential component of constructing phronesis is the reflection that each student teacher is expected to learn 'to do' and also 'do' during their professional development. A new experience (learning) can be seen in the principles of professional learning: "awareness …of one's own learning process is fundamental to the process of becoming" (Korthagen, 2001b, p. 74). This awareness can only be developed if student teachers are reflecting on their own experiences. Such processes are supported by Lebler (2005, p. 43; Claxton, 1999) who insists that "reflections are essential to learning". This importance lies in the fact that in

reflecting the student teacher "examines both the experience as well as his own conceptual framework" (Saddington, 1985, p. 56) and can within this context,"develop new insights" (Wade & Yarborough, 1996, p. 64) that can be used to inform future activities. The reflective stance accepted in this research is viewed as informing practice rather than determining it. During such a process, student teachers are expected to discover and learn for themselves rather than be informed about how to reflect by experts. During the reflection sessions the teacher educator could help the student teachers to use all of their "knowledge and experience to make connections and to draw learnings" (Saddington, 1985, p. 58). This view is supported and extended by Claxton (1999), and Lebler (2005, p. 43) who states that "reflection is a process that will produce greater coherence between knowledge (learning that can be put into words) and know-how (the intuitive ability to do something)". Hence the use of reflective practice is viewed as essential for the construction of a phronesis of, and for, facilitating learning.

2.4.4.3. Research in the field of reflective practice

Research (Hopkins & Antes, 1990) in the use of reflections as reflective practice looks at how student teachers use their reflections to develop their teaching how pre-service teachers develop the skills necessary for reflective teaching and the role of the teacher educator as coach (Ferraro, 2000). The research reviewed in this study includes the benefits of pre-service teachers using action research and engaging in reflective practice (see Schon, 1996; Rearick, 1997; Zeichner & Tabachnick, 2001) and considering one's own experience in applying knowledge to practice (see Schon, 1996). Kettle and Sellars (1996) investigated third year students' reflective writings and interviewed them about their reflective practices. They found that student teachers' use of peer reflective groups encouraged them to challenge existing theories and their own preconceived views of teaching. This would seem

to be a requirement when student teachers reflect on their own experiences and use phronesis during reflection sessions.

The reflective practice of facilitators of learning, within this context, seems to be an essential component to incorporate in this research, both in individual and social settings with a focus on exploring the purpose and nature of the process. Reflection sessions are viewed as essential for student teacher's construction and use of phronesis to enhance both their personal and professional development. According to Korthagen (2001a, p.15), each student teacher "develops his or her own knowledge in a process of reflect[ing] on practical situations." In constructing and using phronesis, private and group reflection, supervision and small group discussion may be essential for the student teachers to share their experiences so that the intricacies and the salient features of these could be critically analysed and challenged.

Moon (1999, p. 52) is of the opinion that reflections have "a role in learning and informing action and in the building of theory to guide practice or action." It is within this context that student teachers could gain experience from "acting and from reflecting upon the action and its consequences" (Handal & Lauvas, 1987, p. 5). Reflection and counselling are viewed as important elements in the professional development of a facilitator of learning because the students are introduced into the world of action, but do not remain there. During counselling (reflection) sessions, a teacher educator could offer assistance to "analyse the social [and] educational processes" (Handal & Lauvas, 1987, p. 5) that a student teacher has experienced. He could do this by helping the "student teachers explore and refine their perceptions" (Nussbaum, 1986, p. 29) and with collaborative reflection between a teacher educator and student teachers and this could lead student teachers developing to advanced

levels of thinking (Hunter and Hatton, 1998). If student teachers' experiences of facilitating learning in the school classrooms are not reflected and elaborated upon, then their learning will be minimal as meanings would not be realized (Van Huizen *et al*, 2007). This could be avoided if, in the reflection sessions, each student teacher's phronesis is explicitly reflected upon and the details of these reflections are shared and explored in a critical, social collaborative manner.

2.4.5. Professional learning, development and assessment

This section focuses on the professional learning and development of student teachers and the assessment thinking and practices undertaken. These are central to the construction of phronesis.

2.4.5.1. Professional learning and development

This different teacher professional development should focus on the professional learning and development of the student teachers. The role of student teachers in the construction and use of phronesis in their professional development is intricately located in their professional learning. Professional learning of student teachers must recognise that "student teachers may have good reasons" (Korthagen, 2001b, p. 71) for the feelings, thoughts, beliefs and the ideals that they hold. They are not ice structures devoid of experiences, feelings, emotions and ideas about what teaching and learning entails. Therefore any teacher professional development programme should start with "the student teachers' views about teaching and learning, and how they come to construct these views" (*ibid*, p. 71).

Professional learning of student teachers, according to Korthagen (2001b, p. 71), is based on the following principles:

1. A teacher's professional learning will be more effective when directed by an internal need in the learner (student teacher);
2. A teacher's professional learning will be more effective when rooted in the learner's own experiences and;
3. A teacher's professional learning will be more effective when the learner reflects in detail on his or her experiences (Korthagen 2001b, p. 71).

It is clear that student professional learning is driven by a need. This need should be understood and 'felt' by each student teacher. But this will not happen if we do not explore the implicit preconceptions that student teachers have about teaching and then to make these explicit by analyzing them (Korthagen, 2001). According to Korthagen (2001b, p. 71), it is "only by such analysis [that student teachers] discover weaknesses in their preconceptions. This, in turn, creates in them the need for further learning which, according to principle 1, is a basic factor for promoting learning." These professional learning principles are linked to student teachers changing their existing preconceptions of teaching and learning to appropriate ones. In a climate of change, however, this could be impossible. It is for this reason that this research should explore the student teachers' construction and use of phronesis in the different contexts – practicum schools.

Teachers' practices strongly influence their professional experience of teaching and learning. This is supported by Villegas-Reimers (2003) and Loucks-Horsely, Hewson, Love & Stiles (1998, p. 32). All these researchers state that much of teachers' "knowledge of teaching is embedded in their practice rather than in codified bodies of knowledge" and the knowledge they have will influence how they teach. Furthermore, the learning processes involves many other aspects not just cognitive ones (Hargreaves, 2001; Marsh, 2003). It is

on these bases that emotions and feelings involved in teaching need to be focused upon as well. Even though professional development, through facilitating learning, reflection and action research (de Kock, 2004), has been researched, a focus on the question of how facilitators of learning construct practical wisdom is essential for both their professional and personal development of not just South African, but all student teachers. In developing student teachers we need to heed Gallego's (2001, p. 312) assertion that: "Dewey argued that personal experiences in schools are critical to the education of teachers, however, he argued that experiences are not necessarily educative". We need therefore to consider the sites (the schools) where the student teachers will facilitate learning, the type of mentor teachers, and the manner and depth of the reflective social discussion sessions. This is crucial if we want these experiences to be educative for the student teachers. We also need to recognise that the professional development of student teachers should focus on their personal **and** professional learning in a reflective and supportive manner. This could enable their construction and use of phronesis in their professional development.

2.4.5.2. Assessment of professional development

Student teachers within a professional development programme participate in many different roles, these include, being supervised and supported by teacher educators and mentor teachers and designers and operators of learning tasks. They therefore could be viewed as "objects of assessment" (Van Huizen *et al*, 2005, p. 280) where this assessment is radically different from formal testing procedures. Here the assessment is viewed as being constructive for the learning and development of student teachers and is focused on the process of learning and development, not the end product. Since the old ways of preparing student teachers are not working, the strategies of assessing their professional development have been changed. New assessment strategies look into effectively connecting learning

theories with teaching practices by synchronizing curricula with real-life classroom situations (Nave, 2000) and specially designed supervised clinical practice experiences (Zeichner, 1992).

Student teachers who facilitate learning in practice can develop if it is done in situated assessments that are constructive (Black & William, 1998; Clarke, Timperley & Hattie, 2003). These assessments could be used to inform the decisions that the student teachers make about the design and the operation of their learning tasks and to also monitor the outcomes of their learners. The purpose of these assessments is in terms of the learning and development that the student teachers experience during their professional development. This leaning and development focuses on the student teachers' demonstrating what they can do when they are not aware of what should be done (Claxton, 2000). In the process of learning, this uncertainty that the student teachers experience serves as the turning point to their personal and professional development. It is at these times that the student teachers will draw on their practical wisdom to inform their decisions and actions.

It is therefore accepted that for student teachers to develop in the facilitation of learning, a continual process of assessment is required. This can be managed through the use of professional development portfolios. Portfolios have been used as a "vehicle to enhance reflective thinking" and it "provides a venue for developing "critical reflection skills" among novice teachers (Yost, Sentner & Forlenz-Bailey, 2000, p. 45). This portfolio represents the entire experience of the student facilitator's learning process of professional development. It provides all the necessary hard evidence that has to convince an examination panel of the quality of professional development through a hard copy portfolio with all the hard evidence, an oral professional development portfolio presentation, and a

final probing interview that determines the student teachers' assessment of their professional development.

2.4.6. Mentoring

The type, nature and role of the mentors in the student teacher's construction of phronesis is critical. Generally the role of a mentor for novice teachers is "so diverse that the skills [required of mentor teachers] need to be equally diverse in order that they can advise on the many aspects needed by the new entrant to teaching" (Moyles, Suschitzky & Chapman, 1998). Halverson & Gomez (2002, p. 6) suggest that learning phronesis has traditionally taken place in "apprenticeships or mentoring arrangements". One of the focuses of this research is on the student teachers' construction and use of phronesis in an exploration-experiencing-mentoring arrangement where teacher educators (at the university site and the school site) and mentors (at practice schools) support the student teachers. This exploration-experiencing-mentoring is not one of modelling practice, but that of providing space where the student teachers can plan, act and reflect, and in so doing, are constructing and using their phronesis (practice theory).

2.4.7. Student teachers - personal and professional identities

In the process of constructing and using phronesis, student teachers' identities are challenged. It is not just any identity that is challenged - it is a personal identity. Personal identities are complex and these are further impacted on when looking at teacher identities (Goodson, 1996). According to Coffey (2001, p. 52) "no longer is the self seen as a fixed, static entity, the self is increasingly viewed as dynamic, fluid, multiple and subject to contestation." Personal identity is constructed by the student teacher during the learning experiences in the professional development programme. If all experiences are learning,

then according to Knowles (1980, p. 50) “learners derive their self-identity from their experience” and they define themselves from the range of experiences that they have. Identities are a means by which we perceive ourselves within our social environment on a relational level with others (Zirkel, 2000). Our identities may be private or public, providing a link to what, how and why we perceive ourselves and present ourselves to the world (Zirkel, 2000; Van Huizen *et al*, 2005). What is equally crucial, however is how we perceive others when developing our identities.

In student teacher professional development we cannot deny the importance of the evolving identity that student teachers experience during their professional development. Bullough (1997, p. 21) contends that “teacher identity – what beginning teachers believe about teaching and learning and self-as-a-teacher – is of vital concern to teacher education: it is the basis for meaning making and decision making…teacher education must begin, then, by exploring the teaching self.” An expose` of the student teacher’s identities is crucial to developing an understanding of their experience of meaning making when constructing and using phronesis.

Beijaard, Meijer & Verloop’s (2004) review of studies on teachers’ professional identity that it fell into three groups - teachers’ professional identity formation, the identification of characteristics of teachers’ professional identity, and the use of teacher’s stories to represent their professional identity. They suggested that research on teachers’ professional identity should focus on the relationship between concepts like ‘identity’ and ‘self’ and the role of the context in the professional identity development. They also suggest that researchers should consider the features of professional in professional identity, and research perspectives other than the cognitive one.

In constructing phronesis, critical features of an individual's personal and professional identity should be developed. The following features are essential to this construction: "self-directed individuals… critical reflectors … and experiential learners" (Brookfield, 1995, p. 2-4). Self-directed individuals should plan and act on the construction of knowledge about teaching and learning by becoming aware, reflecting and re-constructing their perceptions and beliefs of the particular role that they have to play (Brookfield, 1995). Secondly, self-directed individuals construct both cognitive and emotional understanding about the contexts that they experience and they recognise the importance of this understanding for their personal theories (Brookfield, 1995). Thirdly, self-directed individuals are resourceful in their experiences, perceptions, ideas and personal attributes. Furthermore, experience and reflections in action (Schon, 1987) of practical situations in particular contexts could influence a student teacher's personal and professional development and construction of the student teacher's identity as a facilitator of learning.

2.4.8. The Vygotskian perspective on learning and development in a sociocultural context

Different theories have been used to analyse student teacher learning in professional development. The competency based theory (Elam, 1971; Houston, 1974) used a public standard for teaching (performing effectively), while the personality-oriented (Combs, 1982; Fuller, 1970) and the reflective inquiry theories (Schon, 1983; Zeichner & Liston, 1987) focused on the development of the personal and the use of formal procedures (reflecting), respectively. These theories did not address the comprehensive aspects of learning that student teachers experience during their professional development. Furthermore they did not recognise the importance of the context for the learning in professional development.

This choice of theory is based on the feature that it "concentrates on the connections between individual functioning and development *and* the sociocultural practices in which individuals take part" (Van Huizen *et al*, 2005, p. 271). Each student teacher's learning and development as a facilitator of learning cannot be understood if it is viewed as removed from the everyday actions e.g. thinking, facilitating learning actions that the student teacher participates in. Within this theory the student teacher and his/her environment (society) are viewed as "a unified system in which these two elements are joined together in a dialectical relationship" (*ibid*). It also views a student teacher's environment and his/her activity as the most comprehensive and fundamental concept (Van Huizen *et al*, 2005). This suggests that a student teacher's learning and development is to be in the context of the student teacher participating in a sociocultural practice in a variety of activity systems during his/her professional development (van Huizen *et al*, 2005; Wenger, 1998).

In the process of learning and developing, a student teacher develops towards "fuller (more extended, more responsible, and more autonomous) participation" (Van Huizen *et al*, 2005, p. 272) where social functions are internalised and fit in as psychological functions, i.e. meaning is developed. This development requires of the student teacher to experience an environment where an ideal standard of achievement is modelled and where supporting conditions are present. It is in this context that the student teacher will then be successful in achieving the required "ideal form" (*ibid*, 205, p. 274). This form is concerned with "the professional image" of a student teacher serving the values of facilitating learning and the student teacher's "functions and tasks, and the competences that have to be learned to be effective" (*ibid*, 2005, pp. 274-275) in their role as facilitators of learning.

In conducting, his/her activities as a facilitator of learning in the particular contexts, the student teacher's actions not only "serve the maintenance of the activity system, but also its further development" (*ibid*, 2005, p. 272). In conducting these activities the student teacher is learning to be a participant in the teaching world. This involves learning an "action-repertoire in relation to the meanings behind this repertoire" (*ibid*, 2005, p. 272) where each student teacher shares his/her experiences of facilitating learning in a social setting. Each student teacher then reflects on their learning from the social setting and constructs a personal meaning of it for himself/herself (van Huizen *et al*, 2005). This interaction between exploring and developing public (professional image of teaching) meaning may be presented in a way that the student teacher could challenge and clarify his/her personal choice of teaching as a career. In confirming this choice and learning and developing the required identities and trappings of a facilitator of learning, a student teacher also develops a personality that enables him/her to make "committed action choices" (*ibid*, 2005, p. 272).

Another feature of this theory is the "development of a personality [that] runs parallel to the creation of a personal identity" (*ibid*, 2005, p. 272) and there is continuity between the two, not opposition. Finally, student teacher emotional experiences are critical to developing meaning and a personality. The extent to which a student teacher will participate in activities is influenced by his/her emotions, needs and motives. And it is in participating that a student teacher's personality which comprises rational, decisions and emotions are developed further (Van Huizen *et al*, 2005).

The Vygotskian principles have advantages for the purposes of this research in that it fits with constructivist, socio-constructivist, meta-cognition and deep learning, reflective practice, authentic learning, emotional development, the importance of the interplay

between performance and meaning, student teacher's perceptions and competence in teaching in relation to "good teaching" (Van Huizen *et al*, 2005, p. 276). At the same time, there is an awareness of weaknesses – for example it focuses on teaching which in this research is regarded as distinctively different from facilitating learning. The plan therefore will be to focus on the provision of learning, and not just any learning, but quality learning by facilitators of learning. Another weakness is that the provision of support is viewed in a cognitive sense and not in an emotional sense. In this theory, emotion is used to explore the development of identity and personality, but the provision of emotional support is not the focus in the process of the student teachers' professional development. A focus on what emotional guided support student teachers receive will be explored. Furthermore, the theory advocates for the development of student teachers to ideal forms, but it does not recognise the impact of the sociocultural learning on developing these ideal forms. A further weakness of the theory is that student teachers are viewed as apprentices, whereas the focus in this research is on the exploration-experiencing-mentoring arrangement between student teachers and mentor teachers. In exploring student teacher's perceptions there is a gap with regard to how these are challenged and changed if they are found to be inappropriate.

So this focus on the professional development of each student teacher *and* the social practices of facilitating learning in which he/she takes part is crucial to exploring and developing an understanding of how each student teacher constructs and uses phronesis to enhance his/her professional development. It will provide the knowing how and why each student teacher constructs and uses phronesis in the way he/she does.

2.5. Conclusion

Preparing student teachers for the 21st century is challenged by many dynamics of change. To address these dynamics, student teachers should construct phronesis in authentic contexts. Research literature on phronesis/practice theory focused on the meanings used and empirical research conducted in various fields to provide a place and scope for the meaning and process of the construction of phronesis in this research project. The choice of theory provided the foundation and support for this research.

Chapter 3 focuses on the research methodology adopted to research the student teacher's construction and use of phronesis. In the chapter, the decision and explanations for the choice of paradigm, strategy, data collection methods and instruments are clearly presented.