



**THE ROLE OF CRITICAL REFLECTIVE TEACHING IN TEACHING PRACTICE FOR THE 21ST CENTURY:
A CASE STUDY**

by

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THESIS

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DECLARATION

I hereby declare that this research study:

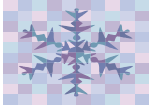
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.....

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To whom it may concern

This is to certify that I proofread and edited the PhD thesis, "The role of critical reflective teaching in teaching practice for the 21st century: a case study of a University of Technology", prepared by Olga Sizakele Ndlovu in lieu of her submitting it to the Central University of Technology, Welkom Campus, for examination purposes.

I corrected punctuation, spelling, sentence construction, number and concord and minor language errors. I also pointed out ambiguities in meaning and, where applicable, suggested adjustments to the sequence and/or construction of sentences and paragraphs which negatively affected the flow of the argument and/or undermined the cohesion and coherence of the same. To the extent possible, I either removed or rephrased unnecessary repetitions of ideas phrased in exactly the same words.

I did not check the correspondence between in-text references and the reference list because the list was not required by the candidate.

I wish the candidate every success with her final submission and trust that the recommendations she made regarding the inclusion of critical reflective thinking and teaching in the existing teacher education programme of the CUT as well as the recommendations for further research will be favorably considered by all parties committed to the improvement of the quality of teaching and learning in the RSA.

Beverley M. Malan (Dr)

(Electronically signed)

ABSTRACT

Newly qualified teachers will soon be required to prove themselves in the classroom before they get a licence to teach. This is one of a number of initiatives to be spearheaded by the South African Council of Educators (SACE) in an attempt to improve and ensure the quality of teachers entering the profession and to guarantee their readiness to meet the requirements of 21st century teaching.

A number of research studies emphasize the importance of nurturing reflective teaching during teaching practice. Student teachers' approach to teaching practice is often very 'mechanical': they do not relate it to their training, nor do they actively develop, process and/or reflect on their teaching practice experiences. Moreover, education faculties find it difficult to facilitate appropriate reflection and debriefing on teaching practice. As a result, much of the professional development for innovative teaching has little effect on classroom teaching and learning.

The aim of this research was to explore how student teachers at the Central University of Technology could be assisted to improve the practice of critical reflective thinking and teaching during their teacher training programme so as to satisfy the requirements of 21st century teaching.

To ensure a solid foundation for carrying out the empirical phase of the study – the selection of participants, data collection strategies, data analysis and the reaching of valid and reliable findings - the researcher explored the most important theories of critical reflection and reflective teaching, as well as the nature of adult learning and the application of contemporary learning theories in the context of adult learning in order to establish a conceptual framework for this study. The literature review focused on 21st century teaching and learning, including critical skills needed by teachers and prospective teachers to face the challenges of education in a post-modern society. The study was undertaken within the interpretative paradigm, following a qualitative approach and, more specifically, a case study design. Data was collected by means of

document analysis (teaching curricula and student portfolios), classroom observations (including the preparation and integration of teaching media) and focus group interviews.

In a nutshell, the core findings revealed that, although there are elements of critical reflective teaching in the teacher training curricula of the Central University of Technology (CUT), students are oblivious to the fact that critical reflection and reflective teaching form an integral part of the theory and practice of teaching and learning, and that critical reflection and reflective teaching run like a golden thread through all aspects of teaching practice – the planning (and actual presentation) of lessons, including the lesson objectives, the preparation of teaching media, the lesson content, learner involvement, and assessment activities. In brief, they regard reflection as a standalone, as something separate to the teaching and learning process. Students moreover raised concerns about their lecturers' and mentor teachers' lack of knowledge of reflective teaching and, consequently, their inability to model it to their students.

Together with a few recommendations, a framework for reflective teaching at the CUT is proposed to address these concerns. It is believed that this framework will assist student teachers to use critical reflection as a means to enhance their teaching practices in keeping with the demand for creative, innovative, collaborative and productive 21st century teaching and learning.

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CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION AND BACKGROUND TO THE PROBLEM

Newly qualified teachers will soon be required to prove themselves in the classroom before they get a licence to teach. This is one of a number of initiatives to be spearheaded by the South African Council of Educators (SACE) to improve and ensure the quality of teachers entering the profession. According to Masondo (2016), SACE is set on this undertaking, arguing that the licence would serve as a benchmark against which the quality of teachers could be assessed.

It is common knowledge that no teacher education programme, whatever its focus, can prepare teachers to work effectively in every classroom setting (Biggs & Tang, 2007). Since 1994, education in South Africa, both at school and higher education level, has been characterised by continual systemic and curriculum change. Moreover, the 21st Information Age and the concomitant dominance of information communications technologies, requires radical changes to the way in which teachers teach and learners learn. School teachers, often set in their ways, generally find it difficult to cope with change. In order to 'survive', they either leave the system or simply carry on the way they always have, pretending that nothing has changed. Consequently, attempts to improve the standard of education might have no effect whatsoever. The licensing of teachers is aimed at changing this, ensuring that prospective teachers possess not only the requisite subject knowledge but also the skills needed to cope with, or manage, change as and when necessary.

One of the skills teachers would need in this regard is the ability to critically reflect on their own teaching and the effect it has on learning. Without this skill they might find it difficult to intelligently apply the knowledge and skills they acquired gained during their formal pre-service training (Hixon & So, 2009). If, however, they are able to critically reflect on what they know and

do, they might be less stressed and/or confused and, consequently, more willing and able to intelligently apply the knowledge and skills they acquired during their pre-service teacher training and in their ongoing professional development. In other words, according to Bracken and Bryan (2010), developing critical reflection early on in their teaching careers will safeguard teachers against professional stagnations. In fact, according to Biggs and Tang (2007), the one quality which, above all others, distinguishes good teachers from the rest is their ability to reflect on what, why and how they do things, and then to adapt their teaching practice as part of a lifelong learning approach. This is the gist of this study, to persuade student teachers to cultivate the lifelong art of critical reflective teaching as early as possible in their teaching career.

Every person who has ever been a teacher will be able to recall the stress and confusion typifying the early days of his/her teaching career. This is a common experience amongst all novice teachers. As they gain experience, though, they acquire a repertoire of teaching strategies to reduce their stress levels and increase their expertise and effectiveness. The particular configuration of strategies teachers preferred by a teacher constitutes his/her teaching style (Bracken & Bryan, 2010), his/her means of coping with many of the routine demands of classroom teaching. The danger is that the adoption of a singular teaching style could inhibit, or hinder, a teacher's professional growth (Noddings, 2005). One way of preventing this from happening is through constant observation and critical reflection on one's own teaching practice.

The purpose of this study is to explore different views on, experiences of, challenges associated with, and the implications of critical reflective teaching as teaching practice. More specifically, it is aimed at the identification of ways in which novice teachers could develop the skill of critical reflection early in their teaching career.

1.1.1 Critical reflective teaching

Since 1993, John Dewey has pioneered reflective thinking as a critical component of teaching, and to this day his ideas are still influential. According to Dewey (1933), reflection commences

when a person thinks about his/her experiences and knowledge in order to find meaning in his/her beliefs. Applied to teaching, this would mean that teachers could, by reflecting on the effectiveness or not of their lessons, plan subsequent activities with foresight and the ends-in-view (Bracken & Bryan, 2010). According to Ditchburn (2015), reflective teaching theory developed over a long time, from the 19th to the 21st century. Theorists who made a particular contribution to its development include Schön (1983), Brookfield (1994), Valie (1992), Moon (2006), Noddings (2005), Scales (2008) as well as Biggs and Tang (2007). Although there are a number of differences between the way in which critical reflective theory is currently conceptualized and the way in which it was originally defined by Dewey (1933), the key principles by which it is informed are very similar. The work of these theorists is discussed in detail in Chapter Two.

While the notion of critical reflection is attractive on paper, translating it into action is difficult and complex (Frey, 2008). This may well be the reason why student teachers do not actively engage in critical reflective thinking, that is, in developing, processing and reflecting on their teaching practice experiences (Hixon & So, 2009). Various studies on critical reflection as a teaching strategy (Choy & Cheah, 2009; Choy & Oo, 2012; Rudd, 2007; Black, 2005; Vaske, 2001) found that student teachers' inability to think critically could be ascribed to difficulties associated with the integration of critical reflective thinking into daily teaching practices.

Critical reflective theory is, moreover, a highly contested area (Frey, 2008). One study, Frey (2008), for example, found no empirical evidence that superior teaching or learning result from reflective teaching approaches. Another study, conducted in the Chitral district in Pakistan, found the opposite. In this study, 150 teachers from 30 community-based schools underwent six months of rigorous training in critical reflective teaching, followed by one month of teaching in which they had to apply what they learnt. At the end of the month, 95% of these teachers indicated (by means of a questionnaire) that they could evaluate their lessons effectively, 85% that they were able to use teaching aids effectively, 75% that they succeeded in involving learners in classroom activities (Ahmad, Said, Zeb, Rehman, Ahmad & Khan, 2013). It is this ambiguity in

findings and opinions on the role of critical reflection in teaching that led the researcher to engage students in a research study on the application of critical reflective thinking during their teaching practice training.

1.1.2 Teaching practice in the 21st century

Following and expanding on Dewey's logic, proponents of 21st century learning argue that schools have a social responsibility to provide students with intellectually challenging experiences and opportunities (Scales, 2008). These experiences and opportunities should stimulate learners not only to think creatively, innovatively, collaboratively, and productively but also to master technology (Bracken & Bryan, 2010). According to them, 21st century teaching is characterised by change and uncertainty because, paradoxically the attributes, skills and capacities with which teachers are to equip learners in order to ensure their prosperity and success in adult life are exactly the ones they have to counteract and mitigate as problems typifying an increasingly globalised economy (Scales, 2008). Hence, in many countries there is a thrust towards the initiation of education reforms that focus on *learning*, not systemic changes to the organization of education and its structures (Kennedy, 2006).

Research indicates that the outcomes of teacher training do not meet most employers' expectations (Rachert, 2005). The general consensus is that pre-service training does not sufficiently empower student teachers to deal with the 21st century issues, contexts and learners. Moreover, not enough practising teachers currently have sufficient experience in the teaching of 21st century skills to support the further development of novice teachers' skills in these areas. As a result, much of the professional development for innovative teaching has been inadequate.

For centuries, schools have been structured and perceived as places where teaching takes place. This view is now being challenged by demands for schools to become 'learning communities' (Alger & Kopcha, 2009), with learners and teachers interacting with and learning from one another. According to Koehler and Mishra (2009), if we believe that 21st century skills are the key

to engaging effectively in global civic and economic spheres and solving problems related to these, then these are the skills we should use in reforming our education system. It follows that, if a teacher training programme has the nurturing of reflective teachers as purpose, it must provide them with realistic opportunities to observe, practice and reflect on their newly-acquired learned 21st century skills in typical classroom settings. Consistent with John Dewey’s emphasis on experiential education, 21st century student teachers should be exposed to ‘best practice’ examples during practice. By observing, participating in and reflecting on these they would be cultivating the art of critical reflective teaching. It follows that, in order for them to do so, those in charge of practice teaching should put in place measures to reciprocally allow feedback from and provide feedback to student teachers.

Figure 1.1 illustrates the concepts involved in teaching practice for the 21st century which forms the cornerstone of this study.

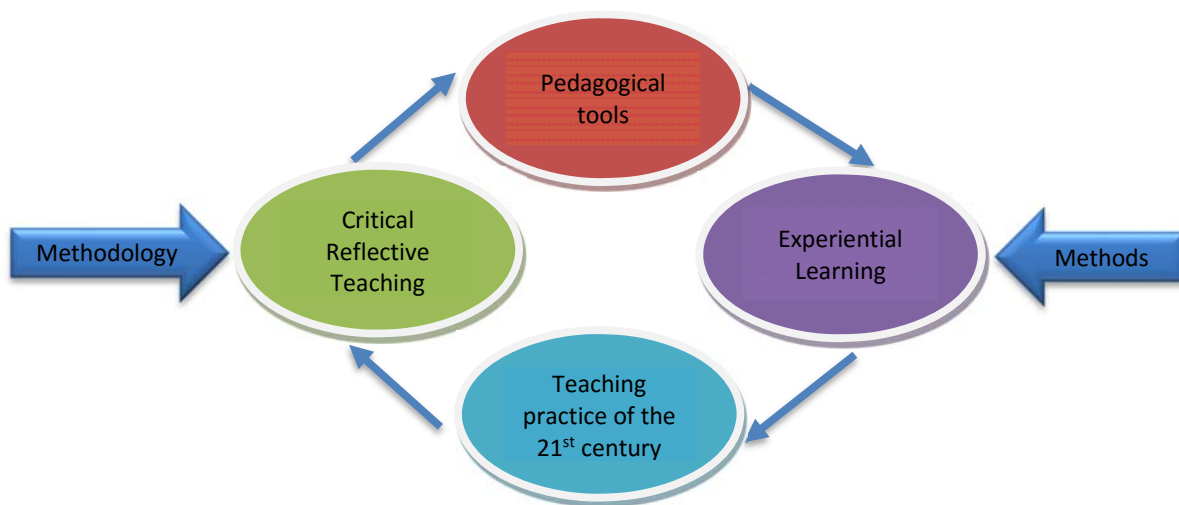


Figure 1.1: Theory-practice Nexus

(Adapted from Wu & Kao, 2008)

As indicated earlier, a number of research studies emphasize the importance of nurturing reflective teaching during/through teaching practice (Moon, 2006). Student teachers’ approach

to teaching practice is often very 'mechanical': they do not relate it to their training, nor do they actively develop, process and/or reflect on their teaching practice experiences (Jang, 2008). Moreover, education faculties find it difficult to facilitate appropriate reflection and debriefing on teaching practice (Moon, 2006). As a result, much of the professional development for innovative teaching has little effect on classroom teaching and learning.

Having taken all of these views into consideration, the main research question that the researcher sought to investigate in this study, was formulated as follows:

How can student teachers at the Central University of Technology be assisted to improve the practice of critical reflective thinking and teaching during their teacher training programme so as to meet the requirements of 21st century teaching?

The following specific research questions were advanced to direct the research:

- What are the implications of using critical reflective thinking and teaching during 21st century teaching practice?
- To what extent are student teachers at the Central University of Technology exposed to the practice of critical thinking and reflective teaching during their teacher training course?
- What are student teachers' opinions about the role of critical reflection in the practical component of their teacher training?
- What opportunities do student teachers get to practice critical reflective practices during their practical training and how effective/useful are these?
- Which challenges do they experience when implementing critical reflective teaching during their practical training?
- How can these student teachers be assisted to improve the practice of critical reflective teaching during teaching practice?

Accordingly, the over-arching aim of the study was to propose a framework that would assist student teachers to incorporate and employ critical reflective thinking in their training. This could ultimately lead to reflective teaching as a means to enhance their teaching practices in line with the demand for creative, innovative, collaborative and productive of 21st century teaching and learning.

Following from the research questions, were the following research objectives:

- To verify the assumed implications of using critical reflective thinking and teaching during their teacher training programme at the Central University of Technology.
- To establish the extent to which student teachers are exposed to the practice of critical reflective thinking and reflective teaching during their teacher training programme.
- To determine student teachers' opinions about the role of critical reflection in the practical component of their teacher training programme.
- To determine whether or not student teachers get sufficient opportunities to practice critical reflective practices during their practical training.
- To explore the challenges which student teachers face when implementing critical reflective teaching during their practical training.
- To establish how student teachers could be assisted in improving the practice of critical reflective teaching during teaching practice.

1.2 CONCEPTUAL FRAMEWORK

The conceptual framework used in in this study drew primarily from John Dewey's (1933) ideas on critical reflective theory in education. In addition, the theories of Schön (1983), Gibbs (1988), Kolb (1984), Pollard (2002), Van Manen (1977), Gore (1987) and Zeichner (2009) were explored. These underpinned a teacher training framework to improve student teachers' teaching practice with the view of producing learners fitting to meet the socio-economic and socio-political

demands in South Africa (National Policy Framework for Teacher Education and Development in South Africa, 2007) and the demands posed by the global educational landscape.

1.3 RESEARCH METHODOLOGY

Research methodology is a way to systematically solve a research problem. It may be understood as the science of studying how research is done scientifically. According to Leedy and Omrod, (2014) methodology includes the design, setting, sampling, methodological limitations, and the data collection and analysis techniques in a study. The research approach in this study was qualitative in nature, falling within the interpretative paradigm, and using a case study design. A detailed discussion of the research approach, paradigm, and design is provided in Chapter 5. However, for the purpose of orientation to the study a brief discussion is provided in the next section.

1.3.1 Research paradigm

According to McMillan and Schumacher (2010), a research design describes the procedures involved in conducting the study, including when, from whom, and under which conditions the data will be obtained. In other words, the research design indicates the general plan: how the research is set up, what will happen to the participants, and which methods of data collection will be used. The lens through which researchers look when deciding on the type of methods they will use to answer their research questions is informed by a specific philosophical worldview, also known as a research paradigm. A research paradigm is informed by certain assumptions. These assumptions influence the way in which the research process is carried out and provide a route towards an understanding of the methodologies used in a specific research endeavour (Gay, Mills & Airasian, 2016). The assumptions informing the research paradigm are reflected in the research strategy, methods and design of the research study concerned. In particular, the research paradigm guides researchers to appropriate research design, suggesting which research

design/s will or will not work and/or identifying or even creating a design that may fall outside the researcher's present knowledge or past experience (McMillan & Schumacher, 2010).

It is important, when considering different research philosophies, that the researchers should know that different philosophies are led by different sets of assumptions about the nature of reality. Many researchers choose to explore these complex philosophical perspectives within the context of three main research inquiry traditions, generally referred to as *quantitative*, *qualitative* and *mixed method* lines of inquiry (Creswell, 2014).

In qualitative research, the philosophical (or ontological) assumption/s about the nature of reality in qualitative research is that it is constructed during the course of the research and the interaction of researcher and research participants about the phenomenon being investigated. The philosophy is therefore referred to as *constructivism* (Creswell, 2014). Such was the case in this study. This implies that I, as the researcher, those individuals being researched and the reader would interpret information linked to our reality differently and individually (interpretivism) (Creswell, 2014), thus the possibility of an objective reality or truth 'out there' was not a consideration in this study.

1.3.2 Research approach

Informed by the purpose of the study, a qualitative line of enquiry was followed. McMillan and Schumacher (2010) point out that qualitative research is naturalistic in nature. It is used when the researcher seeks to understand phenomena in context-specific settings, such as "real world settings" without any "attempt to manipulate the phenomenon of interest." According to Creswell (2014), qualitative research is characterised by its primary aim, namely an understanding of one or more aspects of social life, and its methods, which (in general) has the generation of verbal rather than numerical data as purpose. Topics researched by means of qualitative methodologies include people's different perspectives and understandings of experiences. Consequently, as Leedy and Ormrod (2014) point out, qualitative researchers rarely

try to simplify what they observe. Instead, acknowledging that the phenomenon under investigation has many dimensions and layers, they try to portray it in its multifaceted form.

The following characteristics of qualitative research, identified by McMillan and Schumacher (2010: 321-323), were observed in the study:

- Natural settings - a distinguishing characteristic of qualitative research is that behaviour is studied as it occurs naturally: that there is no manipulation or control of behaviour or settings, nor are there any externally imposed constraints. In my study, students, as the main source of information, were studied in their natural settings (the university campus as their trusted academic and social environment, and the schools where they did their practical teaching).
- Context sensitivity - situational context is critical to an understanding of human behaviour. McMillan and Schumacher base this on the assumption that human actions are strongly influenced by the settings in which they occur (see the previous point).
- Direct data collection - qualitative researchers want to collect data directly from the source. In my study the sources were student participants and documents (teacher training curricula and student portfolios, to be exact).
- Participant perspectives - qualitative researchers try to construct reality from the standpoint/perspective of participants. I used focus group interviews to this purpose, with participating students being asked to unreservedly share their views on and experience of the phenomenon which was being scrutinized.

I considered a qualitative approach suitable to this study because it provided me with useful knowledge of and viewpoints on the phenomenon as verbalized by the participants: they spoke for themselves, indicating and explaining their perspectives by means of words and other non-verbal actions. This in-depth approach allowed me to gain a better understanding of the role of critical reflection in their training.

1.3.3 A case study design

Gray and Malins (2016) define ‘research design’ as a plan in which the how, when and where of data collection and analysis are described. In addition to this, according to Creswell (2014), the research reflects the research logic, illuminating the manner in which the study will be conducted. It identifies all the major elements of the research study - the samples or groups, actions, measures, treatments and/or programmes.

I decided to design my research as an interpretative single case study. Like surveys, case study research can be approached from either a qualitative or a quantitative stance. In the case of this study, I chose to approach the case study from a qualitative angle because I wanted to conduct an in-depth analysis of a single or small number of units (Gray & Malins, 2016). Case study as a strategy of enquiry was used to describe an entity (students being trained as teachers) comprising a single unit (Yin, 2016). My aim was to interpret the data by developing conceptual categories which supported or challenged the assumptions made regarding the phenomenon (Creswell, 2014).

Figure 1.2 illustrates the relationship between the paradigm, approach and design followed in the study.

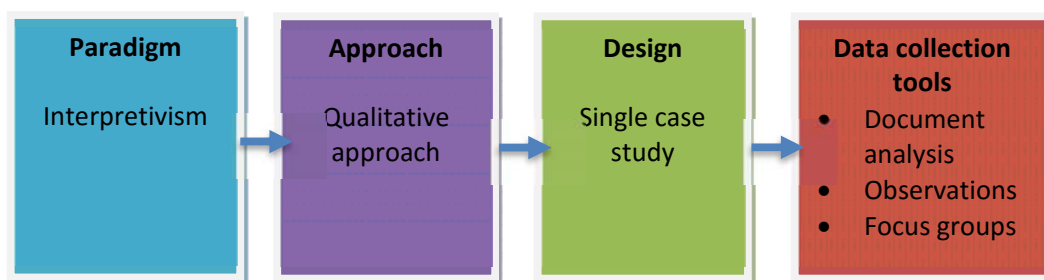


Figure 1.2: The relationship between paradigm, approach, design and data collection tools

1.4 RESEARCH METHODS

In this section the selection of participants, collection of data and data analysis procedures are discussed.

1.4.1 Selection of participants

For the purpose of my study, a purposeful, convenience sampling method was used. It was convenient in the sense that the particular time frame for data collection correlated with the time slot during which participating student teachers were performing their School-based Learning, thus making it easy for me to observe them in action. The sample was also purposive in the sense that the participants were selected based on displaying the characteristics to provide information-rich data to best achieve the objectives of the study. A sample of 40 student teachers was selected, with stratification being employed as an additional measure to ensure representation for the focus groups and the reflective journals. Student teachers were stratified by gender (20 female and 20 male student teachers) as well as by academic year/level (10 from 2nd, 10 from 3rd year) and course of study (10 each from 4th year B Ed: FET and PGCE).

1.4.2 Data collection

Data collection is the precise, systematic gathering of information relevant to a study, using methods such as interviews, observation, focus group discussions, narratives and case histories (Leedy & Omrod, 2014). In this study I triangulated three information sources, namely document analysis, focus group interviews and observations (Leedy & Omrod, 2014) to minimize the possibility of bias undermining the reliability of any aspect of my research project.

1.4.2.1 Literature Review

Researchers conduct literature reviews to obtain a complete picture of what has been said and found about a phenomenon prior to their embarking on their own study of the same. They take

note of the inferences drawn from the findings of previous studies, the inter-relationships and validity of the inferences, the theoretical and practical implications stemming from these inferences, and the important gaps/missing information on the phenomenon in literature on the phenomenon of interest (Creswell, 2014). In the case of this study, my review of literature provided me with a frame of reference against which I could establish the importance of my study as well as with a benchmark for the comparison of my findings with those of other research studies on similar topics. After I had analyzed and interpreted my data, I did another review of the literature to determine the correlation between my findings on critical reflection in teaching with existing knowledge on the same phenomenon (Aveyard, 2014).

1.4.2.2 Pilot study

A pilot study is defined by Richard and Hallberg (2015) as a preliminary study conducted before the intended study. Pilot studies are usually executed as planned for the intended study, but on a smaller scale. In my study, the pilot study involved a small group of student teachers displaying similar characteristics to those who have were selected as my sample. Conducting a pilot study allowed me to gather data which could serve as basis for my planning of the formal focus group interview sessions.

1.4.2.3 Document analysis

Document analysis involves the study of existing documents, either to understand their substantive content or to illuminate deeper meanings which may be revealed by their style and coverage. Documents studied could include public documents, like media reports; government papers or publicity materials; procedural documents, like minutes of meetings; formal letters or financial accounts, or personal documents, like diaries, letters or photographs (Merriam & Tisdell, 2015).

I analysed the teaching practice curricula and relevant study guides developed for the teacher training programmes of the 2nd, 3rd and 4th year Bachelor of Education (B.Ed): Further Education

and Training (FET) students as well as that of the Post-Graduate Certificate in Education (PGCE) (cf. Annexure J). The process was conducted from June to July 2016. Furthermore, 10 posters and 10 three-dimensional frameworks designed by student teachers were used during their teaching practice periods for observational purposes in August 2016. Moreover, 40 reflective journals of student teachers were analysed. These comprised 10 portfolios from students in each academic year (2nd, 3rd, 4th years) in the B.Ed (FET) program and 4th year PGCE students. This process took place between November 2016 and December 2016. The reflective journals provided me with rich, first-person accounts on the art of critical reflection in teaching practice.

1.4.2.4 Participant observation

Participant observation refers to the practice in which the researcher joins the constituent study population in its organizational or community setting with the purpose of recording naturally occurring actions, interactions or events (Merriam & Tisdell, 2015). As the name suggests, participant observation demands first-hand involvement in the social world chosen for study. Immersion in the setting permits the researcher to hear, to see, and to begin to experience reality as the participants do (Saldana, 2011). Ideally, the researcher spends a considerable amount of time in the setting, learning about the daily life of participants. This immersion offers the researcher the opportunity to learn directly from his/her own experience. I was able to use the participant observational technique since I am a staff member at the Central University of Technology (CUT). One of my colleagues acted as a concurrent observer to minimize the chance of my missing or misinterpreting something (Fraenkel & Wallen, 2014).

The specific duration of participant observation depends on the setting, activity and population of interest (Gay, *et al.*, 2016). For example, a researcher might spend an hour, an afternoon, or a series of afternoons in a particular setting (Leedy & Omrod, 2014). For the purpose of this study, the observations took place from the 1st to the 12th of August 2016. During this time, students were allocated to secondary schools in the Lejweleputswa district to conduct their School-Based Learning (SBL). Since school-based student teacher evaluation forms part and parcel of my

responsibilities as an education lecturer, this time period presented me with the ideal opportunity to conduct the empirical investigation. Accompanied by a colleague, who performed the role of co-observer, I observed ten student teachers. As indicated earlier, the inclusion of a co-observer was solely for the purpose of eliminating bias and comparing the results. A structured checklist was used for observation, and each lesson was cam-recorded (Leedy & Omrod, 2014; McMillan & Schumacher, 2010). Figure 1.3 depicts the observation process.

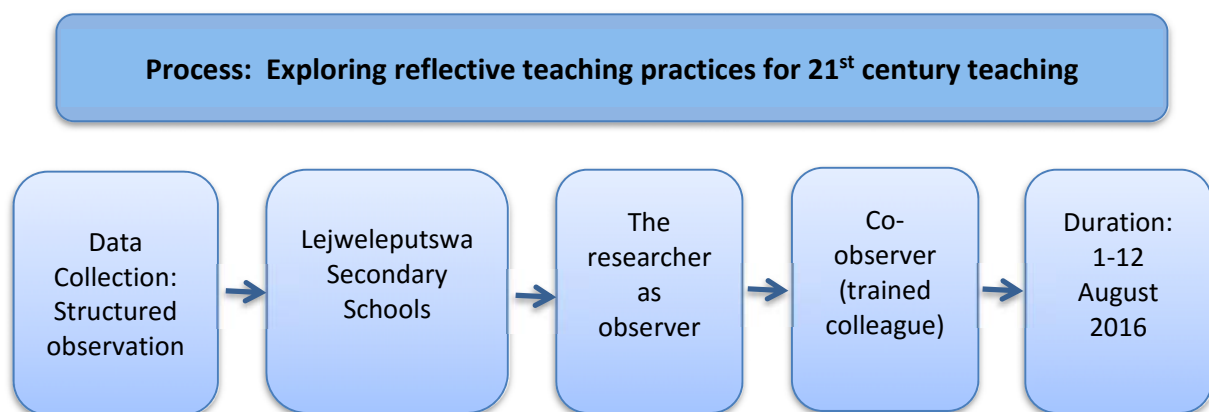


Figure 1.3: The observation process

1.4.2.5 Focus group interviews

According to Krueger and Casey (2015), a focus group interview/discussion involves interaction between one or more researchers and more than one participant for the purpose of collecting data. According to Patton (2015), researchers interview participants with common characteristics or experiences to elicit ideas, thoughts and perceptions about specific topics or issues related to an area of interest. A focus group consists of approximately six to twelve people who share similar characteristics or common interests (Merriam & Tisdell, 2015). Focus group discussions provide participants with a space in which they can discuss a particular topic in a context where they are free to agree or disagree on issues raised (McMillan & Schumacher, 2010). A facilitator guides the group discussion in accordance with a predetermined set of topics, themes or issues and ensures that the environment encourages participants to openly and honestly share their perceptions and points of view (Patton, 2015). In this study, the focus group discussions gave me

the opportunity to explore the ways in which participants’ experiences had shaped their understanding of the role of reflective thinking and their perceptions of or opinions on the challenges and implications associated with it.

The complete proposed plan of chronological focus group discussions conducted in this study is outlined in Table 1.1. Forty student teachers from the different year groups (2nd, 3rd, and 4th year B Ed [FET] students), and selected 4th year PGCE students, were invited to participate in the focus group sessions. Their participation enabled me to compare, contrast and explore a range of experiences, opinions, challenges and implications as far as critical reflective teaching was concerned.

Table 1.1: Time allocation for schedule

TIME ALLOCATED FOR THE SCHEDULE OF FOCUS GROUP ACTIVITIES				
Planning		Interviews	Analysis	
Week 1	Week 2 to 4	Week 5 to 6	Week 7 to 14	Week 15 to 18
Develop the plan	Develop and elaborate on the questions	1 st session (pilot)	Transcribe data	Write up report
	Identify the participants	Feedback and amendments to schedule	Process data	
	Determine the location for the sessions	2 nd session	Analyse data	
	Recruit participants	3 rd session 4 th session		

1.4.3 Data analysis

Data analysis is a mechanism used to reduce and organise data in order to produce findings that require interpretation by the researcher (Gray & Malins, 2016; Leedy & Omrod, 2014). Documents, observation schedules and focus group discussions were analysed from June 2016

to March 2017. As in any other qualitative study, data collection and data analysis occurred concurrently.

1.4.3.1 Case study data analysis

In a case study, data from multiple sources are converged in the analysis process rather than handled individually. Each data source is one piece of the puzzle, with each piece contributing to the researcher's understanding of the whole phenomenon (Yin, 2016). This convergence adds strength to the findings as the various strands of data are braided together to promote a greater understanding of the case. Although the opportunity to gather data from various sources is extremely attractive, it needs to be extremely rigorous given the risks associated with its use (Creswell, 2014). One such risk is that the researcher might be overwhelmed with the massive amounts of data generated, all of which needs to be organized and analyzed. Often, researchers find themselves lost in the data (McMillan, 2012).

1.4.3.2 Document analysis

Analyzing documents requires, amongst other things, the coding of content into themes (McMillan, 2012; cf. Figure 1.4). My document analysis was a four-step process as indicated below.

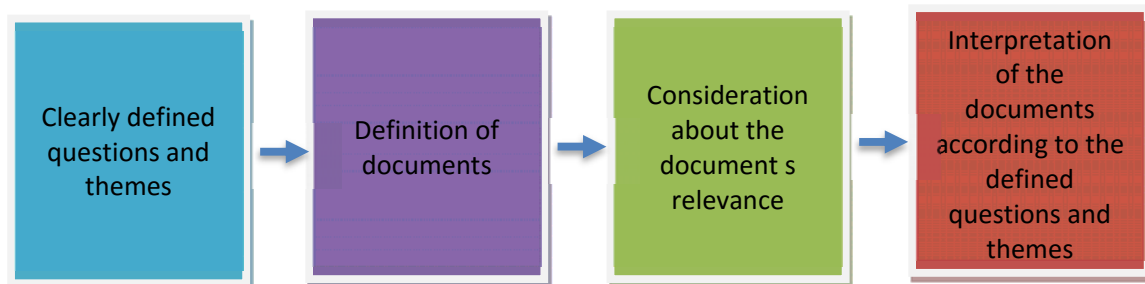


Figure 1.4: Four steps of process document analysis process

(Adapted from Fraenkel & Wallen, 2014)

1.4.3.3 Analysis of observation data

In this study, observation included the making of field notes, the taking photographs and videos, and the screening of a variety of learning and teaching media prepared by students for their micro-lesson presentations (Fraenkel & Wallen, 2014). A qualitative, systematic coding system was used to analyse the data generated through the observations. To this end, I proceeded with a detailed analysis of one group, using coding outlines. These were then expanded through the addition of data generated in other groups (McMillan & Schumacher, 2010).

1.4.3.4 Focus group data analysis

The analysis of focus group data was done immediately after each focus group session. Comprehensive note-making and the summarizing of participant discussions during the sessions facilitated the subsequent analysis of data generated during the discussions (McMillan & Schumacher, 2010). The first step in the data analysis process was to familiarize myself with the data by listening to tape recordings, reading the scripts and the observational field notes taken during the focus group interview (McMillan & Schumacher, 2010). Next came the formulation of major themes, the creation of a thematic framework, sifting, indexing and charting the data. The last step was the mapping and interpretation of data (McMillan & Schumacher, 2010).

1.5 MEASURES OF TRUSTWORTHINESS

Trustworthiness in qualitative research is addressed by using a number of strategies aimed at establishing reliability and quality (Gay, *et al.*, 2016). These include strategies aimed at establishing the credibility and dependability data and the methods used to collect, analyse and interpret it. The steps I took to ensure these are briefly described in the sub-sections which follow.

1.5.1 Credibility

According to Creswell (2014), credibility refers to confidence in the data, that is, whether parties involved in the research process and those with an interest in the research findings believe that the data is accurate and complete. As the researcher, I strove to establish credibility through member checking, peer debriefing and prolonged engagement.

1.5.1.1 Member checking

Member checking is primarily used as a method in qualitative inquiries. Defined as a quality control process, it is used by researchers to ensure the accuracy, credibility and validity of recorded data generated during an interview or discussion session (Creswell, 2014; Merriam, 2009). To this purpose I gave research participants from whom the data was originally collected the opportunity to check and confirm the accuracy of the data and comment on the analytical categories used as well as on the interpretations of and conclusions emerging from the data analysis process (Creswell, 2014).

1.5.1.2 Peer debriefing

Peer debriefing involves the researcher presenting his/her research design, data, analysis and conclusions to a colleague or other peer on a continuous basis (Merriam, 2009). I consulted a colleague working closely with me in the same department as I to fulfil this very important function. As a follow-up measure, my supervisor also assisted in this regard.

1.5.1.3 Prolonged engagement

Prolonged engagement refers to the investment of sufficient time to learn the culture of research participants, test for misinformation, build trust and generally repeating the procedure central to the case study (Creswell, 2014; Merriam, 2009; Yin, 2016). I am a lecturer at the Central

University of Technology, and part of my job description is being responsible for SBL. Prolonged engagement with the participants is therefore routinely part of my working day.

1.5.2 Dependability

According to Merriam (2009) and Creswell (2014), dependability refers to the stability of data over time and conditions. To ensure the dependability of this study, I triangulated my data sources and, in addition to this, asked my supervisor to examine the data, findings, interpretations and recommendations in order to attest to their authenticity.

1.5.2.1 *Triangulation of data sources*

Data triangulation involves the use of multiple methods and means in the investigation of a phenomenon in order to minimize risks associated with bias and validity (Fraenkel & Wallen, 2014). In this study this was achieved by my use of multiple data sources, namely documents, observations and focus group interviews (cf. Figures 1.2; 1.3; 1.4 and 1.5).

1.6 ETHICAL CONSIDERATIONS

To ensure that my study was conducted in accordance with the ethical requirements of qualitative research, I ensured that I obtained the consent of all those who participated in my study, that their participation was voluntary, that their privacy was protected, and that the results of my research would be disseminated to all interested parties, including my research participants if they so desired.

1.6.1 Informed consent

Consent which is freely given is regarded as informed consent. In my study, I made sure that those who participated in my study understood, as far as realistically possible, the aims, risks and

benefits of the protocol and were willing to honour the obligations associated with such participation (Creswell, 2014). I requested written permission to conduct the study from the principals of schools where observations were to take place. I also obtained permission from the principals, the participating students and university management to videotape the lessons presented by students during their practice teaching period (McMillan & Schumacher, 2010).

1.6.2 Privacy

Privacy in the context of research refers to participants' right not to be identified in any way as having provided specific information on the issues addressed during the research study. Put differently, all information collected during the course of the study will be strictly confidential (McMillan & Schumacher, 2010). In this study, I ensured participating students' privacy by not attaching their names to the information and not to share any information they provided with anyone without their permission.

1.6.3 Voluntary participation

I informed the participants that their participation in this research project was voluntary and that they had the right to withdraw from the study at any stage should they wish to do so (McMillan & Schumacher, 2010).

1.6.4 Dissemination of results

Participants were informed of their right to access the research results if they so wished. The report would not expose the secrets or weaknesses of the teaching practices at the CUT to the readers but would recommend improvements to the programme (Kennedy, 2006). Participants were also informed that a copy of the findings would be handed to the University Library for inclusion in the library databases, which are accessible both nationally and internationally.

1.7 DELIMITATION AND LIMITATIONS OF THE STUDY

The following section explores the delimitation and the limitations of the study.

1.7.1 Delimitation of the study

Delimitation of the study refers to the relevance of the study being generalised, whilst its limitations refer to the parameters that the study undertaken has covered (Mligo, 2016). Due to the interpretative and qualitative nature of the present study, generalisation was not an option. As to the delimitation of the study, it was conducted in the field of teacher education in order to:

- add to the existing body of knowledge in the field of teacher education;
- establish the experiences, opinions, challenges, implications and solutions of critical reflective teaching by student teachers at the Central University of Technology's Welkom campus, and
- generate suggestions and/or recommendations on ways to improve and nurture reflective teaching by student teachers enrolled at this institution.

1.8 SIGNIFICANCE OF THE STUDY

Reflective teaching has become popular world-wide and is actively advocated in Canada, Australia, the United States, the United Kingdom, Singapore and Finland (Moon, 2006). Changes in the socio-economic and political environment brought about by globalisation, a key feature of the 21st century, signal a need for the cultivation of teachers who are able not only to respond appropriately to these changes as individuals but also to ensure the relevance of education by keeping abreast with changes in the rest of the world (National Policy Framework for Teacher Education and Development in South Africa, 2007). To this end, teachers should interpret their everyday practice through the use of reflective self-development.

This study, which is based on the afore-mentioned perspectives on the role of critical reflective teaching as the teaching practice deemed most appropriate to the 21st century, could be significant in two ways. First, it could add to the existing body of knowledge and sensitize relevant stakeholders to the importance of critical reflective thinking in a context that is constantly being reshaped by educational and technological change. Second, it could provide student teachers with a platform from which they can air their concerns and expectations regarding their current training as teachers as well as their aspirations for their pending teaching careers.

1.9 EXPECTED OUTCOMES

I envisage that this study will provide invaluable information on ways in which the quality of teacher training curricula at the university could be improved, with specific reference to:

- the experiences and opinions of student teachers regarding the development of their critical reflective teaching skills during training;
- the provision of sufficient and sustained opportunities for students to practice their critical reflection skills during the course of their studies;
- the importance of addressing the challenges student teachers face in their use of critical reflective teaching, and
- the development of a framework that could assist student teachers to improve the practice of critical reflective teaching, not only during teaching practise, but also when they embark on their teaching careers.

1.10 DEFINITION OF TERMS

The following concepts are defined to facilitate a common understanding of the terminology as used in this study.

1.10.1 Critical reflective teaching

In the context of education, critical reflective teaching is perceived as a strategy/technique by means of which professional practice could be improved rather than simply as a way of recreating professional knowledge (Taole, 2015). Critical reflective teaching is also a specific approach to teacher education, one in which student teachers and/or their teachers/lecturers critically examine their own actions and attitudes, and then contemplate how these could be improved. Critical reflective teaching is characterized by retrospection, problem-solving, critical analysis and activating (putting in action) thoughts (Cho & Oo, 2012).

1.10.2 Teaching practice of the 21st century

Kennedy (2006) defines 21st century teaching practice as a process in which student teachers, who are assigned to one or more teachers and classroom for a specific block of time, practice the art of teaching and learning authentic school contexts. Informing this definition is the assumption that teaching practice in the 21st century should equip student teachers with a diversified set of knowledge, skills and attitudes which will help them to keep abreast with continuous breakthroughs in science and rapidly changing technology (Jang, 2008).

Critical reflective teacher training practice presents trainee teachers with the opportunity to improve and develop their professional competence in the context of real classrooms, usually under some form of supervision and guidance (Salter, 2013). According to Perry (2013), practical teaching should comprise activities which create opportunities for student teachers (as adult learners) to demonstrate and improve their pedagogical skills in actual school contexts over a period of time (Sherman, 2013). Teaching practice is thus an important component of becoming a teacher. It is also, however, a period in which those who are responsible for student teachers' training (their teachers/lecturers at teacher training universities and institutions) undergo a period of apprenticeship/internship within the school system (Ghaye, 2010). Informing this 'apprenticeship' are 'hands-on' training in other professions: would-be engineers go for industrial

training to gain practical job experience, while trainee medical doctors go through one or more years of housemanship and clinical studies before they are licensed to practice (Rata & Palicica, 2011).

1.11 DIVISION OF CHAPTERS

Chapter one provided the reader with a background to the study and the formulation of the problem statement. In addition to this, the research aim and objectives as well as the research questions were contextualized, and the outline of the research design and research methods explored.

Chapter two describes the conceptual framework within which the study is located. Consequently, different theories on reflective practices are explored, with specific attention being paid to reflective practices in teaching.

Chapter three is devoted to the provision of a detailed overview of contemporary adult learning theories.

In **Chapter four**, literature on teacher education appropriate to 21st century school teaching and learning as well as the use of reflective skills in this regard is reviewed.

Chapter five is dedicated to the justification of the empirical research methodology used in this study, including the sampling strategy and the research methods used to answer the research questions.

In **Chapter six** a detailed discussion of the results and the interpretation of the findings are provided.

Chapter seven is essentially a summary of the study, the key findings and the conclusions. A framework is proposed that may assist student teachers at the CUT to incorporate critical reflective thinking and teaching in their training programme as a means to align teaching practice to 21st century demand for creative, innovative, collaborative and productive teaching and learning. In addition to this, the chapter includes a number of recommendation for further research on the same or related phenomena.

1.12 CONCLUSION

Chapter 1 detailed the background of the study, the problem being investigated and the aims of the study. The reader was alerted to the importance of critical reflective thinking and teaching and its importance for innovative, high quality teaching in the 21st century. The research design and methodology used in the study were also described in terms of sampling, site selection and selection of participants, as were the data collection methods, namely document analysis, observations and focus group interviews.

Chapter 2 presents the conceptual framework underpinning the study.

CHAPTER TWO

CRITICAL REFLECTIVE THINKING

2.1 INTRODUCTION

It is universally accepted that education is critical to development. One could infer from this that the educational levels of citizens determine the developmental status and/or potential development of their country. Moreover, the quality of education is dependent on the quality of teaching and, by implication the quality of teachers and teacher training. The attributes of quality teachers according to Brock (2015), Darling-Hammond (2006) and Bernhardt (2015) include, amongst others, pedagogical knowledge and skills; a sound subject content knowledge basis, the attitudes necessary for effective learning, a strong sense of ethics, and the capacity for renewal and ongoing learning.

In Chapter one I indicated that, in addition to knowledge and skills like these, effective teachers in the 21st century should also be able to respond appropriately to change, be technologically competent and, most importantly of all, be able to critically reflect on their own teaching and learning. In other words, sustaining quality education has never more critical and challenging than it is today's global world. Educating and training prospective teachers in the management of these challenges, including their development as critically reflective teachers, is therefore absolutely critical to national development. These issues were highlighted in Chapter one, where I contextualized the study and sensitized those who would be interested in reading my research report to the relevance of and need for critical reflective teaching in the 21st century.

Also indicated in Chapter one, was the main aim of my case study, namely to design a framework that could assist student teachers in their attempts to incorporate critical reflective thinking into their teaching framework.

In Chapter two, I present, discuss and compare some past and current ideas and theories on critical reflection with a view to giving as representative a view as possible of its nature, purpose, function and application, with specific reference to the training of prospective school teachers. While it is not possible to give a representative overview of the myriad of writings on reflective practice, the ideas presented in this chapter should provide readers with enough background knowledge on critical reflection for them to appreciate its importance in education, and in the training of educators in particular.

2.2 CRITICAL REFLECTIVE (IN) PRACTICE

The ability to critically reflect on practice is highly regarded in most professions as well as in the business world, albeit for different reasons. Using it as basis for decision-making or the assessment of decisions taken and actions performed, it could assist professional development and/or lead to improvements in service delivery (Ledlow & Coppola, 2014; Bernhardt, 2015), outcomes, or products. In the healthcare professions (medicine and nursing, for example) and allied healthcare professions students are explicitly trained in critical reflection (Lipe & Beasley, 2004; Harland & Wondra, 2011). It is also either nurtured or used for assessment and evaluation purposes in the fields of psychology, philosophy and early childhood education Holzman (2014) and Mantei & Kervin (2009). In the latter case, it is used to determine whether or not those who work or want to work with young children have the ability to critically reflect on the suitability of activities related to early childhood development. In the education sector, critical reflective teaching practice provides student teachers with the opportunity to authentically use and/or fine-tune their reflective teaching skills (Shandomo, 2010; Bernhardt, 2015). In the business sector critical reflection serves a more pragmatic purpose: according to Nilsson (2013), it is used to predict the future of the business, to create an organizational vision, and/or to develop solutions to business challenges.

The teaching of critical reflective skills in higher education, in particular, offers a way for student teachers to gain insight into their own professionalism as well as in the knowledge and power of

the disciplines with which they align themselves (Menter, Hulme, Dely & Lewin, 2010). Despite widespread and long-standing commitments to the notion of critical reflection across other professions, the ability to assimilate it into teaching can be difficult, not only because its terminology is complex but also because of debates on its nomenclature, nature, purpose and applicability and purpose. These debates are most commonly waged in literature on critical thinking, critical analysis, reflective practice and reflexivity in research (Harland & Wondra, 2011). Notable in these debates is the seeming ignorance about either the difficulties, practicalities and methods of critical reflection or the issues of teaching critical reflection in academic contexts. The definition of critical reflection as an extended and abstract outcome of learning is ambiguous, to put it mildly. On the one hand, it could imply that student teachers will absorb such knowledge and skills during their higher education experiences (MacDonald, 2002; Harland & Wondra, 2011). On the other hand, while this may be true, it could also mean that students could learn more effectively if lecturers specifically explained the general purposes and approaches to critical reflection as part of the delivery of curricula.

No introduction to reflection in education, however brief, would be possible without discussing the early work of Dewey. His 1910 and 1933 treatises on critical reflection, based on the ideas of a number of philosophers and educators, are considered seminal in this area. By also interrogating the theories of Schön (1983), Gibbs (1988), Kolb (1984), Pollard (2002), Van Manen (1977), Gore (1987), and Zeichner and Liston (2013), I hope to provide a relatively holistic picture of critical reflective teaching – past, present and future. It is this dimension of critical reflection that is the focus of the next section.

2.3 CRITICAL REFLECTIVE TEACHING

What it means to critically reflect has been extensively debated by a number of philosophers, social theorists, researchers, educators and therapists (Pollard, 2002; Hillier, 2009; Zeichner & Liston, 2013; Sellars, 2014; Howatson-Jones, 2010). Conceptually, it has been accorded the potential to improve thinking, learning and assessment of self and social systems. In the

discussion that follows, though, critical reflection is discussed in terms of its link/s with reflective teaching.

2.3.1 Critical reflection and critical thinking defined

In order to assist students' development towards reflective ability, it is necessary to first define the concept, 'reflective thinking'. According to Lipman (2003), reflective thinking is a learned behaviour, thus it requires time and practice (Lipman, 2003). It follows that starting the development of reflective thinking during the pre-service teacher education process is vital if it is to become a part of student teachers' daily practice. The term, 'reflective teaching' was coined by Dewey (1933), who contrasted routine action with reflective action (Pollard, Collins, Maddock, Simco, Swaffield, Warin & Warwick, 2005). According to Dewey, routine action is typically guided by tradition, habit and authority and/or by institutional definitions and expectations (Schutz, 2010). Reflection, on the other hand, involves the active, persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it as well as the conclusion to which it tends (Dewey, 1933). According to him, critical reflection is closely related to problem-solving or investigation, brought about by a moment of doubt, and leading to a process of thinking about the conditions and effects of that which one is doing. Dewey specifically emphasizes the fact that critical reflection is not behavioural, technical, truth-establishing, or captured by a discipline. Rather, it critiques all forms of knowledge and, in so doing, it moves beyond merely reproducing that which 'is' (Dewey, 1993).

According to Van Manen (1977) and Ahmad (2015), critical thinking is used as a generic term for those intellectual and effective activities in which individuals engage to explore their experiences in order to gain a better or new understanding and appreciation of the activities in which they engage. Schön's definition (1983) is much simpler and straightforward: according to him, reflection is an active rather than passive thinking process which involves a person (or persons) reviewing an experience or practice in order to describe, analyse and evaluate it in an effort to 'learn (more) about practice'.

In education, according to Dewey (1933), critical thinking is a means to improve teachers' professional practice rather than simply a means of recreating professional knowledge. In terms of Kolb's (1984) well-known framework of the learning process reflection is part of a step-by-step cyclical process of learning which starts with planning, proceeds to action and concluded with evaluation. In other words, according to his particular framework, reflection is not an 'add-on' or something outside or independent of learning; it is an intrinsic part of learning. Kolb's conception of reflection therefore extends traditional definitions of 'learning', which focus on the reproduction of received knowledge to a definition which includes the active cognitive processing of knowledge. It follows that, seen from this perspective, learner reflection involves personal actions (engagement with knowledge), thus excluding holistic critiques of learning, teaching or reflectivity itself. Schön (1996) also describes critical reflection as an act of professional artistry, an act that could involve reflection-on-action and/or reflection-in-action. The perspectives of both these theorists seem to support, or correspond with, notions that critical reflection results in the internalisation of knowledge which is critical to the development of competence. Thus, the development of student teachers' ability to reflect critically on their own and others' learning and/or actions would inevitably contribute to their professional development and/or their competence as teachers.

It is, however, also possible to use a self-critical form of reflection in order to gain insight into and/or assess one's own thoughts and behaviour (Hillier, 2009). In this sense, critical reflection, or reflexivity, would then involve the examination of the interrelationship between 'self' and knowledge creation. This kind of reflection is a critical and rigorous process which pays systematic attention to the personal, interpersonal and contextual factors that influence what one says or does, or what one does not say or do. Its concern would be with knowledge issues: why knowledge is created and/or who can lay claim to being knowledgeable (Richard & Nunan, 1990) and to determining how, and whether or not, knowledge creation is directed towards political or ethical goals.

Although these definitions of critical reflection and the purposes that could be served by it may seem very different, they collectively offer teachers and student learners a framework within the parameters of which they should realize when and why they should critically reflect on something, what they should to reflect on, and which techniques they could choose to do so (Lyons, 2010).

2.3.2 Critical reflection and critical pedagogy

Critical pedagogy explores dialogic relationships between teaching and learning (Bartolomé, 2004). Its proponents claim that it is a continuous process of what they call "unlearning", "learning", and "relearning", "reflection", "evaluation", and the effect that these processes have on students, in particular students whom they believe have been historically disenfranchised (Giroux, 2007). Put differently, critical pedagogy aims to expose and resist oppressive forms of power operating within the school system and in the community. It forms part and parcel of critical pedagogy and, according to Shandomo (2010), it represents introspective learning on, or informed by the values, beliefs, knowledge and experiences that contribute to one's perspectives on one's self, other people and the world. It examines, amongst others, the political, economic and social conditions that perpetuate inequities and marginalism in society. This is particularly relevant in the currently volatile South African education landscape which is still haunted by historical inequities.

Socio-politically speaking, critical reflection provides teachers with opportunities to participate in the design and implementation of educational policies and systems (Giroux, 2010). In this sense, the emphasis is on reflection as "imagination, social consciousness and democratic citizenship, which are recommended as a central theoretical referent and critical pedagogy for all educational practitioners" (Bentley, 2006). Critical reflection on broad societal structures challenges the status quo (Gould & Baldwin, 2016), implying that teachers cannot restrict their attention to the classroom alone, leaving the larger setting and purposes of schooling to be determined by others (Zeichner & Liston, 2013). Rather, teachers must actively accept

responsibility for the goals to which they are committed as well as for the creation of social settings in which these could/should prosper. Teachers are not to be mere agents of bureaucrats; they need to determine their own agency through a critical and continuous evaluation of the purposes, the consequences and the social context of their calling (Shandomo, 2010). In doing so, according to Ansari & Kliman, (2015). teachers will start considering alternative ideas and practices which take into account the dynamics of power inequalities embedded within their schools and classrooms. Put differently, they should be willing to confront complex socio-political issues as an integral part of their teaching approach and methodology. If they simply reflect, rather than *critically* reflect, on their experiences, according to Navadeen (2012), experience might become an unreliable and sometimes dangerous guide to use when giving advice to learners.

In South Africa for example, the assumption of power by the African National Congress (ANC) in 1994 resulted in the political transformation of the country. This transformation affected all areas of society, including education (De Wet & Wolhuter, 2009). At a time of transition to democracy, fundamental reforms to the administration, governance and funding of education were immediately necessary, on the one hand representing a complete break with previous arrangements, and on the other advancing critical thinking and problem solving as means to prevent the repetitions of mistakes previously made (Van der Berg, Taylor, Gustafsson, Spaull & Armstrong, 2011). Consequently, teachers now do not wish to be viewed merely as transformation implementers/agents; they expect to be included in meaningful decision-making processes related to what should be transformed and why. In many instances, according to Swanepoel (2009), teachers feel that their expertise as subject and/or learning area specialists is ignored during decision-making processes because little or no attention is paid to their opinions. Consequently, they feel forced to put their professional status and well-meant school changes into jeopardy.

Teachers cannot claim to be ‘truly professional’ unless their critical reflection on historical, political or social problems in the education system results in action aimed at redressing these

(Harland & Wondra, 2011). For this reason, reflecting in a critical pedagogical manner is central to quality education and, thus, to student teachers' professional development.

2.3.3 Reflective practice

Choy and Oo (2012) describe reflective practice as a lens into the world of practice because, according to them, it offers the 'reflectors' a chance to question assumptions often taken for granted. In other words, it provides them with the opportunity to see their own practice through the eyes of others. Reflective practice is important for the development of all professionals because it enables us to learn from experience (Jasper, 2003). However, continuously learning from experience is no guarantee for acquiring the same measure of learning that is needed to bring about change and renewal. Twenty years of teaching may not equate to twenty years of learning about teaching but, disturbingly, may be a matter of only one year repeated twenty times. Huppertz, Massler and Plötzner (2005) hold that teachers should not rely solely on their natural process of reflecting on experience, but that they need to *actively* seek ways to ensure that reflection itself becomes a habit, ensuring their continuing development as professional teachers.

From the discussion above, it is clear that critical reflective teaching involves much more than merely changing teaching strategies in a haphazard way and believing that this would improve practice and bring about improvement and renewal. The practice of reflection is multi-faceted and, in most cases, does not come naturally – it needs to be pursued and actively practised. By implication, student teachers need to *trained* in the art of reflection. The case study in my research sets out to explore whether or not this crucial aspect is, indeed, being accounted for in the current training of student teachers at the CUT (Welkom campus) and, if not, how it can be incorporated in the teacher training programme.

2.4 APPROACHES TO REFLECTIVE TEACHING

According to Given (2008), even though the concept, '*theory*', is commonly used in daily conversations and in educational discussions its exact meaning is unclear. In both the above-mentioned cases, *theory* refers to a prototype, or set of thoughts and statements, that are related to actual events. Because theory is an integrated, comprehensible body of statements that offer a rationally reliable picture of a given matter, a theory could enable the conceptualisation of relevant events, or provide a basis for the implementation of the theory in different situations. Thus, *theories* are structures designed by people to reveal the theorists' conceptualisations of what the organisation of the issue or the matter looks like (Littlejohn & Foss, 2009). Theories can be modified through scientific investigations and developments over time (Wilkins, 2006; Littlejohn & Foss, 2009). In this section, specific theories underpinning reflective thinking and reflective teaching are explained in more detail and their relevance to this research is indicated.

2.4.1 John Dewey

Dewey (1933) was among the first to identify reflection as a specialized form of thinking, stemming from doubt, hesitation or perplexity related to a directly experienced situation. Neither Dewey (1933) nor Schön (1983) considered a problem as an error or a mistake; rather they saw it as a puzzling, curious, inviting and engaging issue for a teacher to investigate. For them, this prompted purposeful inquiry and problem resolution. Dewey also argued that reflective thinking moved people away from routine thinking/action guided by tradition or external authority towards reflective action involving careful, critical consideration of taken-for-granted knowledge (Harland & Wondra, 2011). The reflective process as described by Dewey, starts with a trial or puzzle. From there, a student learns how to navigate the trial or puzzle until s/he finds the best possible solution, something which is achievable only through critical reflective teaching. Informed by the assumption that we learn from doing, i.e. from practice, this way of conceptualizing reflection has to be based on experience. Specifically, Dewey argued that we

think the problem through towards formulating hypotheses in trial and error reflective situations and then use these hypotheses to plan our actions and test out our ideas (Navaneedhan, 2012).

In addition to this, Dewey provides a useful distinction between routine and reflective action. In routine action, the grounds for action have not been actively considered, and tradition, external authority and circumstance serve as guiding factors. Reflective action derives, in Dewey's view, from the need to solve a problem, thus it involves the active, persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it (Dewey, 1933; Choy & Oo, 2012). Teachers who are not inclined to reflective on out their teaching tend to accept the everyday reality in their schools as the norm, hence they concentrate their efforts on finding the most effective and efficient means to solve problems that have been largely defined for them by some collective code. It is not that unreflective teachers are not thinking; it is that their thinking does not allow for the possibility of framing problems in more than one way. Naturally, some would argue that routine action based on on-going assumptions is necessary in classroom actions or reactions. Dewey himself acknowledged the 'arrogance' of an approach that questions everything all of the time (Schön, 1983) but condemned as inadequate the actions of a professional who acts without questioning 'received' truths. The separation of routine and reflective action has a strong appeal for reflectors. Not only does it provide teachers with a point of departure for an analysis of teaching that looks beyond technicalities, but it also provides them with a solid basis from which to approach the teaching profession (Bruno-Jofre' & Johnston, 2014). From Dewey's point of view, reflection enables us to direct our actions with foresight and to know what we are about when we act (Dewey, 1933; Kolb, 1984).

2.4.1.1 Dewey's three prerequisites attitudes for reflective teaching

Dewey recommended three attitudes that have to be nurtured, namely open-mindedness, wholeheartedness, and intellectual responsibility, all of which are essential to the cultivation of a reflective attitude (Harland & Wondra, 2011). These attitudes are depicted in Figure 2.1 and discussed in greater detail in subsequent sections. Figure 2.1 highlights the need for a student to

move away from a routine action to an action that is more reflective action. one which entails, amongst others, the modification of solutions and/or considerations of his/her beliefs. In order to be able to do so, the student must cultivate the three attitudes identified by Dewey and discussed in the paragraph which follow.

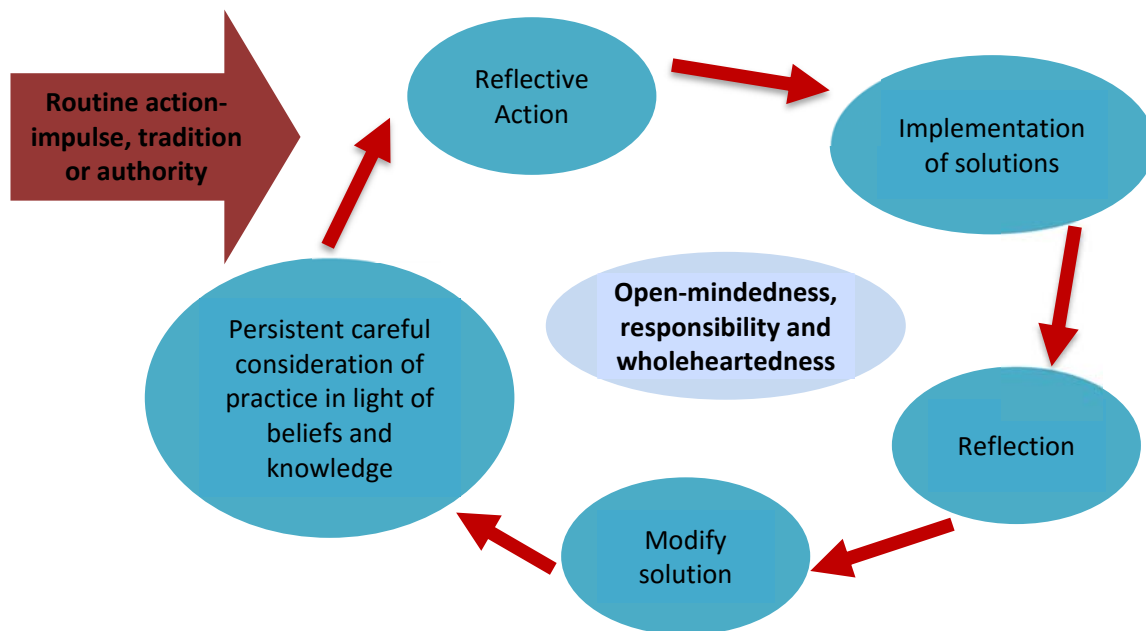


Figure 2.1: Dewey's reflective model

(Hatton & Smith, 1995)

- *Open-mindedness*

Open-mindedness is the same as an intellectual receptiveness to alternatives. To be open-minded is to be willing to listen to more than one side of an issue, and to give attention to alternative views (Dewey, 1933). It is not, as Navaneedhan (2012) argues, a blind acceptance of all ideas without intelligent critique. Rather, it reflects a willingness to entertain difference perspectives and to acceptance that our beliefs may be wrong, no matter how dear they are to us. Ditchburn (2015) adds to this that open-mindedness is an active desire to listen to more sides

than one, to give heed to facts from whatever source they come, to give full attention to alternative possibilities. Open-mindedness is an essential attribute of rigorous reflection because any sort of enquiry that is consciously based on partial evidence weakens only itself (Ditchburn, 2015). In my study the concept is used in the sense of being willing to reflect upon ourselves and to challenge our own as well as others' assumptions, prejudices and ideologies. To be open-minded about evidence and/or to the way it is interpreted is not, however, the same as declining to take up a value-position on important social and educational issues (Navaneedhan, 2012).

- *Wholeheartedness*

Wholeheartedness implies that one is mentally, emotionally and physically committed to solve problems. In essence, it therefore refers to the way in which such consideration takes place (Barbani, 2006). To display wholeheartedness is to be so committed to ideas or projects that we are willing to put aside our fears and uncertainties in order to effect meaningful personal and professional change. Dewey (1933) suggests that reflective teachers are dedicated, single-minded, energetic and enthusiastic. According to him, there is no greater enemy to effective thinking than divided interest. In short, genuine enthusiasm is an intellectual force (Zeichner & Liston, 2013).

- *Responsibility*

Responsibility implies considering the consequences of a projected step and to be willing to accept them if they follow reasonably from a position already taken (Johnston, 2014). Intellectual responsibility, which is, according to Dewey (1933), a consideration the consequences of a projected step, accords integrity to the person if s/he reasonably accepts the consequences of the step to be taken. Reflective practitioners, then, accept intellectual responsibility for long- and short-term solutions to a problem.

It is a person's responsibility to critically evaluate the outcome of steps taken or actions executed. Development of a plan to evaluate change is the final step toward enhancement of reflective thinking. The purpose of this step is threefold. First, practitioners should consider the degree to which their plan is workable given the constraints of the field setting and the degree to which those constraints could either be overcome or preclude the implementation of the planned intervention. Second, there must be systematic monitoring of the execution of and adherence to the plan. In this regard self-evaluating and self-monitoring are critical since they encourage and reinforce reflection on changes in teaching performance and subsequent learning outcomes (Harland & Wondra, 2011).

Together, these three attitudes are vital element of the professional commitment that needs to be demonstrated by those who aim to be reflective teachers. In modern circumstances, these attitudes of open-mindedness, wholeheartedness and responsibility are often challenged, especially if the morale of teachers is low. Remaining hopeful, and imagining future possibilities, Barbani (2006) argues, are essential to the continued commitment of educationists. In his words,

"Beyond simple optimism, this requires a way of thinking about the present and the future that is permeated by critique, particularly of the kind that holds up to external scrutiny. Maintaining a constructive engagement, a willingness to imagine new futures, and a self-critical spirit are thus all connected to reflective practice" (Barbani, 2006: 71).

In conclusion, Dewey (1933) considered reflective practice as an intentional, systematic and disciplined inquiry aimed at change in and the professional growth of teachers (reflection-*on*-action). Despite the remarkable contribution he has made to critical reflection as a theory, and the heavy reliance of numerous theorists on his work, his conceptualization of reflection has over the past decades been harshly criticized by other theorists also focusing on reflection. Central to these critiques is the argument that Dewey conceptualized reflection as *thinking* about action without significantly linking it to *acting* (action *taken*) on the outcome/result of the reflective *thinking process* (Sellars, 2014). Schön (1983), for example, emphasized the importance of a

practitioner to be able to reflect on his or her intuitive knowledge while engaged in the action of teaching (reflection-*in*-action). Schön (1983; 1996), emphasizing the long and ponderous road towards becoming critically reflective, introduced new ideas on the reflective process in his development of a new theory on critical reflection. This theory, which has become very popular over the years, is discussed in the next section.

2.4.2 Donald Schön

It took a long time – nearly five decades - after Dewey's then revolutionary thoughts on reflective practice were explored. It was not until the 1980s, when Donald Schön published a book on reflective practice, of which some scholars argue Dewey was a definitive influence on his work (Pollard, 2002; Neufeld, 2009; Zeichner & Liston, 2013; Anscombe & Pawar, 2015). It was Schön's thesis on Dewey's theory of inquiry which provided him with the pragmatic framework that characterised most of his later work (Choy & Oo, 2012). A philosopher and educational researcher, Schön made the important observation that learning about teaching often means making choices and taking actions without knowing in advance quite what the consequences will be. This, according to him, was especially true of classroom events, which are often ambiguous and ambivalent in that they usually serve more than one purpose. In teaching, it seems, everything cuts more than one way, and/or signifies more than one thing (Huppertz, *et al.*, 2005). While this could make it difficult to prepare lessons in advance, it makes teaching itself interesting and challenging. It also means that teachers could learn from their own teaching by reflecting or thinking about the significance of classroom experiences. Students are not the only people who learn in classroom situations: teachers do, too. What they learn is not, however the same: learners/pupils learn what is prescribed in the curriculum; teachers learn more about student behaviour and motivation, the assessment of learning, and ways in which they could blend a cohort of individual learners into a mutually supportive learning community (Vygotsky, 1978).

According to Schön (1983), professionals constantly find themselves facing situations that are unique; they then tend to use their knowledge and past experiences as a frame for action

(Zeichner & Liston, 2013). This kind of framing is an active, experimental and transactional process that constitutes what Schön (ibid) calls “professional artistry” - the kind of professional competence practitioners display in unique, uncertain and conflicted situations of practice. The point here is that teachers rarely engage in bland routine action: their actions are intelligent, reflecting their knowledge about different things – the curriculum, assessment, behaviour, etc. – hence Schön’s reference to this type of action as “knowing-in-action”. It is this insight into teachers’ knowing and doing distinguishes Schön’s (1983) theory on critical reflection from the routine action theory propagated by Dewey (1933).

2.4.2.1 Schön’s reflection-in-action and reflection-on-action

Schön (1983) defined reflective teaching as looking at what you do in the classroom, thinking about why you do it and thinking about whether or not it works: a process of self-observation and self-evaluation in other words (Pollard, 2002). Using the terms, ‘reflection-in-action’ and ‘reflection-on-action’, Schön (1983) posited that reflection occurs on a continuum: during ‘reflection-in-action’ the assumptions informing the structure of knowing-in-action are questioned, thus giving rise to an on-the-spot experiment, whereas ‘reflection-on-action’, is about trying to articulate tacit and spontaneous intelligence through language. Both Dewey (1933) and Schön (1983) argue that it is in moving along the continuum, from knowing-in-action to reflection-on-action, that teachers gain control of their developing artistry, interpreting and framing their experiences through personal repertoires of values, knowledge, theories and practice. In Figure 2.2 the process of reflection-on-action and reflection-in-action is depicted as the surfacing of tacit understandings that can be examined, critiqued, developed and re-framed (Pollard, 2002).

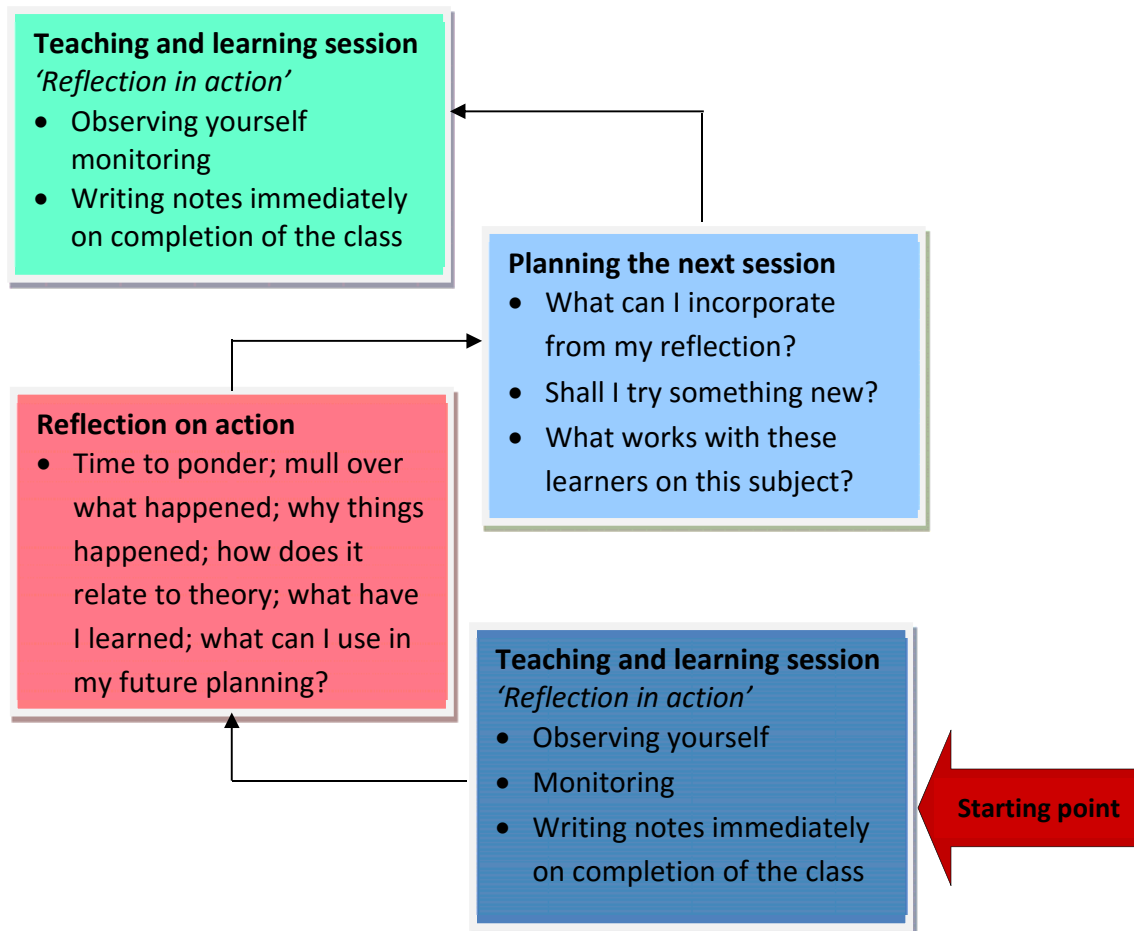


Figure 2.2: Using reflection in and on action to improve teaching and learning

(Schön, 1983)

Schön (1996) applied the concept of reflection to various professions to demonstrate that not only researchers generate professional knowledge, but practitioners such as doctors, teachers, architects and engineers do as well (Meigs, 2008). Schön argued that competent practitioners usually know more than they can verbalize, that some of their knowing is 'tacit', manifesting as "knowing-in-action". It is this kind of knowing - knowing-in-action – which, according to him, distinguished skilled practitioners from unskilled ones. Informed by this insight, he argued that practitioners, at all levels and in all professions, should use what he referred to as 'reflection-in-action', to increase their tacit knowledge and, by implication, their overall competence.

Indications from the preceding description of Schön's (1983) theory are that he did not believe that understanding new perspectives or views constituted reflection. His theory rests on the premise that reflection-in-action necessarily involves experimentation, and that new ideas emerging through reflection-in-action need to be trialled in a supportive professional arena/context, like a classroom (Anscombe & Pawar, 2015). In propagating this view, Schön acknowledged that teachers' classroom experience is a valuable source of knowledge for reflective practice in that teachers' actions, as well as their reflections on these actions, are shaped/informed by previous experience. If their previous reflection experience was successful experience, they would probably be motivated to practice reflection in future teaching and learning situations; if not, the opposite might be true.

One of the critiques levelled against Schön's work is his lack of attention to the discursive dimension of reflection, particularly in respect of reflection as a social practice, in which the articulation of others' ideas is central to the development of a critical perspective (Zeichner & Liston, 2013). Pultorak (2012), for one, argues that dialogue is central to reflection, which is essentially a distributed process, a social process in which the exchange of ideas among members or a learning community could lead to their critically reflecting on the validity, viability, relevance and/or appropriateness of their own and other's ideas. The emphasis is on the development of professional communities within the parameters of which ideas can be freely exchanged, thus stimulating/allowing rather than restricting/limiting critical reflection (Zeichner & Liston, 2013). The problem with the establishment of a professional community is that it is teachers' responsibility to form these communities, and trust is crucial for reflection and freedom of expression: without trust between teachers and/or education practitioners across the spectrum, openly raising concerns and challenges can be extremely threatening (Schutz & Bulman, 2013).

Barbani (2006), adding to these arguments, criticizes what he perceives as a too narrow focus on the individual in Schön's theory of reflection. According to Barbani (2006) Schön's theory does not consider interactions between the individual and social settings and/or in professional contexts, including the purposes of schooling and one's professional career. Reflection that

considers social settings is regarded as an interaction at a higher level (as with critical pedagogical reflection) because it involves teachers shaping their thoughts about the transformation of education (Hillier, 2009; Howatson-Jones, 2010; Ziechner & Liston, 2013; Sellars, 2014).

2.4.2.2 *The interface between the views of Dewey and Schön*

Dewey (1933) considered reflective practice as an intentional, systematic and disciplined inquiry that will ultimately lead to change and professional growth for teachers (reflection-on action). Schön (1983) added to this the idea of a practitioner being able to reflect on his/her intuitive knowledge while engaged in the action of teaching (reflection-in-action). The notion of both types of reflection, in and on action, could also encourage teachers to reflect *for* action. Both Dewey's and Schön's legacies are important in that they moved the concept of reflection far beyond everyday simple musings about a situation to a more rigorous way of thinking, one in which a teacher systematically investigates a perceived problem in order to discover a solution (Harland & Wondra, 2011).

2.4.3. The reflective cycle of Graham Gibbs

In the nursing field, one of the frameworks of reflection most commonly cited is Gibbs' reflective cycle. Figure 2.3 is built on Kolb's experiential learning cycle and proposes that theory and practice enrich one another in a never-ending cycle (Scott & By, 2007). Originally conceived as a debriefing sequence, Gibbs' cycle has been adopted not only in nursing but also in other professional fields as a way to facilitate reflection. Consisting of six stages of reflection, it is currently one of the most popular frameworks in the field. Figure 2.3 offers a graphic representation of this framework.



Figure 2.3: Gibbs' reflective cycle

(Gibbs, 1998)

What follows is a discussion of the usefulness of the cycle for student teachers/teachers when instructed to reflect about a particular activity/set of activities in their teaching portfolios.

2.4.3.1 Description

When reflecting on an activity or a presentation, teachers need to explain to their lecturers/mentors/learners on what they are reflecting (Schutz & Bulman, 2013). In this regard, it is important to keep the information provided relevant and to-the-point. They should not 'waffle' about details that are not required (Ditchburn, 2015).

2.4.3.2 Feelings

With regard to student teachers, the focus of this phase should be on the recording and discussion of their feelings and thoughts about the reflection experience/exercise. Aspects that could be considered for reflection are questions on how they felt at the time, what they thought at the time, and what they thought about the incident afterwards. They should discuss their emotions honestly, bearing in mind that they are busy with an academic piece of writing or discussion, hence 'chatty' texts should be avoided/excluded (Schutz & Bulman, 2013). By implication, the reflective portfolio/activity, should showcase a student teacher's professional, reflective interpretations of a situation, that is, the skill to differentiate between an actual event/activity and a hidden reflective interpretation. This skill needs to be developed and may have either have a positive or negative effect on his/her teaching practices.

2.4.3.3 Evaluation

Brock (2015) explains that, during the evaluation phase, teachers should reflect on how well they *think* things went. Questions to consider are, for example, how they reacted to the situation, how other student teachers reacted, and what the good and the bad aspects of the experience were. When writing about a difficult incident, for example, did they feel that the situation was resolved afterwards?

2.4.3.4 Analysis

During the analysis phase, student teachers should consider what might have helped or hindered the activity. They should also have the opportunity to compare their experience with literature they might have read on the topic. This section is very important, particularly for higher level writing. Many students receive poor marks for reflective assignments because they do not bring theory and experience together (Gibbs, 1988; Ditchburn, 2015).

2.4.3.5 Conclusion

In the conclusion phase, it is important for students to ask questions related to what they had done: whether or not they could have done anything else, what they had learnt from the experience, and whether or not they could have responded in a different way. If they are reflecting about a positive experience, they should indicate whether they would act in a similar way in future to ensure a positive outcome and why. What also needs to be considered here is whether there is anything they could or would change to improve things even more. If the incident was negative, they should explore what they could have done to have avoided it from happening, and what they could do to make sure it did not happen again (Finlay, 2008).

2.4.3.6 Action plan

An action plans sums up anything student teachers need to know and do to improve a subsequent activity or presentation. They might feel that they need to learn about something or attend some training in order to improve (Brock, 2015). Considerations that typically arise are whether they could ask their mentor lecturer or placement lecturer for advice, and what they could do that would better equip them to cope with a similar event in future.

In general, the popularity of Gibbs' (1988) framework could be ascribed to its practical nature. In Gibbs' own words:

"(I)t is not sufficient simply to have an experience in order to learn. Without reflecting upon this experience, it may quickly be forgotten, or its learning potential lost. It is from the feelings and thoughts emerging from this reflection that generalizations or concepts can be generated. And it is generalizations that allow new situations to be tackled effectively" (Gibbs, 1988: 9).

There are, however some points of critique levelled at Gibbs' framework. Forrest (2008: 229-232) and Barret (2013: 1), for example, argue that:

- A more critical approach might sometimes be required.
- The questions provided by the framework may be too general and would have to be refined for use in particular contexts.
- Because Gibbs' framework is educationally rather than practically contextualized, the cycle may not take into account the difference between teaching and learning (i.e. the requirements or expectations of learners).
- His framework is not forward looking but retrospective in nature and, since one of the purposes of reflection is to improve practice, frameworks need to promote both prospective and retrospective reflection to be of real value.

Finlay (2008), too, identifies what he regards as some of the possible weaknesses of the framework. Although it allows the practitioner to learn from experience, she says, the questions are too narrow to result in systematic thinking about the phases of an experience or activity unless professional, experienced guidance is provided. Alternatively, according to her, a more elaborate framework will have to be developed for the pursuit of deeper reflection due to the lack of detailed questions at the different stages. Referring specifically to stage two (Feelings), she feels that although it will enable the practitioner to make a more balanced and precise judgement, the introspection required in this Stage may frighten and intimidate some since it requires the divulging of a person's open and honest view of him/herself.

In the next section I discuss Kolb's Experiential Learning Cycle, his framework for the organization of the basic components of his so-called *Personal Reflection Framework*.

2.4.4 David Kolb

Kolb’s Experiential Learning Cycle provides teachers with a framework for experience-based reflective learning, using/organizing the basic components of his Personal Reflection Framework to this purpose (Kolb, 1984). Figure 2.4 depicts Kolb’s learning cycle, which consists of four steps. Steps One and Two require the reflector to acknowledge the conditions that prompted reflection on an experience by first identifying the experience and then describing it (Kolb, 2014). The next step (step three) the reflector has to take is to describe his/her own understanding of the situation/experience in respect of what it is that needs to be discussed, evaluated and challenged. The fourth and last step in Kolb’s learning cycle is for the reflector to take some or other action, hence, the educative and useful value of the framework to teaching and learning (Harland & Wondra, 2011).

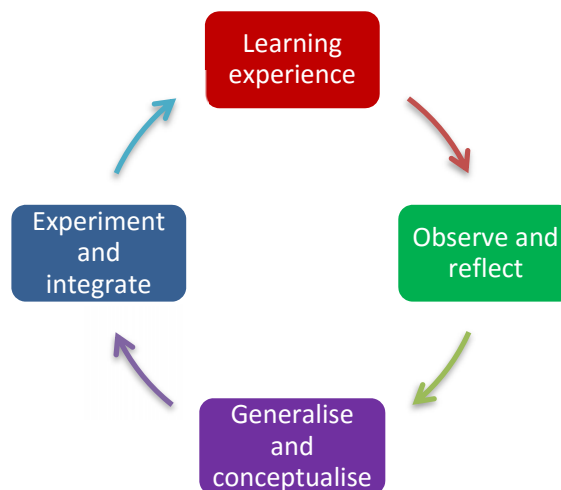


Figure 2.4: Kolb’s Experiential Learning Cycle

(Kolb, 1984)

Kolb (1984) postulates that learning should result in increased self-awareness, change in behaviour and the acquisition of new skills. He describes the learning process as a four-phase cycle in which the student (Kolb, 2014):

- does something concrete or has a specific experience which serves as basis for reflection;

- observes and reflects on the experience and his/her own response to it;
- assimilates these observations into a conceptual framework or relates it to other concepts in his/her past experience and/or to knowledge of implications related to specific actions; and
- tests and applies knowledge gained in different situations.

Aspiring teachers face a number of challenges in order to meet the requirement for action. These include taking decisions on (a) who should decide what ought to be done and (b) whose belief systems and values should be promoted, supported or acted on, and (c) who focuses, or should focus, on the skills and capacities of the individuals engaged in the reflective cycle.

Despite these challenges, however, these three basic phases of reflection are a useful starting point for developing one's own 'personal framework of reflection, necessarily having to take any action. Table 2.1 illustrates how this framework could be used for reflective practice and meta-cognitive activity. In this illustration, a student is asked to think about his/her own thinking processes, beliefs, values and understandings (McGill & Brockbank, 2007). It does not, therefore, separate cognition from personal emotional responses; rather, it promotes discussion of the underlying factors that shape individual views, values and beliefs. Moreover, it incorporates the three-part cycle as a means of organizing the processes embedded in the reflective process itself relating these to aspects of Gardner's (1993) theory on intrapersonal intelligence domains. To this end, reflective practitioners would be able to fully incorporate their self-knowledge and their capacity to use information to achieve their goals.

Table 2. 1: A personal model of reflection

(Sellars, 2014)

Phase (Kolb, 1994)	Questions related to self (Gardner, 1993)
<i>What?</i>	Why have I selected this experience as a focus for reflection? What makes it important for me consciously and purposefully think about this experience at this time?
<i>So what?</i>	What is the focus here as I understand it? Is there more than one level of reflection that I think needs to be considered as a focus for discussion in this experience? In identifying my focus, what level(s) am I prioritizing in my reflection? Why would that be so? Do my priorities reflect my values and beliefs about the nature of teachers' professional work? Do my priorities reflect anything about how I am developing as a prospective teacher? Do I need to engage at a level of reflection that necessitates engaging with ethical and moral considerations? (critical reflection)
<i>Now what?</i>	Do I need to take action or just think about what action may be appropriate if the circumstances permitted? Do I have the skills, knowledge and strategies to make a well-informed decision about what action may be able to be taken? Can I realistically take action? What personal, social and ideological influences have impacted on the action I would take? How does my proposed action reflect my understanding and personal beliefs regarding what constitutes ethical, professional, effective teaching and the role of the teacher? Are my decisions and proposed actions congruent with my ethical and moral perspectives? Do I have the motivation, perseverance and capacities required to activate my plans successfully?

In the first phase, the reflector needs to consider what exactly it is that needs reflection. This may, according to Kolb (1984), be an exceptionally positive, rewarding teaching experience in which a teacher finds a satisfactory solution to the challenges s/he is experiencing. In other words, the student teacher does not blindly accept and/or superficially act on the rules,

guidelines and standards provided. Instead, s/he selects the experience that needs to be thought through, the one that will depend on her/his priorities and is prompted by specific aspects of the encounter. If the situation is reflection-on-action, and is at a descriptive stage, the student should use a personal version of what happened to determine what is significant enough to merit a purposeful consideration at that particular moment and/or at a later stage. Since students are different, an experience that may challenge one student might not necessarily present itself as an occurrence worth working on to another, hence the choice of and decision on what requires reflection would differ from person to person (Ditchburn, 2015).

The first, descriptive phase is followed by an analytic phase ('So what?'). During this phase, the reflector needs to determine the focus of the experience. As the student gains more experience and a better understanding of the context of education, the focus might change (Kolb, 2014: 108). In the last phase ('now what?'), the focus of the student is initially more on the technical goals related to the profession; eventually, though the focus becomes more abstract (Huppertz, *et al.*, 2005). What is important is that the student teacher should, throughout the entire reflection process, take the performance of his/her individual learners against the standards established by the education officials into consideration.

Since Kolb (1984) created his Experiential Learning Theory (ELT) and the accompanying learning framework, their worth and effectiveness have met with stringent criticism. One of the criticisms of this framework is that the concrete experience part of the learning cycle is not appropriately explained in the theory and thus remains largely unexplored. Herron (as cited in Yorks & Kasl, 2002: 180) believes that "the notion of feeling is nowhere defined or elaborated, thus concrete experience is not properly explored - the framework is really about reflective observation, abstract conceptualization, and active experimentation." Another common criticism of the theory that exposes a weakness is the idea that immediate and concrete experience is problematic and unrealistic (Miettinen, 2000, cited in Orey, 2010).

Other criticisms of the ELT are that the concepts outlined by Kolb (1984), being too ill-defined, are open to various interpretations, and that the ideas he presents are an eclectic blend of ideas from various theorists that do not fit logically together (Finlay, 2008). Another, perhaps more serious criticism of Kolb's work is that his ELT framework is only an attempt to explain the societal benefit of his Learning Styles Inventory and thus may actually be “a well derived marketing ploy” (Orey, 2010: 253). Also, it is believed that the phases in the ELT learning framework remain separate and do not connect to each other in any manner (Miettinen, 2000, as cited in Orey, 2010: 253).

The most noticeable weaknesses of the ELT learning framework, however, are the marked differences between it and the ideas established by John Dewey, whose beliefs are largely attributed to the establishment of the ELT (Forrest, 2008). Whereas Dewey (1933) propagated that non-reflective experience borne out of habit is the dominant form of experience, and that reflective experience only occurs when there were contradictions of the habitual experience, Kolb does not adequately discuss the role of non-reflective experience in the process of learning (Forrest, 2008). In addition, according to Dewey, observations of reality and nature are the starting points of knowledge acquisition. Kolb (1984), however, believes that experience is the starting point of knowledge acquisition and disregards observations concerning the subjective reality of the learner. A final weakness in the ELT mentioned by Orey (2010) is the absence of any discussion of the social aspect of experience. The ELT learning framework focuses on the learning process of an individual learner: he fails to mention how the individual fits into a social group during this process and what role this group may play in his/her learning. There is, moreover, no discussion of how a social group may gain knowledge through a common experience.

Having highlighted Kolb's (1984) and Gardner's (1993) personal frameworks of reflection, I now focus on Pollard's (2002) Reflective Teaching Theory in the sub-section which follows.

2.4.5 Andrew Pollard

Andrew Pollard’s research focused specifically on reflective practices in the teaching environment. Jared (2016) holds that Pollard’s notion of reflective teaching leads to a steady increase in the quality of education provided for children. Reflective practice supports student teachers, newly qualified teachers, teacher assistants and experienced professionals because evidence of learning is determined by comparing the learners’ performance against performance standards and competencies. Pollard’s (2002) framework consists of seven characteristics, pulling together some of the strands and traditions that inform reflective practice as described in more than one theory. It relies heavily on Dewey’s work in that it attempts to synthesize elements of different understandings of the reflection process as indicated in the work of Dewey, Schön and those studies that have over time expanded original understandings through new findings (Pollard, 2014). Even so, Pollard’s framework falls short of providing the level of detail that proponents of various schools of reflection would hope to include (Pollard, 2002). Figure 2.5, which graphically depicts Pollard’s reflective teaching framework, is followed by a more in-depth discussion of the framework itself.

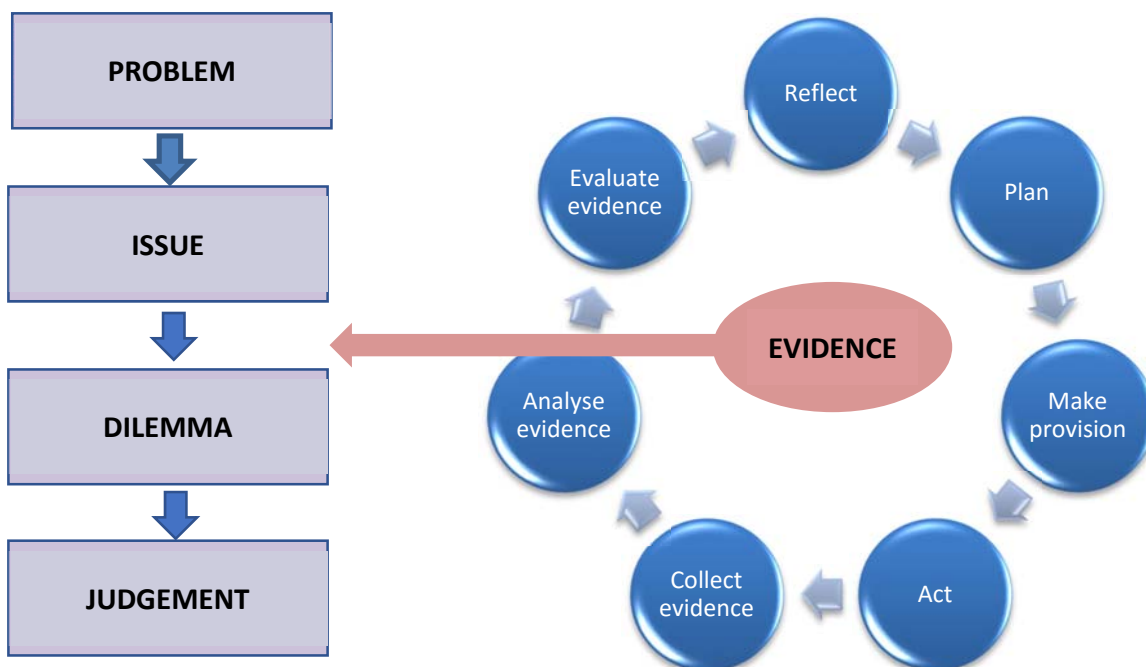


Figure 2.5: Evidence-informed practice

(Kolb, 2014)

The discussion of the seven characteristics/features which constitute Pollard's framework is a synthesis of its interpretation by a number of theorists (Lyons, 2010: 15-17; James, 2013: 120-124; Jared, 2016: 85- 87).

1. Reflective teaching reflects an active concern with objectives and consequences. This includes, amongst others, the responsibility to speak out on professional experiences and the professional organization of government policies and aims as well as lesson objectives and the consequences of classroom practice.
2. The process of reflective teaching is spiral and cyclical in nature, with teachers continuously monitoring, evaluating and revising their own practice. Furthermore, the reflective teaching process is a dynamic, continuous reflexive process which requires the active researching of one's own practice, hence instilling the habit of to self-monitor and change.
3. If teaching is to be effective and the progressive development of higher standards of teaching are to be achieved, teachers must be competent in evidence-based classroom enquiry. They should, moreover, regularly review relevant existing research, gather evidence, use objective and subjective data, analysis and evaluation, and make judgements that lead to decision-making.
4. A reflective teacher exhibits at least the three attitudes of open-mindedness, responsibility and wholeheartedness. Open-mindedness is when a teacher has an authentic desire to listen to more ideas than one, is fully attentive when presented with more than one idea, evaluates alternative possibilities and recognizes the possibilities of error - even with regards to beliefs that are dearest to him/her. Responsibility, on the other hand, involves thinking about four key consequences of teaching: personal, academic, social and political (Pollard, 2014). As indicated earlier, wholeheartedness, according to Dewey, implies the centrality of open-mindedness and responsibility in the professional life of the reflective teacher.
5. Reflective teaching is based on teacher judgement which, in turn, is based on informed, evidence-based enquiry and insights derived from other research (Pollard, 2014). The use of judgment in reflection-in-action, made famous by Schön, may, however, be more

relevant to knowledge generated by research, systematic enquiry and an understanding of political action.

6. The teacher could use dialogue with colleagues to enhance his/her reflective teaching, professional learning and personal fulfilment (Pollard, 2014), with 'dialogue' referring to a teacher's use of communication with specific individuals in school and with stakeholders - individuals, organisations and agencies - beyond the school- to encourage the kind of collaboration and cooperation that should be an integral feature of intelligent schooling.
7. Reflective teaching enables the teacher to integrate frameworks developed or used by other professions into teaching and learning. According to James (2013), Pollard implies that a reflective teacher can justify protective mediation to defend existing practices without overstepping boundaries established by new requirements. Furthermore, the reflective teacher scrutinizes and adapts collaborative mediation to establish a basis for judgements necessary to resistance against the implementation of external requirements through subversive strategies.

A few points of criticism on the reflective approach as proposed by Pollard (2002), are that the approach is not generally associated with the work of a teacher: it is more of an academic exercise (Lyons, 2010). Furthermore, the reflective processes it describes are time-consuming and require development opportunities. Lastly, many may feel that exposing oneself to a group of strangers could make one vulnerable (Lyons, 2010).

2.4.6 Max van Manen

Different types or levels of reflective foci is not a new thing. For example, Van Manen (1977) and Lyons (2010) had earlier developed three levels of reflection based on Habermas's hierarchical structure (Figure 2.6). The first level of this structure depicts the basic, or *technical level* of reflection, which focuses mainly on what works in the classroom. *Practical reflection*, the second level, focuses on learning experience. It is investigative in nature, questioning and clarifying the culminating outcomes and the assumptions behind the teaching activities designed to achieve

these. The third, and last, level is *critical reflection*. This is the highest level of reflection and focuses on which knowledge is valuable to whom. At this level, teachers are not only concerned about the lesson objectives, activities and the assumptions behind them, but also reflect on the broader context of education. Consequently, it requires teachers to question their practices practically, morally and ethically. Despite critiques that Van Manen's level of reflection is too hierarchical, it is useful in the sense that it addressed different aspects of reflective practice relevant to the achievement of teaching and learning purposes.

2.4.6.1 The technical level

The first level of reflective thinking in this instance is technical rationality (Van Manen, 1977: 222 - 226). At this initial level, the focus is on methodological problems and the development of theories that teachers could use to achieve the lesson outcomes. According to Valli (1992), though, technical rationality is non-reflective. Even so, according to Jiang (2012), it requires some reflection since teachers have to evaluate the effectiveness of the ways in which they applied their knowledge in order to achieve lesson objectives in classroom settings. The emphasis at this level is, therefore, on the effectiveness and efficiency of the teacher in ensuring the achievement of predetermined learning goals. Teachers thus also have to reflect on the processes and the competencies required to achieve these goals. This kind of reflective action, which involves practical decision-making, is, therefore a combination of reflection and the technical aspects of teaching and learning (Valli, 1992).

Van Manen (1977) defines technical reflection as simply a reaction since reflectors'/teachers' use of schemata as a means of dealing with novice problematic situations is minimal. They could, for instance, utilize technical reflection when working through lessons or when using instructional management approaches for the achievement of short-term goals. It is assumed that many teachers function at a technical level only given their inexperience in the use schemata and/or in dealing with complex educative problems. Although technical reflection could also involve the making of decisions regarding lessons appropriate to the achievement of outcomes, Van Manen

(1977) argues that these outcomes are neither problematic, nor does the reflector need to deliberate on the context of the situation. What is important in this instance is simply methodological awareness, technical knowledge, the ability to implement and present a lesson, and the application of skills. However, according to Huppertz, *et al.* (2005), they may, even at this level, begin to link theory to practice in order to determine the relevance of activities and outcomes, to solve problems and, through observation and the processing of information, test the viability of possible solutions. In doing so, they would be transiting to a higher level.

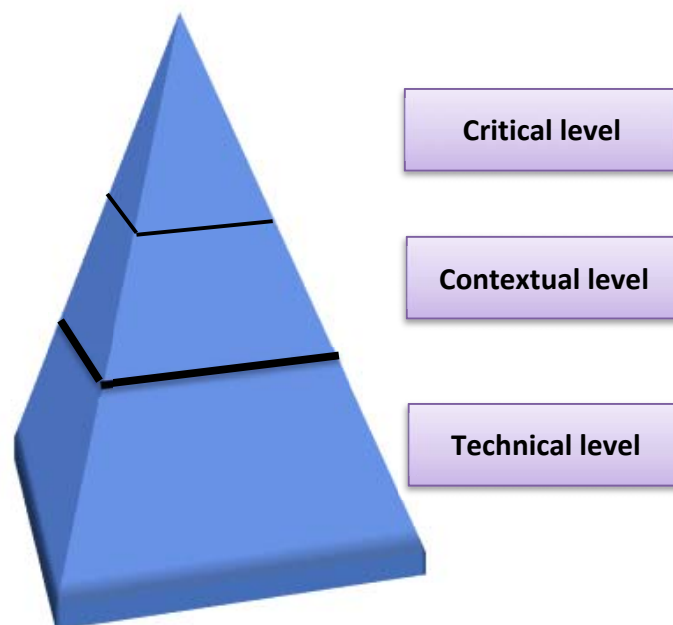


Figure 2.6: Reflective thinking pyramid

(Jiang, 2012)

2.4.6.2 The contextual (practical) level

At the contextual level, the processes used to achieve the objectives, their underlying rationale, as well as the objectives and goals themselves, are subjected to analysis, examination and assessment (Van Manen, 1977). Accordingly, teachers at this stage consider alternative practices and make choices based on knowledge and value commitments, content-related context and/or

learner needs and analysis, as well as the clarification and the validation of principles (Pultorak, 2010). Practitioners functioning at a contextual level should therefore be provided with genuine, continuous experiences, observational learning instruction and thoughtful discussions of problems and their possible solutions. Equally important at this level of reflection is the need to experiment with activities in order to determine whether not they are meaningful (Choy & Oo, 2012). In order to achieve the desired objectives, the lessons should include the presentation of appropriate content as well as the application of pedagogy and other theoretical insights relevant to the teaching and learning of the selected content. Moreover, all of these should lend themselves to the examination and analysis of instructional and management approaches. It follows that practitioners operating at the contextual level of reflection should use their knowledge of learners' characteristics to reflect on problems faced during school-based learning (Huppertz *et al.*, 2005).

2.4.6.3 *The critical level*

The third, and highest, level of reflectivity in Van Manen's (1977) critical reflective hierarchy reflects elements of critical pedagogy, dealing as it does, with moral and ethical issues related directly and/or indirectly to teaching practice. More specifically, practitioners operating at this level consider ethical and political issues related to instructional planning and implementation (Jiang, 2012), dialectically assessing the extent to which curriculum planning is aimed at the fostering of equality, emancipation, caring and justice. At this level, their primary concern, without personal bias, is the worth and social usefulness of knowledge to learners (Moon, 2006). At dialectical level, the ability to make defensible choices and view an event with open-mindedness, is crucial. The reflector's objectives at dialectical level include searching for and analysing knowledge systems and theories in context and in relation to one another, critically examining underlying assumptions, norms and rules, and practising introspection, open-mindedness and intellectual responsibility (Dewey, 1933). Moreover, in addition to exploring the worth and social consequences of knowledge acquired, reflectors should, at this stage, also be able to defend their choices via external and internal dialogues.

Regardless of their potential usefulness to teachers, Zeichner (2009) argues that teachers and student teachers have raised some valid concerns about Van Manen's three-level theory. For example, some teachers have argued that layering the three types of reflectivity elevates the importance of critical reflection on social political factors of schooling at the expense of the technical and practical reality of teachers' daily lives. Responding to this argument, Zeichner (2009) explains that emphasizing the importance of critical reflection and/or conducting research on the fostering of critical reflection, does not mean that other kinds of reflection are unimportant. As Brookfield (in Zeichner, 2009) indicates, teachers cannot get through the day without making numerous technical decisions concerning time and process. Although, according to Zeichner (2009: 141), the "technical and procedural problem of classroom dynamics are more susceptible to being solved through reflection than are structural and political ones", teachers should be wary of limiting reflection to the individualistic and technical aspects of particular classroom environments because they would then lose sight of the political underpinnings, dimensions and consequences of reflection.

2.4.7 Jennifer Gore and Kenneth Zeichner

According to Lyons (2010), reflective theories do not necessarily say much about what it is that the teacher ought to reflect on, which kinds of criteria should come into play during the reflection process, and to what degree teachers' deliberations should incorporate a constructive critique of the institutional contexts in which they work. Sellars (2014) agrees, but argues that, as long as a teacher reflects about something, whatever s/he decides to do during the process of reflection is acceptable. Gore and Zeichner (1991), however, found that teachers reflected on a variety of things, using a range of reflective strategies and/or techniques in doing so. It is these varieties that is the focus of the sub-sections which follows.

2.4.7.1 *Gore and Zeichner's versions and types of teacher reflective practice*

Gore and Zeichner (1991) discuss four *versions* of reflective practices, each with a different focus that a teacher, as reflector, could use: academic, social efficacy, developmental, and social reconstructive.

1. **The academic version:** This version focuses on the skills teacher need to use in the dissemination and/or presentation of disciplinary content to ensure that it is maximally accessible to learners.
2. **The social efficacy version:** This version focuses on research findings and is concerned with evidence-based practice.
3. **The developmental version:** This learner-centred version, focus on the interests and thinking of learners, considers the age- and developmental appropriateness of teaching and learning strategies.
4. **The social reconstructionist version:** In this version the focus is on the political and social issues of schooling, hence it emphasizes reflection on classroom interactions as a means of promoting greater learner equity and justice (Gore & Zeichner, 1991).

In addition to their four *versions*, Gore and Zeichner (1991) also propagate four *types* of reflection, arguing that the importance of each of these is that it highlights one of four major aspects of teachers' professional work. Collectively, these four types thus establish a basis for the questions which teachers should to ask and upon which they should reflect on in order to develop an understanding of interaction in their classrooms. To support teachers in their efforts to develop a holistic understanding of learning in their classrooms, Gore and Zeichner (1991) attached a number of questions to each of their four versions, suggesting what teachers could use for reflective purposes.

- **Academic reflection:** Can I recall my content very well? Am I applying the appropriate pedagogic strategies for my learners' individual needs? Am I prepared for and

resourceful in teaching and learning? Have I arranged the content from the simplest to the most challenging, following the needs of my learners as well as the defining characteristics of my discipline? Have I completed the planning cycle with a variety of suitable, relevant assessment strategies?

- **Social efficacy reflection:** Am I using well-researched teaching and learning methods in teaching this content? How can I implement the strategies that have been proven to increase learner academic success? How can I address the difference between the context and participants used in the research and my classroom situation? How can I use the findings to best meet the needs of learners in my class?
- **Developmental reflection:** Are my teaching and learning tasks and instructions suitable and age-appropriate to my learners? Have I assessed the skills and the thinking abilities on my learners to determine the stages at which each of them is able to participate in different learning contexts? Have I accommodated differences in the learners' thinking, emotional and physical capacities by planning suitable instructions and by modifying tasks? Have I responded to individualized teaching and learning needs by designing activities that are interesting to a diverse group of learners? Have I effectively taken the learners' varied interests into account in the design of my lessons and curriculum?
- **Social reconstructionist (critical) reflection:** What do I perceive to be the purpose of teaching and learning? What is my personal philosophy and beliefs about the values, objectives and functions of education? Have I critically evaluated the Curriculum Assessment Policy Statement (CAPS) from the education authorities who articulated the objectives of schooling in my district? Have I checked who is responsible for the curriculum designed to meet the objective of education? Have I considered authentic findings on how the curriculum supports or neglects the needs of learners from different social, cultural and individual groups? How can I minimize the disadvantages to a particular learner(s) in my classroom when implementing the mandatory curriculum? How can I address the shortcomings in the education system to cater for an equitable education for all? How should I address the bias in mandatory assessments?

Gore and Zeichner (1991) highlight the importance of both the quality and type of reflection involved, the content of the reflection, and the criteria to be considered when asking these questions. But, according to Sellars (2017), although each version of reflection as advocated by Gore and Zeichner is valuable on its own, none of these alone constitutes adequate and appropriate teacher reflection. It is therefore possible that, while one may be a dominant focal point, the other focal points are also considered, albeit to a lesser extent, to ensure good learning and teaching as well as authentic reflective action (Sellars, 2017).

To sum up, I have summarised the main features of each of the approaches to and theories on reflection, critical reflection and reflective practice discussed in this chapter in Table 2.2.

Table 2.2: A summary of approaches to Critical Reflective Teaching

APPROACH	MAIN TENETS	CRITICISM
John Dewey	<ul style="list-style-type: none"> • Reflection is a specialized form of thinking, stemming from doubt, hesitation or perplexing situations. • A problem is considered an inviting, curious and engaging issue. • Reflection engages a (student) teacher in the inquiry and problem-solving of a problem at hand. • The (student) teacher navigates himself/herself to a best possible solution. • Reflection helps (student) teachers to direct their actions with foresight and enables them to know what they are about, when and why they should act. • Reflection requires three attitudes: open-mindedness, wholeheartedness and intelligent responsibility 	<ul style="list-style-type: none"> • Dewey conceptualized reflection as the process of thinking about action but did not significantly link it to action to be taken as the result of reflective thinking
Donald Schön	<ul style="list-style-type: none"> • Classroom events are ambiguous/ambivalent 	<ul style="list-style-type: none"> • Schön’s lack of attention to the discursive or dialogic dimension of teacher learning

(Continued on next page)

Table 2.2 (continued)

APPROACH	MAIN TENETS	CRITICISM
	<ul style="list-style-type: none"> • (Student) teachers employ a professional artistry; as professional competence practitioners they display unique, uncertain and conflicted situations of practice. • Reflection-in-action: (Student) teacher is involved in an on-the-spot classroom tacit experimentation • In reflection-on-action: (Student) teacher articulates tacit and spontaneous intelligence through language. 	<ul style="list-style-type: none"> • His focus is too narrowly on the individual, without necessarily considering the interaction between the wider social setting, including the purposes of schooling and the professional career
Graham Gibbs	<p>The (student) teacher:</p> <ul style="list-style-type: none"> • articulates the lecturer/mentor/students what s/he is reflecting on • deliberates his/her feelings and thoughts about the experience of reflection • expounds whether the reflective experience was good/bad • ponders on what might have helped/hindered the experience • acknowledges whether s/he could have responded in a different way/learned from an experience/could have done anything else • tells about an action plan that includes what s/he should do to improve/needs to know 	<ul style="list-style-type: none"> • The model does not refer to critical thinking/analysis/reflection • It does not take into consideration assumptions that the (student) teacher may hold about the experience
David Kolb	<ul style="list-style-type: none"> • The (student) teacher identifies and describes the learning experience • The (student) teacher describes an experience using his/her own understanding/what needs to be evaluated/discussed and challenged • Educative and useful action from the (student) teacher 	<ul style="list-style-type: none"> • The concrete experience part of the learning cycle is not appropriately explained in the theory and remains largely unexplored • The concepts of Kolb's Experiential Learning Theory (ELT) are too ill-defined and open to various interpretations

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Table 2.2 (continued)

APPROACH	MAIN TENETS	CRITICISM
Andrew Pollard	The (student) teacher: <ul style="list-style-type: none"> • considers the objectives of the lesson, professional organizations and of the government • evaluates his/her reflective teaching cyclically • cultivates the evidence-based classroom inquiry and action research • demonstrates the attitudes of; open-mindedness, wholeheartedness and responsibility • partakes in professional collaborations • integrates frameworks from other professionals without stepping on boundaries 	The framework: <ul style="list-style-type: none"> • does not say what constitutes a reliable research • does not explain the mediating processes that connect evidence and practice
Max van Manen	<ul style="list-style-type: none"> • The (student) teacher is concerned with achieving lesson objectives • The (student) teacher gradually integrates alternatives and analysis of instructional and management approaches • Eventually the (student) teachers reflects on moral and ethical affecting teaching practices 	The framework: <ul style="list-style-type: none"> • is criticized as being hierarchical • does not explicitly acknowledges the impact of emotions, feelings and personal attributes on cognition
Jennifer Gore and Kenneth Zeichner	The (student) teacher reflects on and implements the four reflective versions: <ul style="list-style-type: none"> • An academic version: effective disseminating the content to learners • A social efficacy version: application of evidence-based reflective research findings • A developmental version: implementation of learner-centred teaching and learning strategies • The social reconstruction version: reflecting on the social and political issues of schooling 	<ul style="list-style-type: none"> • None of the four reflective versions constitute adequate and appropriate teacher reflection • The social reconstruction variety as critical reflection has a number of interpretations

2.5 CONCLUSION

It appears that, from all theories discussed above, teacher reflection based on experience is clearly acknowledged as a necessity. As Cornway (2001) posits, individuals experience differently what occurs in their lives; it is essentially a very personal interpretation of events which is mediated by several other paradigms, including prior experiences, personal beliefs and values. Some levels of reflection are more complex than others, and different situations will often require engagement in different aspects of reflection, which will become the major focus of an activity. Importantly, irrespective of the starting point, teachers need to engage in each of these aspects of reflection. As they critically examine the validity and limitations of their personal beliefs, values and principles to help them understand their experiences, they should become more open to other perspectives and interpretations. Lastly, Sellars (2017) is of the opinion that any self-designed starting point of reflection that is based on authentic, personalized experiences and beliefs may most likely produce a more realistic approach to reflective practice and its potential to enhance it.

Chapter 3 focusses on theoretical perspectives on adult learning and its implications for critical reflection in the teaching-learning situation.

CHAPTER 3

TOWARDS REFLECTIVE PRACTICE: THE STUDENT TEACHER AS AN ADULT LEARNER

3.1 INTRODUCTION

As I indicated in Chapter 1, the main objective of my research is to propose a framework which could help student teachers to incorporate critical reflective thinking and teaching into their teaching practice. Implied in the increasing demand for creative, innovative, collaborative and productive 21st century teaching and learning practices is the importance of understanding how adult students learn, an understanding particularly critical to the effective training prospective teachers.

In the previous chapter, I presented my review of literature on reflection, critical reflective thinking and practice, and reflective teaching, skills regarded as essential in the training of teachers. In particular, various theoretical insights from renowned researchers in the field were presented, critically analysed, and interpreted. In this chapter my focus is on students as adult learners. I pertinently outline the characteristics that distinguish adult learning from the ways in which children of school-going age learn. In this regard, I specifically explore the andragogic theory of Malcolm Knowles, following it with a discussion of constructivist learning theories as advocated by Dewey, Vygotsky, Piaget and Bruner, and the experiential learning theory of David Kolb. Finally, I present and discuss Bloom's revised cognitive taxonomy and the implications it has for adult learning.

3.2 THE STUDENT TEACHER AS AN ADULT LEARNER

Taylor and Kroth (2009a) report that, towards the end of the 20th century, there was already a notable body of research which suggested that adults learn differently from children, and that "andragogy" was a better term to describe this process than "pedagogy" was. The term,

‘andragogy’, was originally formulated by a German teacher, Alexander Kapp, in 1833 (Loeng, 2013). Kapp used it to describe elements of Plato’s education theory. Andragogy (*andr*– meaning ‘man’) could be contrasted with pedagogy (paid- meaning ‘child’ and *agogos*, (meaning ‘leading’) (Smith, 2010). Kapp’s use of andragogy had some currency, but when it was disputed it fell into disuse. However, it reappeared in 1921, in a report by Rosenstock-Huessy (in Loeng, 2013), who argued that adult education required special teachers, methods and philosophies which, collectively, should be referred to as andragogy.

Andragogy is a term used with reference to the alignment of instructional approaches to the way in which adults learn. The learning experience of adults are, according to Smith (2010), much more self-directed, in that adults must often set their own schedules for learning and be motivated to commit to study or practice. Adult education is usually also cooperative in that adults tend to work together and review each other's work and understanding of a subject. By contrast, pedagogy is authority-focused and "top-down" (Smith, 2010: 12), with teachers having complete, or nearly complete, control over a child's learning experience. The teaching methods employed in pedagogy are aimed at transferring foundational knowledge, not at stimulating critical discourse. It is a formal process in which grades are typically used to document children's progress.

The differences between andragogy and pedagogy are briefly summarised in the table below.

Table 3.1: Differences between andragogy and pedagogy

	Andragogy	Pedagogy
<i>Definition</i>	The methods and practices used in teaching adults.	The methods and practices used in teaching, especially of children
<i>Focus</i>	On independent, self-directed and/or cooperative learning among adults	On a teacher's methods of transferring knowledge to a student, who is dependent on the teacher's methods and understanding

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Table 3.1 (continued)

	Andragogy	Pedagogy
<i>Authority</i>	Adults have control over much of their learning experience and must be motivated to learn. Can often seek out new or different learning experience, at will.	Teacher controls the learning experience for children, and much of what is taught is based on rigid curricula.

The term ‘andragogy’ became increasingly popular in the 1960s as a result of a theory on adult learning propagated by increased Malcolm Knowles, an American adult educator.

3.2.1 Malcolm Knowles’ Andragogic Theory

Malcolm Knowles (active 1973-1994) is credited with bringing the term ‘andragogy’ back into educational discourse by alerting American adult lecturers during the late 1960s and 1970s to the differences between adult and child learning. Although he wrote many of the central texts that initiated serious scholarly work in the area of adult education and learning, he acknowledged that he was not responsible for the creation of the term: European adult teachers had consistently been using it to refer to the practical aspects of adult teaching and learning as well as to the academic study of adult education (Muneja, 2015). A few researchers with somewhat different interests also directly or indirectly contributed to the popularization of andragogy as an adult teaching approach. The philosopher, John Dewey, whose work was thoroughly discussed in the previous chapter, put forward the concepts of experimental and pragmatic learning, which markedly influenced perspectives on education (Zmeyov, 1998) in general, and adult education in particular.

Knowles, whose mission was to educate young adults in vocational skills, senses early on in his career that educating adults and educating children were markedly different. Based on this realization, he began to verbalize his ideas about these differences. Pedagogy, he argued, represents teacher-centred practices that manifest when lecturers assume the responsibility to

decide what should be learnt, and when and how such learning should take place (Panjwani & Bungum, 2013). Andragogy is much less rigid, the teacher’s primary role being to facilitate learning in accordance with the needs, interests and preferred learning styles of the adult learners concerned. It is not intended to replace pedagogy, which is related to the teaching of children; it is a parallel teaching approach for adults (Knowles, 1984; Amaroo, Cooper & Green, 2013) which might, or might not, include in its wide variety of educational strategies, techniques and methods, practices traditionally associated with school learning.

Table 3.2: Pedagogical and andragogical assumptions about teaching and learning

(Knowles, 1984)

Pedagogy (Lecturer-centred)	Andragogy (Student-centred)
Planning and assessment is conducted by the lecturer.	Planning and assessment is a collaborative affair (i.e. lecturers and students in an equal partnership)
Teaching is characterised by transmittal techniques.	Teaching is characterised by inquiry, experiments, projects, etc.
Students are dependent.	Students are independent and self-directed
Students are externally motivated.	Students are intrinsically motivated
The learning environment is formal and characterised by competitive and value judgements.	The learning environment is more informal and characterised by equality, respect and cooperation
Evaluation is accomplished by external methods.	Evaluation is characterised by self-assessment

There have been continual debates about whether Knowles’ theory is an adult learning theory, a teaching method, a philosophical statement, or all of the above. It is useful, in considering this question, to take the origin and development of andragogy into account. When Knowles began writing about andragogy, he was already a well-respected figure in the adult education establishment. Since then he has participated in the compilation of the “Black Book”, a collection of writings aimed at defining adult education as a discipline (Knowles, 1989). As a lecturer, writer and leader in the field of adult education, Knowles was an innovator, responding to the needs of the field as he perceived them. He became a key figure in the growth and practice of adult education throughout the Western world, sensitizing people ‘out there’ to the need for a

distinctive curriculum and methodology for adult learners. In the 1990s, Knowles wrote down his conviction that andragogy not only reflects the core principles of adult learning but also of adult teaching and curriculum design, the tools needed to establish more effective learning processes for adults. His proposed framework is transactional in nature, focusing on the characteristics of a learning transaction, rather than on its goals and/or aims. As such, it is applicable to any adult learning situation.

Over time, the use of the term, 'adult', became almost permanently interchangeable with andragogy, which is somewhat misleading. Even Knowles himself revised his original position on andragogy to reflect that the central principles of the framework were not limited by the age of the student (Knowles, 1989). Recently, andragogy seems to be moving away from a teaching-oriented approach aimed at a specific age group towards other frameworks that emphasize the role of the student in teaching and learning. This new version of andragogy focuses on student-centred teaching methods (Sadlin, 2005). Knowles discovered through his work with adults that instructors needed to care about the actual interests of students instead of focusing on what instructors believed were students' interests (Knowles, 1984; 1989). Thus, relying solely on traditional pedagogical practices would prevent students from advancing into more mature and advanced thinking processes (Muneja, 2015).

3.2.1.1 Assumptions of Andragogy

The assumptions of andragogy contrast sharply with the assumptions of pedagogy, the latter implying that students are dependent personalities who bring little or no experience to the educational activity (Knowles, 1984). According to Knowles (1984; 1989) the best educational experiences are cooperative, guided interactions between the lecturer and student with many available resources. During these interactions, the lecturer guides the student towards the development of his/her own potential. Based on his own observations, Knowles developed a set of four assumptions about adult students. These assumptions, as summarized in Table 3.3, are in stark contrast with the conceptual framework of pedagogy.

Table 3.3: An overview of Knowles’ andragogical assumptions

(Knowles, 1975)

Knowles’ andragogical assumptions	
<i>Self-concept of the student</i>	As a person matures his/her self-concept moves from one of being a dependent personality toward one of being a self-directed human being. Lecturers have a responsibility to encourage the student’s movements from dependency toward self-directedness, but at a different rate for different student in different dimensions
<i>Adult learner experience</i>	As a person matures he/she accumulates a growing reservoir of experience that becomes an increasing resource for learning. A student will attach more meaning to learning s/he gained from experience than those who acquire it passively. The lecturer should use techniques such as laboratory experiments, discussions, problem-solving scenarios, etc.
<i>Readiness to learn</i>	As a person matures his/her readiness to learn becomes oriented increasingly to the developmental tasks of his/her social roles. The lecturer should create conditions and provide tools and procedures for helping students to discover their ‘need to know’. Students are ready to learn something when they experience a need to learn it in order to cope more satisfactory with real-life tasks and problems
<i>Orientation to learning</i>	As a person matures his/her time perspective changes from one of postponed application of knowledge to immediacy of application. As a result, his/her orientation toward learning shifts from one of subject- centeredness to one of problem centeredness. Students want to apply whatever knowledge and skills they gain today to be able to live more effectively tomorrow. They see education as a process of developing increased competence to achieve their full potential in life

Knowles and his colleagues later added a fifth and a sixth assumption (Knowles & Associates, 1984), namely that adult students (a) are best motivated to learn by internal factors such as self-esteem, self-actualization, recognition, etc., and (b) want to learn what is relevant: as they mature, they want to know why they need to learn something. Further, because adults typically manage other aspects of their lives, they are capable of directing, or at least, assisting in the planning and implementation of their own learning.

3.2.1.2 Characteristics of adult students

There are some similarities in the adult and child classroom, although adults generally have distinctly different motivations to engage in learning. According to Sadlin (2005), Knowles' adult learning theory is founded on four principles of effective training, namely (a) they need to be involved in the planning and evaluation of their instruction; (b) their experience, including mistakes, provides the basis for learning activities; (c) they are more interested in learning subjects that have immediate relevance to their job or personal life, and (d) their learning is problem-centred rather than content-oriented.

Implied in these principles is the need for adult educators to make allowances for differences in style, place, pace, focus and method. Knowles' (1989) andragogical message is that effective adult teaching begins where the students are. Adults will learn faster if what they are studying has an immediate effect on their current situation in life. Since they accept responsibility for their learning, optimal learning does not merely rely on a notable lecturer, but on the mature student's perspective as well. Learning is inaccessible, no matter which resources are provided, if the student him/herself does not take responsibility for acquiring new knowledge (Taylor & Kroth, 2009a). Mature students assume control of the learning process by evaluating the progression of their learning against their own individual goals.

The concept of motivation seems to be an umbrella term covering the majority of the assumptions of the andragogical framework (Knowles, 1989). While adult students respond to both external and internal motivation, it is their internal motivation that prove to be the most compelling. To them, learning is the means to fulfilment, whether it is in terms of job satisfaction or self-esteem, a tool by means of which they can improve the quality of their lives in immeasurable ways (Taylor & Kroth, 2009a). The expansion of an adult's knowledge gives him/her an invaluable sense of competence. It is, therefore, crucial that adult students discover the value of what they are learning and/or the consequences of not learning what they need to.

Table 3.4: The characteristics of adult students

(Knowles, 1980)

Characteristics of adult students	
<i>As do all students, adult students need to be shown respect</i>	Lecturers must acknowledge the wealth of experience that adult students bring to the classroom
<i>Professional advancement</i>	Students want to secure professional advancement, higher status in their future jobs or knowledge that will help in other courses
<i>Community service</i>	Students want to become more effective as citizens and gain insight into human relationships
<i>External expectations</i>	Students are enrolled on the recommendation of some authority and wants to secure a prosperous career future
<i>Cognitive interest</i>	Students want to satisfy an enquiring mind or seek knowledge for its own sake

3.2.1.3 Criticism against andragogy as a theory

The andragogical framework has many strengths, chief among them its flexibility, broad applicability, the ability to take into account the perspective of the student, and cohesiveness with other learning theories. Some of its weaknesses, identified by various theorists, are briefly described in the list that follows.

- One of the main problems with andragogy is that its systematic nature is primarily derived from other theoretical deliberations, not that of its founder (as related by Smith, 2010; Loeng, 2013)
- There is little or no agreement between it and universal theories that apply to all students in higher education, making it difficult for a faculty with little experience in the area to know which theories to implement (Loeng, 2013).
- Changing teaching practice to include more andragogical approaches can be difficult, even if training and resources are provided to facilitate lecturers’ transition to a more student-centred framework. Time, funding, personal preferences, organisational barriers,

misunderstandings about the distinction between what makes instruction pedagogical or andragogical, and other obligations could be obstacles to its implementation (Strong, Harder & Cartwell, 2010).

- Some instructors, even if they are aware of these principles, could still misapply them in classroom settings. Defining who fits into the range of adult students can be problematic, as the few traits identified in literature do not provide a sufficiently demographic description of the target population (Muneja, 2015).
- Knowles assumes that all adult students are willing to engage in a highly participatory and democratic teaching/learning transaction grounded in a Western male concept of individuality (Merriam & Caffarella, 1999). This overarching assumption is a significant weakness of Knowles' portrayal of andragogy which has been stringently criticized by feminists for overlooking gender structures of power in education and for putting forward an oversimplified view of individual freedom (Tisdell, 1998).
- Concerns have also been raised about the soundness of the evidence on which Knowles' six assumptions are based and about how widely varying their interpretation could be. Contemporary learning theories, such as communities of practice, directly challenge Knowles' approach by de-emphasizing individual students (Panjwani & Bungum, 2013).
- Andragogy only addresses certain types of learning at certain times, despite Knowles' claim that the framework could be applied to any adult learning setting. The andragogical approach does not provide a clear delineation of what can and cannot be considered adult education (Holton, Wilson & Bates, 2009).
- Andragogy tends to ignore the need for critical reflection as a necessary component of the adult learning process (Tisdell, 1998).
- Andragogy does not qualify as a theory since it has not been empirically tested (Muneja, 2015). Some of the assumption on which it rests are incompatible: for example, the framework assumes that students should be *trained* to be self-directed, implying some degree of dependence on the lecturer, and not all adult students possess the characteristics that Knowles attributes to them (Strong, *et al.*, 2010).

Despite these limitations, Knowles's ideas still provide a practical instructional guide for all ages, especially adults. Some consider it a pedagogic discipline, others see it as a method, skill, theory or framework of adult learning. Yet others consider it an autonomous science within the framework of the general sciences of teaching and learning (Muneja, 2015). It would therefore be safe to conclude that andragogy is essentially a framework of assumptions about the characteristics of adult students, which differs from traditional pedagogical assumptions about child learners. Rather than being an actual theory of adult learning it is, as Knowles himself indicated, a set of assumptions providing 'but one piece of the adult learning puzzle'.

Having highlighted the criticisms of andragogy, I turn to a discussion of constructivism as an adult learning approach.

3.2.2 Constructivism

According to Mayer (2004), constructivism is a synthesis of multiple theories diffused into one form, which assimilates behaviourist and cognitive ideas alike. The constructivist stance maintains that "learning is a process of constructing meaning; it is how people make sense of their experience" (Merriam & Caffarella, 1999: 260), thus it coincides especially well with current theories on adult learning, is easily translated into a self-directed learning style which allows the individual to absorb all the information in the context within which the problem occurs, and thus facilitates learning (Sadlin, 2005).

Although there is a wide range of constructivist theories, there is agreement among theorists that learning "is a process of constructing meaning; it is how people make sense of their experience" (Merriam & Caffarella, 1999: 261). Two key perspectives on constructivism are the individual constructivist view and the social constructivist view. In terms of the individualist constructivist view, learning is an intrinsically personal process in which "meaning is made by the individual and is dependent upon the individual's previous and current knowledge structure" (ibid: 261). It can therefore be considered an "internal cognitive activity" (ibid: 262). The premise

on which the social constructivist view rests, however, is that learning is constructed through social interaction and discourse and is thus, according to Sadlin (2005), a process in which meaning is dialogically constructed.

It appears that constructivism is a very broad concept with many variations. Since there is no universal definition of constructivism, some consider it as a theory of learning, others as a theory of knowledge, and yet others as a theory of pedagogy (Bull, 2012). Nonetheless, constructivism has a long-standing tradition in the philosophy and practice of education as well as in empirical research (Jia, 2010). It is a theory of knowledge rooted in philosophy, psychology and cybernetics, anthropology, the natural science, semiotics, sociolinguistics, history of education, and education and its influence on education today is reflected in a range of published curricula and instructional practices (Mayer, 2004; Jia, 2010; Sadlin, 2005).

In essence, constructivism is based on the assumption that students construct knowledge for themselves: each student individually and socially constructs meaning as s/he learns. According to Lutz and Huitt (2004), the dramatic consequences of this view are twofold. In the first instance, it directs our focus to the student when thinking about learning, not to the subject/lesson to be taught. In the second instance, we have to accept as our premise that there is no knowledge that is independent of the meaning that the student or community of students, based on experience, attributes to it.

Dewey (1933), one of the first theorists who propagated the notion of constructivism, explained it as part of a critical thinking process that involves the analysis of and judgments about an experience or an occurrence. Students who think reflectively become aware of what and how they learn, controlling their learning by actively accessing what they need to know, what they know, and how they can bridge the gap between the two (Coffield, Moseley, Hall, & Ecclestone, 2004). Therefore, critical thinking incorporates a wide range of thinking skills, all of them directed by desirable outcomes: reflective thinking facilitates the integration of these skills by helping through the making of judgments (Panjwani & Bungum, 2013). An important function

of reflective thinking is to prompt the thinker to step back and think of the best strategies to achieve the desired goals during constructive or problem-solving situations (Bull, 2012). Therefore, teachers who are able to use reflective practices should themselves be attuned to using this strategy of reflective practices in order to help their learners think critically.

Contrary to criticisms by some (conservative/traditional) educators (Bull, 2012; Jia, 2010; Taber, 2011), constructivism does not dismiss the active role of the teacher or the value of expert knowledge. What it does is to *modify* their role, to enable them to help students construct knowledge, rather than to provide them with a series of facts – knowledge – constructed by someone else (Sadlin, 2005). Constructivism is also not a learning theory that compels students to "reinvent the wheel." In fact, as Taber (2011) points out, it taps into and triggers the student's innate curiosity about the world and how things work. Then only, can students create organizing principles which they can transfer to other learning contexts.

3.2.2.1 Constructivism and adult learners

Constructivist philosophy has a long history of application in education programmes for young children, but it is used less frequently in the adult learning environment (Bull, 2012). As humans develop, there are qualitative changes in their ability to think logically about experiences, but the process by which learning occurs (cognitive adaptation and social mediation), are believed to be continuous or remain the same throughout life (Fraser & Tobin, 1988). At the heart of constructivist philosophy is the belief that knowledge is not given, but gained through real experiences that have purpose and meaning to the student and through the exchange of perspectives about the experience of and with others (Piaget, 1971; Vygotsky, 1978). Learning environments for adults based on constructivist philosophy include opportunities for student to make meaningful connections between new material (insights) and previous experience. Students learn the new information that is presented to them by building upon knowledge that they already possess. It is therefore important that lecturers constantly assess the knowledge their students have gained to make sure that students' perceptions of the new knowledge are

what the lecturer had intended. In most pedagogies based on constructivism, the lecturers' role is not only to observe and assess, but to also engage with the students while they are completing activities, wondering aloud and posing questions to the students to promote reasoning. For example, there is a paradigm shift, from how things were done in traditional settings to constructivist ones in that constructivism is student- rather than teacher- or content-centred. Table 3.5 depicts a comparison between a constructivist and a traditional learning environment.

Table 3.5: Comparison of traditional and constructivist instruction

(Long, 1994)

CONSTRUCTIVIST PEDAGOGIES VS. TRADITIONAL PEDAGOGIES		
Approaches	Constructivist learning	Traditional learning
<i>Role of lecturer</i>	Asks, supports, creates environment for student to arrive at their own conclusions, supports, continuous dialogue, etc.	Gives instructions from the front, expects student to be disciplined in receiving the content with the least distractions, gives answers, etc.
<i>Interaction</i>	Lecturers and students learn from each other, students compare their version of truth with that of lecturers and peers to arrive at a socially tested negotiated version of truth	The lecturer is an expert who gives expert advice and instruction to get student gain knowledge efficiently
<i>Nature of students</i>	Students are viewed as unique individuals; the unique nature of students is an integral part of the learning process	Students are viewed as homogenous, expected to meet the normal standards
<i>Collaboration</i>	Students collaborate to arrive at a shared understanding of truth in a specific field through scaffolding	Students should be attentive and disciplined to achieve the content set in the curriculum
<i>Responsibility for learning</i>	Emphasises the active role of students in the learning process	The student is passive and receptive
<i>Learning motivation</i>	Develops students' motivation through authentic experience in handling problems, thus intrinsic	Students' behaviour is reinforced by praises and reward, thus extrinsic

In a constructivist classroom, knowledge is constructed either individually, based on what each student has learnt from through prior experience, or collaboratively through what participants

contribute. The environment is student-centred, meaning that the focus is on adult students' learning rather than lecturers' teaching as in traditional approaches (Taber, 2011). The environment is democratic in nature as far as the sharing of responsibility and decision-making is concerned. It involves curriculum negotiation, which includes deliberately inviting students to contribute to and/or modify the educational plan/programme so that they will have a real investment both in the learning journey and in the outcomes. According to Sadlin (2005), an adult student is an active thinker and an active co-constructor of knowledge, rather than a passive listener.

In the same vein, Francis and Flanigan (2012) posit that the constructivist stance is that adult learning is a process in which meaning is constructed; it is about how people make sense of their experiences, founded on the assumption that, by reflecting on our experiences, we construct our own understanding of the world we live in. Learning, therefore, is a process of adjusting our existing mental frameworks to accommodate new experiences. Constructivists argue that individuals generate mental frameworks and rules as a result of their experiences with other human subjects and with their environment and, in turn, use these rules and mental frameworks to make sense of their new experiences (Bull, 2012). They assert that there are two main principles whose application have far-reaching consequences for learning and the development of cognitive reasoning, as well as for the practice of teaching, interpersonal management and psychotherapy in general (Panjwani & Bungum, 2013). According to Panjwani and Bungum (2013) and Sadlin (2005), these two principles are (a) that knowledge is not passively received, but actively built up by the learner, and (b) that the function of cognition is adaptive and serves as a means of organizing the experiential world.

Yilmaz (2011) outlines three basic types of learning theory, namely behaviourist, cognitive constructivist and social constructivist. For the purpose of discussions on critical reflective teaching, individual cognitive constructivism and social constructivist theories will be discussed in the subsequent paragraphs. More specifically, the focus is on the work of John Dewey, Lev

Vygotsky (social constructivism), Jean Piaget, and Jerome Bruner (individual cognitive constructivism).

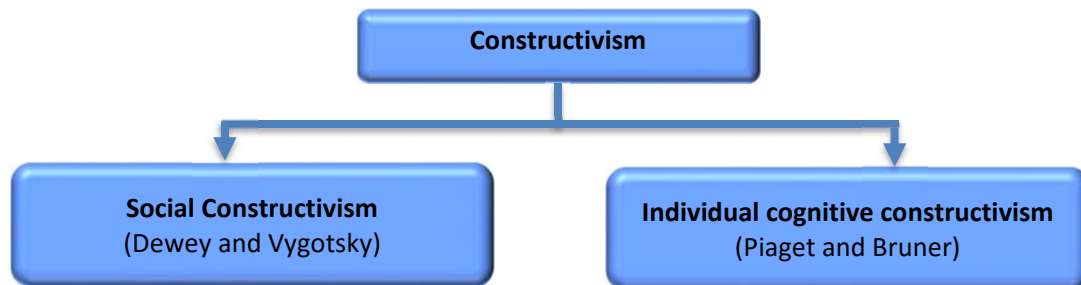


Figure 3.1: Constructivist theories

Table 3.6: An overview of constructivist learning theories

(Lutz & Huitt, 2004)

	Cognitive constructivism	Social constructivism
<i>View of knowledge</i>	Knowledge systems of cognitive structures are actively constructed by students based on pre-existing cognitive structures	Knowledge is constructed within social contexts through interactions with a knowledge community
<i>View of learning</i>	Active assimilation and accommodation of new information to existing cognitive structures. Discovery by student.	Integration of students into a knowledge community. Collaborative assimilation and accommodation of new information
<i>View of motivation</i>	The lecturer facilitates learning by providing an environment that promotes discovery and assimilation/accommodation	Intrinsic and extrinsic. Learning goals and motives are determined both by student and extrinsic rewards provided by the knowledge community

3.2.2.2 Social constructivism

The social constructivist approach, influenced by Dewey’s and Vygotsky’s work, emphasises the social contexts of learning and the fact that knowledge is mutually built and constructed. By interacting with others, students get the opportunity to share their views, thus generating a

shared understanding related to the concept (Amineh & Asia, 2015). Social constructivism is a sociological theory of knowledge according to which human development is socially situated and knowledge is constructed through interaction with others; knowledge fields are determined by such things as politics, ideologies, values, etc. It centres on the ways in which social factors affect groups of people on how they form understandings and create formal knowledge about their world. Importantly, though, these bodies of knowledge are not considered to be objective representations of the external world.

For the purpose of this study, it is the contributions of John Dewey and Lev Vygotsky to social constructivist adult learning and critical reflective teaching and learning which are deliberated in the subsequent sub-sections.

3.2.2.2.1 *John Dewey*

The work of John Dewey (1859-1952) was discussed extensively in the previous chapter and the main tenets of his views on constructivist learning will therefore only be touched on briefly (cf. Paragraph 2.4.1). As a psychologist and philosopher, he promoted the value of *personal experience* in learning. He placed relatively little emphasis on maturational factors and taught that, because human beings understand the world through interaction with their environment knowledge is thus constructed by the individual. Dewey (1938) defined knowledge as having two inseparable parts: content of knowledge and application of knowledge in the real world. He indicated that people acquire knowledge through discovery and proof. Generally speaking, discovery involves a process of generating tentative hypotheses when faced with perplexity. Proof involves a process by means of which ideas are verified on the basis of associated evidence. According to Dewey (1933), the essential features of constructivism include sustaining an adequate attitude, such as open-mindedness, whole-heartedness and responsibility; being regulated by a purpose and/or a conclusion which control the kind of inquiry undertaken; justifying the acceptance of ideas by considering referent evidence so that the ideas would be grounded on a firm basis, and taking consecutively ordered steps.

Dewey also contended that life should form the basic context for learning. More significantly, learning should be organised around the individual rather than around subject matter topics and the predetermined organisation of knowledge domains (Sadlin, 2005). He emphasised the individual's apprehension about not understanding as the stimulus for learning. By implication, the student's interest first has to be aroused, and then learning should be organised around his/her active effort to resolve an issue (Bull, 2012). Another very important aspect of Dewey's work was his emphasis on the role that previous experience and prior knowledge play in the development of new understanding. Taking the time to understand the life experiences of adult learners is particularly important. In this regard, Sadlin (2005) believes that understanding students' cultures, communities, extra-curricular pursuits, employment goals and past experiences is crucial to the generation of interest and the facilitation of reflective thinking.

Devendorf (2014) posits that Dewey has arguably made the most significant contribution to the development of educational thinking in the twentieth century. Having written a comprehensive biography on Dewey's life, Devendorf (ibid) hailed Dewey's philosophical pragmatism, his concern with interaction, reflection and experience as a highly suggestive educative form. Dewey's contribution to adult learning is summarized by Ratner (2015:7) as follows:

First, his belief that education must engage with and enlarge experience has continued to be a significant strand in informal education practice. Second, and linked to this, Dewey's exploration of thinking and reflection - and the associated role of educators - has continued to be an inspiration. Third, his concern with interaction and environments for learning provide a continuing framework for practice. And finally, his passion for educating so that all may share in a common life, provides a strong rationale for practice in the collaborative settings in which educator's work.

3.2.2.2.2 Lev Vygotsky

Lev Vygotsky (1896-1934), a Russian psychologist, developed a Socio-cultural Theory which involves the construction of new knowledge through social interactions. Such construction is the heart of social constructivism, suggesting that knowledge is first constructed in a social context and then internalized and used by individuals. In other words, it highlights the fact that reality is not something that individuals can discover because it does not exist prior to its social invention. Put differently, individuals make meaning through their interaction with others and with the environment in which they live. Vygotsky (1978) believed, moreover, that learning is a continual movement from current to higher intellectual levels which more closely approximate the student's potential. He hypothesized that cognitive development depends upon the so-called Zone of Proximal Development (ZPD), which refers to “. . . the distance between the actual developmental level, as determined by independent problem solving, and the level of potential development, as determined through problem solving under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978: 86). Full development in the ZPD, according to Vygotsky, depends upon full social interaction. The Zone of Proximal Development represents learning that is possible if a student is surrounded by proper instructional conditions (Pollard, 2014).

Vygotsky also argued that one's interactions with the environment contribute to one's successful learning. More specifically, he focused on the relationship between learning and development. The appropriateness of pedagogy is embedded in the relationship between the student and the teacher and its effectiveness is based on the ability of the teacher to match instructional strategies to the developmental capabilities of students. In a teacher-centered classroom, the teacher is the stimulus in the ZPD who captures those functions and abilities that have not yet matured, that are in the process of maturing, that can be accomplished only with assistance” (Vygotsky, 1978: 86). In a student-centered (adult learner) classroom, the student becomes the stimulus in the ZPD. S/he is seen as an active participant, and the role of the teacher changes from the traditional (transmission) one to the role of the one who facilitates the student's

construction of meaning by monitoring, providing help and promoting cooperative learning. According to Pollard (2014), this understanding of the role of the teacher as a guide and a facilitator (besides establishing a learning context in which the learner has an active role) reminds very much of a modern adult teaching approach. In the learning situation, there should always be a more knowledgeable person. This refers not (only) to the teacher, but to anyone who has a better understanding of, or who is more competent than the (novice) learner in respect of some task, process or concept. It could be an older person (teacher, coach), but it could be also a younger person, or a peer. To this end, the more knowledgeable person becomes a partner in in the co-construction of knowledge.

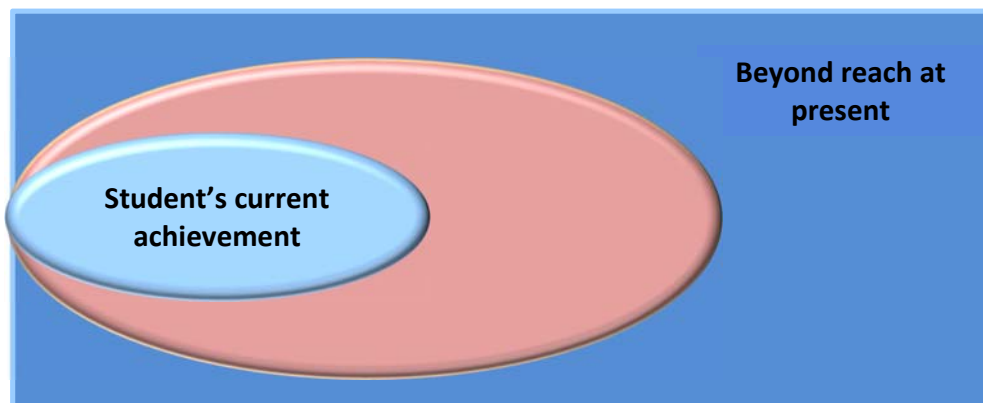


Figure 3.2: An illustration of Vygotsky's Zone of Proximal Development

Ratner (2015) identifies three major principles underpinning Vygotsky's social development theory. First, social interactions play a critical role in cognitive development, in relation to what is learned, when learning takes place, and how learning occurs. This principle asserts that without the learning that occurs as a result of social interaction, and without self-awareness or the use of signs and symbols that allow us to think in more complex ways, we would remain slaves to the situation, responding directly to the environment. The second principle associated with this theory is the idea that the potential for cognitive development is limited to a certain time span (Lutz & Huitt, 2004). Finally, Vygotsky asserted that the only way to understand how humans come to know is to study learning in an environment where the process of learning rather than

the product emerging from learning, is studied. The impact of society and culture is central to the social development theory because, according to Vygotsky (1978) all higher mental functions must first be filtered through an external stage in the form of social occurrences.

The instructional implications of Vygotsky's (1986) social cognitive theory can be summarized as follows:

- Instruction should present students with authentic situations in which they must resolve dilemmas;
- Instructions should be guides to development and targeted at the leading edge of the ZPD;
- In an instructional setting, social partners should be at different levels of development and jointly construct the problem solution, and
- Individualized testing, which is generally the only kind we do, can give only a partial picture of the learner's capabilities because it fails to account for the ZPD.

Although Vygotsky's theory has been heralded as one of the most influential in teaching and learning, several criticisms have also been levelled at his work. According to Lui and Matthews, (2005), Vygotsky's social-cultural theory regards the collective at the cost of the role played by the individual. Informing this criticism is the assumption that knowing is relative to the situation in which the knowers find themselves. Another critique is that the ZPD is unclear in that it does not account for a precise picture of a student's learning needs, a student's present capability level or a student's motivational influences. Hence, the ZPD does not explain the process of development or how development actually occurs (Chaiklin, 2002). Lastly, Vygotsky's socio-cultural theory does not seem to apply to all social and cultural groups. That is, social groups may not be whole and equal with all learners being able to gain the same meaning from engagement. Learners with learning disabilities, for example, might not be able to take away the same meaning from group interaction as those without such disabilities or learning difficulties (Matthews, 1998).

In conclusion, the constructivist elements of Dewey's emphasis on experience and Vygotsky's Zone of Proximal Development complement each other well and, when combined, provide lecturers with the necessary tools to account for both a student's academic preparedness and the context of his or her broader life. The inclusion of Vygotsky and Dewey in the theory construction process is, according to Sadlin (2005) an important step because of the influence and legacy that each theorist has exerted on the field of education.

3.2.2.3 Individual cognitive constructivism

According to Taber (2011), the cognitive constructivist approach focuses on mental processes rather than on observable behaviour. Knowledge is regarded as something that is actively constructed by students based on their existing cognitive structures. Therefore, learning is relative to students' stage of cognitive development, and understanding their existing intellectual framework is central to understanding the learning process. In this regard, Yilmaz (2011) defines the role of knowledge as an entity that is actively constructed by the student, hence any account of knowledge makes essential references to cognitive structures. According to Yilmaz (2011), it is the active systems of mental representations derived from past experiences which constitutes knowledge. Put differently, students interpret experiences and information in the light of their extant knowledge, their stage of cognitive development, their cultural background, their personal history, and so forth. In using these factors to organise their experience and to select and transform new information, they are therefore actively constructing knowledge rather than passively absorbing it. In essence, therefore, knowledge is dependent on the standpoint from which the student approaches it (Yilmaz, 2011).

If knowledge is actively constructed it follows that learning is a process of active discovery. The role of the lecturer is to facilitate such discovery by providing students with the necessary resources and guiding them towards the assimilation of new knowledge into their existing pool of schemata while simultaneously modifying old knowledge to accommodate the new. Lecturers must thus take into account the knowledge that a student currently possesses when deciding

how to construct the curriculum and how to present, sequence and structure new content (Irzik & Matthews, 2001). Motivation in cognitive constructivism involves significant restructuring of existing cognitive structures, and successful learning requires a major personal investment on the part of the student. Without some kind of internal drive on the part of the student to do so, external rewards and punishments, such as grades, are unlikely to be sufficient.

Bruner (1915-2016) posited that discovery leads one to become a constructionist. Though the idea of constructivist theories was developed with respect to child development, more recent innovations in education, and even in industry, have applied the principles of constructivist theory to adults (Jia, 2010). Although the basics of cognitive theory is considered to have begun with John Dewey (1933), it was Jean Piaget and Jerome Bruner who, in the mid- and latter-20th century, were among the leaders in forwarding the constructivist sub-set of cognitive theory.

3.2.2.3.1 *Jean Piaget*

Jean Piaget (1896-1980) was a Swiss biologist, philosopher and behavioural scientist who developed one of the most significant theories in cognitive psychology. His impact on the field of cognitive development cannot be overstated, even though many of the precepts he developed have been criticized by subsequent evidence (Bull, 2012). His stage theory of cognitive development gained wide acceptance in the 1960s and 1970s as a result of the translation of his work into English and its promotion by influential American psychologists like Flavell (Amineh & Asia, 2015). His work focused on developing a general theory of how a child constructs knowledge of his/her world and the role that biology plays in the development of these constructs (Bull, 2012). According to Piaget, intelligence is represented by how an organism interacts with its environment through mental adaptation. This adaptation is controlled through the mental organisations that an individual uses to represent the world and is driven by a biological impulse to obtain balance or equilibrium between those mental organisations and the environment (Yilmaz, 2011).

Children and adults, according to Piaget, use mental patterns (schemata) to guide behaviour or cognition and interpret new experiences or material in relation to existing schemata. New information, which fits into existing schemata, is more easily understood, learned and retained than information that does not fit into an existing schema (Liu & Matthews, 2005). The new concepts that are well anchored by, or attached to, existing schemata will be more readily learned and assimilated than new information relating to less established schemata – a process called *assimilation*. The same holds true for information not attached to any schemata at all (Moon, 2006). When a student encounters a situation in which his/her existing schemata cannot explain new information, the existing schemata must either be changed or new ones have to be made. This process, as termed by Piaget, is called *accommodation*. The condition leading to accommodation is known as calibration: that is, the state encountered by a student in which new information does not fit existing schemata (Lutz & Huitt, 2004). To restore balance to the cognitive system, new schemes are developed, or old ones modified, until *equilibrium* is reached and the new information accommodated into the student's view of the world (Cakir, 2008). Piaget hypothesized that human beings have a natural desire to find and operate in a condition of equilibrium. A person is in disequilibrium when information is too far away from the mental structure to be accommodated but makes enough sense to make it difficult to reject. During transition from one stage to another, individuals with rigid personalities will move more slowly between stages due to their intolerance for ambiguity. A person with a higher tolerance for ambiguity will make the transitions more readily.

The implications of schema theory for instruction can be summarized as follows (Taber, 2011):

- It provides a relevant context for learning in order to activate existing schemata;
- It chooses texts with standard arrangements so that they conform to student expectations;
- It asks questions to determine what students' current schemata might be, and
- It pays attention to student answers and remarks that may give clues about how they are organizing information.

Table 3.7 provides an overview of the process of forming schema.

Table 3.7: Key components of Piaget’s conceptualization of assimilation, accommodation and equilibrium

(Piaget, 1971)

Assimilation	Accommodation	Equilibrium
Occurs when a student perceives new objects or events in terms of existing schemes or operations. This information is compared with existing cognitive structures.	This has occurred when existing schemes or operations must be modified to account for a new experience.	This is a master developmental process, encompassing both assimilation and accommodation. Anomalies of experience create a state of disequilibrium which can be only resolved when a more adaptive, more sophisticated mode of thought is adopted.

- *The Impact of Piaget’s theory of learning on androgogy*

While some of Piaget’s theories of learning have been criticized widely (Sadlin, 2005; Amineh & Asia, 2015; Muneja, 2015), his insights still have a significant impact on instructional practices in the education of young children and adults. Currently, educators at secondary and university levels have altered their approach from an emphasis on memorization and rote learning to an emphasis on making connections between known information (schema) and new information. The realization that “language use depends on our ability to use symbols and map categories and relationships onto the brain” is significant in this regard (Taber, 2011: 26). While some students figure this strategy out for themselves, teachers are now aware of the process and can teach the strategy to adults and help them become more efficient processors of information. It is encouraging to learn that adults continue to develop cognitively and maintain their intelligence throughout their lives if they retain their curiosity, remain active and stay healthy.

What is noteworthy about Piaget’s theory is his conviction that cognition is grounded in the interface between mind and environment. According to Taber (2011), the result of their interplay

is the achievement of, or efforts to achieve a balance between mental schemes and the requirements of the environment. It is thus a combination of maturation and actions to achieve equilibration that advances an individual's cognitive development.

3.2.2.3.2 Jerome Bruner

Jerome Bruner (1915-2016) was a modern theorist born and raised in the United States. He participated in what was called the cognitive revolution, and was influenced by Piaget, Vygotsky and Dewey. He advocated that the development of human intellectual functioning from infancy to such perfection as it may reach, is shaped by a series of technological advances in the use of the mind. These technological advances depend on a person's increasing language ability and his/her exposure to systematic instruction (Bruner, 1977). Moreover, the cognitive processes (thoughts and beliefs) balance what we get from outside stimuli and give us a sense of balance.

Bruner's Three Modes of Representation reflect the way in which information or knowledge are, according to him, stored and encoded in memory. Rather than neat age-related stages (as propagated by Piaget), the modes of representation are integrated and only loosely sequential as they "translate" into each other (Bruner, 1977). According to Bull (2012) the *enactive mode* is employed when a student demonstrates knowledge by using motor activity only to demonstrate his/her thinking. S/he can demonstrate how to do a particular task but cannot explain or use any symbolic medium to express knowledge. Many adults can perform a variety of motor tasks like sewing, typing, etc. but would find it difficult to describe it in iconic (picture) or symbolic (word) form. *Iconic representation* employs the use of organisational structures, spatial signifiers or images to represent past experiences. Someone using this type of representation could relate an experience to images or concrete symbols like maps or diagrams. For some, this is conscious; others say they do not experience it (Cakir, 2008). This may explain why, when we are learning a new subject, illustrations or diagrams accompanying verbal information is often helpful. The third mode of representation is *symbolic* in that it involves design features which either remotely or arbitrarily represent the past. Language is the most common tool used for this type of

representation, its characterizing feature being the use of symbols that need not have to concretely relate to what is being described. In fact, the representation usually goes beyond a concrete connection to the information to a level at which analogies could be used to refer to past experiences. Symbols are flexible in that they can be manipulated, ordered, classified, etc., so the user is not constrained by actions or images. In the symbolic stage, knowledge is stored primarily as words, mathematical or other symbols (Yilmaz, 2011).

Bruner's constructivist theory suggests that learning is effective when the learner is faced with new material to follow a progression from enactive to iconic to symbolic representation; this holds true even for adult students (Bruner, 1987). Regarding instructional design, Bruner's work, according to Yilmaz (2011), also suggests that a student is capable of learning any material as long as the instruction is organised appropriately. The hypothesis here is that any subject can be taught effectively in some intellectually honest form to any person, which means that the instructor has to focus on subject structure and assure that the content fits the student's level of ability (Bruner, 1977). This notion underpins the idea of a *spiral curriculum*: a curriculum in which, as it develops, basic ideas are repeatedly revisited, and built upon until the student has grasped the curriculum (Bruner, 1977). In such a curriculum, the instructor and student engage in active dialogue with one another, together translating information to be acquired into formats appropriate to the student's current state of understanding. By implication, students should be provided with study materials, activities, and tools that are matched to their developing cognitive capabilities, and subject content taught at gradually increasing levels of difficulty (hence the spiral analogy). Ideally, this approach to teaching should lead to students being able to solve problems by themselves.

Bruner (1987) also proposed that learners should construct their own knowledge by organizing and categorizing information in terms of a coding system. He believed that such a coding system would be most effective if it was 'discovered' by the learner/s rather than 'presented' by the teacher. Discovery learning implies, therefore, that students should construct their own knowledge (a constructivist approach). The role of the teacher should not be to impart

information by rote learning, but to facilitate the learning process. This means that a good instructor will design lessons that would help students discover relationships between bits of information. To do this, a teacher must supply students with the requisite information but must not organize it for them. The students have to organize the material, something which would only be possible through their 'discovery' of the relationships between different pieces of information. The use of the spiral curriculum can aid the process of discovery learning

Cakir (2008) regards Bruner as the link between cognitivism and constructivism since he defines knowledge (cognitive structures) as a framework we construct to give meaning and structure to regularities in experience. The world constantly evolves, and one must adapt to the changing environment through the process of learning. Acquiring and adapting knowledge serves the purpose of making sense of the world. Past conceptions, once adequate and appropriate to the students' perceived reality, are replaced by original conceptions that better fit the present mould. Bruner stated that, to understand something, one has to give up some or other way of conceiving it (Bruner, 1977). According to him, learning is a process during the course of which the student selects and transforms information, constructs hypotheses, and makes decisions, relying on a cognitive structure to do so. Cognitive structures (i.e., schema and mental frameworks) provide meaning and organization to experiences and allows the individual to "go beyond the information given" (Bruner, 1977: 123). Bruner felt that knowledge was best acquired when students were allowed to discover it on their own.

- *Bruner on discovery learning*

Discovery learning is an instructional theory based on cognitive views of learning and constructivist principles. Bruner (1977) argued that practice in discovering for oneself teaches one to acquire information in a way that makes that information more readily viable in problem solving. This theory, which later resulted in the discovery learning movement of the 1960s (Banchi & Bell, 2008) suggests that students learn by doing. By implication, instruction should facilitate students' interaction with their environment through exploration and the manipulation

of objects. This method of instruction links nicely to the ideas found in social constructivism. The learning-by-doing-idea requires students to, for instance, deal with questions, perform experiments, conduct research and work on projects to arrive at solutions. Discovery learning is specifically used for problem-solving, with students having to draw on their own experience and prior knowledge to find solutions to the problem concerned. Because it is inquiry-based, instruction involves placing or confronting students with problem solving situations. They then have to draw on their own past experiences and existing knowledge to discover facts and relationships and to learn, on their own, new truths through action and experience. The premise on which discovery learning rests is that students should interact with the world by exploring and manipulating objects, wrestling with questions and controversies, or performing experiments (Barrett, 2013). As a result, they may be more likely to remember concepts and knowledge, because they discovered these on their own (in contrast to a transmission framework).

Proponents of this theory believe that it has many advantages: it encourages active engagement; promotes motivation, autonomy, responsibility and independence; stimulates the development of creativity and problem-solving skills, and 'tailors' the experience of learning experience (Bruner, 1987). Informing all Bruner's work is the assumption that the more often and earlier students are engaged the greater the possibility that they will come to value knowledge and education.

3.2.2.3.3 *Differences between Bruner and Piaget*

As Yilmaz (2011) points out, there are evident similarities between the theories of Piaget and Bruner, but they are significantly different in that Bruner's modes do not presuppose the mode that precedes it. Whilst one mode may sometimes be dominant, they normally co-exist. Bruner (1977) argued that, what determines the level of intellectual development is the extent to which the student has had appropriate instruction, opportunities to practise and the requisite experience. Therefore, the right way of presentation and the right explanation will enable a student to grasp a concept fully. Although Bruner proposes stages of cognitive development, he

does not see them as representing different separate modes of thought at different points of development, as Piaget does. Instead, he sees a gradual development of cognitive skills and techniques into more integrated “adult” cognitive techniques.

Table 3.8: Bruner versus Piaget’s theories of cognitive development

(Lui & Matthews, 2005)

Bruner agrees with Piaget	Bruner disagrees with Piaget
Cognitive structures develop over time	The lecturer should speed-up cognitive development in students
Cognitive development entails the acquisition of symbols	Symbolic thought does not replace earlier modes of representation
students are pre-adapted to learning	Development is a continuous process-not a series of stages
Students are active participants in the learning process	The involvement of adults and more knowledgeable peers makes a big difference

3.2.2.4 Criticism of constructivism

According to Strauss (2000), the neo-Piagetian theories of cognitive development maintain that learning at any age depends upon the processing and representational resources available at the particular age of the student. That is, if the requirements of the concept to be understood exceeds the available processing efficiency and working memory resources, the concept is by definition not learnable (Bull, 2012). Therefore, no matter how active a student is during learning, the learning environment in which s/he must operate/learn has to be appropriate to his/her developmental and individual learning needs, and to possible deviations from norms typical of his/her age. If this condition is not met, construction goes astray.

Several instructors have questioned the effectiveness of this approach in relation to instructional design, arguing that it applies primarily to the development of novices (Jia, 2010). While some constructivists argue that learning by doing enhances learning, critics of this instructional strategy argue that there is minimal empirical evidence to support this statement. Furthermore, since

novice learners do not necessarily possess the underlying mental schemata necessary for learning by doing, not all teaching techniques based on constructivism are efficient or effective for all students (Francis & Flanigan, 2012).

Koehler and Mishra (2009) argue that constructivist teaching methods are unguided methods of instruction: it is an example of fashionable but thoroughly problematic doctrines that can have little benefit for practical pedagogy or lecturer education. They deem highly scaffolded constructivist methods like problem-based learning and inquiry learning ineffective, and claim that the equation of constructivism with hands-on activity is a formula for educational disaster. In justifying this claim, they point out that, although students are engaged in activity, they may not be learning. Although the constructivist description of learning may be accurate, the instructional consequences suggested by constructivist do not necessarily follow (Francis & Flanigan, 2012). One of fault-lines is that instructors often design unguided curricula or lessons that rely on the students' ability to discover or construct essential information for themselves. Another fault-line, according to them, is the imperative to consider an extensive range of personal characteristics as well as the prevalence of learning problems in students today. In other words, constructivist theory is biased in favour of students who desire to learn more and are capable of independently focusing attention on the learning process (Taber, 2011).

Lutz and Huitt (2004), on the other hand, criticize constructivism for not presenting a new didactic paradigm, one that is different from traditional educational theories. Although successful in practical teaching, they argue, constructivism in some educational settings does not reflect a shift from traditional frameworks of thinking. Moreover, its emphasis on active participation dismisses the role that 'passive' perception, memorisation and all the mechanical learning methods in traditional lecturing play in the acquisition of knowledge.

The preceding section discussed the contribution of constructivist theory to adult teaching and learning. The next section focuses on experiential learning as adult learning theory.

3.2.3 Experiential learning

The foundation of experiential learning approach was laid by John Dewey, whom Kolb (1984: 29) regards as the “Father of Experiential Learning” and, “without a doubt, the most influential educational theorist of the 20th century”. It was in his book, *Experience and Education*, that Dewey (1938) outlined his belief that there is an intimate and necessary relationship between the processes of actual experience and education, and proposed a theory of experiential learning based on two principles, namely that (a) **interaction** between past experience and the present situation *causes* the present experience, and (b) that there is **continuity** between past and present experiences, with past experiences *influencing* present experiences.

According to Kolb (1984), Dewey (1933) believed that education should be about living, and he wanted to prove that experience was beneficial and essential to learning by using tools and methods such as field projects, internships, apprenticeship, etc. He set out to prove that experience is beneficial and essential to learning and that these methods bring students into direct contact with the experience, hence they are able to experience the lesson first-hand. Kolb believes that these methods have become very influential in higher education in recent years due to the changing environment of the educational system and the ever-changing needs of students. He also emphasises the benefit of these methods in that they can be used by all students, not just by those who excel academically.

Experiential learning is the foundation for lifelong learning, a concept firmly entrenched in the intellectual traditions of social psychology, philosophy and cognitive psychology (Kolb, 2014). To enable the systematic and coherent development of solutions to issues that plague a profession, academic disciplines need a philosophic position that describes the nature of its reality, truth and value. According to Kolb (1984), experiential learning as a discipline is grounded in pragmatism, the philosophical rationale for the primary role of *personal experience* in experiential learning.

In experiential learning, the learning design shifts from being lecturer-centred (teaching being largely transmissive and students perhaps unmotivated and disengaged) to being semi-structured (students having to cooperate and learn from others through direct experiences tied to real world problems). The role of the lecturer in this process is to facilitate rather than direct the student's progress (Kolb & Kolb, 2009). In this sense, experiential learning is a holistic philosophy of education based on the notion that an individual's life experiences, education and work play a central role in his/her learning and understanding of new knowledge. Experiential learning can therefore be used in a personalised undertaking and/or to support learning in a variety of campus-based, project-based, work-integrated and community contexts (Taber, 2011).

According to Schellhashe (2006), universities worldwide recognize that the purpose of 21st century education has evolved to include the generation of student competence in self-directed learning, eco-sustainability and employability. Universities accept that part of their mission is to prepare their students to be contributing members and/or leaders of local, national and global communities. They have, moreover, discovered that embedding experiential education into their programmes has led to increased student enrolment, retention and completion rates.

3.2.3.1 David Kolb

The work of David Kolb was discussed in the previous chapter as a reflective theory (cf. Paragraph 2.4.4). This section will highlight Kolb's contribution to adult learning theory in particular, with its premise that learning is a process in which knowledge is created through the transformation of experience (Kolb, 1984). This perspective on the learning process originated in the work of seminal experiential learning theorists, such as Dewey (1933), who placed intentional action based on subjective experience at the centre of learning. According to Kolb and Kolb (2009) four propositions serve as the foundation of ELT:

- First, learning is best conceived as a process instead of a product. To improve learning, they argue, the focus should be on engaging students in a process that facilitates optimal

learning. This includes providing feedback on the effectiveness of students in a process rather than the delivery of a product.

- Second, to improve learning, a student's beliefs and ideas on a topic must be considered so they can be drawn out, tested, examined and integrated into new concepts (McLeod, 2001).
- Third, learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world. Conflict, dissonance and disagreement drive learning. In the process of learning, an individual is called to manoeuvre back and forth between opposing modes of reflection and action.
- Fourth, learning is a holistic process of adaptation to the old that involves more than simple cognition. Learning involves the person as a whole, that is, the student plus his/her experiences.

According to Kolb (1984), experiential learning is guided by five principles: (a) students are engaged intellectually, emotionally, socially and/or physically; (b) experiences are structured to require the student to take initiative, make decisions and be accountable for the results; (c) the results of learning are personal and form the basis for future experience and learning; (d) experiential learning occurs when carefully chosen experiences are supported by reflection, critical analysis and synthesis, and (e) the lecturer recognises and encourages spontaneous opportunities for learning.

3.2.3.1.1 Kolb's experiential learning cycle (ELC)

Kolb (1984) claims, moreover, that all people learn in a characteristic four-step pattern. First, a person has an experience. The person then reflects on that experience, analysing it and trying to make sense of it before attempting to fit it into a broader conceptual framework of the world. This entails fitting the sense of the experience into the individual's collection of theories about how the world operates. Once this has taken place, the person formulates a hypothesis on how things work and then tries it out in some or other experiment which, in turn, leads to another

experience, from which s/he can retreat and reflect. Kolb's (ibid) supposition is that this four-step cycle goes on in our lives many times a day, and that reinforcing cycles add to larger structures of belief that we carry with us throughout our lives. He also notes that, over time, people begin to favour some of the steps more than others.

These four steps constitute the foundation of Kolb's Experiential Learning Theory (ELT). In terms of this theory (ELT), knowledge is the result of experiences that have been grasped and transformed (Kolb, 1984). The ELT puts forth two dialectically related modes of grasping experience (namely Concrete Experience [CE] and Abstract Conceptualization [AC]) as well as two dialectically related modes of transforming experience (namely Reflective Observation [RO] and Active Experimentation [AE]) (Kolb & Kolb, 2009). Emerging from these four dimensions of learning, comprehension and transformation are four different, elementary, forms of knowledge - divergent knowledge, assimilative knowledge, accommodative knowledge, and convergent knowledge.

Within the framework of the experiential learning cycle, a person passes through the modes of concrete experiences, reflective observation, abstract conceptualisation and active experimentation (outlined in Figure 3.3). A student must participate in each of these four modes in order to complete the learning cycle because the cycle assumes a continuous process which takes from the past and builds knowledge for future experiences (Abdullah, 2008). While it is possible to enter the cycle at any of the modes, students will usually begin by taking part in an experience, then watching and reflecting upon that experience. After reflection, they would have to analyse their ideas and plan for the final mode, which entails testing out their ideas. Students will differ in their ability to perform in each of these modes; however, adequate performance in each mode is necessary to complete the learning cycle. A student who is able to integrate all four modes in the performance of a single learning task demonstrates a higher level of thinking ability.

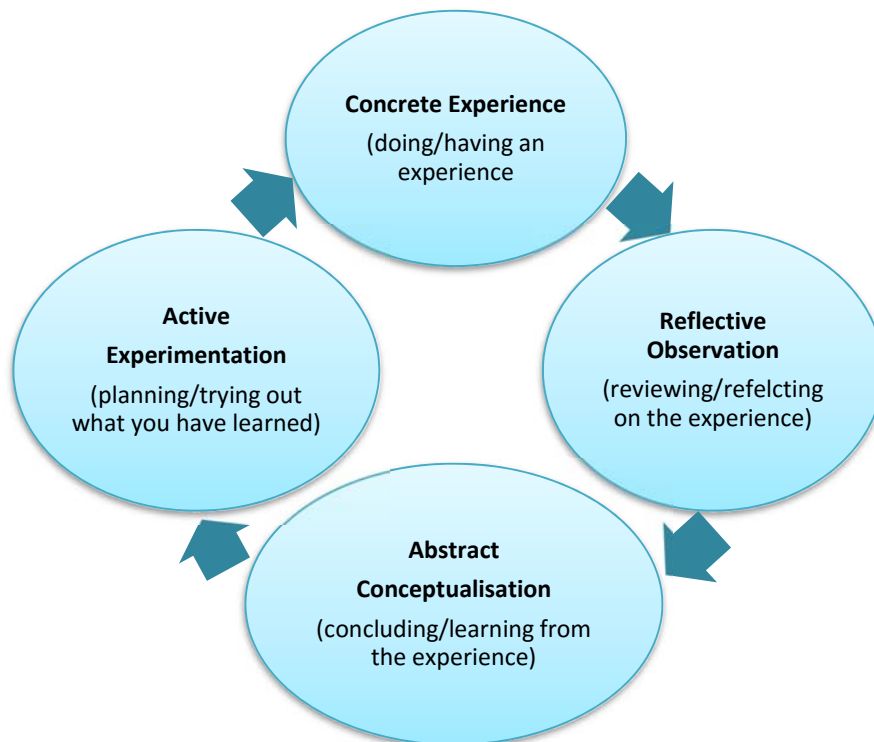


Figure 3.3: Kolb's (1984) experiential learning cycle

(McLeod, 2013)

Learning has been effective if a person has progressed through a four-stage learning cycle which involved his/her having (1) had a concrete experience, (2) observed and reflected on the experience (3) the formed abstract concepts (analysis) and generalizations (conclusions), and (4) used these to test hypothesis for future situations, which would result in new experiences.

- A concrete experience (CE) will be one which is either new or a reinterpretation of existing experience.
- Of particular importance in reflective observation (RO) of the new experience are any inconsistencies between experience and understanding.
- Abstract Conceptualization (AC) follows on reflection, giving rise to a new idea, or a modification of an existing abstract concept.

- Active Experimentation (AE) occurs when the student applies these new ideas to the world around him/her to see what the result/s would be.

Having developed the framework over many years, David Kolb published his well-known *learning styles inventory* (LSI), which is largely based on his ELT, in 1984.

3.2.3.1.2 Kolb’s learning styles inventory

Kolb (1984) explains that people naturally present/prefer a single learning style, which differs from person to person. Various factors influence a person’s preferred style but, whatever may influence the choice of style, the preference of the learning style itself is actually the product of two pairs of variables or two separate choices that we make, hence Kolb represents each of four generic styles as a combination of two stylistic dimensions. He presents these as lines of axis, with conflicting modes at either end of the axis, and claims that a person cannot perform both variables on a single axis at the same time. Figure 3.4 highlights Kolb’s terminology for the four learning styles as diverging, assimilation, converging and accommodation and are subsequently explained (Abdullah, 2008; Baker & Robinson, 2010; Francis & Flanigan, 2012; Bartle, 2015).

Doing (active experimentation-AE)	Watching (reflective observation-RO)	
Feeling (concrete experience-CE)	Accommodating (CE/AE)	Diverging (CE/RO)
Thinking (abstract conceptualisation-AC)	Converging (AC/AE)	Assimilating (AC/RO)

Figure 3.4: Kolb’s (1984) learning styles

(McLeod, 2013)

Diverging (feeling and watching - CE/RO)

These people are able to look at things from different perspectives. They are sensitive and prefer to watch rather than do, tending to gather information and use imagination to solve problems.

They are best at viewing concrete situations from several different viewpoints. Kolb called this style 'diverging' because these people perform better in situations that require ideas generation, for example, brainstorming. People with a diverging learning style have broad cultural interests and like to gather information. They are interested in people, tend to be imaginative and emotional, and tend to be strong in the arts. People with the diverging style prefer to work in groups, to listen with an open mind and to receive personal feedback.

Assimilating (watching and thinking - AC/RO)

The Assimilating learning preference is for a concise, logical approach. Ideas and concepts are more important than people. These people require good clear explanations rather than practical opportunities to learn. They excel at understanding wide-ranging information and organizing it into a clear logical format. People with an assimilating learning style are less focused on people and more interested in ideas and abstract concepts. They are also more attracted to logically sound theories than approaches based on practical value. This learning style is important for effectiveness in information and science careers. In formal learning situations, people with this style prefer reading, lectures, exploring analytical frameworks, and having time to think things through.

Converging (doing and thinking - AC/AE)

People with a converging learning style can solve problems and will use their learning to find solutions to practical issues. They prefer technical tasks, and are less concerned with people and interpersonal aspects. People with a converging learning style are best at finding practical uses for ideas and theories. They can solve problems and make decisions by finding solutions to questions and problems. A converging learning style enables specialist technological abilities. People with a converging style like to experiment with new ideas, to simulate, and to work with practical applications.

Accommodating (doing and feeling - CE/AE)

The Accommodating learning style is 'hands-on', and relies on intuition rather than logic. These people use other people's analysis, and prefer to take a practical, experiential approach. They are attracted to new challenges and experiences, and to carrying out plans. They commonly act on 'gut' instinct rather than logical analysis. People with an accommodating learning style will tend to rely on others for information rather than carry out their own analysis. This learning style is prevalent within the general population.

Figure 3.5 depicts the interaction between Kolb's ELT and the LSI, and shows how a combination of the two finds expression in the experiential learning process.

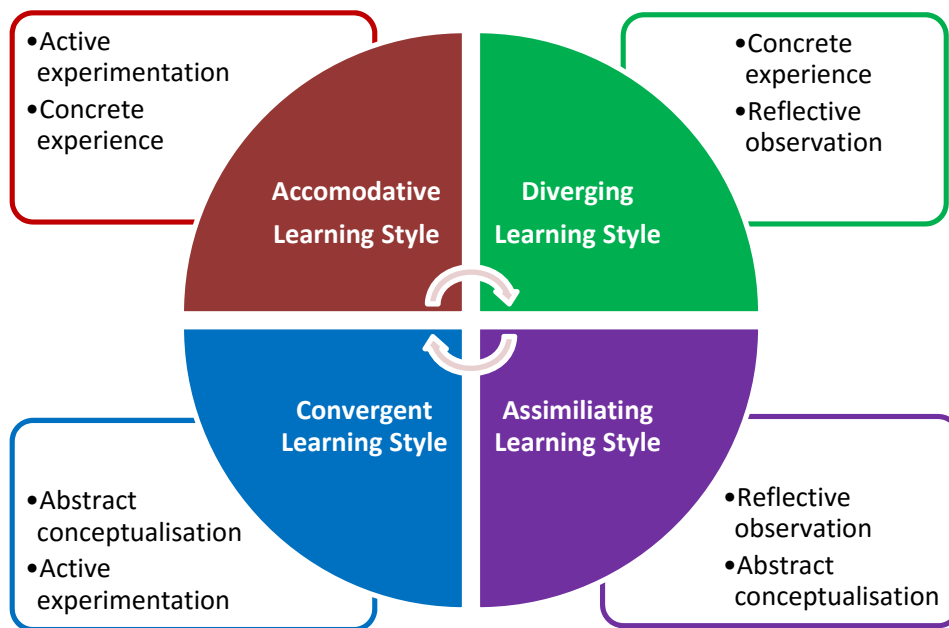


Figure 3.5: A conceptualization of the interactive nature of Kolb's (1984) ELT and LSI
(Coffield, et al., 2004)

3.2.3.1.2 Criticism of Kolb's experiential learning cycle

Although experiential learning is central to adult learning, it has not escaped criticism. Though the majority of researchers seem to accept Kolb's overall theory of learning styles and his cyclical framework, there are questions about the validity of his Learning Styles Inventory (LSI). For example, Kolb's ELT is unclear and contradictory, since the nature of what is being measured continually changes between 'stages' and 'states' (Abdullah, 2008). If learning styles are traits, they are stable; however, if they are states they need to become flexible. This contradiction may account for the continued findings on the unreliability and lack of validity of the LSI (Abdullah, 2008). Other criticisms of Kolb's learning styles include that it defines a learning process rather than a style hence, as a theory, it is too simple (Baker & Robinson, 2010); it does not reflect real life, and its experimental basis is too small (Francis & Flanigan, 2012); it does not pay enough attention to the reflection process (Bartle, 2015), and it hardly takes into consideration people's different background or cultural experiences (Abdullah, 2008), and Kolb attempts to place boundaries on thinking by segregating the thinking process into steps or stages (Bartle, 2015).

Despite these points of criticism, Kolb's (1984) experiential learning cycle and its concomitant LSI are considered to be among the most influential conceptual frameworks illustrating the very nature of experiential learning in education.

3.2.4 Inquiry-based learning

Inquiry-based learning, generally regarded as a branch of constructivist learning, owes its philosophical and theoretical roots to philosophers and theorists such as Jean Piaget, John Dewey and Lev Vygotsky. A comparison of the role played by lecturers/teachers in their respective philosophies/theories indicates that in Vygotsky's philosophy s/he performs the role of a mentor while in Dewey's philosophy his/her role is that of a facilitator. It is the latter, rather than the former, role which fits in with the tenets of inquiry-based learning. The instructional goal of inquiry-based learning is *cognitive development in a social context* (Panjwani & Bungum, 2013).

While constructivism focuses on Piaget's cognitive development in Vygotsky's social context, inquiry-based learning, developed by Dewey (depicted in Figure 3.6), could be said to represent an integration/blending of cognitive (Piaget's) and social (Vygotsky's) constructivism.

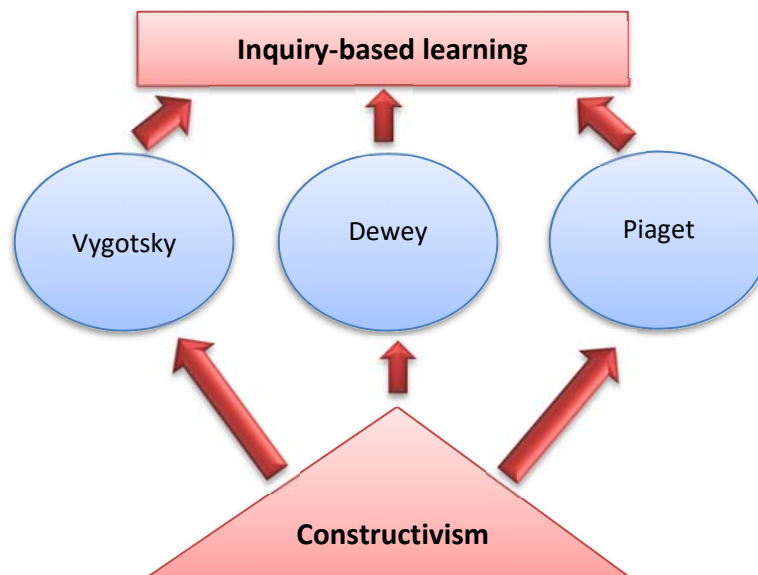


Figure 3.6: Theoretical model of inquiry-based learning

(Dostál 2015)

The inquiry-based framework rests on the premise that first, knowledge is actively constructed by/within individuals and society who use language (which is central to knowledge construction) to interact with one another is central to building knowledge (Vygotsky, 1978). Second, individuals construct their own understanding and knowledge of the world by experiencing things and reflecting on those experiences (Piaget, 1971). Finally, the newly constructed knowledge is coherent with each individual's prior knowledge, personal interest, and his/her experience in/of the real world and society (Dewey, 1933). The Inquiry-based instructional framework is therefore always influenced by the environment and, though it is not an easy task to express all its aspects in a theory, it could be inferred that inquiry-based learning exemplifies what constructivist theories are all about (Banchi & Bell, 2008).

During inquiry-based learning, people are typically engaged in creating questions of their own, gathering evidence to answer or support answers to the question(s), explaining the evidence collected, connecting their explanations to the knowledge obtained from the investigative process, and creating an argument and justification for the explanation (Dostál, 2015). In essence, and at a very practical level, inquiry-based learning simulates what could be described as a typical research process: developing questions (ask), observing, determining existing knowledge/information (investigate), developing methods for experiments and/or instruments for data collection (create), collecting, analyzing, and interpreting data (discuss), outlining possible explanations and creating predictions for future study (reflect).

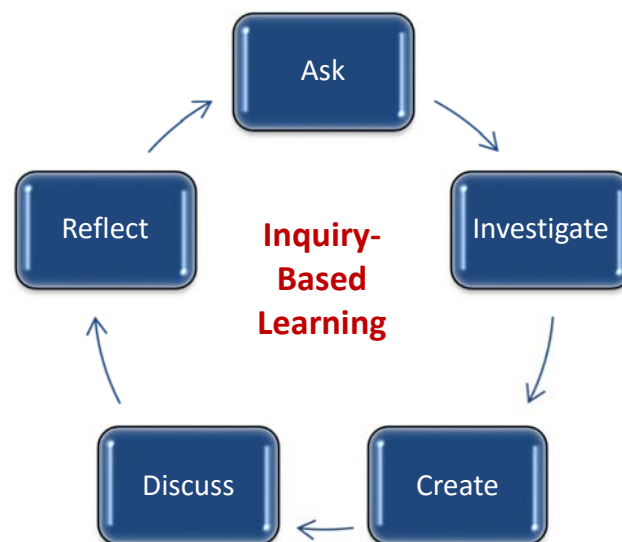


Figure 3.7: A diagrammatical presentation of the basic tenets of inquiry-based learning
(Dostál, 2015)

There are many different explanations of inquiry-based teaching and learning as well as of the various levels of inquiry that could exist within particular teaching-learning contexts. Banchi and Bell (2008), focusing on the levels of inquiry, identified what they regard as the four most critical levels of inquiry. In order of their occurrence, these are confirmation, structured, guided, and open inquiry.

Level 1 - Confirmation Inquiry: The teacher, having taught a particular science theme or topic, develops questions and procedures to guide students through an activity of which the results are already known. This method is useful as a means of reinforcing concepts taught and/or introducing students to procedures which should be followed in the collection and accurate recording and confirmation of data to deepen understanding.

Level 2 - Structured Inquiry: The teacher provides the initial question and an outline of the procedure. Students then have to explain their findings with reference to their analysis and evaluation of collected data.

Level 3 - Guided Inquiry: The teacher provides students only with the research question. They are then responsible for designing and following their own procedures in answering the question and communicating their findings and results to others.

Level 4 - Open/True Inquiry: Students formulate their own research question(s), design and follow through with a developed procedure, and communicate their findings and results. This type of inquiry is often seen in science fair contexts where students derive their own investigative questions.

Banchi and Bell (2008) suggest/recommend that teachers should begin their inquiry instruction at the lower levels, working their way up to 'open inquiry' (p.27) in order to effectively develop students' inquiry skills. Open inquiry activities are only successful if students are motivated by intrinsic interests and equipped with the requisite skills to conduct their own research.

3.2.4.1 Criticism levelled against inquiry learning

Despite the many benefits of inquiry learning, this approach, too, has its challenges. Banchi and Bell (2008) caution that inquiry-based learning requires extensive pre-implementation planning. It is not something that can quickly be put in place in a classroom. Measurements that will be used to determine and/or assess knowledge and competence against set standards must be in place. The teacher's responsibility during inquiry exercises is to support and facilitate student learning, therefore s/he must be able to detect students' weaknesses. According to Dostál (2015),

teachers often lack the ability to do so. According to him, teachers should not assume that students' assumptions and thinking processes are similar to those associated with professionals/scholars in any of the disciplines.

Kuhn and Pease (2008), while acknowledging the existence of different types of inquiry (as stated above), argue that the rigid structure of this kind of inquiry-based learning programmes almost completely rules out the possibility of any real, inquiry-based learning for younger learners ever occurring. They point out that, because each so-called 'unit of inquiry' (2008: 551) is given to the students, already structured (to guide them), there is the danger that students might not be allowed to choose their own path or topic of inquiry. The fact that units are carefully planned to connect to the topics the students are required to be learning, does not leave room for open inquiry in topics of the students' choice. For this reason, Kuhn and Pease (2008) feel that, unless the inquiry learning process is 'open', it is not true inquiry-based learning at all.

Another branch of constructivist learning, often regarded as overlapping inquiry learning, is self-directed learning, the focus of the sub-section which follows.

3.2.5 Self-directed learning (SDL)

Self-discovery learning (SDL) was systematically studied in the early 20th century, partly due to developments in the field of adult learning - adult education was only recognised as a professional field of practice in the 1920s. Before Knowles (1984) popularised the term 'andragogy', theories speculating on the educational needs and/or the identification of these for adults had already established adult learning as a distinctive field in Europe to (cf. section 3.2.1). Researchers elsewhere began to question whether andragogy was truly unique to adult education, and researchers, such as Edwards, Hanson, and Raggatt (1996), argued many of the characteristics ascribed to adult students were also applicable to children – intrinsic motivation to learn, for instance – and that children's experiences were, in certain situations, richer than those of adults. Emerging from observations like these was the argument that learning should

not only focus on the maturity of the student, but also on the situation in which s/he chooses to learn (self-directed learning). Put differently, self-directed learning (SDL) seems to be dependent on the readiness of a student, and the content and context of learning rather than on the student's age. Tough (1971), who conducted pioneering work on SDL, found that an adult typically spent around 500 hours a year on intentional learning projects outside formal education. Subsequent research focused on instructional design for adult students (analysing students, identifying relevant resources, selecting instructional formats and evaluating learning outcomes) and adult learning processes (including student characteristics, the learning context and the nature of learning itself) (Manning, 2007). Emerging from these studies was the realization that without self-directed 'lifelong learning' the human race might not be able to cope with the challenges posed by the 21st century Information Age.

SDL comprises three overlapping, intimately connected, dimensions - self-management, self-monitoring, and motivation (Brookfield, 1994).

- **Self-management** focuses on the social and behavioural implementation of learning initiatives, that is, on external activities associated with the learning process.
- **Self-monitoring** addresses cognitive and meta-cognitive processes, monitoring the repertoire of learning strategies, raising awareness of the importance of being able to think about our thinking.
- **Motivation** plays a significant role in the initiation and maintenance of a commitment to learning and the achievement of cognitive goals.

Definitions of self-directed learning are, however, mostly ambiguous. Some authors (Grow, 1994; Tomei, 2005) emphasize personal characteristics as an aspect of SDL. Song and Hill (2007) stress the importance of process and/or context, while Knowles (1975) emphasizes students' accepting the responsibility for their own (self-) learning by taking the initiative to identify their particular learning needs, setting their own goals, determining and locating the resources they need, and evaluating the outcomes of their learning endeavour. Grow (1994) equates any increase in

knowledge, skill, accomplishment or personal development brought about by an individual's own efforts – selecting the methods, circumstances, time, goals, resources, etc. – as SDL. According to him, the essence of SDL lies in the fact that it is personally initiated and driven, regardless of the circumstances of the person/s concerned and/or the range of challenges that different individuals will have to overcome in pursuit of their goals.

Implied in all these perspectives on SDL are its key features as envisaged by Knowles (1975) that in and through SDL (a) human beings would not only realize the importance of self-direction as an essential component of maturing but would enable them to develop this capacity; (b) learning experiences would be organised and acknowledged as task accomplishments, and (c) adult learners, of whatever age and circumstance, would be motivated by internal incentives, such as the desire to achieve, to develop personally, or to grow emotionally/spiritually, etc.

Informed by ongoing research on and experimentation with SDL, Manning (2007) lists several characteristics of adult students which could guide lecturers in their planning and organization of self-directed learning activities, taking cognizance of students' backgrounds and aspirations. Included in these characteristics are that adult students':

- learning, or the forms learning takes, may not be continuous;
- learning goal is usually concrete;
- in pursuing SDL, adopt a unique learning style and employ a range of strategies, and
- tends to prioritize the acquisition of the ability to cope with particular situations rather than the general principle regardless, hence the need for specific SDL goals.

The significant role of motivation and volition in initiating and maintaining students' efforts is acknowledged in SDL. Brookfield (1994) emphasizes the fact that motivation drives the decision to participate while volition sustains the will to see a task through to the end, so that goals would be achieved. In SDL, Brookfield (1993) points out, control gradually shifts from lecturers to students. Students therefore exercise a great deal of independence in setting learning goals,

deciding what is worthwhile learning, and how to approach the learning task within a given framework. Lecturers scaffold learning by making learning visible and, to that extent, they framework learning strategies and work with students so that they develop the ability to use these on their own. In that sense, SDL is, ironically, highly collaborative (Brookfield, 1994).

The benefits of SDL are best described in terms of the type of student it develops. Brookfield (1993) points out that first, SDL students demonstrate a greater awareness of their responsibility to make learning meaningful, and to monitor themselves. Next, they are curious and willing to try new things, and to view problems as challenges; they desire change, and enjoy learning; they are motivated and persistent, independent, self-disciplined, self-confident and goal-oriented.

3.2.5.1 Criticism levelled against self-directed learning (SDL)

Despite the fact that SDL is valued, it has been subject to intense scrutiny and stringent criticism. Brookfield (1994), for example, criticizes it for being developed from a Western, white, male, North-American worldview, assuming that it would be appropriate and applicable to all and sundry. She warns, moreover, that the over-identification of adult education researchers and practitioners with SDL is unwise due to its inadequate theoretical base. In this regard, she points out that research on SDL has been stalemated in recent years because of the absence of a consistent theoretical base and continued confusion, possibly due to the use of a research instrument (by many SDL researchers) which is difficult to use with certain groups without appropriate validation.

Despite these reservations, it seems that self-directed learning is increasing in popularity. Two reasons given for this are the rich formal and informal learning materials available online and that fact that, since we live in the “age of information” and focus on 21st century teaching and learning, self-directed learning is a particularly apt response to critical thinking and reflection.

3.3 SUMMARY AND CONCLUSION

There is no single theory of adult learning that captures all aspects of how adults acquire knowledge. However, different theories of learning, and particularly of adult learning, complement each other, creating a better understanding of the distinctive manner in which adult students learn. In this chapter, the work of Malcolm Knowles, John Dewey, Piaget, Vygotsky and Bruner, as well as aspects of inquiry and self-directed learning in the context of adult learning provided me with a theoretical foundation for the interpretation of my empirical findings, presented in Chapter 6.

Table 3.9 offers a brief summary of the adult learning theories which were discussed in this chapter.

Table 3.9: An overview of approaches to adult learning theories

THEORY	OVERVIEW	IMPLICATIONS
<i>Malcolm Knowles: andragogy</i>	<ul style="list-style-type: none"> • Proposed a distinctive adult education theory in terms of curriculum and methodology • Adult learners bring a repertoire of experience to the classroom • The role of the lecturer is to facilitate 	<ul style="list-style-type: none"> • Instructors must assume the role of the facilitator rather than a lecturer • The lecturer is a mentor as well as an accessible reference • The lecturer provides an adult learner with a support system • Scaffolding is utilized to gradually diminish the support of the lecturer • Adult students are best resources for one another

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Table 3.9 (continued)

THEORY	OVERVIEW	IMPLICATIONS
<i>John Dewey & Lev Vygotsky: social constructivism</i>	<ul style="list-style-type: none"> • Social contexts of learning and knowledge assimilation • Learning through discovery • Social collaboration and individual contextualizing 	<ul style="list-style-type: none"> • Represents a radical break with both exogenic and endogenic orientation to knowledge • Favours communal as opposed to individualist value investment • Views teaching as more than providing information and checking to see if learners have acquired it
<i>Jean Piaget & Jerome Bruner: individual cognitive constructivism</i>	<ul style="list-style-type: none"> • Active construction of knowledge through the schemata • Interface between mind and environment towards assimilation, accommodation and equilibrium • The student demonstrates using of posters and use language to facilitate learning and teaching 	<ul style="list-style-type: none"> • Aims to assist students in assimilating information to existing knowledge • Places greater importance on strategic that help students to actively assimilate and accommodate new material • Learning is self-motivated
<i>David Kolb: experiential learning</i>	<ul style="list-style-type: none"> • Interaction between prior learning and new information • Students' life experiences, education and work pave a way to understanding new knowledge • Learning involves a student as a whole and his/her experiences 	<ul style="list-style-type: none"> • Students will self-evaluate their own progression in the learning process • Students will be allowed freedom in the classroom • Students will be involved in problems that are practical, personal and social • Students will learn from the learning process and become open to change • Students often will need to be involved with difficult and challenging situations while discovering

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Table 3.9 (continued)

THEORY	OVERVIEW	IMPLICATIONS
<i>Inquiry-based learning (Dewey, Piaget, Vygotsky)</i>	<ul style="list-style-type: none"> • Emanates from a question, problem, issue or explanation • Gives students the opportunity to communicate through a myriad of media 	<ul style="list-style-type: none"> • Leverages students’ personal interest and prior knowledge • Students experience with activities like problem-based learning • Students connects course content to their lives
<i>Self-directed learning (Knowles, Brookfield)</i>	<ul style="list-style-type: none"> • Associated with critical thinking, improved understanding and decision making • A proactive approach to learning • Decreased lecturer control is accompanied by increased student responsibility 	<ul style="list-style-type: none"> • Students are motivated and can exercise self-management and self-monitoring • Students self-monitors progress • Students self-identifies sources and manages their learning

Using the insight I gained from my review of literature in this Chapter, I discuss literature on 21st century teaching in Chapter 4, contextualizing it in critical reflective teaching and learning practices.

CHAPTER 4

PREPARING STUDENTS FOR 21ST CENTURY TEACHING

4.1 INTRODUCTION

Teaching practice is an exercise that is carried out by most teacher education schools, both in South Africa and the rest of the world. Such training is considered valuable and necessary to ensure the provision of effective teachers (Marshall, 2016) to the education system. Not only does it afford student teachers the opportunity to try out some of the ideas which have been developed at university but also to experiment with different approaches, techniques and strategies of teaching typically used in their methodology subjects. To this end, teaching practice in the 21st century is considered to be one of the most influential and vital aspects of pre-service teacher education.

Perry (2013) emphasizes that it is in teaching practice that student teachers are ‘baptized’ into the experience of going about the complex and many tasks involved in actual classroom practice. In as much as teaching practice is important to the preparation of pre-service teachers, it is not an easy task. According to Sherman (2013), teaching practice is the most challenging and difficult experience that student teachers have to go through during their teacher education programme. In acknowledgement of the problematic and challenging nature of teaching practice, researchers have in recent years increasingly focused on determining ways in which current gaps between teaching practice and teaching theories could be bridged as well as on how teaching practice could best be used for professional development and the ability to respond to the demands of 21st century societies (Sellars, 2014).

In this chapter I discuss the preparation of students for critical reflective teaching; the advantages of using critical reflective teaching; a 21st century teaching practice curriculum aimed at preparing student teachers for reflective classroom practices in schools; the characteristics of 21st century

teachers; the teaching of 21st century skills to learners, the assessment of 21st century skills, and the use of information and communications technology (ICT) in 21st century teaching practice.

4.2 PREPARING STUDENTS FOR CRITICAL REFLECTIVE TEACHING

Teacher education programmes are intended to help novice teachers become more aware of their decision-making processes and to determine the effect of their decisions on the context in which they are implemented (Perry, 2013). The final portion of student teachers' professional preparation is aimed at providing them with sufficient real-life experiences which allow them to explore teaching styles and methods, to connect practice and theory, to become familiar with the demands of teaching, and to acquire the values and skills they need to function adequately in such settings. Since the classroom is the arena within which student teachers will presumably spend a major portion of their work lives, it seems reasonable to include experience of this sort as a prelude to their professional activities (Perry, 2013).

Teacher education programmes usually include extensive field practice before student teachers take on their full teaching responsibilities. These field practices help them to analyse different types of teaching methodologies and strategies as they proceed with their training. It is therefore crucial that reflective inquiry should start/begin at this training stage, since the benefits associated with this kind of self-inquiry are immensely valuable to student teachers (Graig & Deretchin, 2008). According to Lyons (2010), the inclusion of reflective inquiry in teacher education curricula equips student teachers with the pedagogical skills and habits necessary for self-directed growth, and prepares them, collectively and individually, for their participation as full partners in educational practices. Their teaching will then take place in accordance with the rationale for responsible professional practice which requires constant renovation. However, if they do not proceed from a stage where practice is mechanical, and do not learn from their experiences in and during classroom teaching practice, relating these to relevant theories, their practice will never be considered professional.

Figure 4.1 depicts a reflective model of professional development in which a student teacher's professional competence is portrayed as the result of theoretical knowledge acquired in an education programme in which theory is blended with extensive practical experience.

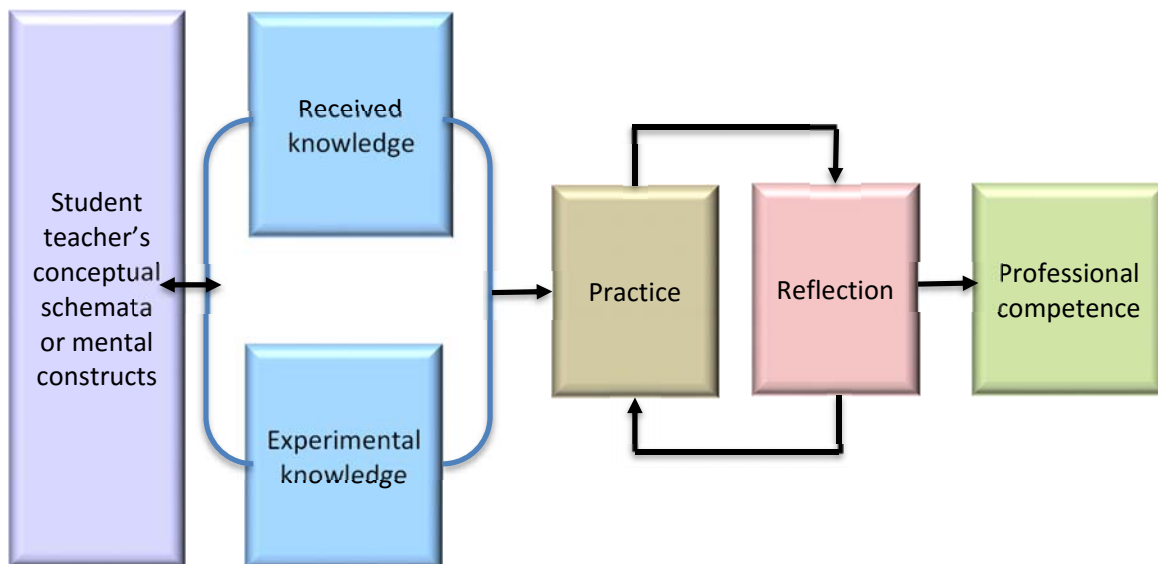


Figure 4.1: A blueprint of a model of professional development for student teachers

(Jiang, 2012)

According to Moon (2006) and Lyons (2010), a teacher education course, as outlined in Figure 4.1 should include two kinds of knowledge for it to be ideally and professionally structured:

- **Received knowledge:** Here the student teacher becomes acquainted with the matching concepts and the vocabulary of research findings, subjects, skills and theories which are widely accepted as being part of the necessary intellectual content of the profession, and
- **Experiential knowledge,** where the student teacher will have developed knowledge-in-action by practice of the profession and will have had, moreover, the opportunity to reflect on that knowledge-in-action (Schön, 1983). In this case, experiential knowledge is not limited to practising the received knowledge. It also includes reflecting on what is done.

Reflective teaching is not simply doing what you are being told to do. The practitioner should really ‘dig in’ and investigate why something is wrong to make intelligent changes to the teaching procedures (Dewey, 1987). This understanding will interconnect experiential knowledge and received knowledge, making the link mandatory for the professional practice. The relationship between practice and reflection should be continuous, allowing for reflection both after and before practice, producing a lifelong professional relationship through professional development. The Pedagogical Content Knowledge (PCK) and the Content Knowledge (CK) in Figure 4.2, form part of the framework of teaching and learning. The latter includes the facts concepts, theories and principles that are taught and learned in specific academic courses, while PCK is the integration of subject expertise and skilled teaching of that particular subject (Darling-Hammond, 2006).

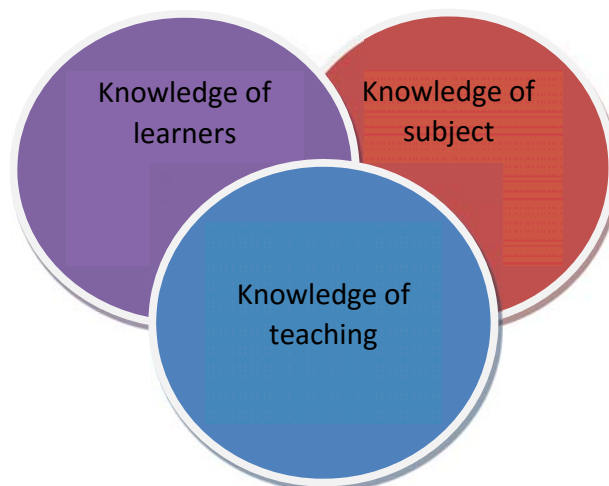


Figure 4.2: A Framework for understanding teaching and learning

(Darling-Hammond, 2006)

Importantly, at this stage one needs to ask, ‘What will a curriculum based on teaching critical thinking and reflection comprise, and what are the practical implications of implementing such a curriculum?’ The next section sets out to answer these questions.

4.3 THE 21ST CENTURY TEACHING PRACTICE CURRICULUM IN PREPARATION FOR REFLECTIVE CLASSROOM PRACTICES IN SCHOOLS

A curriculum is essentially a roadmap or design for learning and, as such, it focuses on skills and knowledge that are judged important to learn (Conklin, 2011). A 21st century curriculum, then, would be one that blends innovation and reflective thinking skills; media; information and ICT literacy, as well as life and career skills in the context of core academic subjects and across interdisciplinary themes (Sherman, 2013).

The overarching purposes of a twenty-first century curriculum, both for student teachers and for schools, are to strengthen civil society and participative democracy, to promote social cohesion and individual development, to develop environmental sustainability and economic prosperity, and to prepare learners for active global citizenship. These national purposes underpin an understanding of the role that education needs to play in ensuring that all young people are prepared for life in the twenty-first century. A curriculum for the twenty-first century should therefore enable all students to gain an understanding of the factors that shape societal, belief, and economic systems and to develop the personal skills and qualities required for them to be informed and responsible participants in a society that is becoming increasingly global in nature and diverse in outlook and composition (Erikson, 2008).

The success of a 21st century curriculum will, however, be dependent on what is experienced by students in and out of classrooms. Curriculum statements need to be responsive and flexible to design for diversity so that student teachers and practising teachers alike can tailor their learning experiences to the needs and interests of learners (Conklin, 2011). The changing demographics of the learner population nationally, coupled with the rapid advances in technology, imply that student teachers should be prepared to play an active role in organizing and developing instruction and content for their learners (Rhoton & Shane, 2006). A 21st century approach to curriculum is about more than just adding an extra class or extra course time to the programme.

Student teachers should acquire the ability to fully apply the knowledge they gained during their training programme to their delivery of school curricula. By implication, they should have a deep understanding and mastery of academic subject knowledge and 21st century skills. To be compatible with 21st century teaching and learning, teacher training curricula should blend innovation, thinking skills, literacy in Information and Communications Technology (ICT), career and life skills in the context of all academic subjects and across interdisciplinary themes (Good, 2008). Moreover, teacher education curricula should be designed to enable student teachers' authentic application and deep understanding of 21st century skills in all subject areas.

Teacher education programmes, then, play an important role in preparing students to design instructions that address both skills and content so that their future learners will learn well. These programmes should offer important, structured opportunities for student teachers to learn how to design learning outcomes for their learners, plan curricula, organise daily practices and evaluate their own and their learners' successes along the way. In short, 21st century teacher education programmes could play a key role in helping all prospective teachers learn, practice, develop, refine, and assess instructional activities for learners (Sellars, 2014). It goes without saying that these idealistic goals will be rendered useless unless reflective thinking and practice form the foundation of their training programme. To this end, they have to be trained in the use of so-called 'tools' (Anderson, 2004) deemed to be necessary to the implementation of a quality teacher training programme. Some of these 'tools' are scrutinised in the section which follows.

4.3.1 Tools for reflective practices

There are too many reflective practice tools to discuss in detail, and therefore, for the purpose of this research project, the emphasis is on micro-teaching and teaching practice, visual imagery integration, reflective journals and e-portfolios.

4.3.1.1 *Micro-teaching and teaching practice at schools*

During teaching practice periods at schools, peers and/or mentor lecturers, or mentor teachers with teaching experience, may choose an object or skill for reflection and have the student teacher or mentee present while audio-recording the lesson. In so doing they can observe the lesson together with the mentee, analyse it, and provide detailed feedback in a way that would stimulate the mentee's reflective thinking (Pultrorak, 2012). This is a good example of action research, where data are collected and the mentee embarks, with the help of the mentor, on a self-reflective, critical and systematic approach related to the ideas of reflective teaching (Pollard, 2002). This type of reflection allows the mentee, and even the experienced teacher, to explore his/her own teaching context in order to bring about positive changes and improved teaching and learning practices. It is, however, important that reflection is not done in an arbitrary fashion – there should be a set of criteria according to which the skill would be practised and subsequently analysed.

The use of peer and/or mentor teacher observations assists in the exposure of each party's teaching styles and provides them with opportunities to critically reflect on their own teaching (Kolb, 2014). Moreover, the observation of each other's lessons will provide them with opportunities to learn from and reflect on how other teachers manage and arrange their teaching and learning procedures, how they ensure the smooth running of their classrooms activities, how they teach, and what the nature of the relationship between the learners and the teacher is.

4.3.1.2 *Visual imagery integration*

In reflective teaching, visual images such as models, posters, photos and real-life objects enable teachers to form a clear picture of what is to be taught and how to proceed with the teaching process. During the learning process, visual imagery - integrated with reflective teaching methodology – supports the thought processes of learners, helping them to retain information by rearranging ideas to create meaningful concepts and organising information from their notes

and textbooks (Jared, 2016). Moreover, visual imagery provides learners with ways to recode information into their long-term memory for retention purposes (MacClosky, 2009). The input from visual stimulation activates the schemata and induces advanced thinking skills in learners (Pollard & Colwell, 2015). The implementation of, for example, Bloom's taxonomy in conjunction with visual imagery will set learning and thinking at the highest levels possible (Jared, 2016).

4.3.1.3 Reflective journals

As reported in Chapter 2, a variety of approaches to reflective teaching have been developed over the years. These include written accounts of personal experiences, individual journal writing, peer observation, diaries, autobiographies, learning logs, and self-reports (Hillier, 2009; Jiang, 2012; Kolb, 2014; Pollard & Colwell, 2015). A reflective journal, also called a portfolio, is defined by Pultorak (2010) as an evolving collection of carefully composed professional thoughts, objectives and experiences that are threaded with assessment and reflection. Reflective journals represent who the student teacher is, what s/he does, why s/he does it and where his/her professional reflective journey has taken him/her (Schutz & Bulman, 2013). In short, a reflective journal provides the student teacher with an opportunity to embark on a holistic assessment of different aspects of his/her professional development.

In 1994, Arredondo and Rucinski conducted a study which looked at the effects of incorporating reflective journals into a workshop approach to graduate and undergraduate teacher education courses. Four key components, which included reflective journals, were investigated. A sample of 69 participants of student teachers participated in the study and data were collected by means of a questionnaire with seven closed-ended items and three open-ended questions, all of which were aimed at soliciting student teachers' perceptions of the effects that the reflective journal had on their individual learning (Henter & Indreica, 2014). Findings indicated that the reflective journaling process fostered much-needed metacognitive skills in students (Arredondo & Rucinski 1994).

In a study conducted in Malaysia, 42 student teachers had their reflective journal entries studied post their teaching practicals at schools. Approximately 77% of them stated that the reflective journal assisted them in evaluating their teaching and learning methods, helped them to identify their strengths and weaknesses, and made them more self-aware of their teaching (Howatson-Jones, 2016). Based on these findings, the researchers recommended that student teachers should be encouraged to use a reflective journal and that training should be provided on how to use these as a tool for reflection (Howatson-Jones, 2016). Johns (2013) lists five possible categories that could be included in the reflective journal:

- The subject expertise of the (student) teacher which includes, amongst others, content knowledge of the subject, how s/he transforms his/her knowledge into a form comprehensible to learners, and how s/he uses subject knowledge to generate explanations.
- The skills and competencies of the teacher, for example, his/her ability to perform complex pedagogical duties, to be well-spoken, his/her communicative and observational skills, leadership skills, and so forth.
- Classroom management skills, such as the ability to establish caring, supportive relationships with and among learners, promote the development of learners' social skills and self-regulation, encourage learners' engagement in academic tasks, etc.
- Participation in professional development, that is, in activities like workshops, qualification programmes, individual/collaborative research, mentoring and/or peer observations, and coaching.
- The relationship between the teacher, his/her colleagues and all other stakeholders - developing nurturing, positive relationships with his/her colleagues and the parents and community at large, for example. In so doing, there would be an exchange of ideas and improved understanding of learning and classroom instruction.

Reflective journal-keeping can be very productive, forcing (student) teachers to express their thoughts and beliefs about classroom events. Not everyone, however, enjoys the process of journal writing. In fact, as Bolton (2014) points out, compiling a reflective journal is a daunting,

on-going and time-consuming task and its contents should constantly be updated and revised according to set objectives. In this regard, Moon (2006) suggests a potentially helpful journaling process for a student teacher to develop his/her reflective capacity. He suggests that the student should provide a personal teaching experience account, detailing feelings and events about his/her (current) teaching experiences in the reflective journal, identifying common patterns and significant events in the reflective journal, and analysing any important factors that may have had an impact on him/her.

4.3.1.4 *e-Portfolios and teacher education*

An extension of conventional portfolios is Frank's and Liebowits's (2016) notion of an e-portfolio - a digital container cable which can store different text types (auditory material, visual material, images, text and sound) designed to support a variety of teaching and learning activities. Put differently, an e-portfolio is an electronic collection of evidence collected over a certain period of time and, according to Johns (2013), provides the student teacher with a dynamic workspace in which to capture learning ideas for reflection on teaching and learning and/or to set goals and receive feedback on their achievement or not.

4.3.1.4.1 *The uses of e-Portfolios*

According to Rowley (2016), there are basically four reasons to create e-Portfolios: student self-evaluation, show-casing of student teachers' work, course evaluation purposes, and employment seeking. At the very least an e-Portfolio will set a student teacher apart from those who do not have one. At best, it will illustrate a high degree of knowledge, competence and professionalism and is said to be the magic ingredient in a successful search for employment.

Having discussed important tools for reflection and reflective teaching in post-modern curricula, it is important to also take cognisance of curriculum design and delivery elements. The focus of the next section is therefore on elements critical to 21st century instructional models.

4.3.2 Design elements for 21st century teaching and learning activities

Instruction is the means by which learning will be achieved. Twenty first century instruction integrates research-verified and innovative teaching strategies, modern learning technologies and real-world contexts and resources (Rowley, 2016). According to Henter and Indreica, (2014), teacher training programmes should therefore consider the following in the design of classroom teaching and learning activities.

- **The importance of rich practical experiences.** There is widespread agreement on the need to construct rich clinical experiences for student teachers since allow them to connect theory with practice.
- **Skills Integration:** When student teachers are fluent in delivering and developing lessons which connect the most essential skills and concepts that learners need to know, they should integrate appropriate technologies and skills acquisition (such as problem-solving and critical thinking) into their lessons.
- **The role of pedagogy, content and technologies in developing higher order thinking skills:** The ability to teach for content mastery, while also developing 21st century skills among learners, is a challenging proposition for most student teachers.

Researchers such as Good (2008), Giroux (2010), and Frank and Liebowits (2016) have distilled the essence of authentic learning experiences into ten principal design elements, providing prospective teachers and practising teachers with a useful checklist that can be adapted to any subject matter domain. Table 4.1 illustrates the aspects which should be considered in the design of learning experiences.

Table 4.1: Design elements of learning experiences for learners of the 21st century
(Lyons, 2010)

Design elements		Learning experiences for learners of the 21 st century
1	Real-world relevance	Learners work actively with facts, abstract concepts and formulae in a realistic and highly social context, mimicking the ordinary practices of the culture.
2	Ill-defined problems	Activities are relatively undefined and open to multiple interpretations, requiring the learners to identify for themselves the tasks and subtasks needed to complete the major task.
Design elements		Learning experiences for learners of the 21 st century
3	Sustained investigation	Activities comprise complex tasks to be investigated by learners over a sustained period of time, requiring significant investment of time and intellectual resources.
4	Multiple sources and perspectives	Activities provide the opportunity for learners to examine the task from a variety of theoretical and practical perspectives, using a variety of resources. Activities require learners to distinguish relevant from irrelevant information in the process.
5	Collaboration	Activities make collaboration integral to the task, both within the course and in the real world.
6	Reflection (metacognition)	Activities enable learners to make choices and to reflect on their learning, both individually and as a team or a community.
7	Interdisciplinary perspective	Activities have consequences that extend beyond a particular discipline, encouraging learners to adopt diverse roles and to think in interdisciplinary terms.
8	Integrated assessment	Assessment is not merely summative in authentic activities but is woven seamlessly into the major task in a manner that reflects real-world evaluation processes.
9	Polished products	Activities culminate in the creation of a whole product, valuable in its own right.
10	Multiple interpretations and outcomes	Activities allow for diverse interpretations and competing solutions.

Studying 21st century teacher training curricula and methodologies begs the question: What does a 21st century teacher look like? The next section attempts to answer this question.

4.4 21ST CENTURY TEACHERS

A 21st century teacher is a person who assesses the needs and learning preferences of learners in order to achieve positive learning outcomes - including the design and delivery of smooth and effective learning experiences. Moreover, s/he is a person who thinks and behaves as a professional, interacting with different stakeholders in education, such as students/learners, staff members, administrators, teachers, parents, families, community members, local business leaders, etc. (Trilling & Fadel, 2009). The 21st century teacher looks forward to the future with confidence. S/he is aware of the ever-changing trends in technology and is not intimidated with what the future may hold in terms of education. A good 21st century teacher is aware of the career opportunities that lie in store for her/his learners, constantly advocating forward thinking and planning teaching and learning in ways that will ensure that no learner will be left behind (Wan & Gut, 2011). Lastly, a 21st century teacher uses teaching strategies that that on preparing today's learners for the future. Table 4.2 represents a summary of six key elements of 21st century learning that the teacher should integrate in all her/his teaching and learning activities.

Table 4.2: Six key elements of 21st century learning
(Bolton, 2014)

SIX KEY ELEMENTS OF 21 ST CENTURY LEARNING	LEARNING OUTCOMES
<i>Emphasize core subjects</i>	English, mathematics, science, reading or language arts, foreign languages, government, civics, arts, economics, geography and history
<i>Emphasize learning skills</i>	<ul style="list-style-type: none"> • Communication and information skills • Problem-solving and thinking skills • Self-directional and interpersonal skills
<i>Use 21st century tools to develop learning skills</i>	ICT (Information and communication technology) Literacy
<i>Teach and learn in a 21st century context</i>	Learners learn school content through real-world examples, experiences and applications both inside and outside of school
<i>Teach and learn 21st century content</i>	<ul style="list-style-type: none"> • Global awareness • Economic, business and financial literacy • Civic literacy
<i>Use 21st century assessments that measures 21st century skills</i>	High-quality sophisticated assessment at all levels using new information technologies

4.4.1 Changes in teacher behaviour

It is important for student teachers to be prepared for the fact that, just as the classroom is changing, so should they, as teachers, adapt their responsibilities and roles. They should no longer teach in total isolation; rather, they should co-teach, team teach and collaborate with other teachers and departments, accepting that they are not the only ones responsible for learners' learning. Other stakeholders, including members of School Governing Bodies (SGBs), parents and the learners themselves, all share the responsibility to educate the learner with the teacher (Good, 2008). Teachers must realize that learner engagement is critical to learning and that they should, therefore provide instruction that creates opportunities for such engagement by using a variety of instructional methods and technologies.

By implication, teachers should keep abreast of what is happening in their field. As lifelong learners, they should themselves be active participants in their own learning, seeking seek out

professional help/support when necessary in order to their own performance and the development of the learners in their care (Trilling & Fadel, 2009). The new roles attributed to teachers in 21st century classrooms require changes in their classroom behaviour, knowledge bases, and attitudes.

4.4.2 Characteristics of 21st century teachers

Teachers work in an environment characterized by uncertainty and change, and sometimes this change can be paradoxical. The paradox lies in the fact that teachers are expected to develop in learners the skills, capacities and attributes that will enable them to succeed and prosper in a knowledge-oriented society while, at the same time, being expected to mitigate and counteract, to an extent, the problems emerging from an increasingly globalized economy (Zhu & Zeichner, 2013). The notion of teachers being in the service of society and also the individual situates their work within an ethical framework which resonates readily with the moral purpose which should direct all professional endeavours in the field of education. In short, education must contribute not just to the individual's well-being but also to the 'common good' (Rhoton & Shane, 2006: 71). The importance of creativity, both as a theme and a pedagogy that underpins the educational experiences of learners, is regarded by educationalists as fundamental to the learning and teaching process. With this in mind, theorists have identified a number of role functions that, if effectively performed, could enhance teachers' professional autonomy (at individual and collective levels) and encourage innovative and creative approaches to teaching which, in turn, should result in the development of learners' ability to think creatively (Good, 2008). In fact, the ability to think creatively, as well as the innovation it stimulates, is central to any modern education system that has the enhancement of young people and children's life chances as purpose. These roles are outlined in the sub-sections which follow

4.4.2.1 Communicator

21st Century teachers should be effective communicators, skilled in the use of tools and

technologies that enable collaboration and communication. They should also know how to facilitate, moderate, manage, stimulate, and control communication (Bybee, 2010).

4.4.2.2 Adaptor

Harnessed as teachers are to assessment-focused education models, the 21st century teacher should be able to adapt the curriculum and its requirements to the use of modern digital tools. They should be able to adapt hardware and software designed for business models into tools suitable to the education of children with different abilities and belonging to different age groups (Marshall, 2016). As 21st century teachers, they should be able to adapt their teaching styles to the needs and preferred learning styles of their learners, the contexts in which they teach and the demands of the subject concerned. Teaching should be a dynamic experience: when everything seems to be going wrong in the middle of a lesson, for example if the technology fails, teachers should be able to let the 'show go on', so to speak.

4.4.2.3 Learner

Teachers expect the children in their classes to become life-long learners, therefore they (the teachers) should set the example by continuing to acquire knowledge and experience to stay on the cutting edge of new developments. Understanding, knowledge and technology are dynamic and fluid, constantly changing and evolving. Teachers should not rigidly stick to unit and lesson plans prepared five years earlier; instead, they should learn, change and adapt in response to ever-changing landscapes and horizons (Rhoton & Shane, 2006; Good, 2008). In other words, the 21st century should also be a lifelong learner.

4.4.2.4 Visionary

The 21st century teacher looks beyond the curriculum and across disciplines, constructing associations and links that add value to and/or reinforce learning in the subject they teach as well

as in other subject areas and/or life contexts. S/he sees the potential inherent in emerging web technologies and tools, and then grasps and manipulates them to serve her/his own and her/his learners' needs (Anderson, 2004; Wan & Gut, 2011). Vision and imagination are thus crucial features of the teacher of today and tomorrow.

4.4.2.5 Leader

The 21st teacher is not a follower but a leader: s/he leads by example. Leaders break new ground, usually following a hunch, an ideal or a vision. They like clear objectives and goals and having these are critical to the success or failure of 21st century teaching. 21st Century teachers must have the skills, incentives, vision, action plans and resources needed to educate successfully (Wan & Gut, 2011). They should be subject experts, often counsellors and frequently administrators as well. One can argue that these characteristics have always been the determinants of outstanding teachers; they are by no means new, 21st century roles. However, these roles will become even more critical as the need arises for new levels of creativity to meet progressively complex educational requirements.

4.4.2.6 Collaborator

The 21st century teacher should be able to leverage electronic media to entice and captivate the attention of learners, especially those learners who would normally be reluctant to participate, discuss, argue and debate (Wan & Gut, 2011). The 21st century teachers should, moreover, make it a point to contribute to and/or collaborate with their fellows or other experts in the many online communities. In the sense that the teacher refocuses discussions, shapes conversations and leads by example, s/he simultaneously performs the multiple roles of facilitator, moderator and referee (Anderson, 2004).

4.4.2.7 Model

Teachers should model the behaviours that they expect from their learners, including reflective practice by personally promoting their own learning and teaching and/or by engaging in reflective practice on social media - Facebook, YouTube, Twitter, blogs, etc. (Trilling & Fadel, 2009). Teachers are often the most consistent role model in a learners' life given that they probably see them more often and/or spend longer periods of more time with them than the children's parents do. The 21st century teacher should therefore model the attitudes and values critical to their learners' participation and survival in a global world, attitudes and values like tolerance, reflective practice and critical awareness of global opportunities and risks.

4.4.2.8 Risk taker

The 21st century teacher takes risks and is prepared to tap into learners' thirst for knowledge of technology. With a vision of what s/he wants and what technology can achieve, s/he could identify desirable goals and facilitate effective learning (Marshall, 2016; Zhu & Zeichner, 2013). Teachers could spur on their learners to teach each other, and to use the strengths of digital natives to navigate and understand new products, full trusting their learners' abilities to accomplish this.

Having outlined the characteristics of 21st century teachers, the subsequent section deals with the question of how teachers should teach 21st century skills.

4.5 TEACHING 21ST CENTURY SKILLS TO LEARNERS

It is crucial for student teachers to be prepared to equip their learners with the requisite 21st century skills. There are decades of empirical research on how individuals learn and substantive critical lessons on the best way to teach learner vital to an ever-changing world (Good, 2008;

Forrest, 2008; Johns, 2013; Harland & Wondra, 2011). Recent research findings and lessons learnt from these are focused on how learners acquire 21st century skills and how pedagogy could address their needs in this regard. Many of the studies or lessons particularly highlight the transfer of metacognitive, technological, creative, and teamwork skills characterizing life and work in the 21st century (Bolton, 2014). Some of the ways in which these could be taught are described in the sub-sections which follow.

4.5.1 Relevance

To be effective, a curriculum must be relevant to learners' lives. Transmission and rote memorization of factual knowledge would therefore be irrelevant. Teachers need to begin with generative (procreative) topics in order to make curricula relevant. Generative topics have an important place in interdisciplinary or disciplinary studies and resonate with both teachers and learners (Bolton, 2014). Teachers could choose generative topics by asking themselves questions like; 'Am I passionate about the topic myself?' 'If so, why?' 'How does this topic connect to the reality of my learners' lives and interests?' 'Are there better ways to frame this topic to make it truly engaging for my learners?'

4.5.2 Teaching through disciplines

Learning through disciplines entails learning not only the knowledge of the discipline but also the skills and knowledge associated with the *production* of knowledge within the discipline. Through instruction in a disciplinary curriculum, learners should learn why the discipline is important, how experts communicate about it and how they create new knowledge (Marshall, 2016). Each of these steps is closely aligned to the development of 21st century knowledge and skills. Learners need to understand the big picture, how pieces fit into it and why it matters in order to appreciate the relevance of a given generative topic. Johns (2013) argues for the imperative to explicitly relate every lesson to the big picture of the generative topic under study, whatever that topic may be. In order to do so, they would have to collect, synthesize and distil information from

written, oral and visual primary and secondary sources. They should know which information will help them to construct an argument, where to look for information, how to interpret the information they find, how to structure complex relationships, how to account for source biases and how to contrast and compare their findings with what has already been presented as historical fact (Marshall, 2016). They must also learn how to communicate their findings, and practise communicating them to a range of diverse audiences.

4.5.3 Simultaneously developing lower and higher order thinking skills

Learners can, and should, develop higher and lower order thinking skills simultaneously. To deepen understanding, teachers might ask learners probing questions that require higher-order thinking. Conklin (2011) argues that higher-order exercises are much less common in existing curricula, while lower-order thinking activities are fairly common. Higher level thinking tends to be difficult for learners because it requires them not only to understand the relationship between different variables but also to be able to transfer or apply that understanding to a new uncharted context (Good, 2008). Higher level thinking skills take time to develop, and teaching them generally requires a trade-off of breadth for depth. Transfer tends to be very difficult for most people. However, applying new understandings to an uncharted context is exactly what learners need to be able to do in order to successfully negotiate the demands of the 21st century (Bolton, 2014). In Singapore and Finland, for instance, learners read content as homework and at school, work on problems in groups while the teacher poses thought-provoking questions and coaches them explicitly on the development of higher-order thinking instead of their having to listen to lectures at school and doing problems at home (Pultorak, 2012).

4.5.4 Teaching learners to learn

There is a limit to the attitudes, skills and dispositions that learners can learn through their formal schooling experience. Therefore, educating them for the 21st century requires teaching them how to learn on their own. They need to be aware of how they learn in order to adapt or add other ways of learning to the way they currently do. Not only is learning to learn a critical skill in itself,

but activities that develop metacognition also help learners to acquire knowledge, skills, attitudes and strategies more effectively. This could be done using metacognition, which involves learning more or reflecting on their own cognitive processes, or techniques related to these (Marshall, 2016). Teachers can develop learners' metacognitive capacity by encouraging them to explicitly examine how they think.

4.5.5 Building metacognition

Metacognition implies an understanding and awareness of one's own thought processes. In that it is a higher order thinking process, it involves active control over the cognitive processes used during learning (Pine, 2009). To develop metacognition in learners the teacher could give them activities such as planning how to approach a given learning task, evaluating progress toward the completion of a task and monitoring their comprehension of the thinking involved.

In addition to developing metacognitive skills, it is also important for learners to develop positive mental models about how they learn, to know the limits of their learning, and to identify mistakes or failures (Bolton, 2014). Although some cultures view learning capacity and intelligence as innate rather than effort-based, others believe that effort overrides innate limitations. Learners benefit from believing that learning capacity and intelligence increase with effort, and that failures and mistakes are opportunities for growth and self-inquiry rather than indictments of ability or worth (Wan & Gut, 2011).

4.5.6 Understanding teamwork as a process/procedure that promotes learning

The ability to collaborate with others is an important 21st century skill. The science of learning tells us that it is not only a desirable outcome but also an important condition for optimal learning. In typical transmission-model classrooms, learners do not learn from and with their peers. Instead, the teacher and textbook transmit information and the learner engages in a one-on-one interchange with the teacher (Bolton, 2014). Through this type of interaction, learners

lose the opportunity to learn from one another and/or to develop the skill of working with others. Learners not only learn better with peers (Bolton, 2014) but working in groups or pairs is an ideal way for them to develop their communicative and metacognitive skills, to practice low and high-order thinking skills, and to replace their misunderstandings with understandings (Good, 2008).

4.5.7 Utilising technology to support learning

Technology potentially provides learners with new ways of developing their critical thinking, communication and problem-solving skills; to transfer them to different contexts; to practice addressing their misunderstandings; to reflect on their thinking and that of their peers; and to collaborate with peers on all topics relevant to their lives as well as in using engaging tools (Bolton, 2014). There are many other examples of web-based forums through which learners and their peers from around the world share, debate, interact and learn from one another. The Internet itself provides a forum for learners' development of 21st century knowledge and skills. The nature of the Internet's countless sources, many of which contribute substantive source bias and provide inconsistent information, provide learners with the opportunity to learn to assess sources for their validity and reliability (Wan & Gut, 2011). It gives them the opportunity to practise their synthesizing skills - from legitimate sources – and to filter out information from unreliable sources. Once they know where to look for 'legitimate'/ validated information (something they must be taught to do), learners will be able to use the Internet as a reference source in countless ways. In addition to its pedagogical potential, technology could enhance education in numerous other ways, especially if teachers use it to share and develop best practices (Bolton, 2014).

4.5.8 Fostering learner creativity

A common definition of creativity is the cognitive ability to produce valuable and novel ideas (Bolton, 2014). Creativity is prized in the civic, economic and global spheres because it addresses challenges, stimulates social and individual progress, and sparks innovations that could lead to

job creation. Like learning capacity and intelligence, creativity is not a fixed characteristic that people either have or do not have. Rather, it is incremental: people, can learn to be more creative (Bolton, 2014).

Intrinsic motivation and relevance both foster creativity: if learners, therefore, view lessons as being relevant to their lives, they are more intrinsically motivated to learn and to creatively use their newfound understanding and knowledge. Therefore, the science-of-learning lesson is that by making learning relevant to learners, teachers are, by implication, developing the learners' creativity. When learners view failures as learning experiences and frame their ability to learn in a positive light, they are more open to creative development (Good, 2008). The role of teachers in this regard is to explicitly enhance learners' creativity by identifying, fostering and encouraging it. Encouragement helps learners to develop positive mental models, also in terms of their ability to become creative. Identifying creativity can help learners to recognize their own creative capacities when they might otherwise not (Pine, 2009). And, as is the case with metacognition, teaching directly about the creative process and what suppresses or animates it contributes to creative development. It follows that, since 21st century skills are more challenging to learn and teach, their assessment would also be more difficult. It is these difficulties that are the focus of the next section.

4.6 ASSESSING 21ST CENTURY SKILLS

Designing and creating tests that measure lower-order thinking skills, such as memorization, is a relatively simple, straightforward process; doing the same to assess and evaluate innovation, teamwork, leadership, teamwork and creativity skills is not (Griffin, McGaw & Care, 2012). Even so, traditional assessment categories – summative and formative assessments – are as applicable to the assessment of higher order skills than they are for skills of a lower order. Hence both remain applicable and useful for the assessment of 21st century skills.

4.6.1 Formative assessment

Formative assessment refers to a wide variety of methods that teachers use to conduct in-process evaluations of learner comprehension, academic progress and learning needs during a subject, lesson or unit (Trilling & Fadel, 2009). Table 4.3 displays some forms of summative and formative assessment typically used in teaching-learning situations. Formative assessments not only help teachers to identify skills that learners acquire with difficulty, learning outcomes not yet achieved, and concepts that learners are struggling to understand but also indicates the kind of adjustments they should make to their instructional techniques and lessons (Perry, 2013). The general goal of formative assessment is to collect detailed information that can be used to improve instruction and learner learning while it is happening. What makes an assessment formative is not the design of a test, self-evaluation or technique, per se, but the purpose for which it is used.

When incorporated into classroom practice, the formative assessment process provides information indicating how learning and teaching should change 'in action'. The process serves as practice for the learner and a check of their understanding during the learning process (Good, 2008). It guides teachers' decision-making about future or upcoming instruction, reminds learners of their learning goals, guides them to manipulate information as they need, gives them feedback on misunderstandings or progress (Bolton, 2014). Griffen, *et al.* (2013) therefore emphasize the need for ongoing formative assessment conducted by teachers, by learners themselves, and by learners' peers in order to help them identify their learning strengths and weaknesses. Formative assessment is, therefore, part of classroom practice: external assessors are not usually involved in it at all.

Table 4.3: Formative and summative assessment strategies for the 21st century

(Harris, 2006)

FORMATIVE ASSESSMENT STRATEGIES		SUMMATIVE ASSESSMENT STRATEGIES	
Analogies	Brainstorming	Unseen examination	Oral examination
Checklists	Computer surveys	Seen exam paper	Attendance
Discussions	Process exemplars	Open book or take-away exam	Participation
Homework exercises	Observations	Multiple choice test in controlled conditions	Creation of a web page
Open-ended questions	In-class activities	In-class test	Learner evaluation
Problem solving	Peer-assessments	Essay or report	Final examination
Product exemplars	Questionnaires	Portfolio	Term papers
Question and answer sessions	Self-marking quizzes	Dissertation	Projects
Self-assessments	Reflection journals	Presentation	Portfolios
Teach a friend	Learner composed questions	Performance	Performances
Discussions	Think-pair-share		

4.6.2 Summative assessment

Summative assessments are used to evaluate learner performance/competence, i.e. their acquisition of knowledge, attitude and/or skills, hence they are generally evaluative rather than diagnostic in nature (Sherman, 2013). Summative assessments are done at culminating teaching-learning points: at the end of a defined instructional period, typically on completion of a project, unit, semester, course, school year or programme (Sherman, 2013).

The results of summative assessments could be used to assess learning achievement and progress, to measure progress toward improvement goals, to make subject-placement decisions, and to evaluate the effectiveness of educational programmes (Gardner, 1993). Summative assessment results are often recorded as grades or scores which are factored into a learner’s permanent academic record or onto a report card, and/or used as selection criteria in school

admissions processes. While summative assessments are typically a major component of the grading process in most subjects, schools, and districts, not all assessments that are considered to be summative are graded.

Summative assessments give learners the opportunity to demonstrate what they understand at a specific point in time. They are useful as a means of certifying learner achievements: to assign grades or scores and to determine a learner's preparedness for further study and or to determine whether or not s/he is entitled to being awarded a certificate, diploma or degree (Bybee, 2010). They are also useful as tools with which to measure teacher, school and system performance for improvement and accountability purposes (Hillier, 2009). On the one hand, teacher-administered summative assessments require high levels of professionalism, teacher capacity and social trust. On the other hand, given their purposes, summative results and assessments need to be standardized to ensure that they serve as a common metric. In this regard, the standardization of marking criteria and tasks is particularly challenging, especially when the skills being assessed are sophisticated (Good, 2008).

4.6.3 Assessment systems that measure 21st century knowledge and skills

In recent years, policymakers, business leaders and teachers in the United States have questioned the current design of assessment systems, asking whether they do not perhaps focus too much on measuring learners' ability to recall discrete facts. This is especially a concern when multiple-choice tests are used for assessment purposes because they do not adequately measure a learner's ability to engage in problem-solving activities and other complex thinking tasks (Holton, Wilson & Bates, 2009). By implication, the gap between the skills and knowledge learners acquire at school and the skills and knowledge needed to succeed in an increasingly global, technology-infused 21st century workplace keeps on widening (Good, 2008). While the current assessment landscape is replete with assessments that measure knowledge of core content areas such as mathematics, science, language arts and social studies, there is a comparative lack of analysis and assessments focusing on 21st century skills and knowledge

(Good, 2008). According to Fraenkel and Wallen (2014), training programmes for teachers should be aimed at developing education leaders who understand and can influence current trends in assessment, particularly assessments focusing on 21st century skills and knowledge. Programmes like these should, amongst other things, serve as evaluation tests and/or as points of departure for research on innovative approaches to learner measurement, integrate 21st century skills and knowledge assessment strategies as key components of the programme assessments and curriculum, and ensure mastery of a wide range of learner assessment methods to evaluate 21st century learners' skills and knowledge.

Assessment is a field in its own right and there is certainly much more that can be said about quality and relevant assessment techniques and practices for future learners in a fast-changing global educational landscape. These reflections are, however, not part of this study. Another equally important aspect to consider in 21st century teaching practice is the role of Information and Communications Technology (ITC), which is subsequently discussed.

4.7 INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) IN THE TEACHING PRACTICE CURRICULA OF THE 21ST CENTURY

According to Marshall (2016), the term ICT is a collective and all-encompassing concept which refers to a great many technologies, including the full gamut of electronic tools by means of which we store, gather and record information, and by means of which we distribute and exchange information to others. (Organisation for Economic Cooperation and Development [OECD], 2008). ICT integration in teaching practices and teacher education is a complex process. Reflective teaching and reflection are related approaches that have been very fashionable in teacher and adult education circles in the United Kingdom (UK), Australia and the USA (Henter & Indreica, 2014). To prepare learners for the future, teacher education programmes must, therefore, ensure that student teachers are equipped for the future world of technology as well. By implication, policy developers and curriculum experts themselves are challenged to revise teacher preparation programmes so that they reflect the needs of 21st century students and, at

the same time, produce teachers who are able to comfortably and effectively use technology to enhance the learning in their future classrooms.

In this regard the findings of a pilot study conducted by Karsenti (2007) on 800 student teachers in the province of Quebec, Canada, is quite significant. First, the researchers found that communication and information technologies seem to help student teachers overcome a great array of the teaching difficulties/challenges they encounter during their teaching practice. Sixty percent of the research participants indicated that the greatest advantage of their use of technology was that it exposed them to a variety of activities that could be used in classrooms. Second, ICTs appear to help student teachers diversify the activities in which they would like learners to engage. Twenty-nine per cent of the participants reported that ICTs assisted in their professional development by exposing them to a wide range of up-to-date teaching-learning resources. Third, more than 22 % of the participants emphasized the fact that technologies helped them present new ideas, theories or concepts. Finally, almost 21% of the participants indicated that ICTs increased learner motivation, especially at high school level, not only because they are captivated by ICTs, but also because these technologies make learning more interesting and fun (Schutz & Bulman, 2013).

In another study, by Lyons' (2010), findings revealed that ICTs are a useful means to increase communication in the teaching fraternity. In fact, many of the research participants indicated that they used ICTs to communicate, since these allowed them to talk about problems, to share ideas, and to get over difficult moments which, according to most, are easier to deal with when you know that others are also faced with them. The research findings indicated, moreover, that the use of communication and information technology increases student communication and collaboration during teaching practice. These findings are testimonies to the fact that social interaction supported by ICTs is no longer limited by space and time; they significantly broaden and transform the social space of collaborative learning. Finally, the sharing of experiences promotes helpfulness and solidarity amongst those communicating with one another (Lyons, 2010).

4.7.1 Technology and teacher education programmes

One of the goals of teacher training programmes is to shift the focus of student teachers from reflecting on themselves to reflecting on their own and their learners' learning processes. One way to help student teachers see beyond themselves and to begin focusing on their learners may thus be through the integration of opportunities that technology provides (James, 2013). Teacher education programmes should therefore provide opportunities for student teachers to observe technology integration, to become designers, rather than just users, of technology, to think outside the box, and to observe their mentors implementing the appropriate technology practices (Dymoke & Harrison, 2008). Such experiences will give pre-service teachers the confidence to apply technological methods in their own classrooms. As a result, they will investigate new ways of using technology to solve problems, to promote learning, to accommodate learner needs, and to better prepare learners for the digital society.

According to Anderson (2004), what is lacking in teacher education programmes as far as the use of technology is concerned is its use to add value to lecturers' presentation of content to student teachers. True technology integration involves more than just using a projector for a PowerPoint presentation or a SmartBoard as a PowerPoint. Using technology in this way does not prepare student teachers to use technology in any other ways once they enter a classroom. In a four-year study of student teachers using technology (Perry, 2013) found that, while its use did not bring about fundamental changes to instruction, it improved or extended these in creative ways.

Technologies such as electronic portfolios (e-Portfolios) and videos could be harnessed in teacher training programmes to support intermediate steps of learning, and/or to promote reflective learning and teaching (James, 2013). Conklin (2011) went on to propose that technologies like discussion boards, blogs and collaborative writing tools, serve as bridges enabling (student) teachers to progress from novice to expert practitioners (Good, 2008). There are many compelling reasons to believe that the most opportune moment for the integration of technology in teaching is at the teacher education stage. Like the familiarity one had to have with the tools

of the trade in the days of pen and paper, today's technology also needs to be practised over a prolonged period before it can be effectively used in teaching practice (James, 2013). Teacher training programmes could provide student teachers with the initial experiences and training in technology which teachers will need in building up their own repertoire of classroom teaching and learning tools.

4.7.2 Limitations to technology integration in today's classrooms

Teachers generally agree that, to prepare learners for the 21st century, our educational system requires the intensive and broad use of technology (Hillier, 2009). By implication, teachers will have to adjust their traditional modes of instruction to include technology. For example, a teacher's use of the internet is necessary to connect children to a virtual world (which simulates the real world) in an increasingly global learning environment (Good, 2008). MacClosky (2009) found, however, that there is a significant gap between the skills and knowledge needed for success in current primary education and those needed for success in secondary education. Moreover, the claim that schools are using technology widely is just not true (Anderson, 2004): most schools use technology frugally, a practice which is both inconceivable and shocking, given vital and complex role education plays in development (Marshall, 2016). It is absolutely imperative that technology should be a feature of daily classroom practice in primary as well as secondary schools (Hillier, 2009; Sherman, 2013; Schutz & Bulman, 2013; Anderson, 2004).

Since technology is embedded in all aspects of our daily lives, and its uses and advances in our society are constantly increasing, one must wonder why its use in public schools and education lags so far behind. Several studies have attempted to address this issue (Conklin, 2011; Bybee, 2010; Singh, 2016; Wan & Gut, 2011). For example, Singh, (2016), reporting on a qualitative study in which 30 teachers were interviewed, found that they were reluctant to integrate technology into their classrooms because of problems with, or lack of, equipment - software availability and scheduling difficulties, for example. Other researchers have found that even with the introduction of new technologies in the classroom, actual instructional strategies remain largely

unchanged and/or attempts to introduce technology are sometimes met with a degree of disdain (Good, 2008). Erikson (2008) too, found that teachers are hesitant and reluctant to adopt a transformative view of technology where laptops are more than just notebooks, where PowerPoint means more than just handwritten overheads, and where e-textbooks do more than simply replace hard copy textbooks. In a study of early childhood classrooms where learners were not given the opportunity to use laptops and iPads, Holton, *et al.* (2009) noted the main stumbling block for teachers was not the technology itself but the methods being used to implement them. Instead of using technologies to change approaches to the curriculum, teachers continued the regular drill and skill methods.

Importantly, South Africa, with its almost 80% underequipped and disadvantaged schools, experiences the lack of technology implementation acutely and unfortunately, due to a variety of factors. This seems to be a self-perpetuating problem which will seemingly not be eradicated soon.

4.7.3 Benefits of e-learning technology in higher education

E-learning has been defined by researchers in various ways. According to Graig and Deretchin (2008), e-learning opens new ways of learning and these new models change the dynamics of learning and the essence of teaching. While Good (2008) defines e-learning as a form of technology-enhanced learning that is engaging, efficient and effective, Sellars (2017) regards it as a means of supporting communities of practice, with learners learning together and interacting with one another. Interaction typically occurs through commenting on or discussing something and/or working together on projects and collaborative writing. E-learning not only to contextualize learning but also to be collaboratively engaged in and connected to what and how they learn. Bolton (2014) and Marshall, (2016) highlight the existence of a dichotomous perspective on technology in that it is both ignored and praised in teacher education programmes and at schools.

While Web 2.0 technology tools abound, too often teachers and researchers in the field choose not to use these technological tools in their classrooms (Marshall, 2016). Numerous research studies confirm that student teachers gain new insights into organization and planning, in delivery, in pedagogical strategies, in content knowledge, and classroom management by reflecting and analysing on video during their teaching practice presentations and micro-lessons (Perry, 2013; Singh, 2016; Giroux, 2007). Video-based reflection generates more specific comments about student teachers' practice and shifts the focus from management to instruction and content. Researchers also found that student teachers were more inclined to reflect on and analyse weaknesses/strengths in their lessons, thus gaining a clearer vision of their prospective roles as classroom teachers. However, although the bulk of the literature describes the positive outcomes and benefits associated with e-learning, some studies have found contradictory results. Findings by Choy and Oo (2012) as well as Marshall (2016), for example, indicate that student teachers did not favour e-learning as a method for learning to teach because they found e-learning methods difficult and cumbersome, preferring video sharing and traditional methods as ways of teaching reflection.

4.7.4 Conditions for ICT integration in education

Infrastructure is one of the crucial factors in the effective integration of ICT into the education system (Tomei, 2005; Scott & By 2007; Bolton, 2014). In this regard, Sellars, (2017) claims that strong infrastructure should be ensured to provide equal access for all. Integrating ICT into teaching practice and teacher education is a challenging and complex issue (Pultorak, 2012). In this regard, Dymoke and Harrison (2008) claim that just equipping schools with the essential ICT tools does not create more effective learning environments and does not improve the quality of instruction. Precautions should be taken to facilitate staff and learners' ease of use of technology, and technical staff should be employed to help users because without the ability to use technology to their own and others' advancement, they will not be able to fully participate in 21st century activities or decision-making.

According to Good (2008), a gap exists between what student teachers are taught and the expectations placed on them to integrate technology into their future classrooms. This gap leads to a disconnection between the skills they master and the perceived usefulness of these skills. Student teachers should ideally be introduced to the concept of technology integration through their own experiences as students (Sign, 2016), with technology-integrated teacher education programmes creating opportunities for student teachers to observe their lecturers modelling the use of technology and then practicing to use it themselves in an encouraging atmosphere. Additionally, informed technology integration should occur in methodology subjects and micro-lessons and in the classes of mentor teachers during students' teaching practice (Bade & Adesoji, 2015). Given the enthusiastic call for technology integration within teacher education programmes, one would expect in the not so far-off future to see teacher graduates who have no qualms about integrating technology into their own classrooms.

4.8 SUMMARY

Chapter 4 was used to outline the essence of critical reflective teaching with reference to 21st century teaching practice as offered by teacher training programmes at higher education institutions. The tools for reflective teaching were briefly examined, and the role and nature of the 21st century teacher were discussed. Lastly, the importance of Information and Communications Technology (ICT) in classrooms and in teacher training programmes were highlighted. It is clear from Chapters 2, 3 and 4, that most of the teaching and learning theories and practices related to critical reflective teaching and learning have been around, recommended and used in schools and other professions for decades. For student teachers then, all that is needed is to put this knowledge into practice through the assistance of dedicated and visionary lecturers.

In Chapter 5, the research design and methods which were used to conduct the empirical part of the research are explained in more detail.

CHAPTER FIVE

THE RESEARCH DESIGN AND METHODOLOGY

5.1 INTRODUCTION

An in-depth literature study highlighting the need to apply critical reflective thinking and its implications for reflective teaching, as well as the relevant theories associated with the phenomenon, were presented in Chapters 2, 3 and 4. Against the background of the literature overview, this chapter focuses on the research design and research methods used in conducting the empirical investigation. Additionally, the justification for the choice of the research approach and data collection methods implemented are provided. Moreover, the data collection and analysis techniques, the validity and reliability of the data collected and the measures used to ensure their trustworthiness are explained. The sample groups selected for the research are subsequently described as are the rationale for the pilot study and the measures taken to ensure that the investigation was carried out in an ethical manner.

As is the case with all research investigations, the research design was directed by the research questions and the objectives of the study as indicated in Chapter 1 (Section 1.1).

5.2 RESEARCH QUESTIONS AND OBJECTIVES

The main research problem, as stated in Chapter 1, was:

How can student teachers at the Central University of Technology be assisted to improve the practice of critical reflective thinking and teaching during their teacher training programme so as to meet the requirements of 21st century teaching?

The following specific research questions were advanced to direct the research:

- What are the implications of using critical reflective thinking and teaching during 21st century teaching practice?
- What are student teachers' opinions about the role of critical reflection in their teacher training programme?
- Do student teachers get sufficient opportunities to practice critical reflection during their practical training?
- What are student teachers' knowledge and experiences of critical reflective teaching in the teacher training curricula?
- Which challenges do they experience when implementing critical reflective teaching during their practical training?
- How can student teachers be assisted to improve the practice of critical reflective teaching during their teacher training?

Accordingly, the over-arching aim of the study was to propose a framework that would assist student teachers to incorporate critical reflective thinking in their training programme. This may ultimately lead to reflective teaching as a means of enhancing their teaching practice in line with the demand for creative, innovative, collaborative and productive 21st century teaching and learning.

More specifically, the research objectives were to:

- verify the assumed implications of using critical reflective thinking and teaching during students' teacher training programme at the Central University of Technology;
- determine student teachers' opinions about the role of critical reflection in their teacher training programme;
- explore student teachers' experiences and knowledge of critical reflective teaching in their teaching training curricula;
- determine whether or not student teachers get sufficient opportunities to practice critical reflective practices during their practical training;

- explore the challenges which student teachers face when implementing critical reflective teaching during their practical training;
- establish how student teachers could be assisted in improving the practice of critical reflective teaching during teaching practice.

Theorists tend to formulate their understanding of research methodology in accordance with what they believe to be the main aspects to consider. Baran and Jones (2016), for example, describes methodology as a coherent group of methods that complement one another and that have the ability to generate data and findings that will reflect the research question and suit the researcher's purpose. Lucienne and Amaresh (2009) see methodology as a framework of theories and principles on which methods and procedures are based, while Kahn (2014) refers to methodology as ways of obtaining, organizing and analyzing data in accordance with the nature of the research question.

Another important aspect of research methodology highlighted by Lucienne and Amaresh (2009) is the logic behind the research methods one uses in the context of the study, and the explanation of the reasons for using a particular method or technique. The latter refers to aspects such as how the research problem was defined; what data were collected, which particular method was adopted, why particular data analysis techniques were used, and a host of similar other questions (Gay, *et al.*, 2016). In this study, methodology refers to the manner in which the research was conducted and what its logical sequence was. Table 5.1 provides an overview of the methodological features of this particular study, all of which are explained in detail in subsequent paragraphs

Table 5.1: Methodological considerations for conducting the research

Paradigm	Interpretivism (Hermeneutical phenomenology)
Approach	Qualitative
Design	Case study
Methods/Techniques	<ul style="list-style-type: none"> • Document analysis • Participant observation • Focus group interviews
Analysis	Thematic approach

5.3 RESEARCH DESIGN AND METHODOLOGY

The research approach in this study was qualitative in nature, falling within the interpretative paradigm, and using a case study design. A detailed discussion of the research approach, paradigm, and design is subsequently discussed.

5.3.1 Paradigm: Interpretivism

A paradigm represents the shared beliefs, or consensus of a community of scholars or researchers on which research questions are most meaningful and which procedures are most appropriate for answering those questions (Gay *et al.*, 2016; Creswell, 2014). McMillan and Schumacher (2010) define research paradigms as distinctive belief systems that influence how research questions are asked and answered, and that which narrow the scope of the investigation to a concentration of a person/s specific world view on issues related to the philosophy of knowledge construction. In this regard, Creswell (2014) declares that the researcher needs to understand the philosophical underpinnings that inform his/her choice of research questions, methodology, and procedures and intentions in order to conduct authentic research and to evaluate research conducted by others.

The different worldviews held by scholars/theorists are reflected in the philosophical paradigms within which they locate their research. Cohen, Manion and Morrison (2013) differentiates between the normative, interpretive and critical paradigm. McMillan and Schumacher (2010) use

positivist, post-positivist, constructionist and/or transformative paradigms while Creswell (2014) favours post-positivist, constructivist, participatory and pragmatic paradigms. The paradigm in which my study is located is most closely aligned to Creswell's constructivist paradigm, thus its epistemologically underpinnings are constructivist in nature.

According to Creswell (2014), the constructive paradigm (also referred to as the interpretive paradigm) is not a single paradigm; it is in fact a large family of diverse paradigms. The philosophical base of interpretive research is hermeneutics and phenomenology (Belk, 2007). Hermeneutics is a major branch of interpretive philosophy which emerged in the late nineteenth century (Cusack, 2008) as both an underlying philosophy and a specific mode of analysis (Creswell, 2014). As a philosophical approach to human understanding, hermeneutics provides the philosophical grounding for interpretivism (Higgs, Jones & Titchen, 2008) and, as a mode of analysis, it suggests a way of understanding the meaning or trying to make sense of textual data which may be unclear in one way or another (Baran & Jones, 2016). The most fundamental principle of hermeneutics is that all human understanding is achieved by iterating between considerations of the interdependent meaning of parts and the whole that they form (Denzin, 2014). Modern hermeneutics encompasses not only issues involving the written text, but everything in the interpretative process, including verbal and nonverbal forms of communication as well as pre-identified elements that affect communication, presuppositions and pre-understandings, for example (Asante, Mike & Yin, 2013).

Creswell (2014) claims that all research is guided by the paradigm or world-view of the researcher. In other words, a study is conducted according to how the researcher sees the world, thinks about it and believes it should be studied. Similarly, Asante, *et al.* (2013) claim that research cannot be separated from the beliefs of the researcher, since his/her beliefs determine the way in which he/she interprets reality, at least in the context of a particular study. Because interpretivist researchers attempt to understand a phenomenon of interest through the eyes of their participants, they consider not the meaning they attach to the phenomenon being studied but the meanings of the participants (Creswell, 2014). Asante, *et al.* (2013) add that an

interpretivist paradigm makes specific demands on the researcher in terms of questions asked and in terms of the interpretation of participant responses.

In the context of this study, which investigated the need for reflective thinking and teaching from an interpretivist perspective, I attempted to gain an in-depth understanding of how, if at all, student teachers apply reflective thinking and reflective practices to their teaching during their practicals at schools. Table 5.2 reflects the assumptions on which, according to McMillan (2012), interpretivist perspectives are based, highlighting the way these assumptions influenced this study.

Table 5.2: Assumptions of an interpretivist perspective and the application thereof to this study

(Nieuwenhuis, 2009)

Assumptions of an interpretivist perspective	How it featured in this study
<p>“Human life can only be understood from within”, therefore we study the subjective experiences and interpretations of people and their interaction with their social environment.</p>	<p>Through semi-structured focus group interviews, I created an opportunity for my participants to share their experiences and understandings of reflective practices in their training programme.</p>
<p>“Social life is a distinctively human product” (p.106) and the meaning people give to a certain phenomenon is linked to the unique context thereof.</p>	<p>The contexts in which the phenomenon of reflective practice is embedded play an important role in how it is interpreted. The training environment where the occurrence of reflective practices features, had to be considered.</p>

(continued on next page)

Table 5.2 (continued)

Assumptions of an interpretivist perspective	How it featured in this study
<p>“The human mind is the purposive source or origin of meaning.” (p. 206) Exploring the complexity of a phenomenon, leads to a better understanding of the meaning it has for people.</p>	<p>Through an in-depth literature study, the complexity of reflective thinking and reflective practices were revealed, enabling the researcher to gain a more holistic view and a clearer understanding of the challenges faced by participants.</p>
<p>“Human behaviour is affected by knowledge of the social world.” (p. 107). Understanding more about reality enriches our conceptual frameworks and provides a link between the concrete world and the abstract theory.</p>	<p>The empirical part of the study provided the opportunities to meet participants face to face and to engage in conversations with them, resulting in a better understanding of the issue under investigation and bringing the theoretical part of the study to life.</p>
<p>“The social world does not ‘exist’ independently of human knowledge.” (p.107) Our prior knowledge, values, beliefs and intuition influences the way we understand reality.</p>	<p>The prior teaching experience of the researcher and the knowledge gained through reading about reflective teaching practices provided the lens through which the study was approached and how it was understood.</p>

According to Denzin (2014), the strength of an interpretivist perspective lies in the rich descriptions it provides of the phenomenon being investigated; however, at the same time the findings of such a study are limited to the specific research context and cannot be generalized beyond the boundaries of the study.

5.3.1.1 *Criteria for evaluating an interpretive paradigm*

Interpretivist positions are founded on the theoretical belief that reality is socially constructed and fluid (Creswell, 2014). Thus, what we know is always negotiated within cultures, social settings and relationship with other people. From this perspective, validity or truth cannot be grounded in an objective reality (Denzin, 2014). Since what is taken to be valid or true is negotiated, there can be multiple valid claims to knowledge. Some criteria for the evaluation

of research from an interpretivist perspective, independently formulated by for Denzin (2014), Lederman and Abell (2014), are listed below. They are:

- careful consideration and articulation of the research questions;
- carrying out inquiry in a respectful manner;
- awareness and articulation of the choices and interpretations the researcher makes during the inquiry process, coupled with evidence of his/her having taken responsibility for those choices;
- a written account that develops persuasive arguments, and
- an evaluation of how widely results are to be disseminated.

5.3.2 A qualitative approach

As I was interested in understanding the meaning participants attached to the phenomenon, reflective teaching, and how they made sense of their world (their studies) and of their educational experiences in this world (Khan, 2014), I used an interpretative qualitative approach in this study. Since the concern of qualitative enquiry is to explain social phenomena in order to help human beings understand the social aspects of their worlds (Gay, *et al.*, 2016), this approach was deemed appropriate to my study. My approach to the investigation of the phenomenon was systematic (carefully planned and carried out), people-centred (incorporating essential characteristics and qualities which were systematically uncovered), credible (realistic and believable), verifiable (evidence could be checked and verified), justifiable (a convincing case could be made for undertaking this research), useful (its findings could be applied in practice), valuable (it would enhance current practice), and trustworthy (honest, genuine and based on sound research ethics) (Merriam & Tisdell, 2015). It was also exploratory, naturalistic, inductive, ideographic and descriptive/ interpretive (Forrester, 2010). Consequently, it resulted in the generation of descriptive-narrative as well as visual-non-numerical data which, together, gave me a unique insight into the phenomenon, 'critical reflection' (Gay, *et al.*, 2016). Put differently, this approach provided me with a richer, more intimate view of the educational world than other

approaches would have done, since its emphasis on inductive reasoning leads to an incremental understanding of participating students' life worlds and perspectives.

In keeping with the deliberations on qualitative research above, Delamont (2012) adds that qualitative studies are, for the most part, a naturalistic type of enquiry conducted in natural settings, capturing participants' perceptions as they occur naturally and in their actual words. The qualitative researcher constantly tries to understand the phenomenon being observed from participants' viewpoints (Leedy & Ormord, 2014). Accordingly, I focused on understanding the insider perspectives of participants and their settings by engaging in direct personal, and often, participatory contact. This approach afforded me the opportunity to understand their experiences and allowed them the platform to express their views about the research topic without fear or favour (Leedy & Ormord, 2014). As a result of using this approach I had the opportunity to conduct a detailed enquiry of issues, which gave me an in-depth, intricate and detailed understanding of participants' meanings, actions, observable and non-observable phenomena, attitudes, intentions and behaviours. Moreover, it gave participants a voice/platform by means of which they could share their 'lived worlds' with me, thus uncovering issues that lay beneath the surface of presumed behaviours and actions presented (Denzin, 2014).

In summary, the following core characteristics of qualitative research, as outlined by Shein and Chen (2011), Yin (2016), and Vhalemm (2012) are evident in the procedures and methods that I followed:

- My sample was relatively small in scale and purposively selected on the basis of salient criteria.
- My study was concerned with the opinions, experiences and feelings of student participants, producing subjective data.
- Data collection was intensive and done over a lengthy period of time.
- Data generated were very detailed and information was rich and extensive.

- Data were analysed through the extraction of themes and related categories.
- The social phenomenon (encouraging critical reflective thinking and teaching) was observed as it occurred naturally.
- Data were presented in the form of words, quotes from documents and transcripts (Chapter 5).

5.3.3 A case study design

My research was designed as a case study. According to McMillan and Schumacher (2010), case studies examine *bounded systems*, or cases in depth, over time, employing multiple sources of data found in particular settings. The case may be a programme, an event, an activity, or a set of individuals bounded in time and place. Gay, *et al.* (2016) add that case study research is an all-encompassing method covering sampling, data-collection techniques, and specific approaches to data analysis. The researcher should therefore choose the specific type of case study relevant to his/her particular research study.

Ardalan (2016) too, points out that the selected case becomes the basis of a thorough, holistic and in-depth exploration of the aspect(s) that are researched, and is characterized by a very flexible and open-ended technique of data collection and analysis. Case study design is based on the assumption that the case being studied is atypical of cases of a certain type and therefore a single case can provide insight into the events and situations prevalent in a group from where the case has been drawn (Ardalan, 2016). According to Morehouse (2012), the focus in a case study is on the idiosyncratic complexity of the particular case, not a whole population of cases. In selecting a case, therefore, the researcher usually employs purposive, judgmental or information-oriented sampling techniques.

5.3.3.1 *Categories of a case study*

There are several *categories* of case study research. Aveyard (2014) for example, identify three categories, namely exploratory, descriptive and explanatory case studies. First, *exploratory case studies* are used to explore any phenomenon emerging from data which could serve as a point of interest to the researcher. In such a case study, prior fieldwork and small-scale data collection may be conducted before the research questions and hypotheses are proposed (Yin, 2016). As a prelude, this initial work helps prepare a framework for the study. A pilot study is considered an example of an exploratory case study and is crucial in determining the protocol that will be followed eventually (Yin, 2016; Onwuegbuzie & Frels, 2016). Second, *descriptive case studies* lead to description of natural phenomena which occur within the collected data. Thomas, Nelson and Shein and Chen (2011), suggest that descriptive case studies may be presented in a narrative form. Third, *explanatory case studies* examine the data closely, both at a surface and deep level, in order to explain the phenomenon inherent in the data (Biggam, 2015: 154). On the basis of the data, the researcher may then form a theory and is set to test this theory.

Some researchers also identify other categories of case studies, *evaluative* or *interpretive*, according to Bailey (2007), or *intrinsic*, *instrumental* or *collective*, according to Ardalén (2016). Although Ardalén's (ibid) also uses a triple case study categorization, they are not the same as those mentioned in the previous paragraph. The *intrinsic case study* is solely aimed at describing a particular case in order to better understand, not a broad social issue, but only the case in question. *The instrumental case study* is used to elaborate on a theory or to gain a better understanding of a social issue. The case study merely serves the purpose of facilitating the researcher's gaining of knowledge about the social issue while the *collective case study* furthers the understanding of the researcher on a social issue or the population being studied. The interest in the individual case is secondary to the researcher's interest in a group of cases, with these being chosen in order to compare them and the concepts used to describe them order to extend and/or validate existing theories on particular phenomena.

For the purpose of my study, the focus was on an intrinsic case study. Student teachers' experiences and document analysis were involved to ascertain (their) knowledge on and implementation of critical reflective teaching practices in their teacher training programme. The case study could also be categorized as interpretative, because it allowed me to interpret data on the opinions and experiences of student teachers reflected in the data I collected.

Figure 5.1 depicts the intensive and complete study of the case, including the direct analysis of the mutual interrelationships of causal factors and study of behaviour patterns.

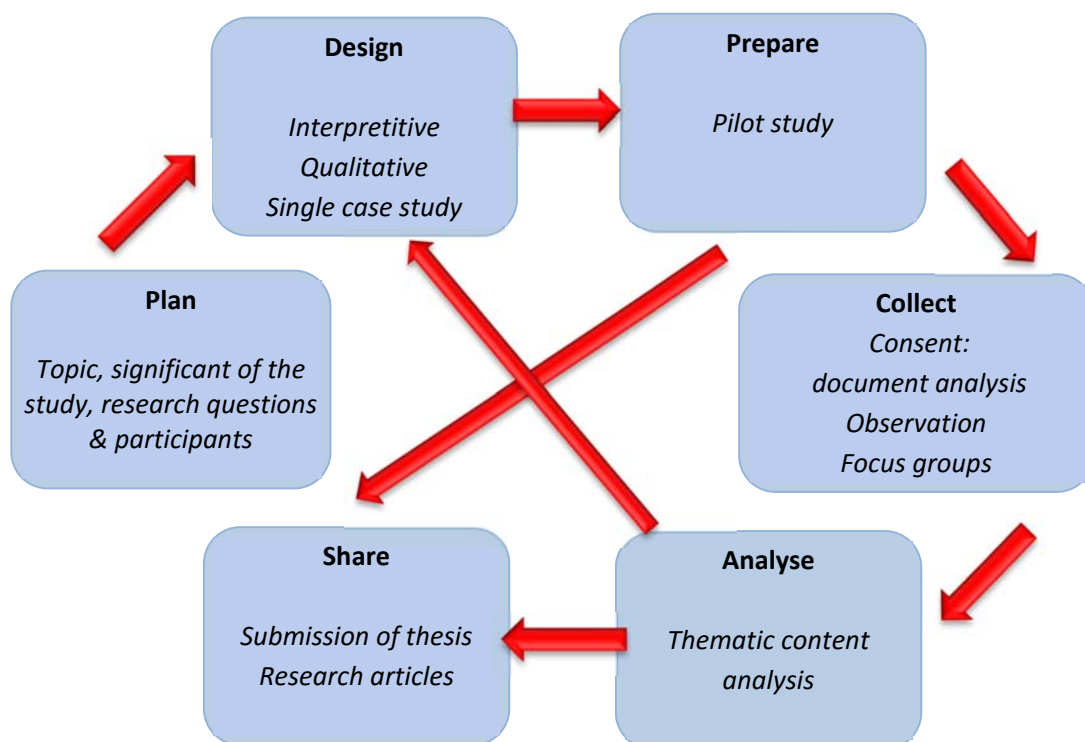


Figure 5.1: Doing the case study as a linear but iterate process

(Adapted from Aurum & Wohlin, 2005)

The following features, which characterized this study, reflect Creswell's (2014) precepts in that:

- A specific phenomenon (critical reflective thinking and practice) was identified prior to the conducting of an intrinsic case study which included student teachers at the Welkom campus of the Central University of Technology.
- The case was illustrated while being described and detailed.
- An in-depth understanding of the case was a good hallmark where interviews and observations have been conducted, and documents were analysed.
- A description of the case was done as an important key to understanding the analysis of data.
- Specific situations, themes and issues were identified (see Chapter 6).
- The overall understanding derived from the case was summarised in the form of specific conclusions (see Chapter 7).

5.3.4 The role of the researcher

As a qualitative researcher, one forms a collaborative partnership with participants in order to collect the data needed and the data is then analyzed to come to a better understanding of the phenomenon one is investigating (Asante, *et al.*, 2013). Apart from this, one also needs to observe, ask questions, probe and interpret what one sees and hears in order to fully understand the complexity of findings. The functions of a researcher's role, as mentioned by McMillan and Schumacher (2010), applied to this study, namely preparing and facilitating focus group interviews, observing lesson presentations and analyzing curricula.

McMillan and Schumacher (2010) point out that an interpretivist study is usually conducted in the field, which means that the natural setting where the participants live and work is chosen as the research site. The role of the researcher is established by the position of the researcher, as well as his/her relationship with the participants. In a case where the researcher enters the research site as an insider, he/she will be involved in the activities taking place at the research site. For the present study, the research site was also my work environment, and as an insider

(lecturer), I conducted focus group interviews, observed lessons, and analyzed the collected data.

Saldana (2011) argues that it is crucial for social researchers to clarify their roles in order to ensure the credibility of their research. This is especially important for researchers who use qualitative methodology because they adopt a variety of roles while in research settings. These roles can range from complete membership of the group being studied (an insider) to being a complete stranger (an outsider) (Denzin, 2014). While there are a variety of definitions for insider-researchers, insider-researchers are generally those who choose to study a group to which they belong, while outsider-researchers do not necessarily belong to the group under study (Cresswell, 2014).

Saldana (2011) identifies three key advantages of being an insider-researcher: having a greater understanding of the culture being studied; not altering the flow of social interaction unnaturally, and having an established intimacy which promotes both the telling and the judging of truth. Further, insider-researchers generally know the politics of the institution, not only the formal hierarchy but also how it “really works”, hence they know how to best approach those in the institution. In general, they have a great deal of knowledge, which takes an outsider a long time to acquire (Cohen, *et al.*, 2013). There are, however, also problems associated with being an insider. Greater familiarity could, for example, lead to a loss of objectivity. Unconsciously making wrong assumptions about the research process based on the researcher’s prior knowledge could also be considered a bias. From my perspective, I believe that each position (insider and outsider) has advantages and disadvantages depending on the particular circumstances and purposes of the research (Saldana, 2011).

Whether the researcher is an outsider or insider, there are various issues she/he should pay attention to, ethical considerations being one. This is especially important to outweigh the displacement of subjects, settings and the researcher. In my case, my role as insider assisted me in gaining the trust of participants and, according to McMillan and Schumacher (2010), this is a

typical feature of qualitative studies. My inside knowledge and the relationship of trust with the participants helped them to relax, knowing that they would not be judged. All the participants responded to questions spontaneously and confidently and supplied me with rich narratives about their understanding and experiences of reflective thinking and teaching. As McMillan and Schumacher (2010) argue, qualitative researchers often have prior professional experience of the phenomenon under investigation, which enables them to empathize with their participants, and to recognize subtle meanings in the responses of their participants. Such was the case in this study. While interviewing the participants, I realized that, as a lecturer involved in the practical component of the teacher programmes, I could easily put myself in their position and could fully understand their concerns and frustrations. Moreover, since qualitative researchers are known for their subjective reflection and critical self-examination throughout the research process (McMillan & Schumacher, 2010), care was taken not to ‘read between the lines’, but rather to focus on what was explicitly stated, thus ensuring that the interpretation was reliable and valid. Denzin (2014) stresses the fact that case study researchers must acknowledge their personal roles, biases and prejudices, as well as the possible effects of these on their research in order to ensure that their conclusions are impartial.

5.4 RESEARCH METHODS

In this section the selection of participants, the research site, the collection of data and the data analysis procedures are discussed.

5.4.1 Population and sampling

A population is the entire range of individuals who share the same characteristics and are of interest to a researcher Morehouse (2012) refers to the population as an aggregate or totality of all the objects, subjects or members that conform to a set of specifications. In this study the population comprised all the student teachers at the Welkom campus of the Central University of Technology.

5.4.1.1 The selection of the participants

Small samples of people nested in their context are studied in-depth in qualitative research (McMillan & Schumacher, 2010). To enable me to understand the research problem, a small, distinct group of participants were selected as my sample. I applied stratified purposive sampling to select the informants since I believed that a sample selected in this way would provide me with the most information relevant to the objectives of my study. In the case of this study, four focus group interviews (which included one pilot interview) were conducted with the following student groupings: eleven 2nd Year B. Ed (FET) students, seven 3rd Year B. Ed (FET) students, nine 4th Year B. Ed (FET) students, and five PGCE students.

In the selection of participants for lesson observations, I used convenience sampling: all the students selected were at that stage student teachers at the Welkom campus of the CUT and were readily available and willing to participate in the study (cf. Annexure H). They formed part of a group of 25 students who were assigned to me by the SBL lecturer (student teachers are usually divided into groups and allocated to all lecturers who are tasked to conduct the formal SBL assessments).

5.4.2 The research site: focus group interviews

The size of the CUT, both campuses, comprise 759 academic staff members of which 662 are based at the Bloemfontein campus. The Welkom Campus accommodate 3571 Students with 97 Academic staff members and three faculties are presented. At the time of the study, there were 933 enrolled student teachers, whose ages ranged from of 18-49; 19 education lecturers; one HOD (Postgraduate Studies), and one departmental manager (Professional Studies). The B.Ed programmes include Economics and Management Sciences, Language Education, Mathematics, Natural Sciences and Technology.

5.4.3 Data collection

Data collection is the precise, systematic gathering of information relevant to the research problem and could, in qualitative research, include, using methods such as interviews, participant observation, focus group discussion, narratives and case histories (Krueger & Casey, 2015). Data collection begins with the researcher deciding from where and from whom data will be collected (Patton, 2015). The empirical phase, which involves the actual collection of data is followed by the preparation of data for analysis (Krueger & Casey, 2015). Whichever sources of evidence are used, there are three key principles of data collection that need to be observed (Yin, 2016), namely triangulation, a case study basis, and a chain of evidence.

- **Triangulation:** one of the great strengths of case studies, as compared to other methods, is that evidence can be collected from multiple sources. Triangulation involves the use of evidence from different sources to corroborate the same fact or finding. In my study, observations, document analysis and observations were used to ensure the validity and reliability of the findings (cf. Annexure H). This is one of the great strengths of case studies as compared to other methods. According to Cresswell (2014), evidence can be collected from multiple sources, which was the case in this study. The different data sources helped validate the findings by exploring different views of the situation under investigation (Witcher, 2005). By combining these different methods and empirical materials, I hoped to overcome the weakness or intrinsic biases, as well as the problems associate with the use of single method, single-observer and single-theory studies (Baran & Jones, 2016). Often the purpose of triangulation in specific contexts is to obtain confirmation of findings through convergence of different perspectives, as was the case in this study.
- **A Case study database:** Whilst a report or dissertation may be the primary distillation of the case study, a further outcome which strengthens the repeatability of the research and increases the transparency of the findings is a well-organized collection of the evidence base (Yin, 2016). This base may include case notes made by the investigator, case study

documents that are collected during a case study, interview notes or transcripts and analysis of the evidence. Table 5.3 illustrates the database for the study at hand. When preparing a research report, it is useful to agree with a supervisor whether some elements of this evidence base should be presented as annexures to the thesis.

- **Chain of evidence:** the researcher needs to maintain a chain of evidence. The report should make clear from which sections of the case study databases it draws its data, usually by means of the appropriate citation of documents and interviews (Kennedy, 2006). Also, the actual evidence needs to be accessible in the database, it should be clear which protocols were followed, and links between the protocol questions and the propositions should be transparent (Yin, 2016). These procedures have been followed meticulously, as is evident from Table 5.3.

5.4.3.1 Data Sources

In the present study, the collection of data took place as set out in Table 5.3 as shown on the next page.

Table 5.3: Case study data management

(Yin, 2016)

Case study database	
<p>Document analysis:</p> <p>Curricula (2nd, 3rd, 4th years and PGCE)</p> <p>Forty reflective journals (2nd, 3rd, 4th years and PGCE)</p> <p>Ten posters (3rd Year and PGCE)</p> <p>Ten 3 D-frameworks (3rd Year & PGCE)</p>	<ul style="list-style-type: none"> • Salient summary points: A handwritten summary of main points and pictures regarding critical reflective teaching from the curricula, reflective journals, posters and 3 D-frameworks • A unique document identifier: Observation schedules, focus group schedules, criteria for document analysis • Date of the documents: When were the curricula, reflective journals, posters & 3 D-frameworks analysed? • Archival source: Assigning file names to the salient summaries saved in computer files • Author of documents: authors/compiler of the curricula, notes, reflective journals, posters and 3 D-frameworks were acknowledged • A short summary: A triangulated, typed summary of the curricula, reflective journals, posters and 3 D-frameworks
<p>Participant observations:</p> <p>Ten student teachers (3rd Year and PGCE)</p>	<ul style="list-style-type: none"> • Handwritten notes: Taken during the lesson presentations by the research colleague and myself • Expanded notes: Immediately after each lesson presentation by both the research colleague and myself. • Archival information sheet: Typed, named and saved in a computer file.
<p>Focus groups:</p> <p>32 Student teachers</p> <p>Eleven (2nd Years)</p> <p>Seven (3rd Years)</p> <p>Nine (4th Years)</p> <p>Five (PGCE students)</p>	<ul style="list-style-type: none"> • Consent forms: Were handed out three weeks in advance • Audiotape of the focus group: The focus group interviews were audiotaped and transcribed • Seating chart: horseshoe classroom seating (cf. Figures 6.43; 6.44; 6.45 & 6.46) • Handwritten notes: Captured in the original schedules • Expanded notes: Done immediately after each interview •

(continue on next page)

Table 5.3 (continued)

Case study database	
	<ul style="list-style-type: none"> • Debriefing notes: I did a short debriefing session before and after each interview session. I explained the purpose of the research and encouraged everyone to take part. At the end, I summarised main points and thanked everyone for participating • Archival information sheet: Typed records, saved in a computer file

5.4.3.2 Case study protocol

The data collection stage was followed by the case study protocol, using multiple sources of evidence, creating a case study database and maintaining a chain of evidence. Table 5.4 demonstrates the protocol for the study, which involved, among others, the research overview, research questions and data analysis procedure

Table 5.4: Case study protocol

(Adapted from Yin, 2016)

CASE STUDY PROTOCOL	
<i>Selection</i>	<ul style="list-style-type: none"> • Single case study (for depth and pluralistic perspective)
<i>Category</i>	<ul style="list-style-type: none"> • Interpretive case study
<i>Type</i>	<ul style="list-style-type: none"> • Intrinsic case study (researcher examines case for its own sake)
<i>Overview</i>	<ul style="list-style-type: none"> • How can student teachers at the Central University of Technology be assisted to improve the practice of critical reflective thinking and teaching during their teacher training programme?
<i>Field procedures</i>	<ul style="list-style-type: none"> • Document analysis (teacher curricula; student portfolios of evidence) • Observations (teaching practice at schools) • Focus group interviews at CUT premises (cf. Annexure I)

(continue on next page)

Table 5.4 (continued)

CASE STUDY PROTOCOL	
<i>Research questions</i>	<ul style="list-style-type: none"> • What are the implications for using critical reflective thinking and teaching during the 21st century teaching practice? • To what extent are student teachers at the CUT exposed to the practice of critical thinking and reflective teaching during their teacher training course? • What are the student teachers' opinions about the role of critical reflection in the practical component of their teacher training? • Do the student teachers get sufficient opportunities to practice critical reflective practices during their practical training? • Which challenges do they experience when implementing critical reflective teaching during their practical training? • How can these student teachers be assisted in improving the practise of critical reflective teaching when executing teaching practice?
<i>Data collection matrix</i>	<ul style="list-style-type: none"> • Embedded case with multiple sources of information (document analysis, participant observation and focus group) • Create a case study database
<i>Data analysis</i>	<ul style="list-style-type: none"> • Qualitative data analysis • Thematic approach

5.4.3.3 Pilot study

A pilot study usually generates primary data for qualitative analysis (Yin, 2016). This characteristic distinguishes pilot studies from secondary data analysis which have the gathering of background information as purpose. Some researchers refer to a pilot study as a process that generates qualitative information, considering it as a small-scale trial of the proposed procedures, materials and methods, which sometimes includes coding sheets and analytic choices (Kennedy, 2006).

For the purpose of this study, the permission to conduct a pilot study was sought from the CUT Ethical Clearance Committee, and the participants were given a consent form to sign (cf. Annexure A & C). The pilot study was conducted with seven participants who met the selection criteria, using a stratified purposive sampling method. The pilot participants were 2nd Year

student teachers enrolled for B Ed (FET & SP). The pilot went well and, as such, the data was sufficiently rich and relevant to be included in the final findings. The use of the focus group afforded me the opportunity to adjust the language of the questions to ensure that it would be compatible with language usage with which students were comfortable. In addition, it enhanced my confidence levels because it increased my experience of interviewing and interpersonal skills, and ensured that I was conversant with qualitative data collection and analysis (Gray & Malins, 2016).

5.4.3.4 Participant observation

Participant observation is generally associated with exploratory research and objectives — why questions, causal explanations, and the uncovering of cognitive elements, rules and norms that underpin observable behaviours (Leedy & Ormord, 2014). Data generated are often free-flowing, making the analysis much more interpretive. Merriam (2009) points out that this aspect of participant observation is both the method's greatest strength and the source of its most stringent critiques. Embedding oneself in a scene as a participant inevitably means that the information collected is, in certain ways, unique to the individual collecting the data. My role as participant observer has been clarified in detail in Paragraph 4.4.3.5.1.

5.4.3.4.1 Preparing for the participant observation

A thorough understanding of the study helps the researcher to stay focused during participant observation (Cohen, *et al.*, 2013). Once the researcher has a clear idea of what the research is about, s/he could determine specific objectives for the participant observation activity. It may be useful to create a list of things to pay attention to, entering these in field notebook which is kept in the researcher's pocket for quick reference (Vhalemm, 2012). Participant observation could cause a change in the student assistants' normal behaviour, attributed to the knowledge that their behaviour is being studied, known as Hawthorne effect (Fraenkel & Wallen, 2014). For the purpose of this study, I combated the Hawthorne effect by using triangulation. I triangulated the

document analysis and focus group interviews in conjunction with participant observation to enhance validity of the findings (Creswell, 2014).

In preparing for the participant observation activity, I, together with a research colleague, observed 10 student teachers who presented lessons at different schools in the Lejweleputswa district during their official teaching practice sessions, as scheduled by CUT teacher education programme). Both of us are employed at the CUT and are familiar with the schools where the student teachers presented their lessons. Table 5.5 highlights the elements that were considered relevant to the study during the participant observation sessions. Immediately after each lesson presentation we compared and verified our field notes, a process which was repeated during the data analysis process.

Table 5.5: Programme components observed

(Yin, 2016)

PROGRAMME COMPONENTS OBSERVED IN STUDY	
<i>Characteristics of participants</i>	<ul style="list-style-type: none"> • Gender, age • Skills and knowledge
<i>Interactions</i>	<ul style="list-style-type: none"> • Levels of participation • General climate for learning
<i>Non-verbal behavior</i>	<ul style="list-style-type: none"> • Facial expressions, gestures and postures • Interest and commitment
<i>Student teachers</i>	<ul style="list-style-type: none"> • Knowledge of subject • Sequence of activities
<i>Physical surroundings</i>	<ul style="list-style-type: none"> • Amenities • Seating arrangements
<i>Products of a programme</i>	<ul style="list-style-type: none"> • Posters/three-dimensional model • Reflective journals/portfolios

5.4.3.5 Conducting the focus group sessions

The focus group interviews were useful to the exploration and examination of participants' opinions on the topic as well as their reasons for these. They were not pressurized into making

decisions or reaching a consensus (Klenke, 2016). This gave me valuable insights into diverse forms of communication, something which might not have been possible if I had asked them to respond to more direct questions typically used in surveys and questionnaires (Creswell, 2014).

5.4.3.5.1 *The role of the moderator and assistant moderator*

As the moderator (and researcher) I developed rapport with the group and promoted interaction among the members (Morehouse, 2012) by thanking them for attending, making introductions and explaining the purpose of the focus group once they were seated. This was necessary to the clarification of my own and participants' expectations (Morehouse, 2012). Participants were then presented with the ground rules for the session (Menter, Elliot & Hulme, 2010), including a reminder not to disclose information given by other participants to anyone else. During the session I encouraged divergent thought and prompted participants to talk to one another so as to make the experience as energetic and informal as possible (Morehouse, 2012), making brief notes in a notebook while I was leading the discussions.

At the end of the discussion, I summarized the main points and asked if participants agreed. They were then asked how they felt about the session and if they had any questions (Cohen, *et al.*, 2013). Finally, they were thanked for their contributions and the session was ended. I made sure that I was the last person to leave the room in case participants, as they said goodbye, might still volunteer additional useful information. Immediately after the focus group session, the assistant moderator and I made notes on the following (Onwuegbuzie & Frels, 2016; Morehouse, 2012): our impressions of the interaction between participants, incidents that hindered or facilitated the discussion, the general atmosphere of the group, and the extent to which we thought the participants had 'opened up'.

5.4.3.5.2 *Transcribing the data for the interviews*

Bazeley (2007) claims that *transcribing* data involves the translation from an oral language, with its own set of rules, to a written language with another set of rules. Original reality is not represented as copies when transcribed; rather, *transcripts* are interpretative constructions that are useful tools for given purposes. Due to the fact that words may lose some meaning - as tone, volume, emotionality and accompanying facial, body gestures and disposition cannot be portrayed - recollection exists in the process of transcription (Bazeley, 2007).

All the interviews were audio-recorded by means of a tape-recorder. Immediately after the recordings I compared my field notes with those of the assistant moderator, after which I transcribed the data in order to retain the form and style of participants' expressions. The data-transcription was pragmatic approach in that I attempted to deal with the data as truthfully as possible. Separate notes were compiled to record the appearance of body language accompanying the transcripts during and immediately after the interviews. Following the procedure proposed by Brians, Willnat and Rich (2016), the following steps were taken during the transcription process:

- The fully transcribed data-presentations included all the “uhms”, “mms”, repetitions and the like. Something about the thinking and emotions of interviewees are communicated when repetition occurs.
- I did not correct incomplete sentences or poor grammar. The form and style of participants' utterances were captured as accurately as possible.
- Events which created interruptions in the flow of the interviews were noted, e.g. a cellphone ringing. I tried to avoid interruptions as far as possible due to the fact that the interpretation of the text could be influenced.
- Non-verbal and emotional conversational elements, such as pauses and laughter were precisely recorded. I observed the importance to record the emotional tone and the use

of rhetoric. Where sarcasm is recorded verbatim, the opposite of the meaning intended may be conveyed.

- Where non-intrusive affirmations of the participants were provided by me, these affirmations were simply recorded by placing them in parenthesis or square brackets within the text flow, e.g. [Int:mmm]. To break the flow of the text by beginning a new paragraph was not considered necessary.
- I kept the controversial issue of digressions from the topic in mind in my study. It was my responsibility to decide whether these should be included and whether or not there was any meaning in digression.

5.4.4 Data analysis

As mentioned, interpretive research attempts to derive data through direct interaction with the phenomenon being studied (Merriam, 2009). Typically, a case study database will include a multitude of evidence from different sources. In this case study, the database was established through document analysis, participant observations and focus group interviews. The analysis of data derived from these rich resources included the examination, categorization and tabulation of evidence. Interpretive researchers attempt to derive their data through direct interaction with the phenomenon being studied, which was the case in this enquiry. The aim of qualitative data analysis is to discover patterns, concepts, themes and meanings. An important aspect of data analysis in a qualitative case study is the search for meaning through direct interpretation of what is observed by the researcher as well as from what is experienced and reported by the subjects. Krueger and Casey (2015), define qualitative data analysis as working with the data by organizing it, breaking it into manageable units, coding it, synthesizing it, and searching for patterns.

5.4.4.1 Analysis of interview data

I attempted to bring order, structure and meaning to the mass of the collected focus group data, searching for general statements about relationships among the data categories (Cohen, *et al.*,

2013). McMillan and Schumacher (2010) emphasize that *qualitative data analysis* is a process of interim discovery aimed at the development of coded topics and categories which may initially come from the data or may be predetermined to seek a pattern or plausible explanation.

The researcher is forced to become familiar with the data in intimate ways by means of reading, reading and reading (McMillan, 2012). I read the transcripts and notes intensively to familiarize myself with their content and listened attentively to all the recordings, comparing them with the transcripts to confirm the accuracy of the latter. I conducted a phenomenological analysis, using a representational approach to get clarity on what I read and heard. Following Creswell's (2014) advice, I listed participant statements that seemed significant before grouping these into larger information units or themes. I then described the participants' experiences of the phenomenon by including verbatim examples, thus creating a *textural description*. Following this, I reflected on the setting and context in which the phenomenon was experienced, incorporating textual and structural descriptions of the phenomenon in culminating themes which explained what and how participants experienced these (Creswell, 2014). Having done so, I searched through the data for regularities, patterns, topics, words and phrases to represent these experiences, continuously plotting them into manageable, colour-coded topics and/or emic or categories, determined during the data collection process (McMillan & Schumacher, 2010).

In a case study like this one, data collection and analysis are usually iterative in that the results of the analysis guided the collection of subsequent collection of the data (Patton, 2015). The two processes therefore informed each other, resulting in a higher level of information synthesis (Klenke, 2016). The iterative cycle was repeated and the design and development were checked and revised throughout the process.

5.4.4.2 Analysis of document and artefact data

Document analysis is critical to historical interpretation; it is not, according to Creswell (2014), a mere summary or description of what happened, but rather an analysis of the motivation,

intent and purpose of a document within a particular historical context. It is usually produced for specific purposes other than those of the research study but can be used by the researcher for cognitive purposes, e.g. letters, newspapers, diaries and websites (Anderson, 2004). Altinay, Paraskevas and Jang (2015) assert that, in case study research, the most important use of documents is to corroborate and augment evidence from other sources.

Document analysis in my study was used as a corroborative method of data collection and analysis supplementing and/or supporting data collected through observation and focus groups interviews. Once data had been incorporated into the case study database, it was first deconstructed and then reconstructed in more meaningful ways. All the data collected in this study, when transcribed and converted into written form, eventually became a written text.

For the purpose of this study, the teaching curricula, reflective journals/portfolios, posters and three-dimensional frameworks were analyzed. Furthermore, in line with Witcher (2005) guidelines, these were viewed with the skepticism that historians apply as they search for truth in old texts. A written document analysis checklist and the list of questions were used for the content analysis of CUT teaching practice curricula and reflective journals/portfolios, the posters and the three-dimensional frameworks (cf. Annexure E, F, G, H & I). To this purpose, I summarized salient points from the all the documents, assigned a unique document identifier and dated the document, archival source, author of document. I also wrote concise summaries, which I stored in a computer file.

The documents and media were significantly valuable in that they enabled me to examine the study from different angles, thus enriching my knowledge of an insights into the experiences and opinions of the student participants. It also helped me to identify, highlight and pursue any contradiction in the evidence emerging as a result of inconsistencies between the data cleared in the documents, media, the participant observations and focus groups interviews

5.4.4.3 Participant observation data analysis (including posters and three-dimensional models)

Developed primarily from cultural anthropology and qualitative sociology, participant observation is both an overall approach to inquiry and a data-gathering method (Delamont, 2012). Its demand for first-hand involvement in the social world chosen for study, implying the immersion of the researcher in the research setting, allows him/her to hear, see and begin to experience reality as the participants do (McMillan, 2012).

An observation schedule (cf. Annexure H) was used to analyze the data collected from the observations. First, the posters and three-dimensional frameworks which formed part of the lesson presentation were analyzed twice, first to determine how the student teacher integrated them into the teaching practice lesson s/he delivered in a specific school setting, and then on the detail they contained as documents in their own right. As the researcher, I reciprocally collaborated with a research colleague during all ten the lesson observations. During the participant observations, I unobtrusively but systematically recorded all the data in the form of field notes, which were included in the analysis of data (Khan, 2014). I then sifted through the mass of field notes to make sense of events, situations and observed interactions. To ensure that the data analyzed and interpreted during the data collection stage did not get lost and/or were not later ignored, the data as well as the result of their analysis and interpretation were regularly stored in computer files (Delamont, 2012).

5.5 MEASURES OF TRUSTWORTHINESS

According to Gray and Malins (2016), trustworthiness is the truth value of a piece of research. A research project is trustworthy when it reflects the reality and ideas of the participants (Rubin & Babbie, 2009). Bryman (2008) adds that its trustworthiness depends on the extent to which the researcher delves into participants' experience rather than their theoretical knowledge. In this

study, trustworthiness was ensured by allowing participants access to the transcripts to ascertain whether or not they were true reflections of the discussions and experiences.

Research, according to Klenke (2016) has to be valid and reliable. While qualitative researchers also have to prove that validity and reliability of their research, they do not, however, use these two terms, or the methods used to affirm them in quantitative research. Instead, according to Leedy and Ormord (2014), the trustworthiness of qualitative research is measured against the credibility, dependability, conformability and transferability of the research processes and findings. Each of these trustworthiness criteria are described in the sub-sections which follow.

5.5.1 Credibility

According to Lichtman (2013), credibility, which is similar to internal validity in quantitative research, refers to confidence in the data. Internal validity is important in qualitative research, as researchers are able to demonstrate the reality of the participants through detailed description of the discussion. Data are regarded as credible when the research findings accurately reflect the perceptions of the people under study. Moreover, theoretical concepts should be generalizable and transferable, applicable to other similar situations, in other words (Merriam and Tisdell, 2015), hence the importance of thick/rich descriptions in qualitative research. I used audio and video recordings as well as field notes to ensure accuracy (Krueger & Casey, 2015), and to help me lay an audit trail of my research process. Moreover, I checked out final reports with the participants to make sure inaccuracies and/or misrepresentations did not slip into my analysis of collected data.

5.5.2 Member checking

Member checking involves giving feedback to participants on preliminary findings and interpretations and securing their reaction to these (McMillan & Schumacher, 2010). Data collected from participants were checked throughout the data collection process. This was

achieved by my summaries, paraphrasing and the verbatim repetition of participants' utterances (Rubin & Babbie, 2009), confirming with participants that my interpretations were a true reflection of their perspectives. This was carried out both during data collection and analysis.

5.5.3 Peer debriefing

Peer debriefing involves the researcher exposing his/her analysis and conclusions to a colleague or other peer on a continuous basis for the development of both design and analysis of the study (Morehouse, 2012). In this regard, my supervisor acted as my sounding board, since she was also a lecturer in the Education Faculty on the campus.

5.5.4 Prolonged engagement

Prolonged engagement refers to investment of sufficient time to learn the culture, test for misinformation, build trust and generally repeat the procedures central to the case study (Yin, 2016). The researcher was currently working in the research environment as an academic staff member and the process of data collection spanned over a period of two months.

Table 5.6: Data collection schedule

DATA COLLECTIN SCHEDULE		
Data collection method	Documents and participants	Duration
<i>Document analysis</i>	<ul style="list-style-type: none"> Teacher education curricula, forty reflective journals, ten posters and ten 3-D models 	<ul style="list-style-type: none"> Two months
<i>Participant observations</i>	<ul style="list-style-type: none"> Ten student teachers (3rd & PGCE student teachers) 	<ul style="list-style-type: none"> Two weeks 1 every week day
<i>Focus groups</i>	<ul style="list-style-type: none"> 11 (2nd year student teachers- pilot study) 7 (3rd year student teachers) 9 (4th year student teachers) 5 (PGCE student teachers) 	<ul style="list-style-type: none"> Two weeks 2 groups per week

5.5.5 Dependability

According to Aveyard (2014), dependability refers to the stability of data over time and conditions. It can be likened to reliability in quantitative studies. According to Onwuegbuzie and Frels (2016), a dependable study is one which is both accurate and consistent. Two methods of assessing dependability of data are stepwise replication and inquiry audit (Aveyard, 2014).

- **Stepwise replication** requires the involvement of several researchers who could be divided in two teams, each of which conducts a separate inquiry on the phenomenon in question, with a view to comparing data as well as conclusions. Data and conclusions would typically be compared by the researcher and/his/her supervisor.
- **Inquiry audits** occur when data and/or relevant supporting documents are scrutinised by an external reviewer. The supervisor of this study was responsible for examining the findings, interpretations and recommendations in order to attest that they were supported by data.

In this study, a case study protocol was used to share with other the decisions I took in developing the study and the reasons for these. Furthermore, the case study database was open for scrutiny by my supervisor and other colleagues.

5.5.6 Triangulation of data sources

The use of triangulation (see Figure 5.2) enabled me to distinguish true and valid information. I conducted a literature review to familiarize myself with findings from other studies about reflective thinking and teaching. I, moreover, collected data by means of documents analysis, participant observations and by conducting focus group interviews in order to get rich and in-depth information regarding the student teachers' experiences and opinions. Triangulation via data sources involved the use of a diversity of informants (different year levels of students from

both genders in two different teacher training programmes), and a range of documents were consulted (teacher training curricula and reflective journals) as well as lesson observations and observing teaching media.

The use of multiple methods not only enabled data triangulation but also ensured that I effectively overcame most of the weaknesses of each method used (Glasper & Rees, 2016 and Figure 5.2).

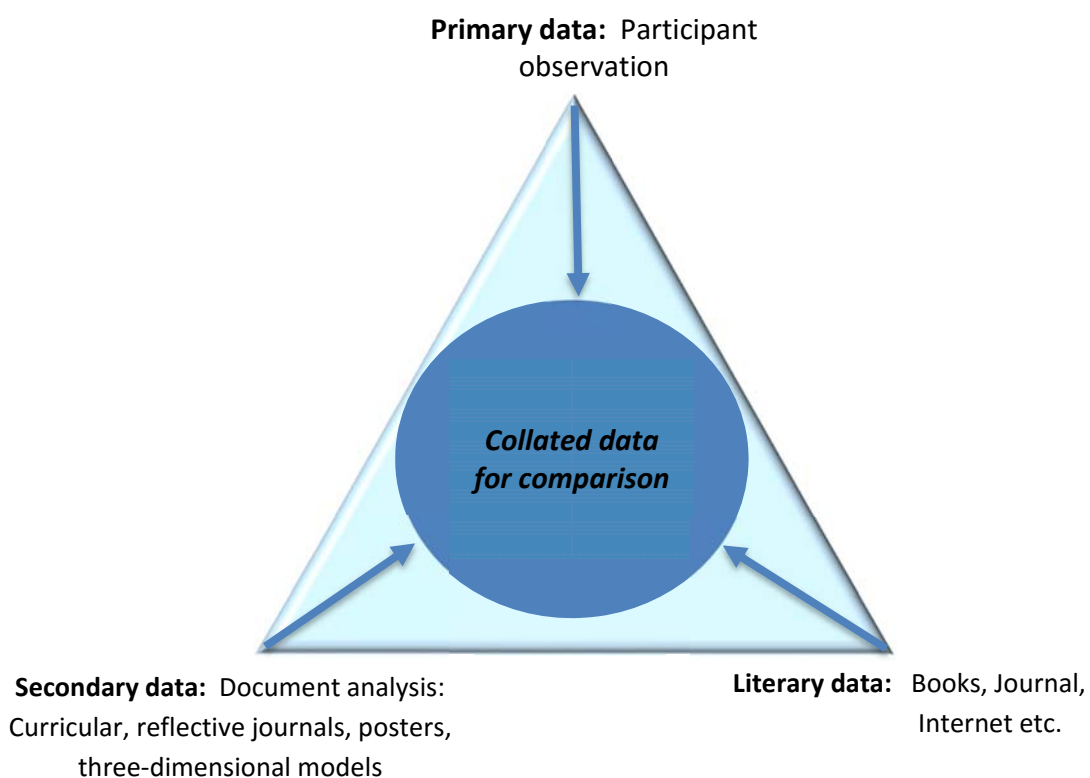


Figure 5.2: Data triangulation

(Adapted from Gay, et al., 2016)

5.6 ETHICAL CONSIDERATIONS

Ethical measures are as important in qualitative research as in quantitative research, and include ethical conduct by the researcher regarding participants' information as well as honest reporting of the results (McMillan, 2012). To this end all researchers, regardless of research designs, sampling techniques and choice of methods, are subject to ethical considerations (Saldana, 2011). The ethical measures in this study included informed consent, privacy of participants, voluntary participation and dissemination of results. These rules were generally regarded as essential for the development of trust between myself as a researcher and the student teachers as study participants.

In order to ensure that my research was ethical, I took the following steps:

- I submitted a detailed, prescribed application to conduct my research to the Ethical Clearance Committee of the Central University of Technology for its approval (cf. Annexure A).
- I sent a letter seeking permission to conduct research at the respective schools to the relevant school principals, informing them of the nature and purpose of my study and providing them with my contact information (cf. Annexure B).
- In signing a consent forms which contained a confidentiality clause, my contact information, and an explanation of the participation requirements (e.g. activities and duration), students indicated their willingness to be research participants (cf. Annexure C & D).

5.6.1 Informed consent

In every discipline it is considered unethical to collect information without the knowledge of participants and their expressed willingness and informed consent (Bailey, 2007). Informed consent implies that subjects are made adequately aware of the type of information you want

from them, why the information is being sought, what purpose it will be put to, how they are expected to participate in the study and how it will directly or indirectly affect them (Patton, 2015). It is important that consent should be voluntary and without pressure of any kind.

Participants in my study were given a detailed consent form to sign in which I emphasized that their consent to participate could be withdrawn at any stage of the research programme should they wish to do so (cf. Annexure C & D).

5.6.2 Privacy

According to McMillan & Schumacher (2010), privacy refers to agreements between persons that limit the access of others to private information. Privacy also refers to the freedom an individual has to determine the time, extent and general circumstances under which private information will be shared with or withheld from others (McMillan, 2012).

When participants agreed to participate in my research study, they granted me access to their information, but this was not unlimited access. Access is a broad term and generally includes viewing, touching or having information about participants (Saldana, 2011). People have a right not to have their lives invaded. It was well worth thinking about how to conduct observational research in an unobtrusive manner, and to respect the privacy of those who are observed (Bailey, 2007). I was particularly careful to ensure that participants did not experience intrusion, however unintended. In my judgement, I succeeded in observing this very important aspect

5.6.3 Voluntary participation

In addition to all the above-mentioned precautions, it was made clear to participants that my research was solely for academic purposes and that their participation in it was absolutely voluntary. No one was forced to participate (McMillan & Schumacher, 2010). Participants were

informed that they could withdraw from the study at any time if they wished to. This right was explained to participants prior to engagement in the study (Saldana, 2011; cf. Annexure C & D).

5.6.4 Dissemination of results

Results will be disseminated in the form of a research report. It is hoped that the report would stimulate readers to want to study it to determine its feasibility for implementation (Patton, 2015). The report does not expose the secrets or weaknesses of the institution to the readers, but rather recommends improvements of the service (Kennedy, 2006). Participants were informed that a copy of the findings would be handed to the CUT university library and that the findings may be released in the public domain by means of a journal article.

5.7 SUMMARY

In this chapter the focus was on research methodology and design. It covered the application of the qualitative research approach, and described the methods used in the collection of data, namely semi-structured interviews, document data and observation schedules. The aspects of reliability and validity in qualitative research were explained. Ethical considerations and the researcher's role as research instrument were clearly articulated.

In the next chapter (Chapter 6) the focus is on the analysis and interpretation of the data collected. The results and the findings will also be presented.

CHAPTER 6

ANALYSIS, DISCUSSION AND INTERPRETATION OF FINDINGS

6.1 INTRODUCTION

In Chapter 5 I presented the overall research design and methodology I followed in the study as well as my motivation for choosing the paradigm, the approach, the strategy of enquiry and the methods for conducting the empirical phase of the study. In Chapter 6, I present and discuss the findings. As I indicated in Chapter 5, data collection for this study involved the analysis of documents, the observation of and focus groups interviews with research participants. During the process of data analysis, I was able to reduce the collected data into manageable sizes in order to establish possible patterns and themes. The analysis of data sourced from the data collection instruments (documents, observations, focus group interviews) was done individually and methodically, as explained in Chapter 5, identifying individual themes and categories which were later compared and triangulated to validate the findings.

The main research question that directed the study was:

How can student teachers at the Central University of Technology be assisted to improve the practice of critical reflective thinking and teaching during their teacher training programme so as to meet the requirements of 21st century teaching?

The conceptual framework presented in Figure 6.1 provides a holistic picture of the structure and methods followed in the study.

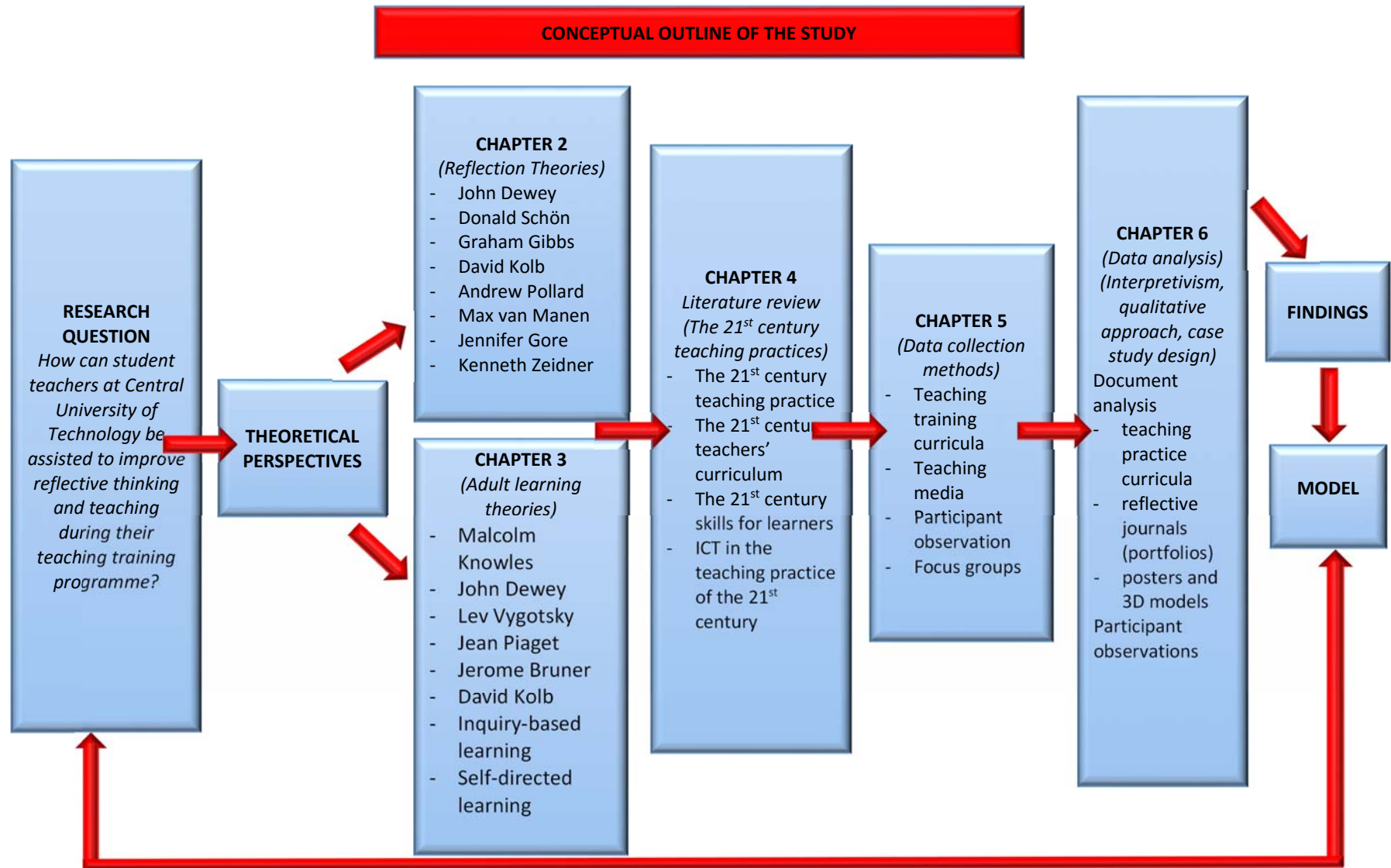


Figure 6.1: Conceptual outline of the study

What follows is a brief discussion of the themes and categories identified through the analysis of collected data.

6.2 ANALYSIS OF TEACHING PRACTICE CURRICULA

This section describes the themes and categories augmented from the teaching practice curricula, including the study guides, textbooks, notes/slides and printouts for each course. Included for data analysis at this stage were students’ teaching portfolios as well as the media they used as teaching aids during their micro-lessons and practical teaching at schools. All courses offered from the 1st to the 4th academic year were scrutinized with the focus being specifically on content related to critical reflective thinking and teaching (cf. Annexure J) for the different programme outlays. Table 6.1 indicates which themes and categories featured in the teaching practice curricula.

Table 6.1: Themes and categories: teaching practice curricula

Theme 1	<i>Aspects focusing on theory of critical reflection</i>
Theme 2	<i>Aspects focusing on micro-teaching and reflection</i>
<i>Category 2.1: Reflective micro-teaching skills</i>	
Theme 3	<i>Instructional methods and reflection</i>
Theme 4	<i>Assessment methods and reflection</i>
Theme 5	<i>Aspects focusing on 21st century skills and reflective teaching</i>
<i>Category 5.1: Basic digital literacy skills</i>	

6.2.1 Theme 1: Aspects focusing on critical reflection theory

The 4th year curriculum component

In the General Subject Didactics III module, students are taught that curriculum is never developed in a vacuum since particular values and beliefs always influence the foundations of a

curriculum developer's thinking. These values and beliefs stem from the areas of philosophy, sociology and culture, as well as from psychology. More specifically, according to Smith (2002), reflective thinking in curriculum is derived from four major theories, namely perennialism, progressivism, essentialism and social reconstruction. In Perennialism, classrooms are teacher-centred. Learning involves learners' reading and analysing the work of history's finest thinkers in order to develop their ability to think deeply, analytically, flexibly and imaginatively. Progressivism, on the other hand, advocates learning by doing, arguing that learning happens best when learners are engaged in real-life activities. The emphasis is thus on experiential learning, problem-solving, critical thinking and co-operative learning projects. Essentialism emphasizes the existence of a core of information and skills – typically related to specific subjects – without which teachers would be unable to facilitate learners' development of higher-order skills and knowledge (Bloom, 1956). Metaphorically, Essentialism is likened to a bank transaction: the teacher 'deposits' information into learners' heads, and the latter must then 'draw this information from their memory bank' as the 'capital' by means of which they can invent and reinvent the world – a good example of social reconstructionism.

Fourth year students are also sensitized to different ways in which teachers could manage/respond to curriculum change, the most typical ones being co-option, non-implementation or gradual adoption. The latter occurs when change is incremental – a series of small steps – with the teacher continuously considering the context in which changes have to be made. Teachers who 'co-opt' change simply for the sake of change, with no intention to critically reflect on his/her instructional methods. Non-implementation could either happen because the teacher refuses to change or because s/he struggled to make the changes due to a lack of understanding, support, training and/or resources. Implied in these three responses is the notion that critical reflective teaching is crucial to effective curriculum change since it ensures that teachers have the requisite repertoire of skills/tools needed to manage the required changes (cf. Paragraphs 2.3.2; 2.4.1).

6.2.2 Theme 2: Micro-teaching and reflection

During the 2nd year of the B. Ed (SP & FET) and the PGCE programmes, the curriculum suggests ways in which student teachers could improve the practice of critical reflection by reducing the gap between theory and practice. For example, students should be afforded sufficient opportunities to put into practice the theories they have learned (Gibbs, 1988). The curriculum further indicates that students should explore skills and actions in the classroom that will foster critical reflective teaching - thinking about how they act, speak and behave in the classroom setting, for example. The practice of reflection should be exercised in a safe classroom environment, with constructive observations and self-evaluative practice-based teaching (cf. Paragraphs 2.4.3; 4.3.1).

6.2.2.1 Reflective micro-teaching skills

The 2nd year B. Ed and PGCE curriculum components

Table 6.2 presents the steps in micro-teaching which involves self-reflection *after* the student had presented a micro-lesson (School-Based Learning II & IV) (Taole, 2015). Micro-teaching elements like lesson preparation, presentation, observing, getting feedback, discussions and importantly, re-planning, re-presentation and re-evaluation phases by their very nature require some degree or form of reflection (cf. Paragraph 2.4.3.3).

Table 6.2: Micro-teaching steps

(Taole, 2015)

STEPS	ACTIVITIES
<i>Step 1: Preparation</i>	<ul style="list-style-type: none"> • Selection of the skill • Explanation and demonstration of the skill • Discussion of the value of the skill • Discussion of the observation sheet
<i>Step 2: Presentation</i>	<ul style="list-style-type: none"> • Preparation and planning of a presentation • Selection and organization of the content, activities, sources and resources
<i>Step 3: Observation</i>	<ul style="list-style-type: none"> • Evaluation of the presentation using agreed upon criteria • Focus is on particular teaching skills
<i>Step 4: Feedback</i>	<ul style="list-style-type: none"> • Self-, peer and supervisor assessment • Development and reinforcing what should be done right • Self-reflection
<i>Step 5: Discussion</i>	<ul style="list-style-type: none"> • Giving and receiving feedback to make meaning of the presentation

Student teachers are, to a certain extent, afforded the opportunity to practise critical reflective teaching when they are taught how to compile a lesson plan in line with the National Curriculum Statement (NCS) for Grades R-12. The NCS endeavours to enable learners to acquire and apply knowledge and skills meaningfully in the process of learning (Education II; General Subject Methodology I, Education IV; Professional Studies IV). It promotes active learning, identification and solution to problems and decision-making consistent with the Curriculum Assessment Policy Statement (CAPS) and encourages the effective use of technology and visual language skills in various modes (cf. Paragraphs 4.3.1; 4.4.2; 4.7).

Other skills such as introduction and set establishment, using teaching media, questioning and concluding a lesson as highlighted in Table 6.3 are also covered. All these micro-teaching skills imply reflective activity from the student teacher, especially upon conclusion of the lesson.

Table 6.3: Micro-teaching skills

(Taole, 2015)

MICRO-TEACHING SKILLS	
<i>The skills of introduction and set establishment</i>	<ul style="list-style-type: none"> • Evaluation of the existing knowledge and experience of learners • Indicating the purpose of the learning material
<i>The skill of using teaching media</i>	<ul style="list-style-type: none"> • Considering appropriateness for the development of learners • Considering compatibility of the lesson objectives
<i>The skill of questioning</i>	<ul style="list-style-type: none"> • Providing learners with the opportunity to assimilate and reflect on teaching and learning
<i>The skill of concluding a lesson</i>	<ul style="list-style-type: none"> • Reflection/repeating key points • Was the learners' pre-knowledge integrated with the new lesson matter?

Bloom's taxonomy is covered as a tool to promote critical thinking and problem-solving in both student teachers and learners. Students are taught that higher-order questions require more than simple memory recall and descriptive answers; they require productive thinking in order to answer questions (Bloom, 1956). Different types of learning styles of learners (Good, 2008) - auditory, visual, kinaesthetic and tactile – are also covered.

Table 6.4 details the theoretical underpinnings of micro-teaching, highlighting reflective teaching as having the characteristics of cognitive apprenticeship, constructivism and reflective pedagogy.

Table 6.4: Theoretical underpinnings of micro-teaching

(Taole, 2015)

THEORETICAL UNDERPINNINGS OF MICRO-TEACHING	
<i>Cognitive apprenticeship</i>	<ul style="list-style-type: none"> • Lecturers/supervisors and mentor experienced teachers present and demonstrate how a particular skill is performed
<i>Constructivism</i>	<ul style="list-style-type: none"> • Construction of knowledge through problem-solving and critical thinking

(continued next page)

Table 6.4: (continued)

THEORETICAL UNDERPINNINGS OF MICRO-TEACHING	
<i>Reciprocal teaching</i>	<ul style="list-style-type: none"> The student teacher teaches, participants observe, ask questions on the presentation, there are discussions, new understandings about the presentation are generated, lead to construction of meaning by the supervisor, presenter and the student teachers
<i>Reflexive pedagogical approach</i>	<ul style="list-style-type: none"> Student teachers revisit the process involved in producing a piece of assessed work in order to evaluate and build on their experiences and positions

The next category investigates the degree to which reflection and reflective teaching forms part of learning material, focusing specifically on aspects of instruction and instructional methods.

6.2.3 Theme 3: Instructional methods and reflection

In the 3rd year curriculum (Education III) the students’ knowledge of what they are actually teaching, especially content and conceptual knowledge, is the most important resource they have: it is what makes them professionals. According to Sadlin (2005), rich subject knowledge enables a student teacher to enrich the learning process with a broad range of illustrations, and to make connections between different concepts and ideas at different levels. In discussions of pedagogy, a distinction is often drawn between teacher-centred and learner-centred classrooms (cf. Paragraphs 2.4.6.2; 3.2.1), the former being termed ‘traditional’ and contrasted with more progressive or constructivist learner-centred pedagogies.

The PGCE programme (Professional Studies IV), and the 2nd Year programme (Education II) sensitize students to the importance of progressive coverage of learning content, i.e. from the simple to the complex. The curriculum for this programme advocates child-centred schooling, emphasising that an acknowledgement of children’s interests in the design and delivery of curricula should be evident from a teacher’s lesson objectives. The lesson should not state what the teacher is supposed to do but rather, what the desired learner actions are. By implication, the lesson objectives should be observable and operational (i.e. learners should be able to

achieve them) (cf. Paragraph 2.4.6). Student teachers are advised to use only one action verb for each objective, and never to use abstract verbs such as “know” or “understand” (Bloom, 1956). Moreover, these objectives should be classified in terms of their being affective, psychomotor or cognitive, as indicated in Table 6.5.

Table 6.5: Classification of objectives

(Taole, 2015)

Classification of objectives	
<i>Affective domain</i>	emotional development (feelings, emotions, attitudes, etc.)
<i>Psychomotor domain</i>	muscular and motor skills (drawing, cutting, writing, etc.)
<i>Cognitive domain</i>	acquisition and manipulation of information (development of intellectual abilities and skills, e.g. recalling, creation of new ideas)

The lesson objectives in these modules highlight learner-centred methods which focus on the learner playing a central role in teaching-learning activities through active participation in classroom activities. Active participation often leads to productive interaction between the teacher and the learners and among learners themselves. Learner-centred instructional methods, according to Caffrey (2012), could include discussion, cooperative learning, projects, role play and experimentation.

Discussion is a learning strategy in which discourse between a learner and the teacher serves a very definite purpose. In an andragogical context (the training of student teachers being such), Knowles and Associates (1984) indicates that discussion is an important adult learning strategy (cf. Paragraph 3.2.1.1), with lesson objectives guiding the direction of discussions and the sharing of their experiences, all of which contributes to their gaining knowledge of the topic/issue being discussed. The role of the teacher is to make sure that the class environment promotes the use of discussions.

Another method is *cooperative learning*. In this instance, learners work together to ensure that all members in their groups have learned and understood the same content (Good, 2008). As

discussed in Chapter 3, cooperative learning is an inquiry-based form of learning which contributes to cognitive development (Piaget, 2001) within social contexts (Vygotsky, 1978) (cf. Paragraphs 3.2.1.1; 3.2.3). In cooperative learning, learner groups are organized and tasks are structured in such a way that learners must work together to reach a goal, solve a problem, make a decision or produce something, hence stimulating reflective teaching and learning. The teacher needs to be flexible and non-judgmental in the management of cooperative learning given that its greatest benefit is that it stimulates creative and divergent thinking in problem-solving activities.

In the *project method*, learners have to participate in a real and meaningful project aimed at solving a particular problem. This instructional method requires learners to work individually or in groups, with the teacher acting as a guide only. The *experimental learning method*, on the other hand, allows learners to experience and discover reality, encouraging them to learn through self-discovery, exploration and observation (Taber, 2011). Learners using the experimental method learn how to do and interpret experiments, to observe, classify, communicate, measure, predict and infer. All these methods are learner-centred and involve a high level of critical reflective teaching.

These programme modules are similar in that all of them have as purpose of instilling in student teachers a critical awareness of the imperative for teachers to select learning content appropriate to the age, intelligence levels and career goals of the learners in their care. Content should be derived from or add to what a community knows, does, feels or thinks and would include its home life, its occupations, its leisure pursuits and its governmental institutions (Knowles, 1989) but should include all three content types: knowledge, skills and values, referred to as KSVs (cf. Paragraphs 2.4.6; 3.2). Knowledge usually refers to *factual information*, skill to that which a person can *do*, and values to *moral beliefs and/or attitudes*. Skills acquisition is a time-consuming process which requires *scaffolding*, while values teaching is a potential mine-field. Teachers therefore have to take critically reflect on ways in which they would incorporate and teach values and morals in this particular classroom contexts.

6.2.4 Theme 4: Assessment methods and reflection

Students are taught how to use a variety of assessment methods and are made aware of each method's advantages and disadvantages (School-Based Learning II & IV; General Subject Methodology I; Professional studies IV. They should know when, why and how to use the different types of assessment methods effectively. As expected, the two types of assessment which play a prominent role in the respective modules are formative and summative assessment.

Table 6.6: Formative and summative assessment

	FORMATIVE	SUMMATIVE
<i>Purpose</i>	To monitor and guide a learning process while it is still in progress	To judge the success of a learning process at its completion
<i>Time of assessment</i>	During the process	At the end of the process
<i>Type of assessment technique</i>	Informal observation, quizzes, homework, learners' question, worksheet, discussion, group work, cooperative method, problem-solving, role-play, project-based learning, research, individualized and differentiated learning, etc.	Formal tests, projects, June and November exams, assignments, presentations, self-tests
<i>Use of assessment information</i>	Improve and change a process while it is still going on	Judge the overall success of a process, grade, place and promote

6.2.5 Theme 5: Aspects focusing on 21st century skills and reflective teaching

Twenty-first century teaching encourages, amongst others, the use of teaching aids and resources such as iPads, notebooks, cell phones, etc. (Rowley, 2016). If used correctly, these teaching aids and resources could enhance a futuristic learner-centred pedagogy which stimulates learner activity in line with 21st core teaching and learning requirements (cf. Paragraph 4.7.1). The transformation of different resource types into learning resources do, however, require linking them to the objectives and specific aims of the lesson if they are to be effectively used for reflective teaching and learning.

6.2.5.1 Basic digital literacy skills

The 2nd, and PGCE curriculum components

Student teachers at these two levels of the programme are taught to use basic digital literacy skills (Computer Literacy II for both the 2nd years and PGCE students) as depicted in Table 6.7. Not only are they skilled in a variety of computer applications, including MS Word, MS Excel, Power-point, and the Internet, which they can use to design 3-D charts but also in how to search for authentic, reliable educational material for classroom use. By using these effectively, they should be able to present their lessons in ways that will grab the attention of learners with various learning styles and needs.

Table 6.7: Basic digital literacy skills and teaching media

(James, 2013)

BASIC DIGITAL LITERACY SKILLS	
<i>Essential computer concepts</i>	<ul style="list-style-type: none"> • Describe the components of a computer system • Describe how data is shared among different types of application software
<i>Exploring the basic of windows XP and managing files</i>	<ul style="list-style-type: none"> • Run software programmes, switch between them and close them • Get help when you need it
<i>Browser and E-mail basics</i>	<ul style="list-style-type: none"> • Learn the relationship between the Internet and World Wide Web • Save a Web page and a graphic from Web page
<i>MS Word</i>	<ul style="list-style-type: none"> • Copy formatting with format painter • Insert and edit graphics
<i>MS Excel</i>	<ul style="list-style-type: none"> • Create 3-D charts • Add and modify drawing objects using the drawing toolbar
<i>MS PowerPoint</i>	<ul style="list-style-type: none"> • Create a presentation using the AutoContent Wizard • Create and print speaker notes and slides • Create a diagram using Diagram Gallery
<i>MS Access</i>	<ul style="list-style-type: none"> • Create a table in Datasheet view • Add fields to a table using Data Type Gallery • Modifying a form/report' design in Layout View
<i>Integrating Word, Excel, Access and PowerPoint</i>	<ul style="list-style-type: none"> • Object linking and embedding
<i>Internet</i>	<ul style="list-style-type: none"> • Searching information

Over and above electronic media, other types of media that students are encouraged to use to foster higher-order thinking are listed in Table 6.8. Student teachers are encouraged to move from fun activities associated with media-based teaching to developing higher-order conceptual understanding of the different learning areas. Conceptual understanding, rather than memorization of facts, is vital in a world where facts change rapidly and where the aim of teaching is for learners to apply knowledge.

Table 6.8: Teaching media

(Taole, 2015)

TEACHING MEDIA	
Additional printed materials	Electronic technologies
<ul style="list-style-type: none"> • Newspapers • Academic journals • Wall charts • Maps • Magazines • Brochures • Posters • Billboards, etc. 	<ul style="list-style-type: none"> • Radios • Audio recorders • DVD recorders • Computers • Interactive videos • Internet • PowerPoint • CDs • 3-D models • White boards • Tape recordings, etc.

According to the 2nd year and PGCE programmes, there is usually a lot more to media messages than what 'meets an eye'. Therefore, students need to show learners how each medium reports the same event in a different way, how to recognize the hidden messages that are carried by the popular media, and how to distinguish between the denotation and connotation of media messages.

6.2.6 Critical reflection: teaching practice curricula

It appears that the notion of critical reflection seems to be catered for within the theoretical models since beliefs, real-life activities, learner-centeredness, problem-solving, co-operative learning, critical thinking, etc. are highlighted. As indicated earlier (Chapters 2 & 3), these cognitive skills are the cornerstones of critical reflective teaching. In the modules dealing with instruction and assessment, critical reflection and reflective teaching are partially covered. Provision is also made, to a certain extent, for 21st century instructional and assessment methods; however, from the analysis of curricula and the assignments issued to students, it is not clear to what extent these are applied in practice. In the micro-teaching modules, reflective teaching is

covered sufficiently in the theory sections and moderately in practice. In practice, student teachers are not afforded enough opportunities to reflectively observe their own and/or other student teachers' video-recorded presentations; neither do they get the opportunity to participate in discussions on these and/or to provide constructive feedback to their peers.

It seems, then, that critical reflection, creative thinking and reflective teaching do form part of the curricula, but rather indiscriminately. There appears not to be a section or a unit dedicated to the art of reflection, critical thinking and reflective teaching, outlining its origin and objectives, different approaches, steps, strategies, and benefits.

6.3 PRESENTATION AND DISCUSSION OF THEMES: REFLECTIVE JOURNAL (PORTFOLIOS)

In this section I present and discuss the thematic analysis of forty reflective journals (portfolios) of the sampled 2nd, 3rd, 4th year B.Ed and PGCE student teachers. The theme is presented according to the categories as outlined in Table 6.9.

Table 6.9: Themes and categories: reflective journals (portfolios)

THEME	REFLECTIVE JOURNAL (PORTFOLIO) AND CRITICAL REFLECTIVE TEACHING
Category 1:	Evidence of creative and reflective lesson objectives
Category 2:	Evidence of creative and reflective introductions
Category 3:	Evidence of creative and reflective content presentations
Category 4:	Evidence of creative and reflective application and conclusion
Category 5:	Evidence of creative and reflective applications and conclusions
Category 6:	Reflective assignments
Category 7:	Reflective essays

6.3.1 Theme: Reflective journals (portfolios) and critical reflective teaching

The portfolios were analysed individually per level of study. From thereon, the data for the different levels were compared and combined for ease of reporting.

6.3.1.1 Category 1: Evidence of creative and reflective lesson objectives and identification of prior learning

The objectives outlined in Table 6.10 were provided to students in their practical modules as examples of the different levels of knowledge to be applied in their lessons.

Table 6.10: Examples of lesson objective verbs which students used in the lesson plans

LESSON OBJECTIVES USED IN THE LESSON PLANS		
Level of study	Lower order objectives/verbs	Higher order objectives/verbs
2 nd year	state, define, describe, explain, give, identify, list, use, communicate, add and subtract	apply, draw, distinguish, compare differentiate, calculate, interpret, balance, prove, multiply
3 rd year	build, do, find, simplify, change, mark, adjust, make, sketch, recognize, correct, insert, write name, explain, give, identify, list, use, communicate, add, subtract and multiply	outline, elaborate, prove, deduce, differentiate, describe, interpret, compare, solve, calculate, balance, interchange, distinguish
4 th year	find, simplify, change, distinguish, show, mark, adjust, make, sketch, recognize, correct, insert, write name, calculate, explain, give, identify, list, use, communicate, add, subtract and multiply	deduce, solve, outline, elaborate prove, differentiate, describe, interpret, compare and prove, build,
PGCE	do, find, simplify, change, show, mark, adjust, make, sketch, recognize, correct, build, insert, write name, calculate, explain, give, identify, list, compare, use, communicate, determine, add, subtract, multiply, specify and tell	outline, elaborate, prove, interchange, distinguish, deduce, solve, differentiate, describe, interpret, prove, develop, observe, prepare, illustrate, convert,

In Table 6.11, the knowledge, skills and values used by students in the planning of their lessons are listed. According to Taole (2015) the knowledge, skills and values represented in this table reflect what learners should learn over and above the lesson content to give them a

comprehensive understanding of public life, hone their critical thinking skills and develop the abilities to collaborate with diverse groups in the solving of problems and the creation of change.

Table 6.11: Examples of knowledge, skills, values and attitudes which students identified in their lesson plans

KNOWLEDGE AND SKILLS	VALUES AND ATTITUDES
Problem-solving, interpretation, application decision making, common sense, listening, time management, speaking, communication, reading, interpersonal and critical thinking, analysis, numeracy, comprehension.	Curiosity, commitment, equality, respect, participation, teamwork, honesty, responsibility, human dignity, open-mindedness, compassion, positive attitude, enthusiasm, teamwork, confidence, cooperation, integrity, diligence, discipline, flexibility, reliability.

In line with Bloom’s Taxonomy, it was evident from all the levels of study that students were, to a certain degree, able to identify increasingly advanced lesson objectives (Conklin, 2011).

They used operational/behavioural verbs and few non-operational verbs like “know” and “understand”. Some lesson objectives were partially attained and some were not achieved at all (cf. Paragraph 2.4.6). Table 6.12 illustrate the percentage of reflective objectives used at the different levels of study. Indications are that 2nd year and PGCE students struggle to establish a good mix of reflective objectives, whereas the 3rd and 4th year students found this less difficult.

Table 6.12: Participants’ use of reflective objectives

Level of study	Poor mix	Fair mix	Good mix
2nd Years	40% (4)	50% (5)	10% (1)
3rd Years	20% (2)	60% (6)	20% (2)
4th Years	20% (2)	70% (7)	10% (1)
PGCE	40% (4)	50% (5)	10% (1)

Figure 6.2 contains an example of a lesson in which the objectives were not stated correctly. There was only one lesson objective and, although it presented the potential for reflective teaching and learning, it could have been preceded by lower level objectives which stated that learners should, at the end of the lesson be to:

- *Identify* algebraic functions used in quadratic equations
- *Outline* the steps in solving quadratic equations
- *Solve* quadratic equations by means of factorization

The inclusion of lower level objectives would have assisted the student in systematically preparing the content phase, allowing learning to progress from elementary to advanced thinking while being actively involved in the lesson throughout.

**B ED (FET) & PGCE
LESSON PLAN FOR STUDENT TEACHERS'
TRAINING PURPOSES
2017**









STUDENT NAME	[REDACTED]	STUDENT NUMBER	[REDACTED]
MICRO LESSON GROUP or SCHOOL	Marematlou S.S	SUBJECT	Mathematics
NUMBER OF LEARNERS	29	GRADE	10
DATE	2017/08/11	TIME	30Minutes
		Language:	English
	SUBJECT TOPIC (Broad) Algebra		
	LESSON TOPIC Quadratic equations		
	LESSON OBJECTIVES At the end of the lesson learners must be able to: 1. Solve quadratic equations by factorization.		
EDUCATIONAL AIDS 	1. Chalkboard 2. Chalk 3. Duster		
SOURCES 	Textbook	KNOWLEDGE AND SKILLS 	<ul style="list-style-type: none"> Analyze Problem solving Discussion
LEARNING MATERIAL 	<ul style="list-style-type: none"> Activity books Stationary 	VALUES AND ATTITUDES 	Open mindedness, attentiveness and discipline.
IDENTIFICATION OF PRIOR LEARNING 	Learners already know: 1. Students are familiar standard form of linear function and how to solve it. 2. Exponents		
METHODS 	Teacher-directed methods		Learner centred method
	<input checked="" type="checkbox"/> Telling method <input checked="" type="checkbox"/> Scaffolding method <input checked="" type="checkbox"/> Demonstration method <input checked="" type="checkbox"/> Questioning method		<input checked="" type="checkbox"/> Cooperative learning <input checked="" type="checkbox"/> Discussion <input type="checkbox"/> Project method <input type="checkbox"/> Role-play method

Figure 6.2: An example of a lesson plan with a poor mix of lesson objective levels

Similarly, Figure 6.3 portrays a lesson plan where the student became confused between objectives and questions. The content lent itself to a fair mix of lower and higher order objectives, but instead of using non-behavioural verbs such as “know”, the student could have opted for more reflective objectives such as:

- *Differentiate* between a salary and a wage journal;
- *Draw* up a wage journal;
- *Calculate* the basic wages and overtime;
- *Work* out an employee’s deduction and employer’s contribution.

These verbs would have addressed the reflective objectives correctly and would have ensured that learners had a clear understanding of what each objective entailed.

**B ED (FET) & PGCE
LESSON PLAN FOR STUDENT TEACHERS'
TRAINING PURPOSES
2014**







STUDENT NAME [REDACTED]		STUDENT NUMBER [REDACTED]	
MICRO LESSON GROUP or SCHOOL		EDU-COLLEGE	SUBJECT ACCOUNTING
NUMBER OF LEARNERS	13	GRADE	11
DATE	2016/04/07	TIME	1h10min
Language: English			
SUBJECT TOPIC (Broad) FINANCIAL STATE			
LESSON TOPIC INCOME STATEMENT			
LESSON OBJECTIVES At the end of this lesson, the learners should be able to: 1. Know the format of the Income Statement 2. Know the purpose of the Income Statement 3. What is meant by the financial position 4. How to calculate Sales or Cost of Sales when a markup is given 5. Treat Adjustments correctly			
EDUCATIONAL AIDS 	1. Grade 11 New Era Text book 2. White board 3. White board marker pen 4. Calculator		
SOURCES 	*Hall, T Woodroffe, D Singh, P. Ramsamy, J & Aboobaker, H. New Era Accounting Grade 11. 2013 South Africa	KNOWLEDGE AND SKILLS 	*Calculate Profit or Loss *How to treat profits/losses or salaries in a partnership situation *Effectively record activities of the company to determine the profits and losses of the company
LEARNING MATERIAL 	*Grade 11 Text Book, * Activity, *Homework	VALUES AND ATTITUDES 	*Qualified Accountants aspire to be members of the South African Institute of Chartered Accountants or commercial or financial accountants.
IDENTIFICATION OF PRIOR LEARNING 	In grade 10 the Income Statement and Balance Sheet of Sole Traders was taught. Learner are required to list out the format of the Income Statement and what must be added and what must be subtracted to obtain the Profit or Loss. The learner are required to demonstrate how to work out the Sales or Cost of Sales when a mark-up is given.		
METHODS	<i>Teacher-directed methods</i>		<i>Learner centred method</i>

Figure 6.3: An example of a lesson plan with a fair mix of lesson objective levels

The lesson objectives stated in Figure 6.4 display the student’s ability to formulate lesson objectives in a way that may provide learners with a scaffold which would give them a solid basis from which to move from prior knowledge to the assimilation of new knowledge content (Piaget, 2001). According to Van Manen (1977) and Pollard (2002), verbs should be observational and operational in order for learners to demonstrate understanding. In this example, the behavioural

verbs “interpret”, “draw” and “investigate” catered for lower to higher levels of learning according to Bloom’s Taxonomy (Bloom, 1956). The student teacher could, however, have stated these verbs in ascending order, starting with “draw”, then “interpret”, and lastly “investigate”.

B Ed SP AND FET TEACHING
English LESSON PLAN FOR STUDENT TEACHERS'
TRAINING PURPOSES

STUDENT NAME	REARABETSWE	STUDENT NUMBER	
MICRO LESSON GROUP	SECONDARY	SUBJECT	Natural Sciences
SCHOOL	SCHOOL	GRADE	8B
NUMBER OF LEARNERS	35	TIME: 30 minutes	Language: English
DATE	31 July 2017	SUBJECT TOPIC (Broad)	
ELECTRICITY AND MAGNETISM			
LESSON TOPIC			
ELECTRIC CIRCUIT			
LESSON OBJECTIVES			
At the end of this lesson, the learners should be able to:			
1 Interpret an electric circuit diagram			
2 draw an electric circuit diagram			
3 investigate the flow of current using simple circuit board			
EDUCATIONAL AIDS	1 Chalkboard		
SOURCES	1. Spot on Natural sciences Grade 8 2. X-kit physics Grade 11	KNOWLEDGE AND SKILLS	<ul style="list-style-type: none"> Safety should be a first value Be critical and creative Listening and applying skills
LEARNING MATERIAL	<ul style="list-style-type: none"> Circuit board Electrical components 	VALUES AND ATTITUDES	<ul style="list-style-type: none"> Respect Cooperative learning Be obedient
IDENTIFICATION OF PRIOR LEARNING	Learners are familiar with: <ul style="list-style-type: none"> How electricity is generated The manner in which the electricity is directed to their different homes. 		
TEACHING METHODS	Teacher-directed methods <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Telling method <input type="checkbox"/> Scaffolding method <input checked="" type="checkbox"/> Demonstration method <input checked="" type="checkbox"/> Questioning method 	Learner-centered methods <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Cooperative learning <input checked="" type="checkbox"/> Discussion <input type="checkbox"/> Project method <input type="checkbox"/> Role-play method <input checked="" type="checkbox"/> Experimentation method 	
Teacher's Actions		INTRODUCTION	Assessment

Figure 6.4: An example of a lesson plan with a good mix of lesson objective

6.3.1.2 Category 2: Evidence of creative and reflective introductions

As Kolb (2014) suggests, it is important for students to devise a creative introduction, so that the lesson would stimulate learners’ interest and encourage their active involvement. Student teachers at the CUT are quite familiar with the sources for creating interesting introductions (Micro-teaching module) such as engaging learners by means of personal anecdotes, a historical event, a thought-provoking dilemma, a real-world example, a short video clip, probing questions, etc. (cf. Paragraph 3.2.2.1). According to Duit (2008), the following questions are useful when planning introductions:

- How will I check whether learners know anything about the topic or whether they may have any preconceived notions about it?
- Could there be some commonly held ideas or possible misconceptions about this topic that learners might be familiar with?
- What will I do to introduce the topic?

The use of creative and reflective introductions was varied. For example, 70% of the 3rd years and 60% of the 4th years managed to introduce their lessons creatively by means of experiments or the use of scenarios as forms of set induction. Through close analysis of the lesson plans I concluded the following:

Table 6.13: Participants’ use of creative introductions

Level of study	Little evidence of creative introductions	Evidence of a fair number of creative introductions	Evidence of creative introductions
2 nd Years	30% (3)	50% (5)	20% (2)
3 rd Years	10% (1)	30% (3)	60% (6)
4 th Years	10% (1)	20% (2)	70% (7)
PGCE’s	20% (2)	50% (5)	30% (3)

Figure 6.5 reflects a good example of a lesson that was planned with very little creativity and which did not leave much to the imagination. The lesson topic was letter writing, specifically the writing of a cover letter in which the writer responds to a job advertisement. Whereas Piaget (2001) indicated that establishing the prior learning of learners is a prerequisite for a good introduction, the student in this case went straight to the business of the day, without establishing learners' knowledge about letter writing - the different types of letters, their different structures, etc.


	<input type="checkbox"/> Scaffolding method <input type="checkbox"/> Demonstration method <input type="checkbox"/> Questioning method	<input type="checkbox"/> Cooperative learning <input type="checkbox"/> Discussion <input type="checkbox"/> Project method <input type="checkbox"/> Role-play method <input type="checkbox"/> Experimentation method
INTRODUCTION		
Teacher's Actions:- <ol style="list-style-type: none"> 1. Introduce the learners to the task. Explain that they have to write a letter in response to a job interview. 2. Explain to the learners that the letter is formal and that the register should be formal 3. Give them the rubric on which they will be assessed on so they know what is expected of them. 4. Explain the Process in writing to them. 	Assessment Strategies -Baseline assessment -Question answer	
Learners' Activities <ol style="list-style-type: none"> 1. Learners observe and listen attentively 2. Learners look at how a formal letter looks like and what is expected. 3. Learners look at the rubric to know how they will be assessed and consider the formal register. 	Debate Discuss	
PRESENTATION		
Teacher's Actions: <ol style="list-style-type: none"> 1. The teacher gives them the assessment and the learners start with their planning. 	Assessment Strategies -Formative assessment	
Learners' Activities <ol style="list-style-type: none"> 1. Learners start with their draft and planning. 2. Learners continue with their pre-writing and after that give their writing work to their peers for assessment. They check each other's work and rectify mistakes with a pencil. 3. Learners give the corrected or checked work back to the owners 		
APPLICATION AND CONCLUSION		
Teacher's Actions The teacher gives the learners a clean page to right their final draft or final	Assessment Strategies -Summative assessment	

Figure 6.5: Example of an uninspiring lesson introduction

The lesson in Figure 6.6 displays an introduction with a fair amount of creativity. The student started off by asking a question (“Who can help me.... What are the three trigonometric ratios...?”). From there on the student built on learners’ answers to these questions by providing a detailed background to the topic that would be covered on that day. Learners were immediately ‘drawn into the lesson’ by providing answers and asking follow-up questions. As Bruner (1987) notes, this kind of introduction is usually successful in establishing links between prior knowledge and new content that is to be explained.

INTRODUCTION	
Teacher's Actions	Assessment Strategies
The teacher will ask the learners to identify the trigonometric ratios of sine, cosine and tangent. Then the teacher will further draw a Cartesian plane and draw a terminal arm in the Cartesian plane with a point R (x; y) and construct a right-angled triangle with sides named r, x and y and then ask learners to identify the three above mentioned trigonometric function ratios in terms of r, x and y. EXPECTED ANSWERS: $\tan A = y/x$, $\cos A = x/r$ and $\sin A = y/r$. since learners are familiar with the CAST method, they will be asked to identify in which quadrants are trigonometric ratios positive and negative, Expected Response; Quadrant I-all +, Quadrant II-only sine +, Quadrant III-only tangent +, and Quadrant IV-only cosine +.	
Learners' Activities	
The learners will write down the notes and pay attention to the teacher and provide answers to the teachers questions and ask questions where they don't clearly understand.	Question Answers
PRESENTATION	
Teacher's Actions	Assessment Strategies
The teacher will introduce the new concept to the learners by labelling the angles on a Cartesian plane and shows the learner the restrictions of angles of each of the four quadrants. The teacher will take a ... the learners how to attempt the questions ... consideration when	

Figure 6.6: Example of an introduction displaying a fair amount of creativity

Figure 6.7. illustrates and even more creative introduction. The student grouped the learners in groups of five, immediately setting the scene for collaboration, group learning, and active involvement. Both Vygotsky (1986) and Knowles (1989) hail collaborative and active learning as a very effective means of introducing new content. The student then referred learners to a 3-D model of human lungs to capture their attention and to introduce the topic of the day. He subsequently discussed the objectives of the lesson, which was a good starting point for preparing learners to assimilate new knowledge into their existing schemata (cf. Chapters 2 & 3).

INTRODUCTION	
Teacher's Actions	Assessment Strategies
The teacher will ask learners to form groups of 5 and provide each group with the model of human lungs. The teacher will ask learners what is the name of the model and briefly discuss the model with the class. From there the teacher will ask learners what do they understand by 'gaseous exchange'. The teacher will discuss the lesson objectives.	Baseline assessment Diagnostic assessment
Learners' Activities	
Learners will form groups as requested and listen attentively. Learners will analyze the model, provide its name and briefly discuss it with the teacher. Learners will from there provide their own definition of gaseous exchange and write down notes.	Discussion, answer question.
PRESENTATION	
Teacher's Actions	Assessment Strategies
The teacher will use the overhead projector to present the slides on gaseous exchange. The teacher will discuss the model and the definition of gaseous exchange with the class. The teacher will draw the structure of the alveoli on the chalkboard and state its function. The teacher will explain the process of gaseous exchange using the model of the human	Formative assessment

Figure 6.7: A good example of a creative introduction

6.3.1.3 Category 3: Evidence of creative and reflective lesson content

Students are encouraged to make use of the following when planning their lessons:

- **Educational aids (learning and teaching media):** Students have access to a variety of educational media that could be considered in the planning of their lessons. These include the chalkboard/whiteboard, computer facilities, data and overhead projectors, diagrams, posters and facilities to produce 3-D models, flashcards, charts and magazines.
- **Sources:** Textbooks, the internet and video clips, previous question papers; printed media, etc.
- **Teacher-centred methods,** such as direct instruction.
- **Learner-centred methods,** such as co-operative learning, problem-based learning, discussion, role-play, experimentation, etc.
- **Active learning strategies,** to ensure maximum learner involvement.

All the students employed visual aids in the form of one or more of the following: 3-D models, real-life objects, posters and flashcards. In the lesson plan evaluation sheet, the use of media account for 20% of the results, although indirectly a few other criteria on the evaluation sheet are also closely linked to the functional use of media. To this end, the use of media plays a crucial role in the quality of their lesson plans.

LESSON PLAN EVALUATION SHEET

NAME: [REDACTED] STUDENT NUMBER: [REDACTED]

SCHOOL: NANNBOLELA S-S

METHODOLOGY: NATURAL SCIENCE... B Ed SP & FET Teaching

OPTIONS	1	2	3	4	5	6	7	8	9	10
Lesson plan correctly completed								X		
Gaining attention and maintaining interest									X	
Actualising pre-knowledge									X	
Facilitation of teaching and learning through activities								X		
Logical progression of lesson								X		
Attainment of learning/lesson objectives							X			
Assessment								X		
Quality of resources/media							X			
Integration of resources/media						X				
Originality and creativity								X		

Lecturer's/Teacher's comments:
The lesson was presented well.

TEACHER/LECTURER: [Signature]

DATE: 07 August 2017 MARKS: 78 %

Figure 6.8: Example of a lesson plan evaluation sheet

Table 6.14 gives an overview of the extent to which participants, according to my view, planned their lesson content in a creative and reflective manner.

Table 6.14: Participants’ use of creativity and reflection during the planning of the content phase

Level of study	Little evidence of creativity and learner involvement	Evidence of a fair amount of creativity and learner involvement	Evidence of creative presentation and active learner involvement
2nd Years	4 (40%)	2 (20%)	5 (50%)
3rd Years	0 (0%)	5 (50%)	7 (70%)
4th Years	0 (0%)	3 (30%)	5 (50%)
PGCE’s	0 (0%)	4 (40%)	6 (60%)

Figure 6.9 is an example of a poorly planned content lesson. The student failed to indicate his actions, except for the definition of the quadratic equations, something which, according to Pine (2009) is critical to effective lesson planning. According to him (ibid), a teacher should explain in chronological steps the way in which s/he is going to deliver the lesson. In this case, the student also failed to include explanatory examples or to plan in advance activities/questions that would foster critical reflection in learners.

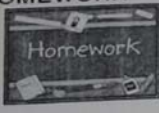
		<input type="checkbox"/> Experimentation method
INTRODUCTION		
Teacher's Actions	Teacher will ask learners to give standard form of linear equation and its degree.	Assessment Strategies
Learners' Activities	Students attempt to answer teacher's question. Students and the teacher will discuss the answers for clarity. Linear equation is of the form $mx + c = 0$, to the power of 1.	Baselining question Answers
PRESENTATION		
Teacher's Actions	Quadratic equation is an equation of the second degree and is of the form $ax^2 + bx + c = 0$, based on the theorem: if $ab = 0$, then $a = 0$ and $b = 0$.	Assessment Strategies Questions and answers
Learners' Activities	Learners listen attentively and ask questions when needed. Therefore learners participate in the lesson by providing answers to the questions that teacher asked. Also notes are taken.	Question and answers
APPLICATION AND CONCLUSION		
Teacher's Actions	The teacher will give the learner the summary on quadratic equations and elaborate the important facts. Furthermore give learners class activity and move around to monitor the process. Then discuss the answers of class activity with learners and give them homework.	Assessment Strategies Question and answers
Learners' Actions	Learners complete the class activity and discuss the answers with the teacher. Then listen very attentively to the instruction of the homework.	Questions
HOMework	Homework is from classroom maths activity 2, page 98.	
		
EXPANDED OPPORTUNITIES	The teacher will ask learners to use different books to deepen their understanding, problem solving and skills regarding quadratic equations.	

Figure 6.9: Example of a poorly planned lesson

The lesson plan in Figure 6.10 displays a fair amount of creativity and reflective potential. The student planned to use a chalkboard summary which, according to Taole (2015), is one of the long-standing teaching media that will hardly be replaced in future – specifically in learning contexts where poverty prevails and funds for resources are scarce. The student planned to

“explain” the brackets, orders, division, multiplication, addition and subtraction (BODMAS) and the Least Common Multiple (LCM). She also ensured learner involvement by giving learners activities to do during the presentation phase.

The teacher will then write down the	the learners how much of the... will then cut each part that was cut equal... leads to our topic of common fractions. The teacher will then write down the topic and try to get information of what her learners understand about the standard form of common fractions.	
	-Learners expected to respond with different answers.	
PRESENTATION		
Teacher's Actions	The teacher will write brief notes on the chalkboard about what common fractions are and their standard notation. She will then explain what number is a numerator and what number is a denominator in a common fraction and also what number is a whole number. Before continuing with her lesson she will introduce the BODMAS to her learners and how it works. It is only then she will give a few examples of addition and subtraction of common fractions. In the case of different denominators, she will show her learners how to find the LCM in order to be able to add or subtract. If all learners say they understand her, she will randomly pick one of them to do the given example and ask her peers to correct her if she is wrong and try to explain amongst themselves.	Assessment Strategies Formative Assessment
Learners' Activities	-Learners will pay attention and listen attentively to the teacher then actively take notes and ask questions for clarity.	Response and Questions
APPLICATION AND CONCLUSION		
		Assessment

Figure 6.10: A lesson plan displaying a fair amount of creativity and potential for reflection

The lesson plan presented in Figure 6.11 is a good example of proper lesson planning. The student detailed the different steps he would follow in introducing new knowledge. Dewey (1933) and Schön (1996) suggest that a teacher should perceive a puzzle as a plan to teach in and/or on action (cf. Paragraph 2.4.1). In this example, the student perceived the “puzzle” as a new lesson topic - the “Pythagorean theorem”- and he planned to “teach-in-action” by using learner activities, learner collaboration and peer teaching (Knowles & Associates, 1984). He

further planned to “teach-on-action” by using retrospection when referring to the “Cartesian plane” as a foundation for his lesson.

Teacher's Actions	PRESENTATION	Questions and ask questions	Answers
<p>The teacher will introduce the new concept to the learners by labelling the angles on a Cartesian plane and shows the learner the restrictions of angles of each of the four quadrants. The teacher will take a practical question to teach the learners how to attempt the questions and what important things should be taken into consideration when attempting to answer the question. The question will be as follows: if $\cos A = 4/5$ and A is an element of $[0;90]$, calculate without the use of a calculator and with the aid of a diagram the values of $\sin A$, $\tan A$, and the angle A. The teacher will introduce the Pythagorean theorem in solving for the missing side and will also demonstrate to the learners that the first thing to consider when a question is asked like that is the quadrant where the terminal arm will lie. The teacher will solve another question similar to the one above using a different trig ratio and then give learners a question to do by themselves and then answer it on the board with the help of learners. The teacher will give learners a short activity based on the lesson presented and then mark it with the learners. The teacher will give learners a chance to ask questions to check how far the learners have understood the concept of the terminal arm and angles on a Cartesian plane.</p>			
Learners' Activities			
<p>The learners will listen attentively to the teacher's presentation of a lesson for the day and write notes, then give answers to the teacher's questions and also ask for clarity where they didn't understand. the</p>			

Figure 6.11: A lesson plan portraying good planning for introducing new knowledge and creativity

6.3.1.4 Category 4: Evidence of creative and reflective applications and conclusions

According to Gore and Zeichner (1991), the summary of the lesson should be presented in such a way that it promotes academic reflection by using relevant assessment activities. In Figure 6.12, the planning of the application and conclusion of the lesson is unimaginative and poorly planned – in fact, on the whole this is a poorly planned lesson. In addition to the language errors, there is no thorough explanation of what is expected of learners. No context is provided (such as an advertisement for a job) that would encourage learners to apply their minds and write an application letter following the desired steps. Importantly, the student should have indicated her actions during this phase (Taole, 2015) - moving around in the class, assisting where she could and encouraging the learners to complete the activity.

Learners' Activities		Debate Discuss
1. Learners observe and listen attentively 2. Learners look at how a formal letter looks like and what is expected. 3. Learners look at the rubric to know how they will be assessed and consider the formal register.		
PRESENTATION		
Teacher's Actions:		Assessment Strategies -Formative assessment
1. The teacher gives them the assessment and the learners start with their planning.		
Learners' Activities		
1. Learners start with their draft and planning. 2. Learners continue with their pre-writing and after that give their writing work to their peers for assessment. They check each other's work and rectify mistakes with a pencil. 3. Learners give the corrected or checked work back to the owners		
APPLICATION AND CONCLUSION		
Teacher's Actions		Assessment Strategies -Summative assessment
The teacher gives the learners a clean page to right their final draft or final work.		
Learners' Actions		
1. Learners rewrite their work neatly and corrected. 2. Learners re-check the rubric in order to know what is expected of them.		
HOMEWORK	Page 124 of platinum English textbook.	
EXPANDED OPPORTUNITIES	Learner can make a CV to in order to attach it to the leaflet to know a format of a CV	

Figure 6.12: A lesson plan portraying a poor application and conclusion of a lesson

The application and conclusion phases reflected in Figure 6.13 could be regarded as fairly effective. In this instance, the student allowed the learners to discuss the lesson of the day. While she did not issue a written assessment task, the fact that she encouraged a class discussion and asked a volunteer to provide a summary of the lesson, was equally effective. She regarded oral questioning as an appropriate way to gauge learners' understanding. One disadvantage of this technique, though, is that specific cases where a learner may experience challenges could easily be overlooked.


<p>-Then learners will take out their classwork books and write the activity that will be in their textbooks. And they will ask questions where they need clarity so that they can be able to write with the good understanding.</p>		Questions and answers
APPLICATION AND CONCLUSION		
Teacher's Actions		Assessment Strategies
<p>-I will preferably allow learners to discuss what do they understand by the term dialogue -Then after I will ask maybe one learner to tell us what we were doing in the class, as to show that they have understood what I have taught them. -There after I will sum up our topic for the day and I will allow learners to ask questions.</p>		Summative assessment: Questions and answers.
Learners' Actions		
<p>-Learners are expected to give any dialogue that they have seen on TV or that they have heard on radio, as to show that they did understand -Learners are expected to pose questions so that they can show that they are participating</p>		Questions and answers
HOMEWORK	Learners should research more on how dialogues are done and write their own dialogues.	
		
EXPANDED OPPORTUNITIES	Learners has to watch TV more often as to can see on how dia is done and also they should go to the libraries to can borrow that talks about dialogue so that they can learn more about it.	

Figure 6.13: A lesson plan displaying a fair application and conclusion of a lesson

Ideally the application and conclusion phase should, according to Taole (2015), involve a summary of the main points of the lesson. In the lesson plan portrayed in Figure 6.14, the student recapped the lesson by writing the main points on the chalkboard, after which she gave the class an activity to do. Learners knew what was expected of them and, upon completion of the activity, the answers were marked (peer assessment) and a homework activity was given. This line of action provided enough scaffolding to enable learners to apply what they had learnt.

Learners will ask question for clarity.		Answer question.
APPLICATION AND CONCLUSION		
Teacher's Actions	Assessment Strategies	
The teacher will conclude the lesson by writing important key point on the chalkboard. The teacher will provide learners with a class activity and explain to them how that activity should be answered. The teacher will move around to monitor learner's progress. The teacher will then discuss the answers to the activity. The teacher will give learners homework, explain the homework and the expanded opportunity and thereafter kindly dismiss the class.	Summative assessment	
Learners' Actions	Question and answer.	
Learners will jot down notes and ask questions for clarity where they do not understand. Learners will then discuss and mark the class activity with the teacher.		
HOMEWORK	Do a research and prepare a poster on respiratory disorders namely,	

Figure 6.14: An example of a lesson plan with a good application and conclusion phase

6.3.1.5 Category 5: Evidence of creative and reflective assessment tasks

Planning suitable assessment activities relate very closely to the lesson objectives that were stated and should be devised in such a manner that students can clearly establish whether or not learning was actually successful (Taole, 2015). A recurring problem that I noticed was the fact that students (and not only participants in this study) tended to ‘reproduce’ the lesson objectives in the form of questions as an assessment activity. This, of course, is a very tedious and unimaginative way of testing learners’ knowledge and understanding. Students know full well that they must compile creative assessment tasks which would challenge their learners to go beyond that which was learnt, and to demonstrate their understanding by applying knowledge to new situations.

An analysis of assessment tasks of the participant students revealed the following:

Table 6.15: Participants’ use of creative and reflective assessment activities

Level of study	Poor assessment activities	A fair amount of creative and reflective assessment activities	Creative and reflective assessment activities
2 nd Years	4 (40%)	2 (20%)	5 (50%)
3 rd Years	0 (0%)	5 (50%)	7 (70%)
4 th Years	0 (0%)	3 (30%)	5 (50%)
PGCE	0 (0%)	4 (40%)	6 (60%)

Figure 6.15 portrays a poorly planned reflective assessment activity. The compilation of questions include verbs denoting lower-order thinking such as “Name...”, “State...”, “What is the importance...?”, “Which diagram....?” and “Explain.....” (Bloom, 1956). These lower level operational verbs were not challenging the learners to reflect, and it is equally clear that the student himself did not make any effort to reflect when compiling the activity.

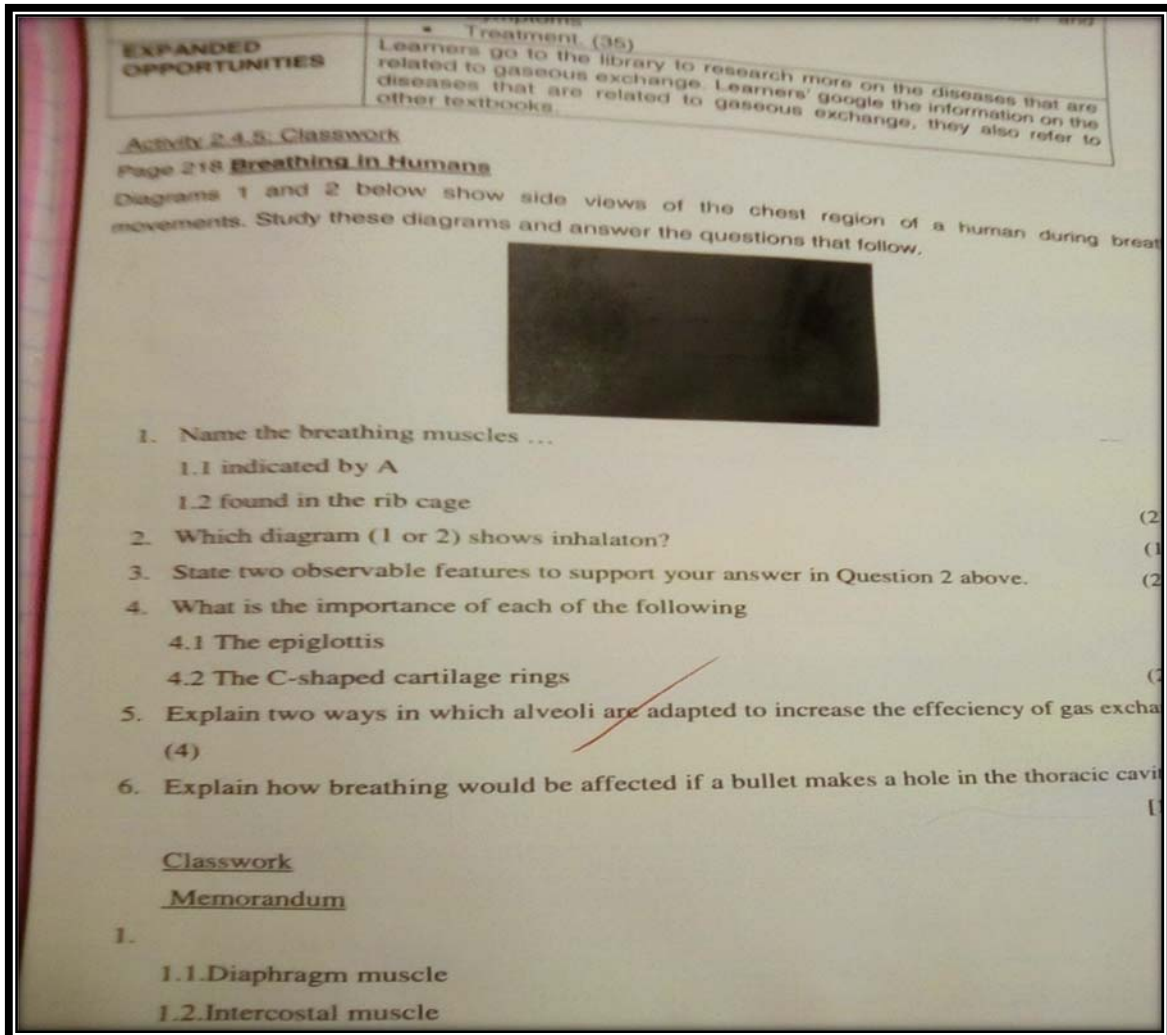


Figure 6.15: A lesson plan depicting a poor reflective assessment activity

In Figure 6.16 the student also got stuck in asking mainly lower-order questions by using the following operational verbs: "Where would you find....." (lower order), "Is the blood that enters....." (lower order), "What are the gasses....." (lower order), "Provide labels" (lower to medium order) and "How is a blood cell...?" (higher order).

GRADE 10
LIFE SCIENCES: GAS EXCHANGE SYSTEM
CLASS ACTIVITY
JULY 2016

Study the diagram below and answer the following questions:

1. Where would you find a structure like this?
(1)

2. Is the blood that enters at X oxygenated or deoxygenated?

3. What are the gases that move as indicated by A and B?

4. Provide labels for C-G.

5. How is a red blood cell well suited to transport oxygen?
(2)

Figure 6.16: A lesson plan portraying a fair usage of reflective assessment

Figure 6.17 depicts a fairly reasonable measure of reflective assessment: “Define....” (lower order), “What....?” (middle order), and “Investigate.....” (higher order). The last question involved critical reflective thinking, inquiry, and research.

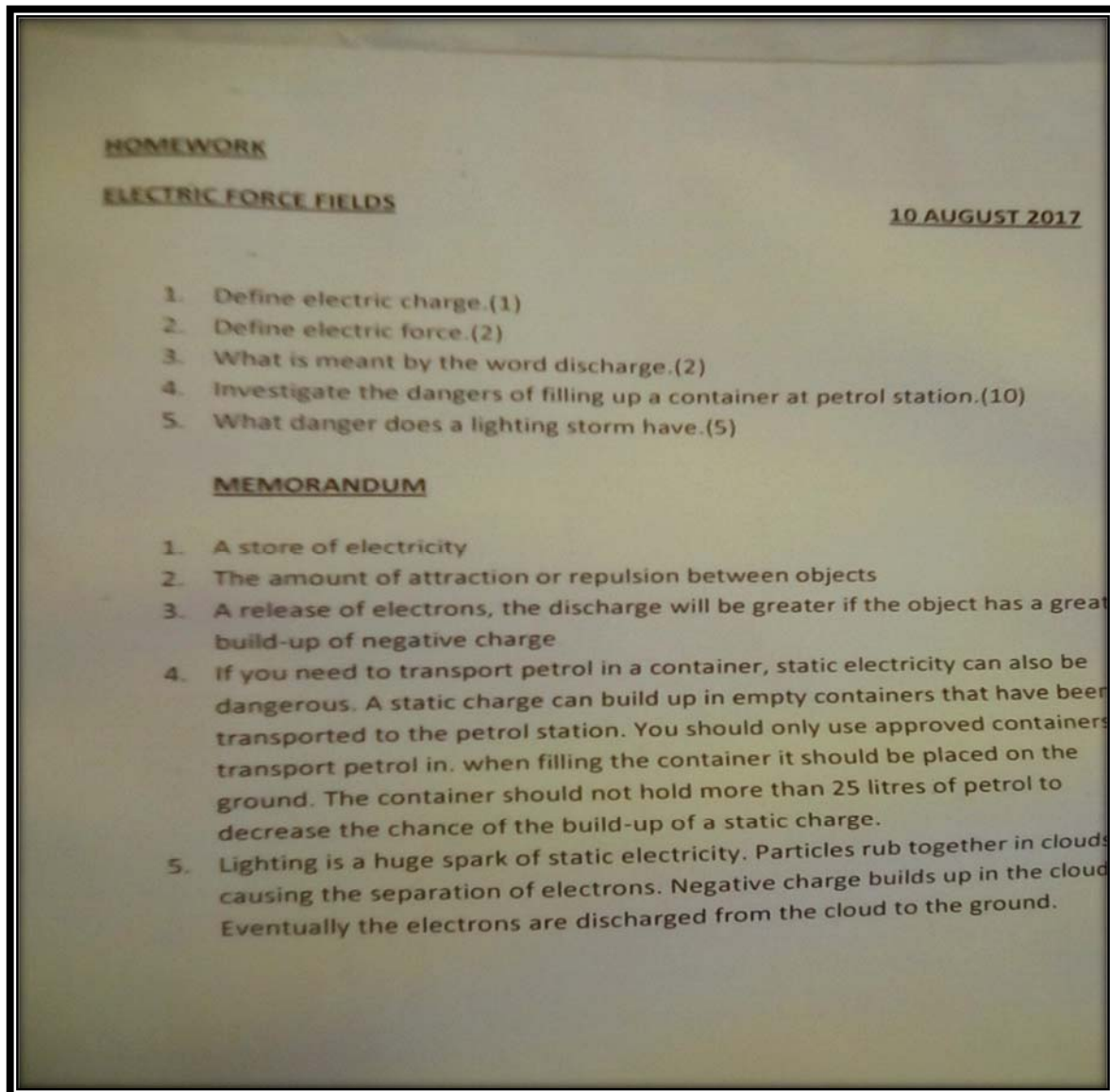


Figure 6.17: A lesson plan displaying a fairly good measure of reflective assessment

6.3.1.6 Category 6: Reflective assignments

One of the reflective tools to be included in student teachers' portfolios at the CUT are assignments which focus specifically and directly on reflection. The students are required to reflect on the different facets of their stay at the host schools. These include their teaching practice experiences in terms of academic, social, emotional and environmental factors.

Table 6.16 provides an overview of the extent to which participants engaged in creative and reflective portfolio assignments in this regard.

Table 6.16: Creative and reflective and creative portfolio assignments

Level of study	Poor portfolio assignments	Average portfolio assignments	Creative and reflective portfolio assignments
2 nd Years	3 (30%)	2 (20%)	5 (50%)
3 rd Years	0 (0%)	5 (50%)	7 (70%)
4 th Years	0 (0%)	3 (30%)	5 (50%)
PGCE	0 (0%)	4 (40%)	6 (60%)

Figure 6.18 is an example of poor reflection – the student chose the easy way out and offered short, meaningless answers in reply to question on which he as supposed to critically reflect.

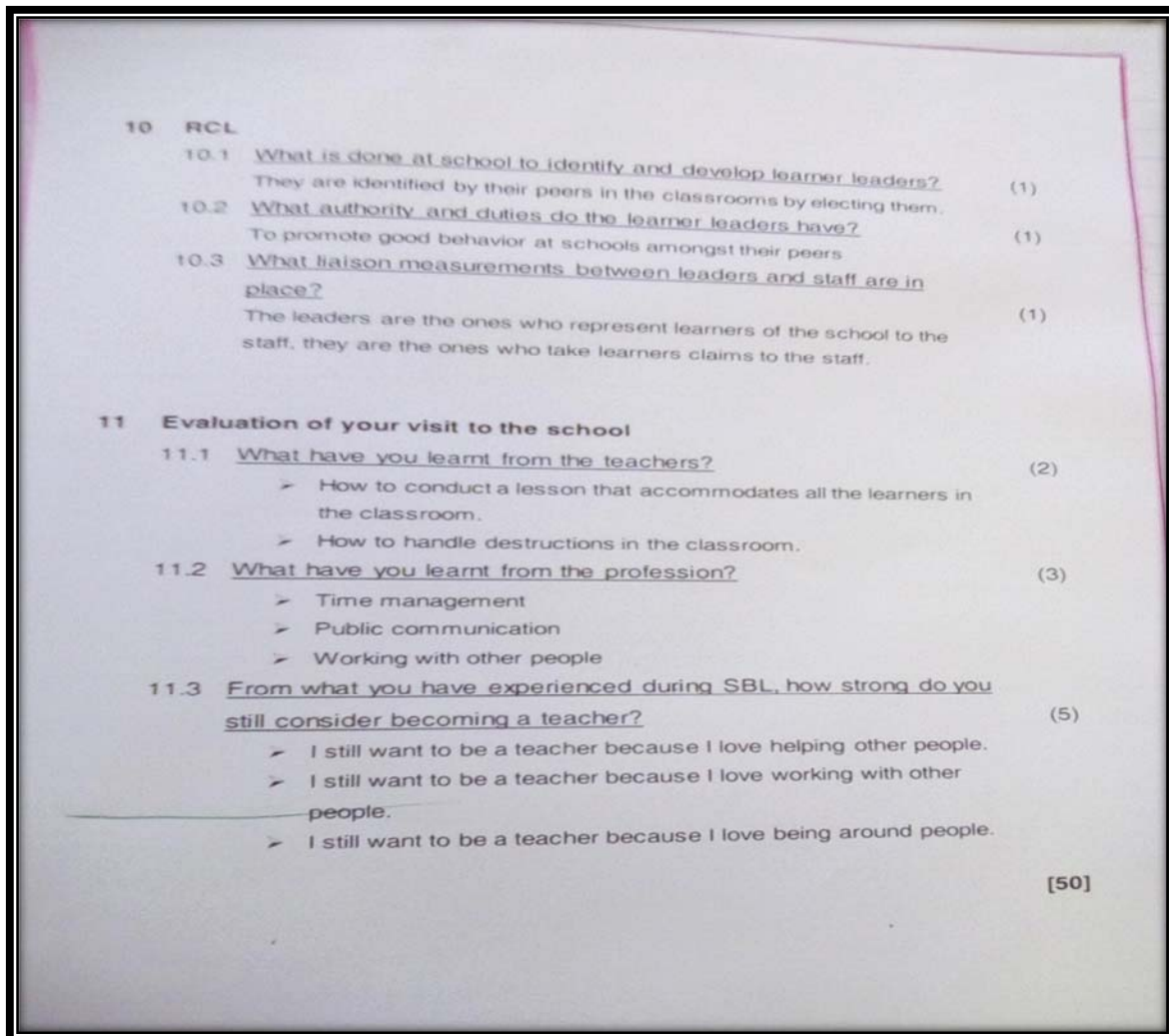


Figure 6.18: A poorly constructed reflective assignment

Schön (1983) as well as Bruner (1987) point out that language is very important in reflection as it involves the person trying to articulate tacit and spontaneous intelligence by using words to verbalise his/her thoughts. Students are encouraged to report richly and in grammatically correct sentences. In Figure 6.19, the student teacher used fairly descriptive language, but the grammatical errors may be an indication that he did not go back and edit his work – which is also a form of reflection (Wan & Gut, 2011).

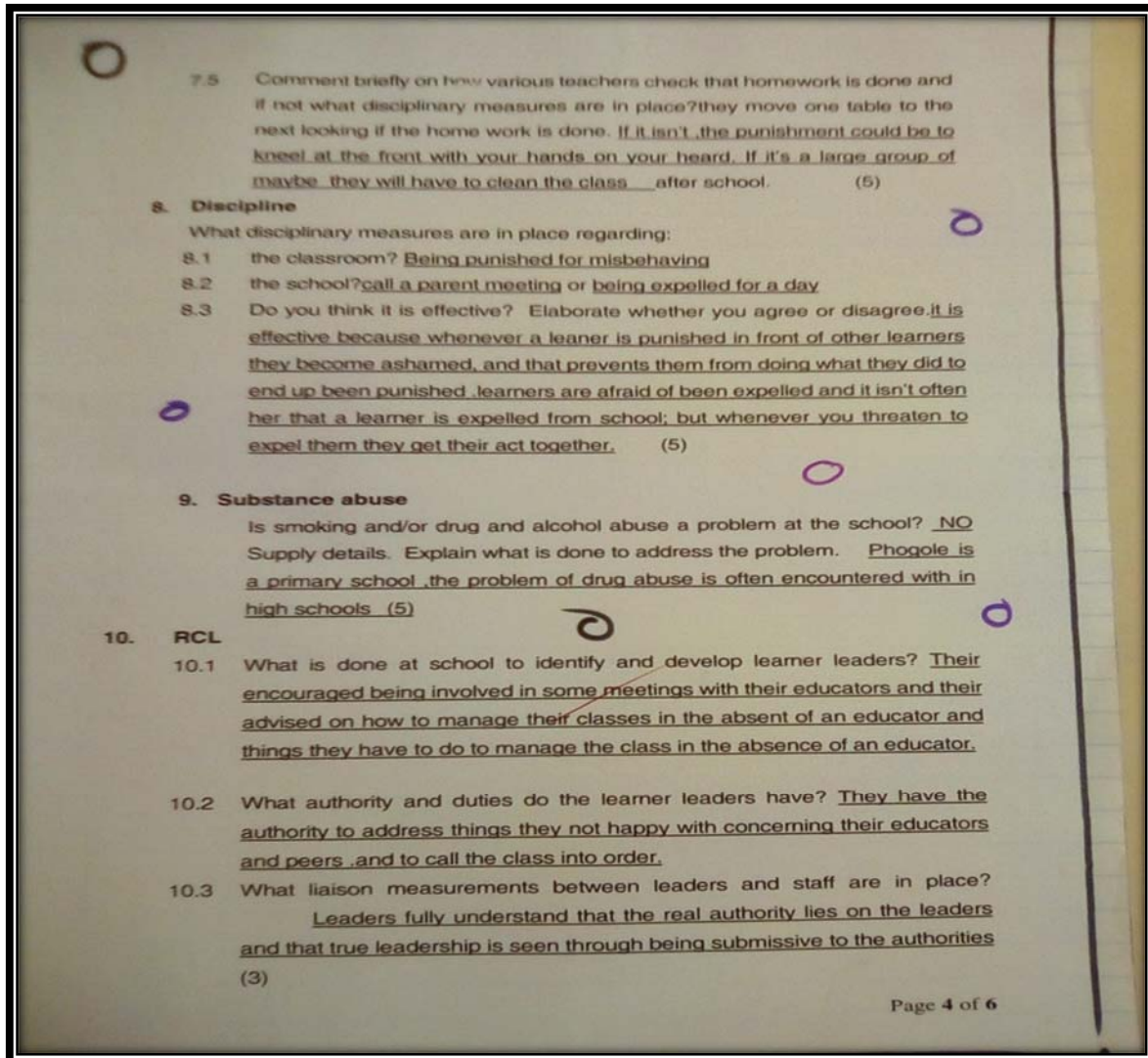


Figure 6.19: An assignment portraying a fair amount of reflection

Figure 6.20 displays a good reflective assignment. The student poured her heart out about still wanting to be a teacher and by supplying the reasons for this (Yilmaz, 2011).

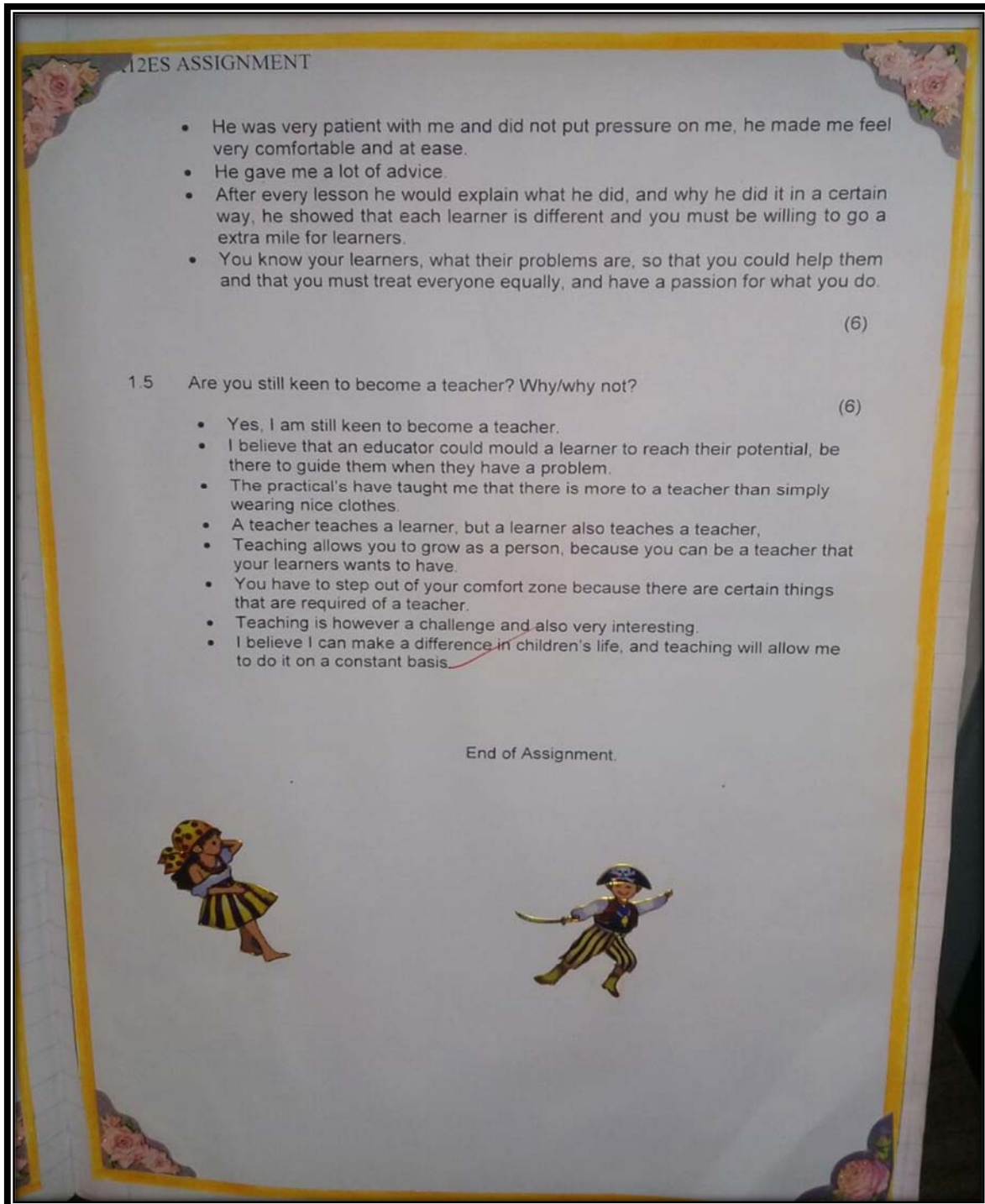


Figure 6.20: An assignment with good reflective properties

6.3.1.7 Category 7: Reflective essays

The reflective essay is yet another tool used to foster reflective teaching in student teachers. Reflective journaling (essay) is open-ended, thus the students are free to choose what they want to reflect on (Schön, 1996). These essays usually provide proof of the depth of a student’s reflections – whether s/he can ‘read between the lines’ and reflect about what matters, instead of reporting superficially. It involves grooming a student teacher on reflecting about the following: the preparation provided by CUT coordinators and lecturers, the school time-table, the time allocated to subjects, the break time(s), the conduct of the learners, the mentor teachers and the principal, the culture of the school, the seating arrangement of learners, and so forth. Students had to compile the reflective assignments by evaluating their SBL residency period and pointing out aspects they would like to change or improve.

Table 6.17 provides an overview of the extent to which participants engaged in creative and reflective portfolio essays

Table 6.17: Creative and reflective and creative portfolio essays

Level of study	Poor portfolio essays	Average portfolio essays	Creative and reflective essays
2 nd Years	4 (40%)	3 (30%)	3 (30%)
3 rd Years	0 (0%)	5 (50%)	5 (50%)
4 th Years	0 (0%)	6 (30%)	4 (40%)
PGCE	0 (0%)	4 (40%)	6 (60%)

Sellars (2014) points out that any mention of a teacher about something that s/he did or whatever decided to do during the process of ‘thinking about’, counts as reflection and, as such, is acceptable (cf. Paragraph 2.4). The fact remains however, that quality reflection is necessary to effect improvement in teaching.

Figure 6.21 presents a very poor reflective essay with minimal information and virtually no evidence of reflection.

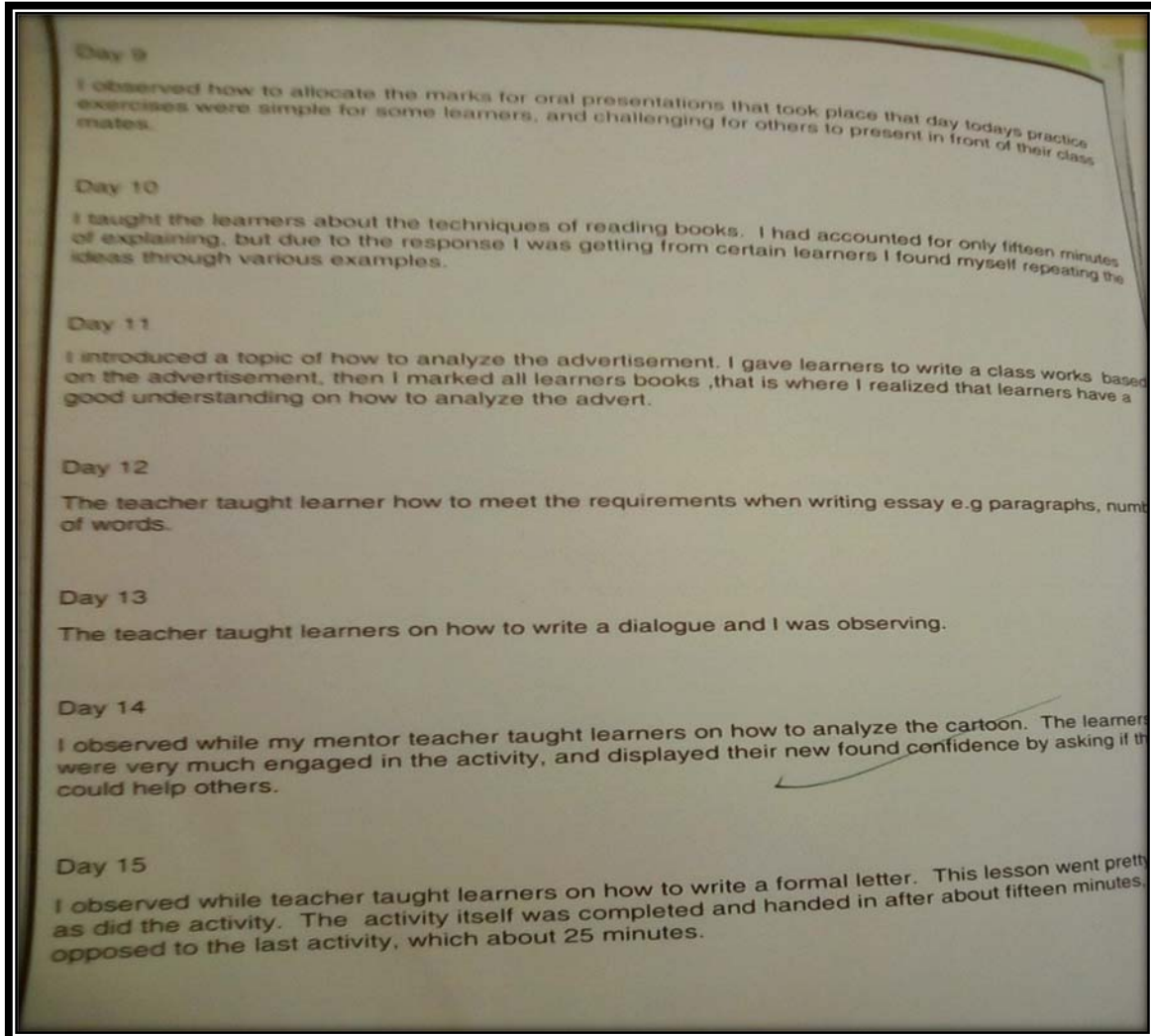


Figure 6.21: A poorly-constructed reflective essay

Figure 6.22 portrays a fairly reflective essay, with the student incorporating experiences such as “The worst day of my life” and more academic activities like “Teaching and controlling the class” as well as “Working on my reflective journal (portfolio)”. The essay demonstrated both reflection-in-action and reflection-on-action (Pollard, 2002). As far as ‘reporting’ goes, it is, however, ‘thin’ in comparison with the essay in Figure 6.23.

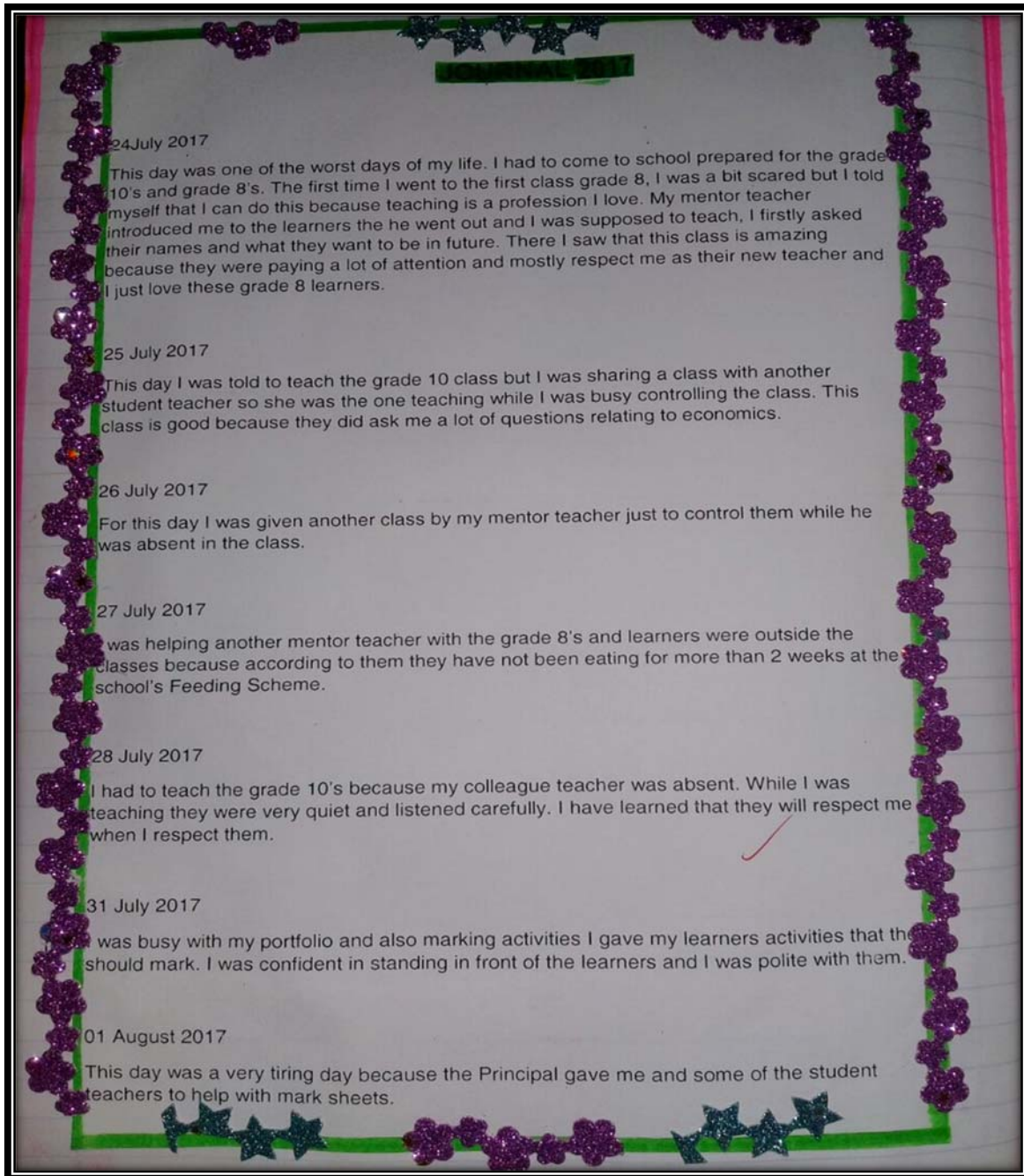


Figure 6.22: A fairly average reflective essay

The essay is elaborative and reflective in the sense that the student provides the order of events in a systematic manner. For example, the accounts included dates, times, names of mentor teachers, the events that unfolded, etc.

Figure 6.23 provides an example of a good reflective essay, with rich reporting and written in an engaging style. The student provided quite an extensive account of her experiences, detailing incidents and her associated feelings, impressions and experiences.

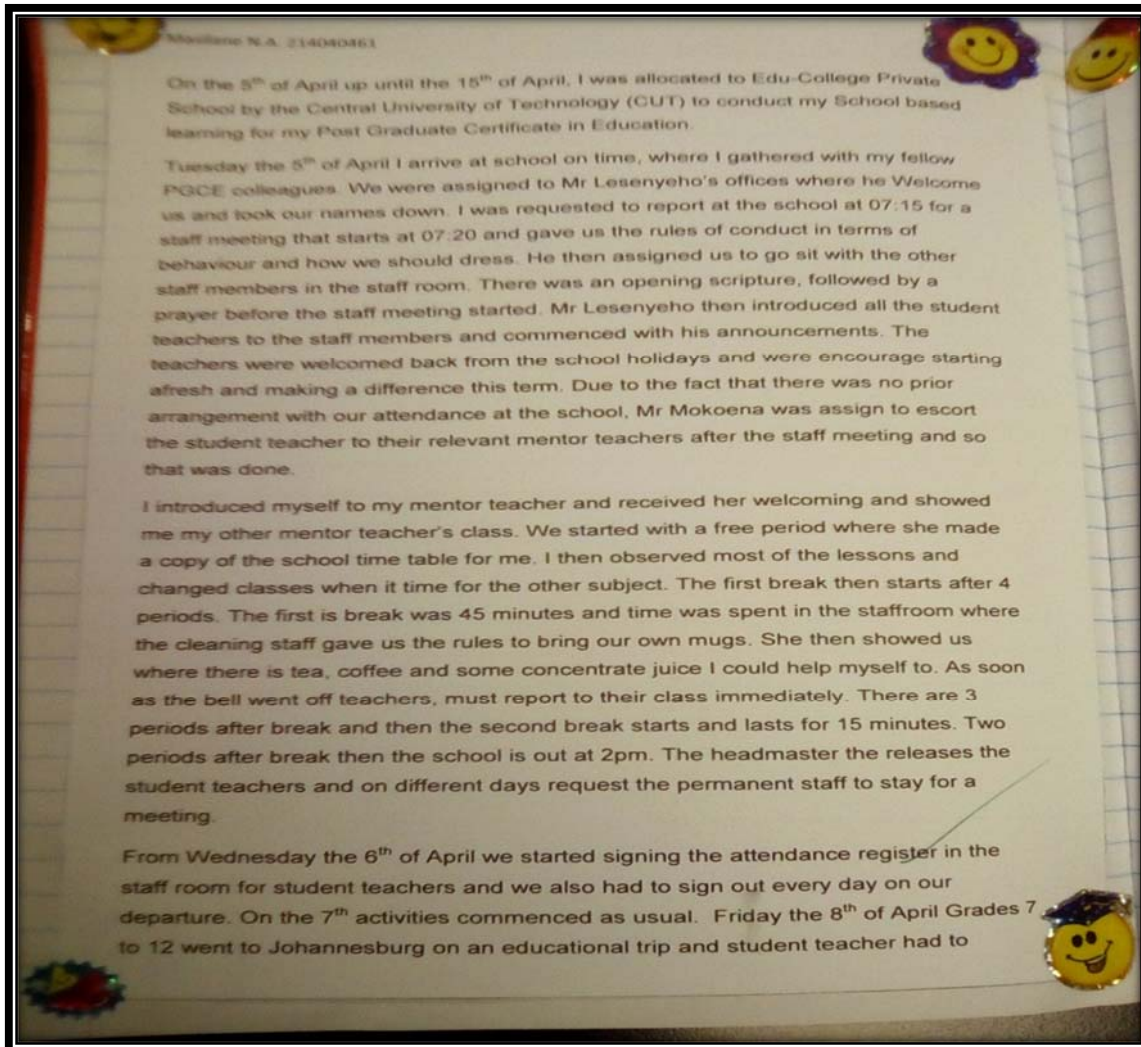


Figure 6.23: A good reflective essay

6.3.2 Conclusion

On the whole, the reflective portfolios provided definitive, but varying levels of evidence of critical reflection and creativity: while some categories revealed a good measure of reflection,

most categories showed average levels of creativity and reflection. The levels of reflection and creativity categorized as ‘poor’ was relatively low.

Table 6.18 provides an overview of the use of reflection and creativity with regard to the different categories.

Table 6.18: An overview of the levels of creativity and reflection used in different categories by all participant groups

CATEGORY	POOR %	FAIR (AVERAGE) %	GOOD %
<i>Planning of reflective and creative objectives</i>	30	57,7	12,5
<i>Planning of reflective and creative introductions</i>	17,5	37,5	45
<i>Planning of reflective and creative lesson content</i>	10	35	55
<i>Planning of reflective and creative assessment activities</i>	7.5	35	57.3
<i>Reflective and creative essays</i>	17	38	45
Average	16.4	40.5	43

It is clear that there is room for improvement in some parts of the reflective journal, especially with regard to the formulation of objectives in the lesson plans, the planning of introductions and reflective essays. The way in which reflective objectives are combined determines whether or not a lesson plan (and, by implication, its delivery) is good: if they are not mixed properly, the rest of the lesson plan could be a waste of time.

6.4 PRESENTATION AND DISCUSSION OF THEMES: TEACHING MEDIA

The posters and 3-D models of ten student teachers (five B.Ed 3rd year and five PGCE students) who participated in the participant observation sessions were partially analysed during the lesson

presentations, and again after the presentations in more detail. These are the only two groups who are formally evaluated by education lecturers during their mid-year SBL practicals. The different categories identified during the analysis are indicated in Table 6.19.

Table 6.19: Themes and categories: posters and 3-D models

(Taole,2015)

THEME	21 st CENTURY SKILLS: REFLECTIVE PROPERTIES OF POSTERS AND 3-D MODELS
	<p>Category 1: Appropriateness in terms of learners’ cognitive developmental level and learning styles</p> <p>Category 2: Promoting critical thinking and problem solving</p> <p>Category 3: Fostering learner reflection</p> <p>Category 4: Catering for a variety of instructional and assessment methods</p> <p>Category 5: Reflective educational value</p>

6.4.1 THEME: Reflective properties of posters and 3-D models

The reflective properties of the posters and 3-D models in terms of good and/or poor are discussed below.

6.4.1.1 Category 1: Appropriateness in terms of learners’ development level

The student teachers used the posters and/or 3-D models interchangeably to serve one purpose: to stimulate the senses of the learners, imperative in critical reflective teaching. It really did not matter whether or not a student teacher used a poster or a 3-D model; the decisive factor was the creativity behind the presentation of the media (cf. Figures 6.2 - 6.21). In terms of Piaget’s stages of cognitive development, school learners between the ages of 15 and 18 are at the formal operational stage of development. The cognitive (thinking) capabilities of learners in this age range are described as scientific in the sense that they are able to solve abstract problems through systematic experimentation (Piaget, 2001). The use of teaching media to enhance critical thinking in this regard is therefore very important.

Posters

It is quite challenging to design a poster that would stimulate learners' thinking, especially in subjects falling in the social sciences such as Business Studies, Life Skills and Languages. My experience as lecturer has been that student teachers generally look for a few quite unimpressive or, at most, colourful pictures and then ask learners to identify the pictures by pasting the appropriate headings to the pictures. There is certainly nothing wrong with this method, but unless interesting and imaginative pictures are selected that cover all aspects or phases of the lesson, the student will not be able to integrate the posters effectively as assistive teaching media during a lesson. The posters displayed in Figures 6. 24 – 6.26 represent typical examples of posters which, while relatively descriptive and eye-catching, were not appropriate to the developmental levels of the learners and consequently they did not encourage reflective teaching.

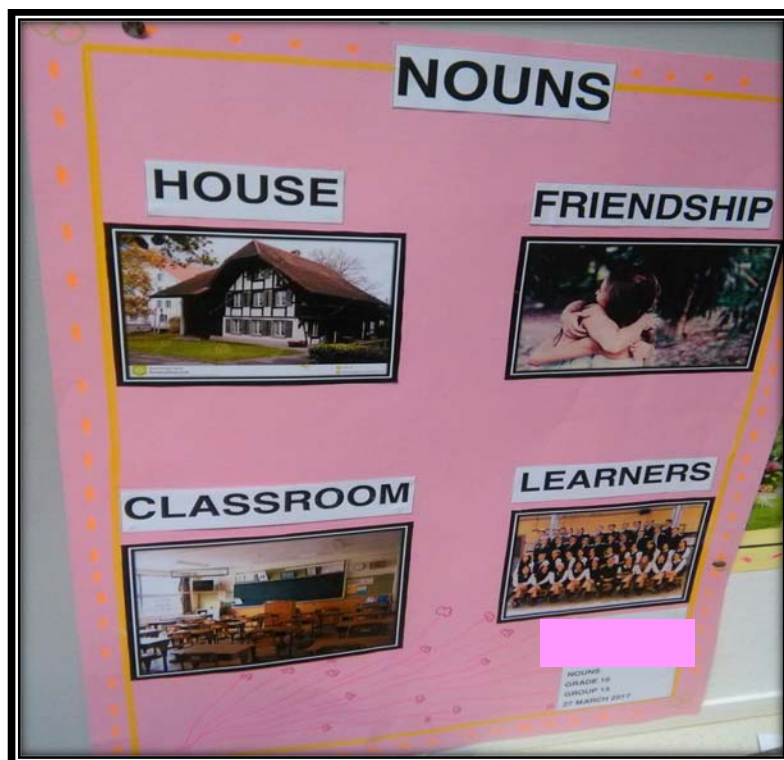


Figure 6.24: A very elementary poster depicting different types of nouns in an English language lesson



Figure 6.25: A poster depicting adjectives in a Sesotho lesson



Figure 6.26: A poster depicting homonyms in a Sesotho lesson

The 3-D models

In general, I regarded the 3-D models as appropriate in terms of learners' cognitive development level as these were neither too simple nor too advanced. They gave learners the opportunity to visually integrate their prior knowledge with new information. The learners could see, feel and touch the models, thus heightening their senses. The models were used to assist learners in solving abstract problems in the sense that they had to tap into their imaginative, problem solving and critical thinking skills. Sometimes learners struggle to grasp a concept on their own without the assistance of 3-D models, which clearly served as scaffolding too, assisting them in the assimilation process (Piaget 2001). All-in all, the models successfully fostered individualized and differentiated learning by enhancing concepts already understood by stronger learners and fostering a better understanding of concepts for the weaker learners.

6.4.1.2 Category 2: Promoting critical thinking and problem solving

As a whole, the posters and 3-D models provided evidence of critical thinking and problem-solving skills. It took some level of creativity and reflection on the part of the students to decide on the educational media that would be suitable for the developmental stages of the learners. Importantly, educational media should be well in line with the lesson outcomes to facilitate both critical thinking and problem-solving skills (Mayer, 2004). Problem-solving and critical thinking both have the same goal, namely to reach a solution to a problem. These processes differ, however, in the sense that critical thinking involves both creativity and reflection (Jang, 2008).

Figure 6.27, a lesson on 'The water cycle', provides a good example of this. The poster illustrated the journey water takes to circulate from the land to the sky and back. The advantages and disadvantages of water conservation methods were explored (cf. Paragraph 2.4.5) and the student used the poster effectively to facilitate a discussion on the importance of water by asking questions such as, "Why do we need to save water?" "Do you know of any cities experiencing a water crisis right now?" "What is your responsibility as far as water conservation is concerned"?

Apart from the fact that the student could have used arrows to outline the cycle, the poster and the line of questioning were very good examples of a lesson which allowed for reflection and critical thinking.

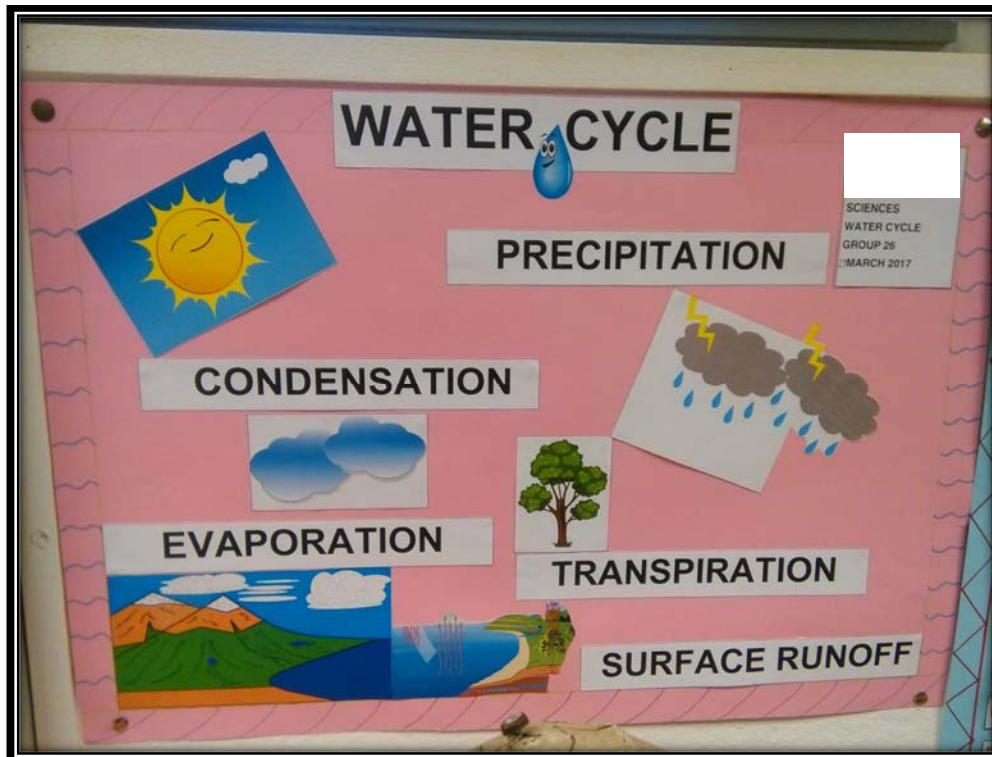


Figure 6.27: A poster allowing for critical thinking and problem-solving skills

The 3-D model in Figure 6.28 afforded the learners an opportunity to manipulate objects and discuss the model in detail. The model portrayed government's mandatory responsibility to provide certain service sectors to its citizens to ensure their (citizens') safety, health and development (Mpele, 2014). The student incited the learners to suggest possible outcomes as they were manipulating the 3-D model. Human rights issues were discussed, such as the inequality and different status of South African citizens. Learners clearly exercised critical thinking skills while brainstorming possible outcomes.



Figure 6.28: A typical thought-provoking 3-D model of one of the participants

The model used in Figure 6.29 represents the process of fracking, which is currently a very contentious topic in South Africa. This was a science lesson explaining the scientific processes involved in extracting natural gas from shale rocks. Learners' critical thinking and problem-solving skills were further stimulated when discussions were extended to the advantages and disadvantages of fracking in terms of the economy, its impact on the natural environment and the consequences it might have for the tourism industry. This paved the way for thought-provoking questions which sparked lively class discussion. The student teacher was able to integrate the model throughout the lesson and all aspects of the new content were represented in the model.

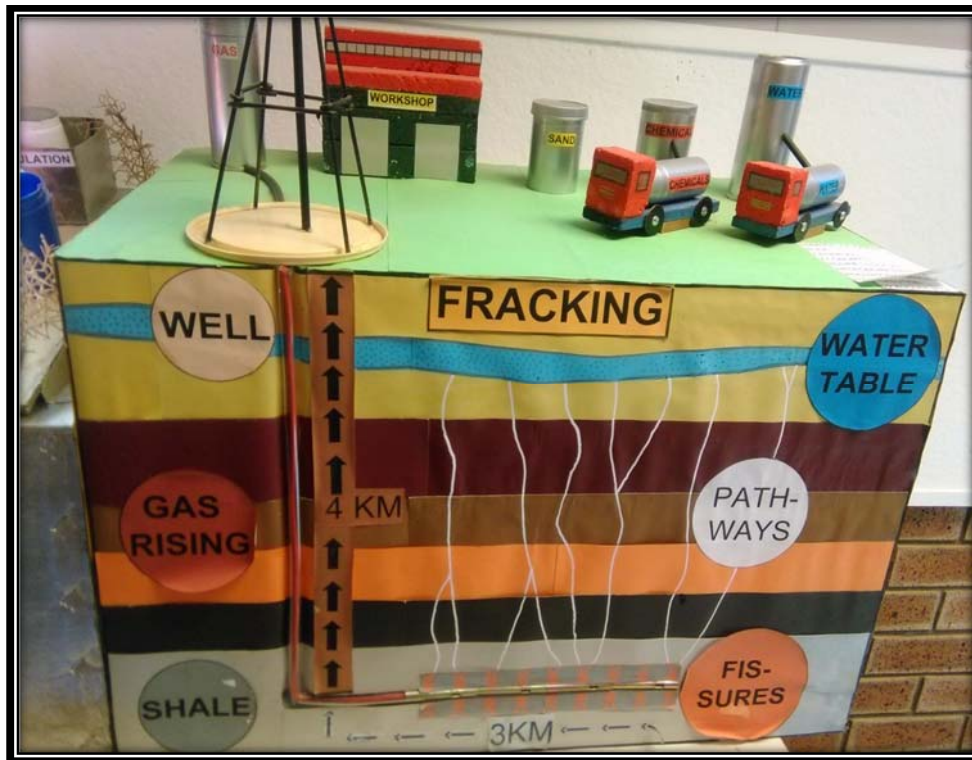


Figure 6.29: Example of a poster as an effective scaffold for reflection and application of knowledge

The objects depicted in Figure 6.28 were moved around to mimic people with different scenarios, needs and tasks.

6.4.1.3 Category 3: Fostering learner reflection

The use of educational media makes provision for learner reflection by posing higher-order questions starting with, for example, words such as “How”, “Why” and “Demonstrate” (Bloom, 1956). Noticeably, it was the Language 3-D model (cf. Figure 6.38) and the Mathematics poster (cf. Figure 6.34) which proved to be most effective in fostering learner reflection. According to Lyons (2010), reflective practice involves the advancement of learners’ critical thinking, unlike traditional approaches which emphasize memorization. Some posters and 3-D models made it

possible for learners to engage in meaningful enquiry-based learning that was of considerable value to them.

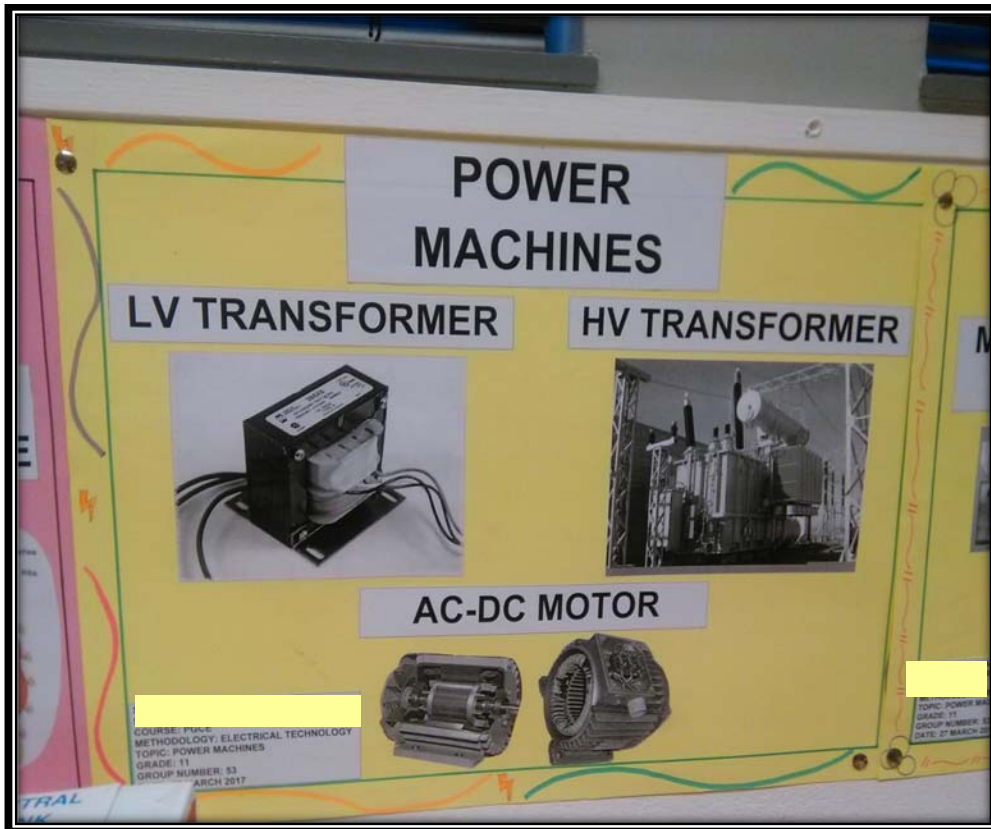


Figure 6.30: Example of a poster fostering learner reflection: Power machines

The model in Figure 6.31, for example, prompted learners to consider the correct wiring of the parallel circuit, answering questions like, “How beneficial and dangerous is electricity to us?” “Do you know of any criminal activities related to electricity use?” “What should you do with such information?”, etc.

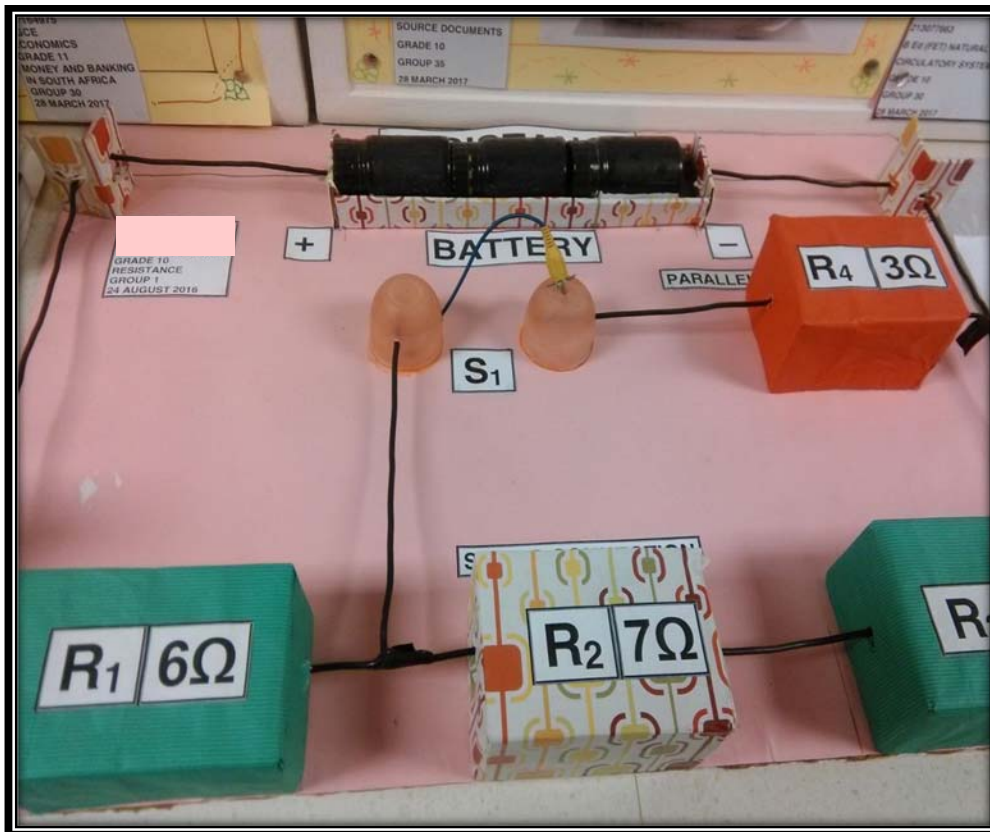


Figure 6.31: An example of an effective 3-D model fostering learner reflection

The model in Figure 6.32 represents a chloroplast, which is an organelle unique to plant cells that contain chlorophyll (which is what makes plants green) and is responsible for enabling photosynthesis to occur so that plants can convert sunlight into chemical energy. Learners were introduced to new concepts such as thylakoids, chlorophyll, nucleoids and ribosomes, and the functions of these were explained in a learner-friendly manner. Reflection was encouraged by asking learners questions such as “What will happen if there were no chloroplasts? How would it affect nature, and how will that impact on humans?”



Figure 6.32: A 3-D model depicting a chloroplast

The poster in Figure 6.33 was colourful and neat and, despite the fact that it was too cluttered, it served its purpose in terms of explaining the topic with all the complex terminology associated with it. A good mix of direct teaching and effective questioning techniques throughout maximized learner involvement. During the assessment activity, the poster assisted learners in the answering of questions, thus not only making it a very helpful tool, but also encouraging them to reflect on what they had learnt.

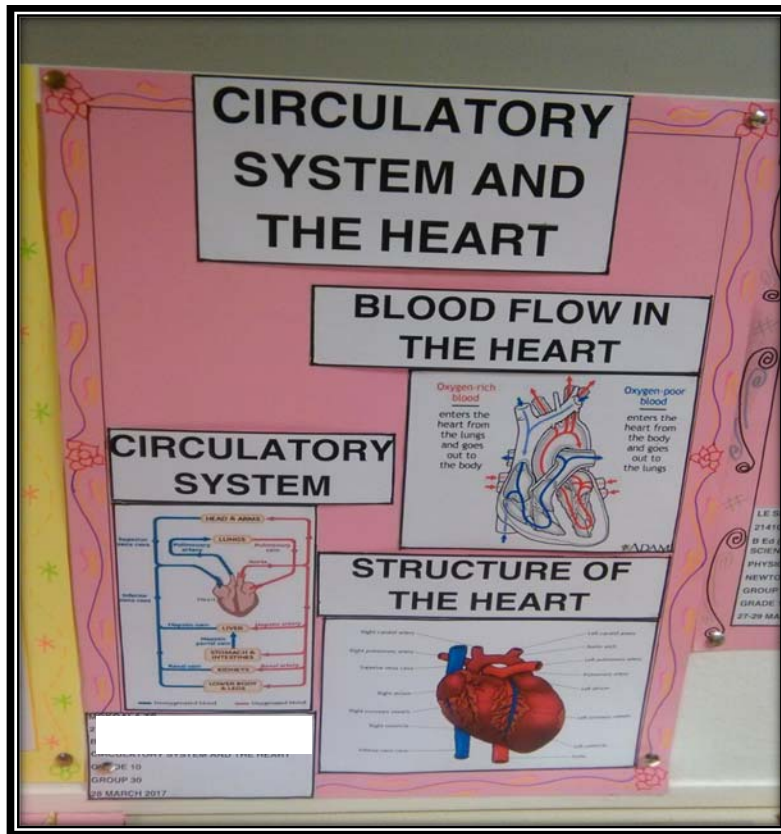


Figure 6.33: A poster about the circulatory system and heart

The poster in Figure 6.34, which illustrated algebraic equations, was used as an effective tool to show the side-by-side comparison of the quadratic and linear equations. Apart from the examples provided on the poster, additional examples were discussed, and learners were encouraged to ask questions and discuss the solutions step-by-step (Pollard, 2002).

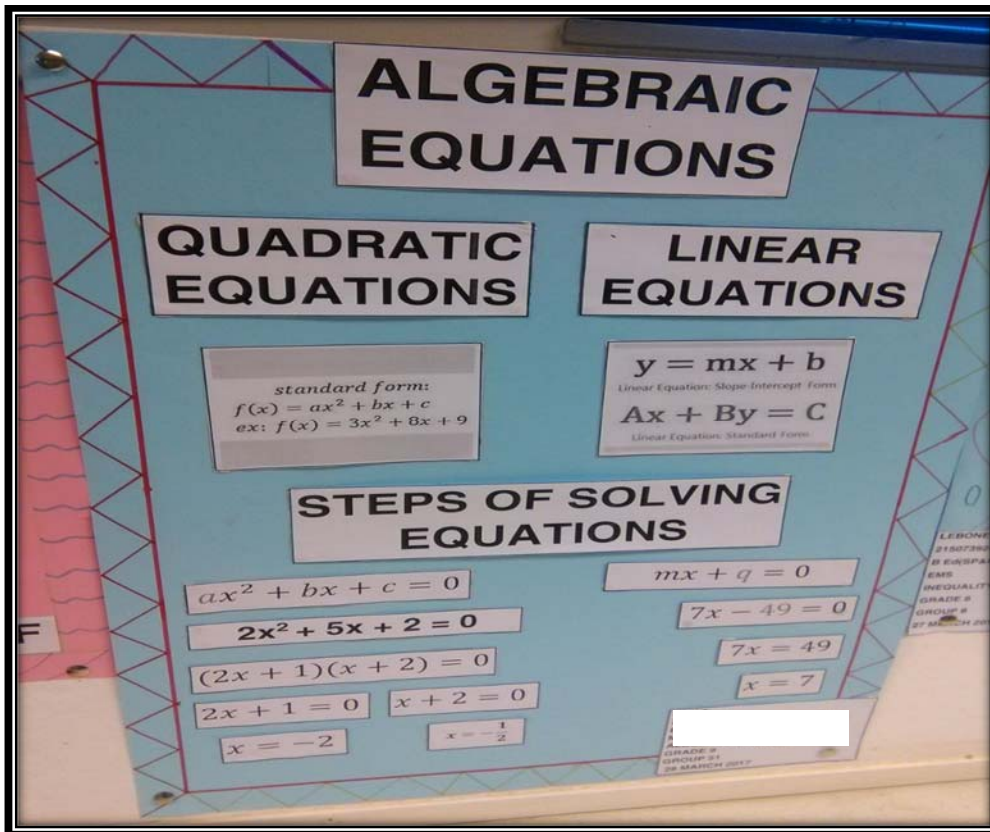


Figure 6.34: Example of a poster as an effective scaffold for reflection and application of knowledge

6.4.1.4 Category 4: Catering for a variety of instructional and assessment methods

In general, the posters and 3-D models catered for a variety of instructional and assessment methods and techniques, including the use of technology. It made provision for different learning styles by utilizing instructional methods such as direct instruction, discovery learning, problem-based teaching, co-operative learning (discussion groups), role play, individualized teaching (helping learners during their individual assessment activities), etc. (cf. Paragraph 3.2). In fact, good media allow for differentiated learning and teaching opportunities (Jared, 2016). The poster portrayed in Figure 6.35, for example, allowed for both group discussions and problem-based enquiry - the student used the pictures to introduce the lesson by asking, "Have you ever

experienced inequality in your life?”. Later on, during the presentation phase (direct instruction), questions such as “Is inequality experienced by all races?” and “What are the solutions to inequality?” led to a lively discussion which ultimately culminated in problem-solving scenarios:



Figure 6.35: A poster about trade unions encouraging the use of multiple modes of instruction

The 3-D models portrayed in Figures 6.36 and 6.37 covered the topics, ‘Sectors of production’ and ‘Types of products’ – a very popular choice since students in general seem to think that the aesthetical aspects of their model will draw away attention from tapping too much into their own creativity for the lesson content. Consequently, they tend to merely discuss the different sectors and give a low-key activity at the end during the assessment phase. In these lessons, the students

stimulated further reflection on the broader economy of South Africa and on the specific problems experienced in the different sectors. In the case of Figure 6.37, instead of using the direct/telling method, the student invited the learners to stand in a circle around the model and encouraged them to discuss what they were seeing (Wan & Gut, 2011). She asked thought-provoking questions such as, “How does global warming affect each sector?” and “What is the reciprocal relationship between the different sectors?” and “How does each sector benefit/disadvantage the other?”



Figure 6.36: A 3-D model which lends itself to differentiated modes of instruction: Sectors of production



Figure 6.37: A reflective 3-D model about types of products



Figure 6.38: A 3-D model representing key elements of a novel prescribed for learners

The 3-D model reflected in Figure 6.38 represented key themes in a prescribed Sesotho novel. Learners were asked to role-play scenes from the novel by focusing on any element of their choice - characters, plot, setting, etc. This was a very successful learner-centred lesson, with the student teacher acting as facilitator and the learners demonstrating their understanding of the different elements in creative ways. The learners clearly enjoyed this lesson and the student teacher demonstrated her ability to diversify her instruction within a single lesson.

6.4.1.5 Category 5: Reflective educational value

The media were unquestionably of educational value and it maximized the quality of the teaching-learning situation. Students displayed a reasonable amount of creativity – the majority used colourful pictures, their posters and models representing curriculum content in the respective learning areas quite aptly. The layout was functional and the writing was legible (Pollard & Colwell, 2015). There were, however, a few examples where the media did not meet the necessary requirements. The poster depicted in Figure 6.39 displayed very little creativity; virtually no colour was used save for the headings and captions and the writing was not legible for learners at the back of the class.

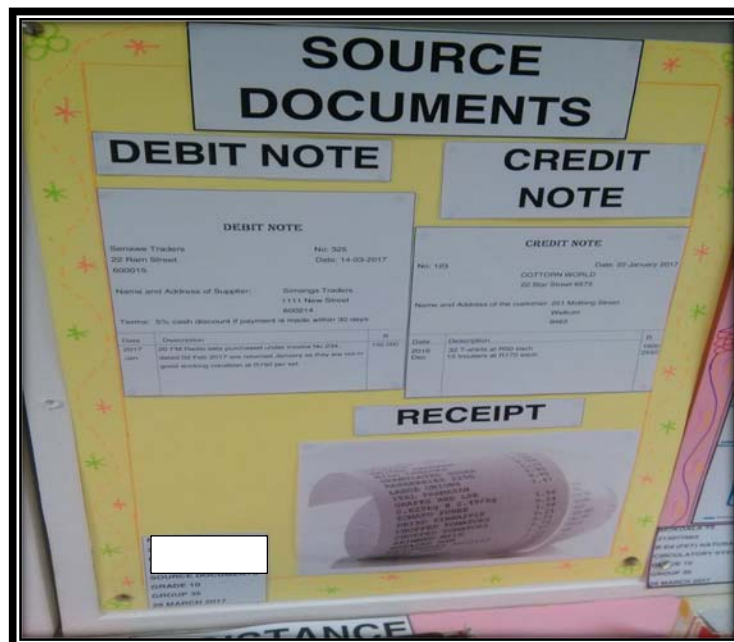


Figure 6.39: A good example of a poster of little educational value

Using concrete and real-life examples as displayed in Figures 6.40 and 6.41 facilitated understanding and displayed a fair amount of creativity - they were eye-catching and brought reality into the classroom. Although they seemed a bit clustered, they were quite successful in illustrating links between theory and practice.



Figure 6.40: A 3-D model about money and banking



Figure 6.41: A 3-D model illustrating functions and forms of payment



Figure 6.42: A reflective 3-D on agricultural production

The model displayed in Figure 6.42 served as an excellent learning and teaching tool throughout the lesson. Apart from its aesthetical and creative properties, the model also resulted in learners paying attention to it during the student's entire presentation, asking challenging questions about agriculture and production in the primary sector and also extending the discussion to the current state of land property in South Africa.

In conclusion, most of the posters and 3-D models displayed to a lesser or greater extent characteristics of functional teaching media as proposed by Pultorak (2010). These included age-appropriateness, encouraging critical thinking and problem-solving, and acting as a reference point for assessment activities. They made abstract realities concrete and facilitated problem-solving and critical reflective thinking skills in both the student teachers and the learners. Moreover, they encouraged learners to apply a good measure of both lower order and higher order thinking skills (Pollard, 2014). Higher order skills were inculcated when learners were encouraged to critically discuss the relationship between the posters and/or 3-D models, the lesson outcomes, their real-life experiences as well as the global application and implications of these (cf. Paragraph 3.2.8).

Table 6.20 provides an overall summary of strong and weak poor properties in the posters and models discussed in this section.

Table 6.20: Reflective properties of good and poor poster(s) and 3-D model(s): A summary

No.	POSTERS	GOOD AND/OR POOR PROPERTIES	3 D-MODELS	GOOD AND/OR POOR PROPERTIES
	Critical thinking & problem solving	Posters	Critical thinking & problem solving	3-D models
1.	Figure: 6.27 <i>Condensation</i>	<ul style="list-style-type: none"> • Eye-catching, colourful & visible pictures • Did not show the cycle flow 	Figure: 6.29 <i>Fracking</i>	<ul style="list-style-type: none"> • Depicts clearly the process of fracking from natural to industry and to retailers
2.	Figure: 6.30 <i>Power machines</i>	<ul style="list-style-type: none"> • Could have used colourful pictures to show different parts and different colours of wires 	Figure: 6.40 <i>Banking and moneys</i>	<ul style="list-style-type: none"> • Well-planned and not clustered
3.	Figure: 6.33 <i>Circulatory system and the heart</i>	<ul style="list-style-type: none"> • Too clustered, too small labels and too much information 	Figure: 6.31 <i>Circuit breaker</i>	<ul style="list-style-type: none"> • Could have used authentic batteries, light bulbs and real switches
4.	Figure: 6.34 <i>Algebraic equations</i>	<ul style="list-style-type: none"> • Side-side comparison and straight to the point 	Figure: 6.32 <i>Chloroplast</i>	<ul style="list-style-type: none"> • Creative yet confusing a bit in a sense that it could be mistaken for something else
5.	Figure: 6.35 <i>Trade unions</i>	<ul style="list-style-type: none"> • Observable pictures, yet the message is not clear and the rose seems misplaced 	Figure: 6.36 <i>Business sectors</i>	<ul style="list-style-type: none"> • Clear sectors but a bit crowded and too elementary
6.	Figure: 6.28 <i>Inequality</i>	<ul style="list-style-type: none"> • Visible pictures and encouraging discussion and reflection. 	Figure: 6.42 <i>Forms of payments</i>	<ul style="list-style-type: none"> • Visible products, but incorrectly placed – not on top of labels. Could have labelled a taxi, etc.
7.	Figure: 6.24 <i>Nouns</i>	<ul style="list-style-type: none"> • Too simple - leaves virtually no room for reflective teaching and learning 	Figure: 6.38 <i>A novel/short story analysis</i>	<ul style="list-style-type: none"> • Very reflective and creative; presenting important elements in the novel

(continued on next page)

Table 6.20 (continued)

No.	POSTERS	GOOD AND/OR POOR PROPERTIES	3 D-MODELS	GOOD AND/OR POOR PROPERTIES
	Critical thinking & problem solving	Posters	Critical thinking & problem solving	3-D models
8.	Figure:6.25 <i>Adjectives</i>	Very easy for the learners at high school level and not challenging	Figure: 6.40 <i>Money and banking</i>	It is colourful and eye-catching, however, it is a bit crowded
9.	Figure: 6.26 <i>Homonyms</i>	<ul style="list-style-type: none"> Colourful pictures yet not challenging enough 	Figure: 6.20 <i>Government responsibilities money</i>	<ul style="list-style-type: none"> Clear structure, functional to topic
10.	Figure: 6.39 <i>Source documents</i>	<ul style="list-style-type: none"> Not striking enough; the font is too small and resembles textbook notes 	Figure: 6.21 <i>Farming</i>	<ul style="list-style-type: none"> Well-planned, creative and straight to the point

The next section is devoted to brief descriptions of the participant observation.

6.5 PRESENTATION AND DISCUSSION OF THEMES: PARTICIPANT OBSERVATION

As mentioned, ten students participated in the observation sessions - five 3rd year and five PGCE student teachers, since they are the two groups that are evaluated during their annual official school-based practicals (SBL). The observations were conducted at four secondary schools in the Lejweleputswa Education District. Table 6.21 presents the participant profile for the observations.

Table 6.21: Participant profile: observations

Participants (student teachers)	Level of study	Subject taught	Situation of school	Duration of observation
Female student	3 rd year	Life Orientation	Wesselsbron	40 minutes
Male student	PGCE	Economics	Wesselsbron	40 minutes
Male student	3 rd year	Physical-Sciences	Wesselsbron	40 minutes
Female student	PGCE	Mathematics	Wesselsbron	40 minutes
Male student	3 rd year	Natural Sciences	Allanridge	40 minutes
Female student	PGCE	Business Studies	Allanridge	40 minutes
Male student	PGCE	English	Odendaalsrus	40 minutes
Female student	3 rd year	Sesotho	Odendaalsrus	40 minutes
Male student	PGCE	Geography	Welkom	40 minutes
Male student	3 rd year	IsiXhosa	Welkom	40 minutes

The following themes were identified during the data analysis process:

Table 6.22: Themes and categories: participant observation

THEME 1	LESSON INTRODUCTIONS
THEME 2	CRITICAL REFLECTIVE LESSON PRESENTATIONS
THEME 3	INDIVIDUALIZED LESSON DELIVERY
THEME 4	IMPLEMENTING A VARIETY OF TEACHING AND LEARNING MEDIA

The results are reported in accordance with the theme headings for each group separately, and includes not only my own observations, but also those of the co-observer. It is important to note that many of the aspects discussed in the section which follows are illustrated in the posters and 3-D models presented in Section 6.4.

6.5.1 THEME 1: Lesson introduction

3rd year participants

The lesson objectives were well-written on the lesson plans but only two of the five participants explained the lesson objectives at the beginning of the lesson as advance organisers. Those who did, failed to explain them adequately. Three students opted for attention-grabbing introductions; one student called the learners to the front of the classroom to watch an experiment about the electrical circuit as displayed in Figure 6.4. The second student asked learners to take out their cell-phones, to open and send a 'Please call me' message, a missed call notification and an SMS advertisement as an introduction for a lesson on advertising. This was clearly a very successful strategy to grab the attention of the learners and to ensure maximum participation during the rest of the lesson (Vygotsky, 1978). The third student was equally creative in her lesson on *Factors of Production* when she asked learners to quickly go outside and bring along any natural products they could find. Learners brought sand, stones, tree leaves, etc. This activity facilitated / required the use of lower order and higher order thinking skills in one lesson. The actual loose objects stimulated the lower order thinking skills, while the application and integration with other subjects, as Good (2008) attests to, served the purpose of developing higher order thinking skills. (cf. Paragraph 4.5.3). The importance of a striking introduction goes a long way to capturing the attention of learners.

The PGCE participants

Four participants failed to explain the lesson objectives at the beginning of the lesson; however, three of them did explain these obliquely by starting off with a scenario. Four students introduced themselves and then asked a question to recap on the contents covered in the previous lesson – a good example of identification of prior knowledge. The four students who did explain the lesson objectives at the beginning of the lesson made use of scenarios and pictures. In my opinion the scenarios were not particularly creative or relevant, but my co-observer insisted that they were quite inventive. In one of the scenarios the student used the learners to role-play the selling of sweets at the beginning of the lesson with the aim of identifying prior learning to introduce a lesson about entrepreneurship. Both my co-observer and I agreed that the pictures were eye-catching and served the purpose of grabbing learners' attention. Only one of the five participants had a quite boring and unimaginative introduction to her lesson.

6.5.2 THEME 2: Lesson presentation

The 3rd year participants

One student regrettably did not show a mastery of the content material as she was note-bound throughout her presentation. By comparison, the other four students presented the content in an easy-flowing, conversational style, integrating their media very effectively. This is in agreement with what Lyons's (2010) stance that a teacher should be able to integrate media effectively to maximise learners' assimilation of new knowledge by showing how the media fit into a bigger picture (cf. Paragraph 4.5). Three participants managed to involve learners by implementing higher-order assessment strategies when activities were carried out and when questioning the learners (Pine, 2009). The class activities and the expanded opportunities were introduced by using operational verbs such as "Demonstrate", "Reflect", "Critically discuss with your partner...", and "Draw your own diagram that represents.....", etc.

The PGCE participants

The PGCE participants performed quite well in this category. All but one of them demonstrated mastery of the content material. Both the co-supervisor and I agreed that the note-bound presenter who failed to display mastery of the subject content was not well-prepared and appeared to be a bit 'out of his depth'. According to my judgement, three students only partially engaged learners in higher-level thinking activities by asking, for example, 'How', 'Why' and 'What is your opinion' questions, although the co-observer felt that they succeeded very well in soliciting higher-order answers from learners.

6.5.3 THEME 3: Individualized lesson delivery

The 3rd year participants

In general, the lessons were presented in a way that catered for the individual needs of learners, since four of the five presenters used different modes of presenting their lessons to cater for diverse learner needs. These ranged from problem-based learning, discovery learning, co-operative learning and the direct instructional method (Jang, 2008). In her observation notes, the co-observer indicated that four out of the five participants used learner-centred teaching methods, where the lessons were characterized by learner involvement and the students acting as facilitators. For example, in one lesson the learners labelled the poster depicted in Figure 6.6 during the lesson presentation and in another lesson the 3-D model was passed around in the class, with learners being asked content-related questions to identify certain aspects of the lesson topic. As Knowles (1989) point out, it is methods such as these that maximize learner involvement throughout the lesson (cf. Paragraph 3.2).

The PGCE participants

According to Moon (2006), individualizing content takes into consideration alternative instructional methods for learners with different backgrounds and learning styles. Moreover, it is learner-centred as it finds examples of instructional settings in which learners define their own content and pursue learning based on their own interests (Jiang, 2012).

There were mixed feelings about this aspect of the observations and, in general, my co-observer was more lenient in her evaluation of individualized content delivery than I was. It was agreed, however, that at least four out of the five presenters did make use of individualized content delivery to a large extent

6.5.4. THEME 4: Implementing a variety of teaching and learning media

In Chapter 4, teaching media was discussed as a tool for reflective practice (cf. Paragraph 4.3.2). It transpired that effective media stimulate the creation of schemata and help the learners with information retention (Pollard & Colwell, 2015). In paragraph 6.4, the analysis of the posters and 3-D model was deconstructed. It became evident that in comparison to a 3-D model, it is very difficult to design a poster that is challenging enough to encourage critical reflective teaching. Both the co-observer and I concurred that all student teachers in both groups used a variety of teaching and learning media. To illustrate, apart from the posters and 3-D models that were used royally, regalia like artefacts and real-life objects (tins, leaves, bank notes and coins, cell phones, rocks, etc.) were used to add flavour to the presentations. These were used quite effectively to ensure learner involvement. For example, loose sweets were used in a tuck-shop role play, bank notes and coins were used to bring the 'real world' into the classroom when the banking industry was discussed, and salary payment printouts were used in a lesson on budgeting (Jang, 2008). In that sense, we were quite impressed with the students' creativity and inventiveness and we concluded that the media lab activities lectured by the SBL lecturer were successful.

6.5.4.1 Reflection: Participant observations

On the whole, the lesson presentations went fairly well, but it was clear that there was a considerable need for improvement. While most of the participants did manage to teach creatively and foster reflection in their learners, this occurred only in different ‘chunks’ of the lesson, and was not implemented and/or applied in a consistent manner throughout individual lessons.

Having discussed the participant observations analysis, I focus on the findings of the focus group discussions in the last section of this chapter.

6.6 PRESENTATION AND DISCUSSION OF THEMES: FOCUS GROUPS

Four focus groups were conducted with the 2nd, 3rd, 4th years and the PGCE student teachers. The 2nd year focus group interview was initially conducted as part of the pilot study; however, the data collected from the pilot group was so information-rich and detailed that I decided to incorporate it as part of the data collected from the main focus group interviews.

6.6.1 Participant data

Table 6.23 (next page) reflects the compilation of the focus groups and the codes assigned to each participant:

Table 6.23: Focus groups: participant coding and duration

Participants (Student teachers)	Total number of participants per level N=32	Code	Duration of focus group
FOCUS GROUP 1: 2nd Years 5 Male students 6 Female students	11 x 2 nd years	SM 2 nd (1-5)	55 minutes
		SF 2 nd (1-6)	
FOCUS GROUP 2: 3rd Years 4 Male students 3 Female students	7 x 3 rd years	SM 3 rd (1-4)	45 minutes
		SF 3 rd (1-3)	
FOCUS GROUP 3: 4th Years 4 Male students 5 Female students	9 x 4 th years	SM 4 th (1-4)	45 minutes
		SF 4 th (1-5)	
FOCUS GROUP 4: PGCE 2 Male students 3 Female students	5 x PGCE	SM PGCE (1-2)	45 minutes
		SF PGCE (1-3)	

The theme and the categories identified throughout the data analysis process are presented in Table 6.24.

Table 6.24: Themes and categories: focus group interviews

THEME 1: CRITICAL REFLECTIVE PRACTICES
Category 1: 21 st Century reflective teaching
Category 2: Student experiences and practices of critical reflective teaching
Category 3: The challenges and advantages of using critical reflective teaching
Category 4: Ways in which student teachers could be assisted with critical reflective teaching
THEME 2: THE REFLECTIVE JOURNAL (PORTFOLIO) AND CRITICAL REFLECTIVE TEACHING
Category 1: The benefits of the reflective journals (portfolios)
THEME 3: SKILLS AND KNOWLEDGE ACQUIRED FROM SBL

Seating arrangements for the different focus groups are presented in Figures 6.43-6.46.

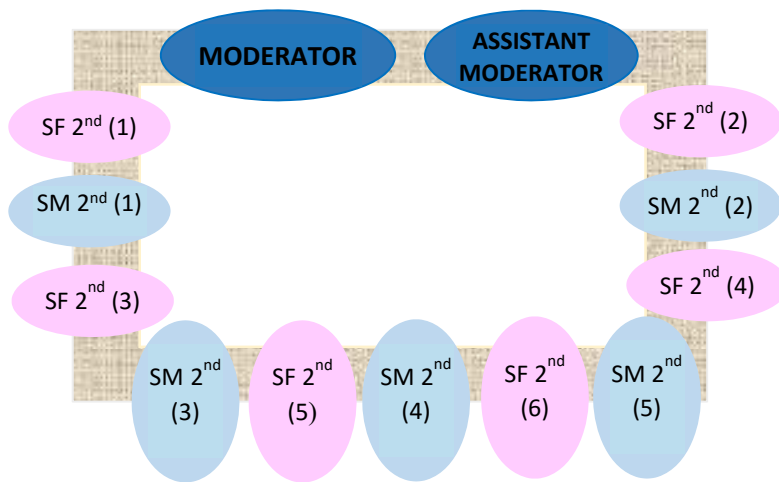


Figure 6.43: Seating arrangements for the 2nd year focus group

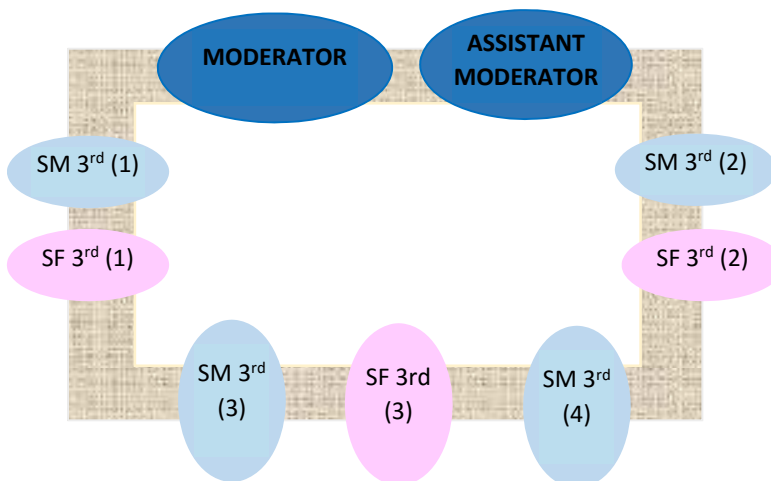


Figure 6.44: Seating arrangements for the 3rd year focus group

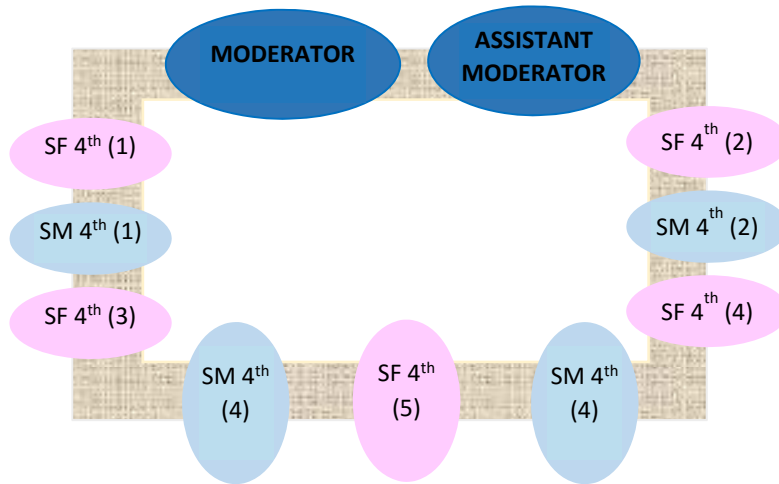


Figure 6.45: Seating arrangements for the 4th year focus group

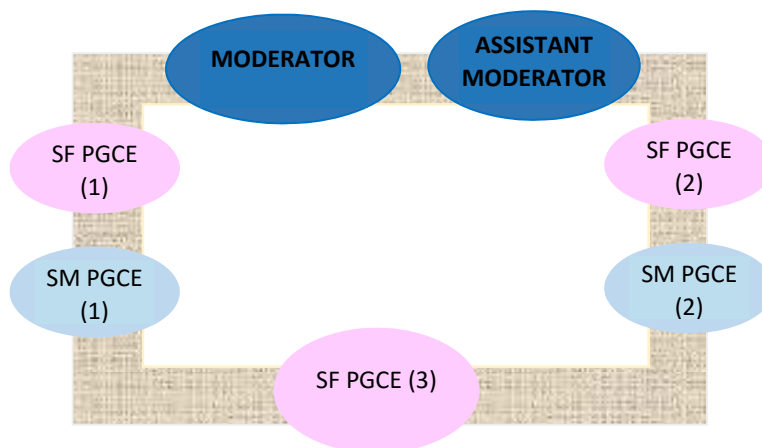


Figure 6.46: Seating arrangements for the PGCE focus group

What follows is a discussion of the different focus group sessions. Some categories identified during the coding process were omitted owing to the low frequency of responses from participants. The aim was to report the information as authentically as possible in order to “hear the voices” of participants loudly and clearly. To this end, liberal use was made of their direct words, without editing errors in language usage

6.6.2 THEME 1: Critical reflective practices

The results of the focus groups data are reported in accordance with the categories as outlined in Table 6.24. The results for all groups are reported as a unit, although they were analysed individually and compared and combined for triangulation purposes.

6.6.2.1 Category 1: 21st Century reflective teaching

The 2nd year students were surprisingly competent in displaying their understanding of reflective teaching when they described it as the act of reflecting, looking back to adjust or improve, keeping abreast with developments in the education system, a deep mental process that involves beliefs, values, personality, and a process that sometimes involves having to adjust some of the rules that are set by the school, government and educational authorities (cf. Paragraph 2.3.1). One of the participants explained it as follows:

“... reflection is a deep mental process. I shall say it involves our beliefs, values and personality. I should be able to adapt certain norms according to my views. Sometimes I even have to over-step certain rules that are set by the school, or the government.....even by the education department.” [SM 2nd (5)].

The 3rd year participants defined reflective teaching as revisiting one’s teaching practice and planning how to approach a lesson, how to teach and how to improve (Hillier, 2009). They pointed out that it is like looking at oneself in the mirror, an action, a verb, a theory; its practical application is blended with one’s personality. Phrases like ‘*teaching from the heart*’, ‘*self-invented practices*’, ‘*having a backbone*’ and ‘*using discretion*’ were mentioned (cf. Paragraph 2.3.1). A few participants [SF 3rd (1)]; [SF4th (3)]; and [SM 4th (4)] articulated that no teaching training programme would be able to teach a student teacher everything, and therefore cultivating reflective teaching practices would help them to use their own discretion at times in a calculated way:

“We have to learn to use our own discretion when dealing with certain matters, because, after all we cannot be taught everything.”

The 4th year participants described reflective teaching as the act of reflecting on ‘where one went wrong or did something right’ (MF 4th (3)). They included aspects such as the teacher’s professional life, being optimistic and being affected by the person’s level of creativity (Zeichner & Liston, 2013). It was mentioned that some student teachers, and even qualified teachers with experience, might choose not to keep up with developments in the field of education. One part-time student [MF 4th (3)] had the following to say:

“... I might have taught for many years but only to find that I am still stuck in the sense that I am doing things the same way, even though teaching practice has changed.”

The PGCE students included the following concepts when describing reflective teaching: personality, improving both good and bad teaching practices and the fact that reflection should also be practiced with regard to matters in people’s personal lives (cf. Paragraph 2.3.1).

All the student groups agreed that 21st century teaching skills, content and expertise are characterized by technology. One of the students maintained that 21st century teaching should be learner-centred, and a 4th year student indicated that the integration of technology did not mean that ‘older’ skills like the chalkboard should be done away with. In accordance with Jared (2016), the 3rd year group provided examples of technology that could be used to facilitate critical reflective teaching, including tablets, laptops, modems, I-Pads, music, and YouTube videos. The 4th years added to the list an overhead projector, transparencies, posters and 3-D models (cf. Paragraph 4.7.1), while the PGCE students added the use of pictures, animation and educational video clips.

The 2nd year group agreed that reflection helped them to retrieve theoretical aspects that were covered in the syllabus. It also assisted them in applying this knowledge as best as they could (Piaget, 1971). Lastly, one 3rd year mentioned the very important fact that reflective teaching is not easily acquired (cf. Paragraph 2.3.3). This is evident from the following comment [SF 3rd (2)]:

“So, all in all that is what reflective teaching is but I think that not all everyone will be able to cultivate and master the skill of reflection. Being indecisive points to being at immaturity level and not being able to being[sic] a reflector, which is why I say reflective teaching is a skill only mastered by the few.”

6.6.2.1.1 Concluding remarks

The gist of responses in this category clearly indicates that, in general, students had a fair idea of what 21st century reflective teaching is. For example, they knew that 21st century teaching is characterised by the use of technology. However, when it came to the practice of reflective teaching, they could not really succeed in providing meaningful practical examples - in the sense that, as explained in Chapter 2, reflective teaching involves more than a fuzzy academic concept. For me, this shows that education student teachers at all levels would benefit greatly if a chapter on reflective teaching could be included in their Education module.

6.6.2.2 Category 2: Students’ experiences and practices of critical reflective teaching

The 2nd year participants revealed that they learnt about critical reflective teaching from their study guides, text books and, to a lesser extent, from their lecturers. They mentioned the fact that lecturers modelled critical reflective teaching by using overhead projectors, assignments, projects and presentations. When probed to expand, the 3rd years mentioned lecturer feedback after the micro-lesson presentation sessions. According to Perry (2013), there is still a gap between what student teachers are taught and what is expected of them while teaching their peers and/or children during their lesson presentations. These sentiments were echoed by the 4th year focus group participants when they highlighted that most of their lecturers still rely too much on notes and textbooks. Based on this observation, they came to the conclusion that lecturers themselves do not practise critical reflective teaching. The PGCE group reserved further comments as far as their experiences with their lecturers’ critical reflective teaching abilities were concerned.

According to the 2nd year participants, their opportunities to practice critical reflective teaching during their six-weeks teaching practice were based on the feedback from their mentor teachers on their lesson presentations and on their portfolios of evidence. However, one student [SM 2nd (4), observed that their mentor lecturers tended to evaluate differently from their teacher mentors at the schools. During micro-lesson presentations, they did not, for example, consider feedback from lecturers who had evaluated previous lesson presentations:

“... You see, Mam, there’s a problem....the catch is that different lecturers evaluate differently... they may look at things differently and score certain things differently even. When lecturer A says that I need to work on a certain area when preparing for the next lesson, it seems that lecture B will not even consider the improvement on the previous skill, let alone check the comments of the previous lecturer.”

One of the 3rd years practised reflective teaching by not progressing to the next step of the presentation unless the current work has been mastered by her learners. The 4th year students claimed to have had plenty opportunities to practise critical reflective teaching during the six-months teaching practice they undergo at schools. The PGCE participants indicated that they used their six-week teaching practice opportunity to reflect on a variety of facets:

“...Reflection is about everything that I do as a teacher; it could be about how I mark and how I am giving the feedback to the learners, how I am teaching them and how I am asking them questions, so those are some of many opportunities during my teaching practice.”
[SM PGCE (2)].

6.6.2.2.1 Concluding remarks

Reflective teaching is taught in the teacher education curricula as part of a set of related theories, such as constructivism, experiential learning and inquiry-based learning (cf. Chapter 3), but importantly, it is not covered as a stand-alone chapter. Although participants indicated that they had had ample opportunities to experience and practice reflective teaching during their SBL and micro-teaching, and although they used creative lesson presentation methods such as role-play, co-operative learning, problem-based learning, etc., these were used very scantily. The fact that

the media for each of the four micro-lessons were predetermined by the syllabus may have played a role here but, more importantly, it may also be that they perceived their lecturers as not modelling reflective teaching themselves.

6.6.2.3 Category 3: Advantages and challenges when using critical reflective teaching methods

The majority of 2nd year participants regarded the idea of critical reflective teaching in a very positive light. For instance, they felt that it helped them to grow professionally and it ‘binds everything together’. The same sentiments are shared by Jiang (2012), who claims that critical reflective teaching increases the self-esteem and morale of a teacher. The 3rd years acknowledged that critical reflection during their teaching practice allowed them to compare their own practice with those of their lecturers, their mentor teachers and their fellow students. This encouraged them to be innovative and to align their teaching practices to the latest trends in education. A 3rd year participant [SM 1st (3)] verbalised the general feeling as follows:

“So reflection means that I will change according to the situations, like use the approach at in a certain required situation, as it applies to my teaching. Maybe I will find that I will have to use different approaches, strategies or methods with other classes..... and this is the stage I think where reflection comes in.”

And:

“... I will be able to keep up with the changing times as we have already discussed how teaching changes with time. I am thinking of the different systems that have been applied by our education department- we had OBE, NCS and now we are using CAPS. So as a teacher if I do not use the skill of critical reflection I will find myself stuck with the teaching curriculum that has been replaced.” [SM 4th (3)].

The 2nd year students were concerned about the fact that they might not be able to keep up with the ever-changing developments in education. As one of the 3rd years [SM 3rd (2)] remarked:

“... I cannot teach my learners something that I do not know. I cannot teach my learners to be reflective if I myself lack that skill.”

6.6.2.3.1 Concluding remarks

All in all, it transpired that the participant students were in agreement that, as argued by Pollard (2002), reflective teaching is advantageous because it helps them grow professionally, it builds their self-confidence and it instils creativity within them. In addition, they acknowledged that reflective teaching granted them the opportunity to compare themselves with their lecturers, mentor teachers and peers.

6.6.2.4 Category 4: Ways in which student teachers could be assisted with critical reflective teaching

According to the 2nd year participants, it would be helpful if their lecturers were to model reflective teaching when lecturing them and make them aware of such (Wan & Gut, 2011). The 3rd year students suggested that students should share their thoughts about critical reflective practices with their fellow students, and that the portfolio and action research activities would be very useful in facilitating critical reflective practices. The 4th years would like to see their mentor teachers setting the example in this regard. PGCE participants proposed that student teachers should conduct their own personal research on critical reflective teaching, and then experiment continuously with different methods:

“I will say that we all must be taught about critical reflective teaching, over and over... we should also be given examples; the good ones and the bad ones...so that we can see where we go wrong.” [SM PGCE (1)].

This opinion resonates well with my observation in paragraph 6.5 that it may be a wise idea to include a detailed unit on reflective teaching in the syllabus.

6.6.2.4.1 Concluding remarks

It came out quite strongly that the students felt that their mentor teachers and lecturers should accept their responsibility to lead by example, modelling reflective teaching practices themselves. Equally important, they acknowledged the importance of their peers as sounding-boards (Vaske, 2001), the effective use of their portfolios for reflection and the possibility of conducting their own research on reflective teaching.

6.6.3 THEME 2: The reflective journals (portfolios) and critical reflective teaching

The focus in the following section is on participants' sentiments about the interface between their reflective journals (portfolios) and critical reflective teaching.

6.6.3.1 Category 1: The benefits of the reflective journal (portfolio)

As mentioned in Section 6.3, the student portfolio serves as a guide which assists students in applying and reflecting on a variety of aspects covered during the course of their studies, with specific reference to their SBL course.

Participants were quite vocal about the advantages (and disadvantages, in some cases) of using their portfolios as reflective journals. They were all in agreement that they appreciated the fact that it brought 'order and discipline' and it helped them to perform tasks in a systematic manner (Lyons, 2010; Moon, 2006). According to them, the portfolio provided them with the opportunity to reflect on both good and bad experiences and that these experiences served as lessons on what and what not to do.

Quite a few students admitted that, when they started with the classes on how to compile a portfolio, they were bored until they went for their SBL. They started to appreciate their portfolios as they came to realise how extensive the responsibilities of full-time teachers were.

Updating their portfolios was but a drop in the bucket in comparison to what was expected from their mentor teachers.

One student [SM 2nd (4)] had the following to say:

“Ma’am studying how to compile the portfolio was very boring, LOL, at least for me. But that changed the very first time I went to my teaching practice as I realized that everything I have been taught was relevant and essential. So, the portfolio is very personal, it contains my own views and experiences.”

A similar sentiment was shared by another student [SF 3rd (3)]:

“I remember I did not value the portfolio at first until I got to teaching practice then I started to realize the essence of the portfolio and I could understand why the school-based learning coordinator was always fretting.”

Similarly, a student noted that one of the basic things she learnt from her portfolio activities was to ask herself:

“...Did the lesson go as planned? And if not, what went wrong and how can I improve on that in the future?” [SF 3rd (2)].

From the discussions it was evident that all the groups felt that they benefited considerably by recording their personal reflections. The following quote more or less sums up the general feeling in this regard:

“I have realized that my portfolio as student teacher has a section or part where I must discuss my personal experiences into greater detail... What I have learned and what I would like to change or do differently in the future. And if I am going to change something in the future I should detail how I am going to do that.” [SF PGCE (2)].

The 2nd year and PGCE participants generally felt that the portfolio was of value to them in the sense that it was ‘a source of accomplishment’ which contributed to their overall development and growth:

“...the whole process of the portfolio contributes to my overall professionalism, it teaches me to be punctual, organized also disciplined. It also instils some healthy competition among the student teachers...” [SF 2nd (3)].

and

“... my portfolio is my best work and it depicts me and my attitude.” [SF PGCE (1)].

Time management was another aspect that was singled out (cf. Paragraph 6.2.6). One 2nd year participant mentioned that he realized his portfolio had encouraged him to be responsible in the sense that he arrived early at school to ensure that his early classes could be signed off on his portfolio. To this, participants (PGCE & 2nd year) added that the portfolio forced them to be punctual by honouring prescribed dates and deadlines for the submission of various tasks.

“... it teaches one the skill of time management.” [(SM PGCE (2)].

And

“So the whole process of the portfolio contributes to my overall professionalism, it teaches me to be punctual, organized also disciplined. It also instils some healthy competition among the student teachers. I do not know if you guys have noticed that everyone wants to be the best among the best (laughing).” [SF 2nd (3)].

Most participants indicated that they had learnt to mind the manner in which they spoke to their learners during lesson presentations as this was one of the aspects they were assessed on by the mentor teacher. One PGCE participant, SF PGCE (2) indicated that the portfolio helped her to treat her learners in the same manner as she treated her portfolio - with respect and care.

“And ma’am I would like to add, I remember our school-based learning lecturer once said to us that we must treat our portfolio like a human being, we must treat it with love and respect. As much as we are going to be teachers and teach learners we should also respect the learners and also care for them...”

The topic of professional conduct also surfaced. One of the 4th years pointed out that the portfolio made her acknowledge that there is a right and wrong way of doing things, and that rules applied to everything she did in life. According to a 3rd year participant, [SF 3rd (5)], the portfolio had taught her to be professional irrespective of witnessing some unprofessionalism from some mentor teachers. She added that doing her best made her sleep peacefully at night.

“As for me personally it taught me that I always have to be professional because when you get to the schools you find that some of the teachers neglect their duties. I feel very bad if I think about a time where I have not been totally fair to a learner, it bothers me. But if I know that I have done my job to the best of my ability and learners still fail then I won’t feel guilty.”

This female 3rd year student teacher, [SF 3rd (1)], remarked that her portfolio represents her and that she would use it as a supporting document during a teaching post application:

“... So for whatever job that you apply for your portfolio must accompany your job application. Although it will not always serve as an accurate picture of a person’s character because other people will even pay other people to create portfolios for them, but in the end they will catch you out once you start with the job because you will not be able to live up to what is expected of you.”

Her claims concurred with some of the 3rd year and PGCE participants who indicated that professionalism involved all aspects of their lives, and that this was reflected in their portfolios:

“I think professionalism involves all the aspects of my life. Most people say do not judge a book by its cover, I think it depends on the context. Because most people will say that their clothes do not define who they are but the truth of the matter is that they do and they affect how others view you. When it comes to a portfolio, all is judged including; its cover, the neatness and also the way of pasting all the paper work and the writing should be legible. “[SF 3rd (5)].

One 2nd year participant was confident that, as a result of the portfolio, he would be able to cope even if he were employed at schools where the teachers do not exert themselves when performing their duties.

“The portfolio serves as my trainer; in the sense that by the time I have to face the workload that teachers do I will be tuned in properly. And even when I get to a school where the teachers do not work hard I will have that value of hard work instilled in me and I will not be influenced otherwise.” [SM 2nd (5)].

In summary, the benefits of the portfolios related to (1) completing tasks in an ordered, disciplined and systematic manner; (2) making students aware of essential aspects when preparing for lessons; (3) creating personal reflection opportunities; (4) time management; (5) proper communication with their learners; and (5) behaving in a professional manner.

6.6.4 THEME 3: Skills and knowledge acquired from SBL

One of the benefits of their SBL was that participants realized that it was possible to identify learners’ particular learning styles, intelligences, strengths and weaknesses. These aspects were covered by the curricula. They were confident that they would be able to flexibly cater for learners’ different learning needs and that reflective teaching would assist them in the preparation of creative lessons:

“... the skill of reflection... will assist me to get creative and eventually will assist in the creation of lessons that will cater better for all the learners in my class.” [SF 2nd (3)].

Another 2nd year student recounted how her mentor teacher (in the English class) would use a short descriptive paragraph written by the learners to identify their language, writing and creativity skills and how it helped her in preparing for her own lessons. A few participants indicated that they learnt how to use differentiated teaching by devising extra activities to help struggling learners catch up and cope with learning tasks (Jang, 2008) They realised that, in most cases, it was not that learners were incapable but that they needed more time to master the content:

“...in some cases learners are not stupid - it’s just that they need some extra time to understand things or master a new approach of learning.” [SF 4th (3)].

Criticism against education policies also surfaced. Participants generally felt that poor academic performance was a result of the education authorities' lack of training teachers to apply differentiated teaching in diverse classes. They also raised a concern about the progression system at schools, which allows learners to progress to a next grade despite failing their current grade. However, the general feeling was that student teachers are indeed equipped with 21st century reflective teaching skills to enable them to implement differentiated and inclusive teaching.

Finally, a noteworthy observation was made by one of the participants with the following remark:

“Reflection is essentially like intuition... There are things that the teaching programme will not be able to teach us. That is where reflection comes in place; it can really help me solve any kind of problem.”

6.7 SUMMARY

In Chapter 6, the findings of the empirical investigation were reported. The chapter comprised the analysis of data emerging from my in-depth document analysis of the CUT teaching curricula, my observation of lesson presentations, my analysis of student portfolios, as well as data generated in my focus group interviews of participating students. I indicated how I went about analysing data through the identification of the main themes and categories of intrinsic to different data sets. In addition, the themes emerging from my focus group interviews were discussed using participants' verbatim accounts. Furthermore, appropriate models and theories, as well as relevant evidence from the literature study conducted in Chapters 2, 3 and 4 were used to support my research findings.

The final chapter serves as a summary of the main findings, presenting conclusions about the study and recommending both a framework for the implementation of creative and reflective teaching at the CUT and a demarcation of further areas of study.

CHAPTER SEVEN

CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS

7.1 INTRODUCTION

In Chapter 7, I provide a general overview of the study, with the emphasis being on presenting the conclusions I drew from my research findings. The conclusions relate specifically to the six research questions regarding ways in which *the practice of critical reflective thinking and teaching during students' teacher training programme could be improved to meet the requirements of 21st century teaching* (see Section 1.1).

7.2 AN OVERVIEW OF THE RESEARCH PROJECT

The following summary, which consists of snapshots of each chapter, is an overall exposition of the study.

Chapter One served as an introduction to my research study. To this purpose it included the context of the problem, the research rationale, research questions, the aim and objectives of the study, and the research methodology (cf. Paragraphs 1.3). The significance of the study was also explained in this chapter, as were the envisaged outcomes. In broad terms, the focus of study was on the need to align the Teacher Training Curricula of the Central University of Technology with the requirements of 21st century teaching and teacher training in respect of the need for critically reflective thinking and teaching.

Chapter Two was in essence a comprehensive summary of the historic origin and development of theories on critical reflective thinking and teaching (cf. Paragraph 2.3). In this regard theories on critical reflective thinking and critical reflection expounded by John Dewey, Ronald Schön, Graham Gibbs, David Kolb, Andrew Pollard, Max van Manen, Jennifer Gore and Kenneth Zeichner were presented and compared with one another (cf. Paragraphs 2.4.1 - 2.4.7).

In **Chapter Three** the focus was on the student teacher as an adult learner. To this purpose, theories explicitly or implicitly addressing adult teaching and learning were explored, specifically those propagated by Malcolm Knowles', John Dewey, Lev Vygotsky, Jean Piaget, Jerome Bruner, and David Kolb. The common thread amongst these theories – andragogy and constructivism – was the assumption that adult learning is typically active, inquiry-based and self-directed (cf. Paragraphs 3.2.1 - 3.2.7).

In **Chapter Four** I deliberated on 21st century teaching practice, highlighting the critical importance of a 21st century teaching practice curriculum to enable student teachers to one day run their classrooms as critical reflective teaching/learning sites. To this purpose, the chapter included descriptions and discussions of ways which students could be equipped with critical reflective teaching skills, the characteristics of 21st century teachers, and the inculcation of 21st century skills in school learners. The critical role of Information and Communications Technology in this regard was also specifically addressed.

Chapter Five was devoted to a description of my research design and methodology. I explained why I decided to use a case study design and why I decided to conduct my study within the parameters of an interpretive paradigm. I also described and justified the methods I used to select my research participants, collect and analyse data, and interpret the findings emerging from the data analysis.

In **Chapter Six** I presented my research findings. These emerged from my analysis of documents, observation of participating student teachers during their teaching practice period, and focus group interviews conducted with selected 2nd, 3rd, 4th years and PGCE student teachers.

The focus of **Chapter Seven** is on the conclusions drawn from the findings presented in Chapter 6, the limitations of the study, and the recommendations regarding teacher education curricula in general, and those of the Welkom University of Technology Campus in particular. More specifically, I use this chapter to present and recommend a framework for the inclusion of

reflective teaching in the teacher training curricula of my university as a means of aligning students' teaching practice experiences to the demands that school teachers use creative, innovative and collaborative teaching strategies to equip learners with the skills they would need to be productive 21st century citizens.

7.3 CONCLUSIONS OF THE STUDY

As indicated above, the conclusions relate to the six research questions stated in Chapter 1 (Section 1.1). Consequently, the conclusions are presented in the same order as the research questions were posed. The answer to each of these questions, as suggested in my research findings, is therefore specifically related to the question concerned.

Research question 1:

What are the implications of using critical reflective thinking and teaching during 21st century teaching practice?

Indications from my literature review was that reflective teaching is beneficial to student teachers and experienced teachers alike. Moreover, indications are that the benefits of reflective teaching outweigh its drawbacks, which is why teacher education programmes should increasingly include the integration of reflective practices in their teaching practice curricula. Specific indications from the literature review are that the greatest advantage of critical reflection lies in the fact that it prepares student teachers for the world of work by reinforcing the link between theory and practice. By implication, teaching, as 'work', should improve, if only because student teachers recognize the link between their knowledge of and insights into one or more subject disciplines (the theory of teaching) and the way in which related subjects should be taught at school (teaching as practice) (cf. Paragraphs 2.4.2).

Indications from the analysis of focus groups data are that critical reflection allows students to compare themselves with their lecturers, their mentor teachers and their peers in terms of

creativity and innovation, thus enabling them to adjust and improve their own teaching practice. Participating students specifically stressed the role that critical reflective teaching played in making them more versatile and flexible in their approach to teaching (cf. Paragraph 6.2.2).

Indications from my review of literature in Chapter 2 (cf. Paragraph 2.3) are, moreover, that reflective thinking, amongst others, not only provides teachers with the opportunity to use their context-based knowledge of teaching and learning in the construction of rich and flexible catalogues of ideas, skills and attitudes but also spurs them on to examine their own beliefs about and disposition regarding the knowledge base of their subject/s, the training they received in this regard, and the way/s in which these contributed to shaping them as professionals.

Indications from this review are, moreover, that the explicit linking of reflective thinking theories with reflective practice during teaching practice fosters students' metacognitive thinking abilities. In this regard, student teachers who participated in Warwick' 2007 research study on the Post Graduate Certificate in Education (PGCE) indicated that they ascribed their ability to engage in reflective thinking primarily to their knowledge of and insights into modes of thinking that mirrored Dewey's open-mindedness, responsibility and whole-heartedness (cf. Paragraph 2.4.2).

Critiques against reflection in teaching were acknowledged and critically considered in the review of literature on the topic. Included in these critiques were claims that (a) reflection is generally regarded as an academic exercise rather than a teaching skills; (b) there is a real danger that the term 'reflection', having become part of educational jargon, might be used to describe anything associated with teaching; (c) there is no real evidence that reflection results in action; (d) the process of reflective teaching is complex in that it involves a diverse range of role-players and stakeholders, such as teachers, learners, schools, and society at large; (e) reflection, being a time-consuming process, could cause student anxiety and frustration, especially if they are unable to manage their time effectively; (f) trust is often an issue due to the fact that the establishment of a professional reflective community is seen as the responsibility of teachers; and (g) uncertainty

about the time frame for reflection (whether it should be a short- or long-term process) and whether or not politics, cultural and historical beliefs and values should be involved when reflecting about education-related issues in teachers' reluctance to integrate reflective thinking into their classroom teaching practice.

Research question 2:

What are student teachers' understanding of critical reflection and its role in their teacher training programme?

Dewey (1930) defines critical reflection as an active consideration of any belief or supposed form of knowledge. Schön (1983) adds that reflection is an active process of reviewing an experience of practice (cf. Paragraph 2.4.3), while Gore and Zeichner (1991) discuss four varieties of reflective practices, each focusing on different aspects of reflection (cf. Paragraph 2.4.8).

Focus group participants demonstrated a fairly good understanding of reflective teaching. They indicated, for example, that the concept 'reflection' relates to an action of reflecting, looking back to adjust or improve, keeping abreast with development in the education system, a deep mental process that involves beliefs, values and personality. This process, according to them, sometimes involves teachers having to adjust certain rules (set by the school, government and/or educational authorities) informed by their own experience or a desire to effect change: it is, according to them, an ongoing process that involves thinking and self-evaluation before or after teaching (cf. Paragraph 6.6.1). They also indicated that reflection helped them to revisit their teaching practice, especially with regard to lesson planning/preparation, ways of approaching a lesson, decisions on teaching strategies/techniques, and what to do address their weaknesses. According to some of them, reflective teaching was similar to looking at oneself in a mirror; others described it as an action, a verb, or a theory, while yet others argued that its practical application, blended with the individual's personality resulted in 'teaching from the heart', 'self-invented practices', 'having a backbone', and 'using one's own discretion' (cf. Paragraph 6.6.2), not only in terms of teaching but also in one's personal life.

The focus group analysis indicated, moreover, that students regarded the compilation of a reflective journal (portfolio) as something that taught them order, discipline and systematic ways of executing tasks, helped them to distinguish between good and bad teaching and/or learning experiences and to interpret similar experiences or situations in a variety of ways, thereby fostering a deeper understanding of their experiences (cf. Paragraph 6.6.3). It was impossible, they argued, to acquire all relevant knowledge about critical reflection from the theoretical components of the training programme, hence reflection could essentially be a by-product of, or adjunct to intuition.

Research Question 3:

What opportunities do student teachers get to practice critical reflective practices during their practical training and how effective/useful are these?

Data obtained from the focus group interviews revealed that, although student teachers at the CUT are afforded opportunities to practise critical reflective teaching in different contexts, these were not sufficient (cf. Paragraphs 6.6.2). It was clear that feedback from their lecturers and/or mentor teachers played a crucial role in improving their practice but this, too, was insufficient. For example, during the four annual micro-lesson presentations, the mentor lecturers provided generic feedback on students' presentations, but there was a lack of personal, one-on-one conversations with individual students. Also, students missed out on vital opportunities to learn from watching video recordings of previous presentations of both themselves and their peers. Neither were they afforded the opportunity to engage in constructive feedback sessions with their peers (cf. Paragraph 6.6.2). Students were, moreover, evaluated based on only one lesson presentation during their mid-year SBL period of four weeks. The mentor teachers, however, evaluated twelve lessons per student during that time and this provided a fairly good range of opportunities for reflection. Students used lesson planning, reflective assignments and reflective essays as reflective tools, with the reflective assignments and the lesson plans to be included in their portfolios providing them with ample opportunities for reflection. The quality of these reflections was, however, in many cases, not sufficient.

Data obtained from the data sources as a whole therefore indicate that students were afforded sufficient opportunities to use teaching aids and to plan learning activities when presenting microlessons, compiling reflective journals (portfolios), designing posters and 3-D models and presenting lessons during their school-based learning at host schools (cf. Paragraphs 6.2 – 6.6).

Research question 4:

What are student teachers' experiences of critical reflective teaching in the teacher training curricula?

As reported in Chapter 2, reflective inquiry should start at the training stage of teaching since the benefits that student teachers could obtain from this self-inquiry are quite valuable. For this reason, four-year teacher training programmes usually include extensive field practice before student teachers take on their full teaching responsibilities. Such is the case at the CUT, where ten months in total are dedicated to practical training in the B.Ed (FET & SP) programmes. The PGCE students' six-week exposure to SBL was, however, patently insufficient, save for those who were already employed as full-time teachers. The majority of 2nd year participants regarded the idea of critical reflection in a very positive light (cf. Paragraph 6.2.1). Interestingly, it emerged from focus groups discussions that students were of the opinion that their lecturers did not model critical reflective teaching (cf. Paragraph 6.6.2.3) and, although they used creative lesson presentation methods such as role-play, co-operative learning, problem-based learning, etc., these were used very scantily.

Research question 5:

Which challenges do student teachers experience when implementing critical reflective teaching during their practical training?

One of the challenges mentioned by student teachers was their fear that they would not be able to manage their time effectively – between preparing, teaching, and administration. Another challenge was that mentor teachers, according to them, did not provide specific professional

support to student teachers during the SBL period and that education lecturers, as a staff cohort, themselves failed to model reflective teaching: teacher-centred presentations were at the order of the day, with these lecturers being perceived as relying too much on their notes and textbooks and lacking the ability to explain the fundamentals of reflective teaching. In short, what students learnt in theory about the various instructional methods, different modes of teaching and learning, learner participation, differentiation, and assessment methods, did not materialise in practice during their lectures. Moreover, feedback from their mentor lecturers about the students' teaching was scant and relatively superficial (cf. 6.6.2.3) and their assessment and evaluation of student lessons were conflicting and inconsistent.

Another, external challenge was the fact that host schools were not always sufficiently resourced to make provision for modern, up-to-date teaching methodologies. While technology is indispensable to the preparation of learners for the future, the reality is that most schools, especially those in township areas, are poorly resourced. Training programmes focus on what could and should be available in 21st century schools, but reality dictates otherwise. Students are not prepared sufficiently for the realities of teaching at schools from disadvantaged communities and, importantly: ways in which aspects of reflective teaching could be practised despite a lack of sufficient resources at some schools are seldom, if ever, highlighted.

Lastly, the greater complexity of assessing 21st century skills, which was very different from assessing factual retention, also posed a challenge. In this regard, students mentioned that the progression system prescribed by the DoE resulted in classes where learner competence varies markedly, a challenge for which student teachers were seemingly not adequately prepared. Their inability to differentiate in a creative and reflective manner may therefore make newly appointed teachers feel frustrated, disappointed and unsupported.

Research question 6:

How can student teachers be assisted to improve the practice of critical reflective teaching during their teacher training at the Central University of Technology?

Dewey (1930) was among the first theorists to promote reflection as a means of professional development and the assurance that outcomes would be achieved (cf. Paragraph 2.4.2). Although this observation was not made with teaching in mind, his research provided sufficient evidence of the importance of critical reflection for improved teaching and learner outcomes. Quite a few measures for improvement and/or assisting students in this regard are stated as recommendations at the end of this chapter. Research participants mentioned, for example, their need for their lecturers to model reflective teaching themselves when lecturing classes since this would demonstrate to students some of the techniques that they could perhaps use in their classes one day (cf. Paragraph 6.6.2.3). Peer collaboration was also mentioned as something that could be helpful in this regard: students felt that, if they could share their individual experiences and ideas about critical reflection in teaching and/or also suggest ideas on how to record reflective experiences when compiling their reflective journals (portfolios) with one another, they could all contribute to one another's development as reflective practitioners.

7.4 A PROPOSED INSTRUCTIONAL FRAMEWORK FOR 21ST CRITICAL REFLECTIVE TEACHING AT THE CENTRAL UNIVERSITY OF TECHNOLOGY

Teaching is characterised by a myriad of choices that a (student) teacher has to make on a daily basis. While some of these choices are made instinctively, most of them require student teachers to tap into the knowledge they had acquired during teacher training. In addition to this, they are sometimes faced with complex choices and/or difficult problems that call for a more sophisticated way of reflection (Lipman, 2003).

The proposed framework for the development of reflective thinking and teaching proposed in Figure 7.1 is an attempt to equip student teachers at the CUT Welkom campus with the

knowledge, skills and attitudes they need to overcome not only these challenges but also those associated with the requirements for 21st century teaching and learning. More specifically, the framework is aimed at coordinating the various training components of the programme in such a way that it will enhance the development of students' reflective thinking and teaching skills. The framework is aimed at the creation of synergy among modules comprising the programme at each level (from 1st year to 4th year level and within the PGCE programme) so that the programme outcome would be student teachers who are able to identify and replicate best practices, refine current patterns of thinking and doing in creative ways, and avoid mediocre practices. Graduates like these would, it is assumed, observe and apply reflective teaching practice on an ongoing basis, building on and enhancing their personal and professional development (Sharma, Phillios & Malewski, 2011).

TOWARDS REFLECTIVE TEACHING: A FRAMEWORK FOR DEVELOPING A 21ST CENTURY TEACHER TRAINING PROGRAMME

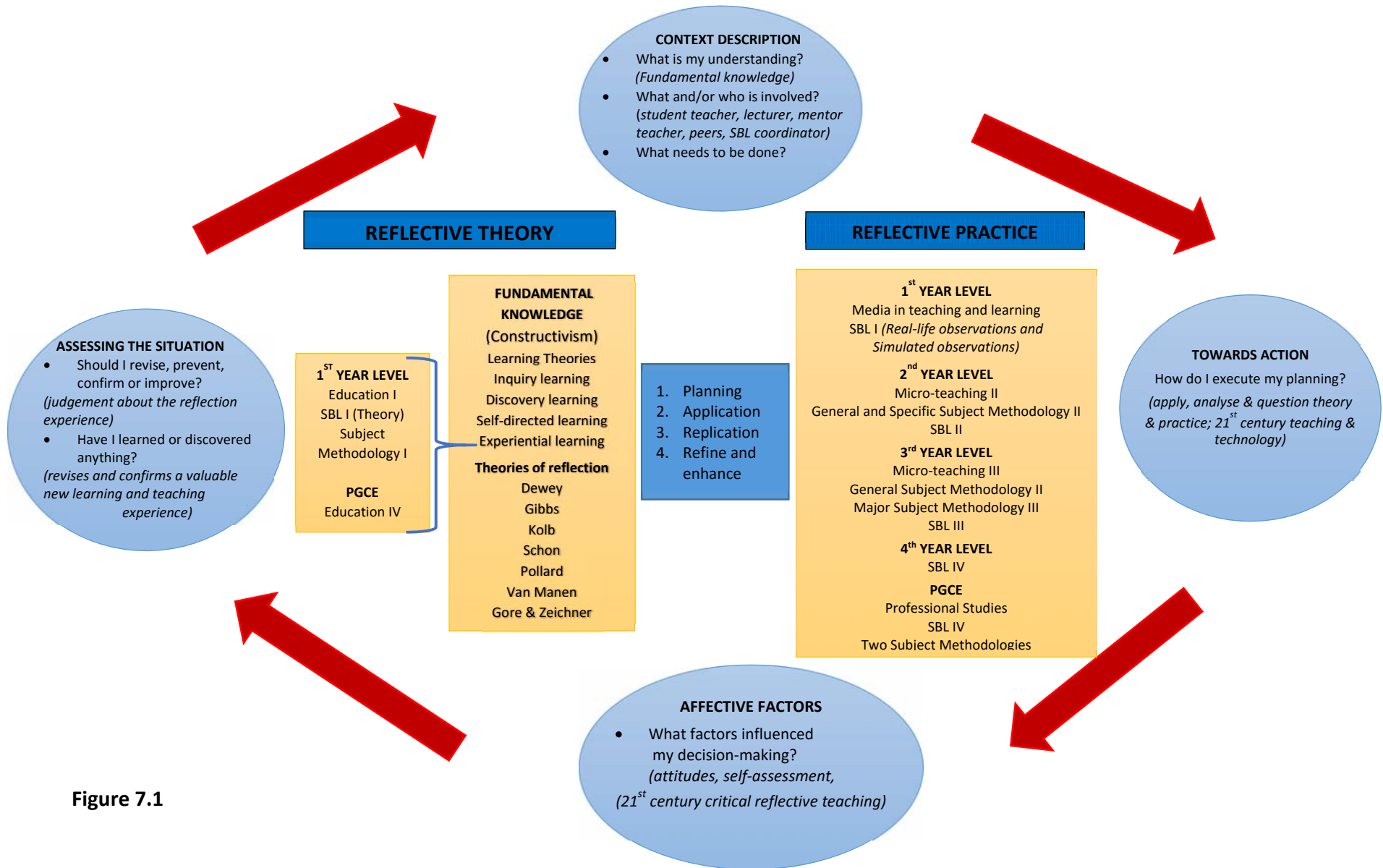


Figure 7.1

The key components of the framework, where the act of reflection and reflective teaching is an iterative process, is subsequently discussed.

7.4.1 Context description

Teaching changes from one context to the next and the skills a student teacher learnt from one theory may not be applicable to all learning environments. The framework highlights the importance of three aspects – three questions to consider in terms of the first step of the context description.

The **first question** is, 'What is the background? Thus, context in this instance has to do with the fundamental knowledge that student teachers should possess before embarking on the act of reflection. Fundamental knowledge includes learning theories (Chapter two & three) which, together, serve as a sound theoretical foundation for the application of reflection and reflective teaching (Chapter two). Indications from my research findings are that this foundation is lacking in the current teacher training programme. Unless it is in place, student might, when they start teaching, be tempted to tap into any available source regardless of its relevance to the experience upon which they should be reflecting. All of them should understand how these fundamentals make reflective teaching possible. By implication, they should at least - for purposes of their own personal professional development - be able to define reflective practice as a disposition to enquiry and to incorporate the elements of the process in their structuring/restructuring of actions, knowledge, theories/beliefs that inform teaching (Gould & Baldwin, 2016). The definition should be a pedagogical one, learnt during training rather than derived from a dictionary. Students should fathom that learning new teaching techniques is akin to the fish that provides a meal for today while reflective teaching is akin to a net that provides meals for the rest of their teaching lives (Biggs & Tang, 2007). In learning the fundamental reflection theories, the student teacher will be able to integrate the knowledge s/he acquired into all other facets of his/her theoretical and practical learning and teaching activities. Thus, if

the curriculum is adequate, and adequately covered, the quality of students' reflective journals, posters, 3-D models, and so forth should improve.

The **second question** to be considered, is, 'Who is involved?' Those involved in making the quest for reflective teaching possible and who ensure that critical reflective teaching becomes a reality are the student teachers themselves, education lecturers (including mentor lecturers), mentor teachers, learners, peers, the school-based learning coordinator, and lastly, the curriculum (contentment knowledge). The context thus pre-supposes that mentor lecturers have been adequately trained to facilitate this process.

The **third question** that needs to be answered, is, 'What should be done and how should it be planned?' Theory and knowledge building is crucial to decisions on what should done in terms of lesson planning and its translation into execution. It is when they take this step that students experience social, intellectual, physical and emotional development. Beginning to shape their reflective teaching at this stage is ideal since it assists them in the retrieval of knowledge and the identification of concomitant skills. Put differently, it would enable them to mentally process their learning experiences, transfer their learning to other situations and modify their understanding based on new information and experiences (Choy & Oo, 2012). Thus, asking themselves whether or not they observed all the steps of reflective and creative teaching as outlined in the theoretical component in their planning is absolutely critical.

7.4.2 Towards action

Great teachers know not only *what* to do, but also *why* they do it. Reflective teaching is an important tool in practice-based professional learning as it brings theory and practice together (Choy & Oo, 2012). In addition, critical reflective teaching should facilitate transformational learning that could occur - either gradually, or from a sudden incident - and alter the way a student teacher views his/her teaching. Consequently, the second question in this step asks, 'When I engage in the act of teaching, how do I execute my planning? How do I scaffold and link

prior knowledge to new knowledge? How do I introduce my lesson? How do I present new content in a way that would foster understanding and assimilation? How effectively do I incorporate education media to enhance learning? How is my questioning – will it lead to adequate learner involvement? How appropriate is the assessment activities I plan to give the learners?

7.4.3 Assessment: affective factors

Critical reflective teaching implies that the student teacher should reflect critically within the teaching and learning environment, acknowledging the importance of freedom of expression and striving towards the ability to solve problems. Developing and displaying self-confidence and social skills, catering for individual and divergent learning, reaching a level of social maturity that would allow him/her to take different perspectives, making independent judgements and taking responsibility for his/her actions are important prerequisites for reflective teaching. The question to be considered in this third step, then, centres around the factors as outlined above.

7.4.4 The situation: a summative assessment

The final step of the proposed framework is the assessment of the situation as a whole. Here the student teacher answers the final questions: What is my new understanding? Have I learned or discovered anything? Where should I revise, prevent, confirm or improve? The answers to these questions are considered by breaking down the teaching and learning experience into components to examine them separately. From there, s/he makes a judgement about the teaching experience complete. At this stage, the student teacher considers the possibility that s/he may have been wrong or right, revises and confirms ideas, and realizes that s/he may have learnt or discovered a valuable new learning and teaching experience. Considering what s/he could do differently and whether s/he would act the same/differently if the situation presents itself in the future, is imminent.

7.5 LIMITATIONS OF THE STUDY

The research project could not explore the reflective teaching process fully because of time constraints. Evaluating reflective teaching effectively needs a considerable amount of time to be considered. As a result of time constraints, the in-depth knowledge, practice, feedback, application of the feedback, improvement, struggles and so forth could arguably not be determined.

The specific limitations of the study are as follows:

1. Since this study was conducted at one of the two campuses of the CUT (representing one university nationally), the findings cannot be generalised to education departments at all South African universities.
2. The population and sample represented only student teachers, not mentor lecturers and mentor teachers. Thus, the picture would be complete had the lecturers and mentor teachers played a major role in commenting on the shaping and modelling reflective teaching practices to the student teachers.

7.6 RECOMMENDATIONS TO IMPROVE CRITICAL REFLECTIVE TEACHING IN 21ST CENTURY TEACHING PRACTICE

The main objective of the research study was to propose a framework that would assist student teachers to incorporate critical reflection as a means to enhance their teaching practices in keeping with the demand for creative, innovative, collaborative and productive 21st century teaching and learning. Based on the findings of the literature and the empirical data, the following recommendations are put forward to improve critical reflective teaching in the teacher training programme at the Central University of Technology.

- **Recommendation one**

The Central University of Technology should introduce a separate unit focussing solely on critical reflection and reflective teaching in the B.Ed (1st year) programme (Education I; SBL I) and the PGCE programme (Education IV). This unit should address theories on reflection and should be linked to a unit on contemporary learning and instructional theories which focuses specifically on the interaction between reflection and learning/teaching. The theoretical knowledge acquired in these units should form the basis of, or the 'canvas' on which the content of all other courses (indicated under 'Reflective Practice' in Figure 7.1, from the 1st to the 4th year academic level of the B.Ed curriculum as well as the PGCE curriculum) are offered. Students should continuously be made aware of how critical reflection and reflective teaching run like a golden thread through all aspects of teaching practice – the planning (and actual presentation) of lessons, including the formulation and achievement of lesson objectives, the preparation of teaching media, the lesson content, learner involvement, and assessment activities. In brief, reflection should not be regarded as something separate to the teaching and learning process; it should be an integral part of the theory and practice of teaching, and students should constantly be reminded of this.

- **Recommendation two**

The school of teacher training at the CUT should put in place a mentoring training programme for education lecturers, focusing on the integration and demonstration of reflective teaching in their lectures, thus enabling them to mentor and assist their students to practice reflection in all aspects of teaching theory and practice. Micro-lessons, in particular, should be a main focus since these present lecturers/mentors with the ideal opportunity to teach students about this crucial aspect. Importantly, the training should focus on the reflective evaluation of student teachers' practical presentation of lessons, micro-teaching presentations, their utilization of reflective portfolios, their preparation of teaching media, and the ways in which they devise assessment activities.

- **Recommendation three**

Similar training for mentor teachers is equally important. The relationship between the university and the host schools are paramount to maintain consistency and ensure synergy between the university training and SBL. Teachers could benefit immensely from this training in terms of their own practice. This training also needs to focus on how and when best to make their own classroom changes after critical reflection.

7.7 RECOMMENDATIONS FOR FURTHER STUDY

- **Recommendation one**

A similar study including all teacher training departments at all universities in South Africa would provide more in-depth insight as it would enable more student teachers to share their experiences. Data thus generated, from both within and across universities, could then be generalized.

- **Recommendation two**

Related to recommendation one, a mixed method study would arguably render more reliable, objective findings, further enabling generalization across the teacher education population as a whole.

- **Recommendation three**

The last recommendation would be the suggestion that lecturers and mentor teachers should be included as research participants since they are important role players in the reflective teaching process, thus creating a more holistic picture of reflective teaching as a phenomenon.

7.8 CONCLUSION

Chapter 7 not only serves as an overview of the research process but also included a discussion of the findings emerging from the analysed data on critical reflective teaching as an element of teaching practice. Moreover, based on the results of the analysis of documents, reflective journals, posters, 3-D model and focus groups interviews, it served as an opportunity to put forward a number of recommendations deemed necessary to the assurance that critical reflective teaching would be included as a critical component of teacher education programmes.

In addition, the chapter shared with readers the limitations of the study as well as recommendations for overcoming these, key amongst which is the development of a model which could be incorporated in the CUT teacher education programme in order to assist lecturers and student teachers to jointly improve the latter's practice of critical reflective teaching.

The study took me on a journey through the highs and lows of the teacher training programme at the CUT and as such, it provided much needed insight into the role and importance of critical reflection and reflective teaching to meet the requirements of a sustainable 21st century teaching curriculum. The findings of the study may serve as an impetus for change and improvement in the teacher training programme at the CUT to create an environment where student teachers may contribute constructively to build a better South African education system.

REFERENCES

Abdullah, M. M. B. A. (2008). Adult participation in self-directed learning programs. *International Education Studies*, 1 (3), pp. 66.

Ahmad, F. K. (2015). Use of assistive technology in inclusive education: making room for diverse learning needs. *Transcience*, 6 (2), pp. 62-77.

Ahmad, I., Said, H. B., Zeb, A., Rehman, S., Ahmad, S. & Khan, W. (2013). How reflective practice improves teachers' classroom teaching skill? Case of community based schools in district Chitral, Khyber Pakhtunkhwa. *Social Sciences and Humanities*, 4 (1), pp. 73-81.

Ahmed, E. W. & Al-Khalili, K. Y. (2011). The impact of using reflective teaching approach on developing teaching skills of primary science student teachers. *Journal of New Horizons in Education*, 3 (2), pp. 58-64.

Aitken, J. Fairley, J. & J. Carlson, J. (eds.) (2012). *Communication technology for students in special education and gifted programs*, pp. 66-81.

Alger, C. & Kopcha, T. J. (2009). eSupervision: a technology framework for 21st century field experience in teacher education. *Issues in Teacher Education*, 18 (2), pp. 31-46.

Altinay, L., Paraskevas, A. & Jang, S. (2015). *Planning research in hospitality and tourism*. (2nd ed.) London: Routledge.

Amineh, R. J. & Asia, H. D. (2015). Review of constructivism and social constructivism. *Journal of Social Sciences, Literature and languages*, 1 (1), pp. 9-16.

Anderson, V. (2004). *Research methods in human resource management*. London: Chartered Institute of Personnel and Development.

Andrews, D. P. S., Perderson, P. M. & McEvoy, C. D. (2011). *Research methods and design in sport management*. Champaign: Sheridan Books.

Ansari, S. G. & Kliman, G. (2015). A basis for creating a reflective network in schools: reflective network therapy in a small middle and high school. *Asia Pacific Journal of Counselling and Psychotherapy*, 35 (7), pp. 714-732.

Anscombe, B. & Pawar, M. (2015). *Reflective social worker practice: thinking, doing and being*. Australia: Cambridge University Press.

Ardalan, K. (2016). *State: a multi-paradigmatic approach*. <http://iippe.org/wp/wp-content/uploads/2013/06/00.-State-a-Multi-Paradigmatic-Approach-Complete-with-Exhibit.pdf> [Retrieved: 24 August 2015].

Arredondo, D. E. & Rucinski, T. T. (1994). Using reflective journals and the workshop approach in university classes to develop students' self-regulated learning. Paper presented at the *Annual Meeting of the American Educational Research Association*, New Orleans, LA, 4-8 April, 1994.

Asante, M. K., Mike, Y. & Yin, J. (2013). *The global intercultural communication reader*. (2nd ed.). Routledge: Taylor & Francis Group.

Aurum, A. & Wohlin, C. (eds.). (2005). *Engineering and managing software requirements*. Germany: Springer.

Aveyard, H. (2014). *Doing a literature review in health and social care; a practical guide*. (3rd ed.). New York: McGraw Hill.

Bade, A. & Adesoji, O. (2015). *Teacher education system in Africa in the digital era*. Dakar: Codesria.

Bailey, K. D. (2007). *Methods of social research*. (4th ed.). Toronto: Maxwell Macmillan International.

Baker, M. A. & Ribinson, J. S. (2010). Aligning Kolb's experiential learning theory with a comprehensive agricultural education model. *Journal of Agricultural Education*, 53 (4), pp. 1-16.

Banchi, H., & Bell, R. (2008). The many levels of inquiry. *Science and Children*, 46 (2), pp. 26–29.

Baran, M. L. & Jones, J. E. (2016). *Mixed methods research for improved scientific study*. United States: Information Science Reference. USA: IGI Global.

Barbani, M. R. (2006). *Quality improvement in teacher education: crisis and change*. New Delhi: Sarup and Sons.

Barrett, T. 2013. Gibbs' critical reflection model. *Health Information and Libraries Journal*, 25 (3), pp 229-232.

Bartle, E. (2015). Experiential learning: an overview. A discussion paper prepared for Professor Joanne Wright, Deputy Vice-Chancellor (Academic) for the Vice-Chancellor's Retreat at *The University of Queensland*, Australia, 23-24 March, 2015.

Bartolomé, L. (2004). Critical pedagogy and teacher education: radicalizing prospective teachers. *Teacher Education Quarterly*, pp. 97–122.

Bartolome', L. I. (ed.). (2008). *Ideologies in education: unmasking the trap of teacher neutrality*. New York: Peter Lang Publishing, Inc.

Bazeley, P. (2007). *Qualitative data analysis with NVivo*. London: Sage.

Belk, R. W. (2007). Extended self in a digital world. *Journal of Consumer Research*, 40 (3), pp. 477-500.

Bentley, R. A. (2006). Strontium isotopes from earth to the archaeological skeleton. A review *Journal of Archaeological Method and Theory*, 13, pp. 135-187.

Bernhardt, P. E. (2015). Two teachers in dialogue: understanding the commitment to teach. *The Qualitative Report*, 17 (104), pp. 1-14.

Biggam, C.P. (2015). *English colour terms: a case study*. Edinburgh: Edinburgh University Press.

Biggs, J. & Tang, C. (2007). *Teaching for quality learning at university*. (3rd ed.). Berkshire: Open University Press.

Black, S. (2005). Teaching students to think critically. *The Education Digest*, 70 (6), pp. 42-47.

Bloom, B. S. (1956). *taxonomy of educational objectives: the classification of educational goals. Handbook 1: cognitive domain*. New York: David McKay Co. Inc.

Bolton, G. (2014). *Reflective practice: writing and professional development*. (4th ed.). London: Sage.

Bracken, M. & Bryan, A. (2010). The reflective practitioner model as a means of evaluating development education practice: Post-primary teachers' self-reflections of "doing" development education. *Monitoring and Evaluation* 11, 17-21.

Brian, C. L., Willnat, L. & Rich, C. R. (2006). *Focus group methodologies*. New York: Pearson Longman, 2006.

Brock, A. (ed.) (2015). *The early year's reflective practice handbook*. London: Routledge.

Brookfield, S. (1993). Self-directed learning, political clarity, and the critical practice of adult education. *Adult Education Quarterly*, 43 (4), pp. 227-242.

Brookfield, S. D. (1994). *Self-directed learning*. London: YMCA George.

Bruner, J. (1977). *The process of education*. Cambridge, MA: Harvard University Press.

Bruner, J. (1987). *Actual minds, possible worlds*. Cambridge, MA: Harvard University.

Bruno-Jofre', R. & Johnston, J. S. (eds.) (2014). *Teacher education in a transnational world*. Toronto: University of Toronto Press.

Bryman, A. (2008). *Social research methods*. (3rd ed.). New York: Oxford University Press.

Bull, P. H. (2012). Using spatial constructivist thinking theory to enhance classroom instruction for students with special needs. *Communication Technology for Students in Special Education and Gifted Programmes*, pp. 66-81.

Bybee, R. W. (2010). *The teaching of science: 21st century perspectives*. Arlington, VA: NSTA Press.

Cakir, M. (2008). Constructivist approaches to learning in science and their implication for science pedagogy: a literature review. *International Journal of Environmental and Science Education*, 3 (4), pp. 193-206.

Choy, S. C. & Cheah, P. K. (2009). Teacher perceptions of critical thinking among students and its influence on higher education. *International Journal of Teaching and Learning in Higher Education*, 20 (2), pp. 198-206.

Choy, S. C & Oo, P. S. (2012). Reflective thinking and teaching practices: a precursor for incorporating critical thinking into the classroom? *International Journal of Instruction* January, 5 (1), pp: 167-182.

Coffield, F., Moseley, D., Hall, E. & Ecclestone, K. (2004). *Learning styles and pedagogy in post-16 learning: a systematic and critical review*. <http://www.lsda.org.uk/files/PDF/1543.pdf> [Retrieved: 23 August 2017].

Cohen, L., Manion, L. & Morrison, K. (2013). *Research methods in education*. (5th ed.). London: Routledge.

Conklin, W. (2011). *Higher-order thinking skills to develop 21st century learners*. Huntington Beach: Shell Education.

Conway, P. F. (2001). Anticipatory reflection while learning to teach: from a temporally truncated. *Teaching and Learning*, 17, pp. 89-106.

Creswell, J.W. (2014). *Research design: qualitative, quantitative and mixed methods approaches*. (4th ed.). Thousand Oaks, CA: Sage Publications.

Cusack, A. (2008). *The wanderer in 19th-century German literature: intellectual history and cultural criticism*. Rochester, New York: Camden House.

Darlington-Hammond, L. (2006). *Powerful teacher education: lessons from exemplary programs*. San Francisco: Jossey Bass.

Delamont, S. (ed.). (2012). *Handbook of qualitative research in education*. Cheltenham: Edward Elgar.

Denzin, N. K. (2014). *Interpretive autoethnography*. Los Angeles, CA: Sage

Devendorf, S. (2014). *John Dewey: a pioneer in educational philosophy*.

https://www.docs.google.com/document/d/1Bcg6oq5DNBAunrjRIInqMgbw1qihyk_tA4n7wLhBpAoopub/ [Retrieved: 29 August 2017].

De Wet, C. & Wolhuter, C. (2009). From “borrowing” to “learning” in international comparative study: a critical reflection, *South African Journal of Education*, 27 (2), pp. 317-328.

Dewey, J. (1910). *How we think*. New York City: BiblioLife, LLC.

Dewey, J. (1933). *How we think: a re-statement of the relation of reflective thinking to the educative process*. Chicago IL: Henry Regnery Co.

Dewey, J. (1938). *Experience and education*. New York: Simon & Schuter.

Dewey, J. (1987). My pedagogic creed. *The School Journal*, 3, pp. 77–80.

Ditchburn, D. M. (2015). Remembering reflection in pre-service teachers' professional experience. *Australian Journal of Teacher Education*, 40 (2), pp. 93-110.

Donnelly, O. (2004). *Experiential learning: the application of Kolb's theory on a body of students in the National College of Ireland*. Unpublished Masters Dissertation. European Business and Languages National College, Ireland.

Dostál, J. (2015). *Inquiry-based instruction: concept, essence, importance and contribution*. Olomouc: Palacký University.

Driscoll, M. (2005). Meaningful learning and schema theory. *Psychology of Learning for Instruction*, 3, pp. 111-152.

Duit, R., Treagust, D., & Widodo, A. (2008). *Teaching science for conceptual change: theory and practice*. New York, London: Routledge.

Dymoke, S. & Harrison J. (2008). *Reflective teaching and learning*. Los Angeles: Sage.

Edwards, R. Hanson, A. & Raggatt, P. (eds.). (1996). *Boundaries of adult learning*. New York: Routledge.

Erikson, I. V. (ed.). (2008). *Science education in the 21st century*. New York: Nova Science Publishers.

Finlay, L. (2008). Reflecting on 'reflexive practice'. *Practice Based Professional Learning Centre*, 52, pp. 1 – 27.

Forrest, M. E. S. (2008). Learning and teaching in action. *Health Information and Libraries Journal*, 25, pp. 229-232.

Forrester, M. A. (ed.). (2010). *Doing qualitative research in psychology: a practical guide*. London, UK: Sage.

Fraenkel, J. R. & Wallen, N. E. (2014). *How to design and evaluate research in education?* (9th ed.). New York: McGraw-Hill.

Francis, A. & Flanigan, A. (2012). Self-directed learning and higher education practices: implications for student performance and engagement. *Mountain Rise, the International Journal of the Scholarship of Teaching and Learning*, 7 (3), pp. 1-18.

Frank, M. & Liebowits, J. (eds.). (2016). *Knowledge management and e-learning*. London: Tylor and Francis Group.

Fraser, B. J. & Tobin, K. G. (eds.). (1988). *International handbook of science education*. (part 1). Dordrecht: Kluwer Academic Publishers.

Frey, T. (2008). Determining the impact of online practicum facilitation for in-service teachers. *Journal of Technology and Teacher Education*, 16 (2), pp. 181-210.

Gardner, H. (1993). *Frames of minds: the theory of multiple intelligences*. Cambridge: Basic Books.

Gay, L. R., Mills, G. E. & Airasian, P. W. (2016). *Educational research: competences for analysis and applications*. (11th ed.). New Jersey: Pearson.

Ghaye, T. (2010). *Teaching and learning through reflective practice: a practical guide for positive action*. (2nd ed.). Oxon: Routledge.

Gibbs, G. (1988). *Learning by doing: a guide to teaching and learning methods*. Oxford: Further Education Unit, Oxford Polytechnic.

Giroux, H. (2007). Utopian thinking in dangerous times: critical pedagogy and the project of educated hope. *Utopian pedagogy: Radical experiments against neoliberal globalization*, pp.25-42.

Giroux, H. A. (2010). *On critical pedagogy*. New York, NY: Continuum.

Given, L. M. (ed.). (2008). *The SAGE encyclopedia of qualitative research methods*. (vol. 2.). Thousand Oaks, CA: SAGE Publications.

Glasper, A. & Rees, C. (ed.). (2016). *Nursing and healthcare research at a glance*. United Kingdom. Wiley-Blackwell.

Good, T. L. (2008). *21st education: a reference handbook*. Thousand Oaks: SAGE Publications, Inc.

Gore, J. M. (1987). Reflecting on reflective teaching. *Journal of Teacher Education*, 38 (2), pp. 33-39.

Gore, J. M. & Zeichner, K. M. (1991). Action research and reflective teaching in preservice teacher education: a case study from the United States. *Teaching and Teacher Education*, 7 (2) pp.119-136.

Gould, N. & Baldwin, M. (eds.) (2016). *Social work, critical reflection and the learning organization*. New York: Routledge.

Graig, C. J. & Deretchin, L. F. (ed.). (2008). *Imagining a renaissance in teacher education*. Lanham. MD: Rowman & Littlefield.

Gray, C. & Malins, J. (2016). *Visualising research: a guide to the research process in art and design*. New York: Routledge.

Griffin, P. McGwaw, B. & Care, E. (eds.). (2012). *Assessment and teaching of 21st century skills*. Dordrecht: Springer.

Grow, G. (1994). In defense of the staged self-directed learning model. *Adult Education Quarterly*, 44 (2), pp.109-114.

Harland, D. & Wondra J. D. (2011). Pre-service teachers' reflection on clinical experiences: a comparison of blog and final paper assignments. *Journal of digital learning in teacher education*, 27 (4), pp. 128-133.

Harris, S. E. (2006). *Teachers' understanding and use of formative assessments in the elementary mathematics classroom*. Doctoral dissertation, Harvard Graduate School of Education.

Hatton, N. & Smith, D. (1995). Reflection in teacher education: towards definition and implementation. *Teaching and Teacher Education*, 11 (1), pp. 33-49.

Henter, R. & Indreica, E. S. (2014). Reflective journal writing as a metacognitive tool. Paper presented at *International Conference of Scientific Paper AFASES*, Brasov, 22-24 May, 2014.

Higgs, J., Jones, M. A. & Titchen, A. (2008). *Knowledge, reasoning and evidence for practice in clinical reasoning in the health professions*. (3rd ed.). Sydney: Butterworth Heinemann.

Hillier, Y. (2009) (ed.). *Reflective teaching in further and adult education*. (2nd ed.). London: Continuum.

Hixon, E. & So, H. J. (2009). Technology's role in field experiences for preservice training. *Educational Technology & Society*, 12 (4), 294-304.

Holton, E. F. Wilson, L. S. & Bates, R. A. (2009). Toward development of a generalized instrument to measure andragogy. *Human Resource Development Quarterly*, 20 (2), pp. 169-193.

Holzman, L. (2014). *Contributor to teaching theory: encyclopedia of critical psychology Vygotsky at work and play*. (2nd ed.). Routledge: Taylor and Francis Group.

Howatson-Jones, L. (2010). *Reflective practice in nursing*. Cornwall: Learning Matters Ltd.

Huppertz, P., Massler, U. & Plötzner, R. (2005). V-share – video-based analysis and reflection of teaching experiences in virtual groups. *Proceedings of the International Conference on Computer Support for Collaborative Learning*. Mahwah, NJ: Lawrence Erlbaum Associates.

Irzik, G. & Matthews, M. R. (2001). Back to basics: a philosophical critique of constructivism. *Studies in Philosophy and Education*, 20, pp. 157-175.

James, M. E. (2013). *Educational assessment, evaluation and research*. New York; Routledge.

Jang, S. J. (2008). Innovations in science teacher education: effects of integrating technology and team-teaching strategies. *Computer and Education*, 51 (2), pp. 646-659.

Jared, K. (ed.) (2016). *Handbook of research on global issues in next generation teacher education*. United States of America: IGI Global.

Jasper, M. (2003). *Beginning reflective practice*. Croatia: Zrinski.

Jia, Q. (2010). A brief study on the implication of constructivism teaching theory on classroom teaching reform in basic education. *International Educational Studies*, 3(2), pp. 197-199.

Jiang, Y. (2012). *Reflection, change and reconstruction in the context of educational reform and innovation in China*. United Kingdom: Cambridge scholars.

Johns, C. (2013). *Becoming a reflective practitioner. (3rd ed.)*. United Kingdom: Wiley Blackwell.

Johnston, J. S. (2014). *John Dewey's earlier logical theory*. New York: Sunny Press.

Karsenti, T. (2007). *Connecting student teachers during their internship: the role of ICTs*. <http://www.karsenti.ca/pdf/scholar/ACT-karsenti-38-2007.pdf> [Retrieved 20 August 2017].

Kennedy, J. (2006). *A study of learning environment in the extended practicum of a pre-service teacher education courses at a catholic university. School of graduate study*. Unpublished Dissertation. Australian Catholic University, Australia.

Khan, S. (2014). Qualitative research method - phenomenology. *Asian Social Science*, 10 (21), pp. 298-310.

Klenke, K. (2016). *Qualitative research in the study of leadership*. Bingley: Emerald Group Publishing Limited.

Knowles, M. (1975). *Self-directed learning: a guide for learners and teachers*. New York: Association Press.

Knowles, M. S. & Associates (1984). *Andragogy in action*. San Francisco, California: Jossey-Bass Publishers.

Knowles, M. (1989). *The Making of an Adult Educator*. San Francisco: Jossey-Bass.

Koehler, M. & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education*, 9 (1), pp. 60-70.

Kolb, A. D. (1984). *Experiential learning: experience as the source of learning and development*. Upper Saddle River, N.J: Prentice Hall.

Kolb, A. D. (2014). (2nd ed.). *Experiential learning: experience as the source of learning and development*. New Jersey: Pearson education Inc.

Kolb, A. & Kolb, D. A. (2009). The learning way: meta-cognitive aspects of experiential learning. *Simulation Gaming*, 40, 297–327.

Krueger, R. A. & Casey, M. A. (2015). *Focus groups a practical guide for applied research*. (5th ed.). Singapore: Sage Publications.

Kuhn, D. & Pease, M. (2008). What needs to develop in the development of inquiry skills? *Cognition and Instruction*. 26 (4), pp. 512-59.

Lederman, N. G. & Abell, S. K. (eds.). (2014). *Handbook on research science education, volume II*. New York: Routledge.

Ledlow, G. R. & Coppola, M.N. (2014). *Leadership for health professional: theory skills and application*. (2nd ed.). Burlington, MA: Jones and Bartlett Learning.

Leedy, P. D. & Ormord, J. E. (2014). *Practical research: planning and design*. (10th ed.). Boston, MA: Pearson.

Lichtman, M. (2013). *Qualitative research in education: a user's guide*. (3rd ed.). USA: SAGE Publication.

Lipe, K. S. & Beasley, S. (2004). *Critical thinking in nursing: a cognitive skills workbook*. Philadelphia: Lippincott Williams & Wilkins.

Lipman, M. (2003). *Thinking in education*. (2nd ed.). United Kingdom: Cambridge University Press.

Littlejohn, S. W & Foss, K. A. (eds.). (2009). *Encyclopedia of communication theory*. (vols. 1-2.) Thousand Oaks, CA: SAGE Publications.

Liu, C. H. & Matthews, R. (2005). Vygotsky's philosophy: constructivism and its criticism examined. *International Educational Journal*, 6 (3), pp. 368-399.

Loeng, S. (2013). Eugen Rosenstock-Huessy – an andragogical pioneer. *Studies in Continuing Education*, 35 (2), pp. 241-253.

Long, H. (ed.) (1994). *New ideas about self-directed learning*. Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

Lucienne, T. M. B. & Amaresh, C. (2009). *DRM, a design, research and methodology*. London: Springer.

Lutz, S. & Huitt, W. (2004). Connecting cognitive development and constructivism: implications from theory for instruction and assessment. *Constructivism in the Human Sciences*, 9 (1), 67-90.

Lyons, N. (2010). (ed.). *Handbook of reflection and reflective enquiry: mapping a way of knowing for professional reflective enquiry*. London: Springer.

Masondo, S. (2016). New teachers will have to shape up. *City Press*, 28 February, p. 15.

Maarof, N. (2007). Telling his or her story through reflective journals. *International Education Journal*, 8 (1), pp. 205-220.

MacClosky, M. (2009). *Visual reflections: a perceptual deficit and its implications*. New York: Rourledge.

MacDonald, M. E. (2002). *Systematic assessment of learning outcomes: developing multiple-choice exams*. Boston: Jones and Bartlett Publishers.

MacGill, I. & Brockbank, A. (2007). *Facilitating reflective learning in higher education (2nd ed.)*. England: Open University Press.

Manning, G. (2007). Self-directed learning: a key component of adult learning theory. *Business and Public Administration Studies*, 2 (2), pp. 3-17.

Mantei, J & Kervin, L. (2009). "Authentic: learning experiences: what does this mean and where is the literacy learning? Paper presented at *National Conference for Teachers of English and Literacy*, West Point Conference Centre, Hobart Tasmania, 9-12 July, 2009.

Marshall, J. C. (2016). *The highly effective teacher: 7 classroom-tested practices that foster student success*. Alexandria: ASCD.

Mathews, M. (1998). *Constructivism in science education*. Dordrecht, The Netherlands: Kluwer.

Mayer, R. (2004). Should there be a three-strikes rule against pure discovery learning? The case for guided methods instruction. *American Psychologist*, 59, 14-19.

McLeod, S. (2010). *Kolb - learning styles*.

<http://www.simplypsychology.org/learning-kolb.html> [Retrieved 12 July 2015].

McMillan, J. H. & Schumacher, S. (2010). *Research in education: evidence-based inquiry (7th ed.)*. Virginia: Pearson.

McMillan, J. H. (2012). *Educational research: fundamentals for the consumer. (6th ed.)*. Boston, MA: Pearson.

Meigs, P. (2008). *A novice principal in a high performing elementary school*. United States: ProQuest.

Menter, I. Hulme, M. Dely, E. & Lewin, J. (2010). *Literature review on teacher education in the 21st century*. Edinburg: Crown Copyright.

Merriam. (ed.). (1993). *Update on adult learning theory*. San Francisco: Jossey-Bass.

Merriam, S. B. (2009). *Qualitative research: a guide to design and implementation*. San Francisco, CA: Jossey Bass.

Merriam, S. B. & Tisdell, E. (2015). *Qualitative research: a guide to design and implementation*. (4th ed.). San Francisco: John Wiley & Sons Inc.

Merriam, S. B. & Caffarella, R. (1999). *Learning in adulthood: a comprehensive guide*. San Francisco: Jossey-Bass.

Mlingo, E. S. (2016). *Introduction to research methods and report writing: a practical guide for students and research in sound sciences and the humanities*. United States of America: Wipf and Stock Publishers.

Moon, J. A. (2006). *Learning journals: a handbook for reflective practice and professional development (2nd ed.)*. London: Routledge.

Morehouse, R. E. (2012). *Beginning interpretative inquiry: a step-by-step approach to research and evaluation*. London: Routledge.

Mpele, O. S. (2014). *Grade 10-12 educators' perceptions and experiences of safety at schools in Lejweleputswa district*. Unpublished Master's Dissertation. Central University of Technology, South Africa.

Muneja, M. S. (2015). A theoretical basis for adult learning facilitation: review of selected articles. *Journal of Education and Practice*, 6 (31), pp. 54-61.

Navaneedhan, C. G. (2012). Reflective teaching-learning process of integrating metaphorical Thinking and Visual Imagery. *Journal of Behavioral and Brain Science*, 2, pp. 407-410.

Neufeld, J. (2009). *Redefining teacher development*. London: Routledge.

Nieuwenhuis, J. (2009). *Analysing qualitative data*. Hatfield, Pretoria: Van Schaik.

Nilsson, P. (2013). Developing a scholarship of teaching in engineering: supporting reflective practice through the use of a friend. *International and Multidisciplinary Perspectives*, 14 (2), pp. 196-208.

Noddings, N. (2005). *The challenge to care in schools*. (2nd ed.). New York: Teacher College Press.
Organization for Economic Cooperation and Development (OECD) (2008). *Innovating to learn: Learning to innovate*. Paris, FR: The Organization of Economic Cooperation and Development.

Ogonor, B. O. & Badmus, M. M. (2006). Reflective teaching practice among student teachers: the case in a tertiary institution in Nigeria. *Australian Journal of Teacher Education*, 3 (2), pp. 1-11.

Onwuegbuzie, A. & Frels, R. (2016). *7 steps to a comprehensive literature review*. London: Sage.
Orey, M. (2010) (ed.). *Introduction to emerging perspectives on learning, teaching, and technology*. Switzerland: The Global Text Project.

Panjwani, N. & Bungum, B. (2013). Teacher's views on inquiry based learning and their examples of inquiry-oriented approaches. Paper presented at the 10th Conference of European Science Education Research Association (ESERA 2013), Cyprus, 2-7 September, 2013.

Patton, M. Q. (2015) *Qualitative research and evaluation methods*. (4th ed.). United States of America: Sage Publications.

Perry, R. (2013). *Teaching practice for early childhood: a guide for students*. (2nd ed.). London: Routledge Falmer.

Philip C. (1991). *Self-direction for lifelong learning: a comprehensive guide to theory and practice*. San Francisco: Jossey-Bass.

Piaget, J. (1971). *Psychology and epistemology*. Middlesex, England: Penguin Books.

Piaget, J. (2001). *The psychology of intelligence*. (2nd ed.). London: Routledge.

Pine, G. T. (2009). *Teacher action research: building knowledge democracies*. Los Angeles: Sage.

Pollard, A. (2002). *Reading for reflective teaching*. London: Continuum.

Pollard, A. (2014). (ed.). *Readings for reflective teaching in schools*. (2nd ed.). London: Bloomsbury.

Pollard, A., Collins, J., Maddock, M., Simco, N., Swaffield, S., Warin, J. & Warwick, P. (2005). *Reflective teaching*. (2nd ed.). London: Continuum.

Pollard, A. & Colwell, J. (2015). *Readings for reflective teaching in early education*. London: Bloomsbury.

Project Tomorrow, (2010). Unleashing the future: educators “speak up” about the use of emerging technologies for learning. speak up 2009 national findings at *Teachers, Aspiring Teachers & Administrators*, Irvine, May, 2010.

Pultorak, A. (ed.). (2010). *The purposes, practices and professionalism of teacher reflectivity: insights for twenty-first-century teachers and students*. Lanham: Rowman and Littlefield Education.

Pultorak, E. G. (2012). *Reflectivity and cultivating student learning: critical elements for enhancing a global community of learners*. Lanham: Rowman & Littlefield.

Rachert, A. E. (2005). Inquiring about practice: using web-based materials to develop teacher inquiry. *Teaching Education*, 16 (4), pp. 297-310.

Rata, G. & Palicica, M. (eds.). (2011). *Academic days if Timisoara: social sciences today*. Newcastle: Cambridge Scholars Publishing.

Ratner, J. (ed.). (2015). *Intelligence in the modern world: John Dewey's philosophy*. <http://www.worldcat.org/title/intelligence-in-the-modern-world-john-deweys-philosophy/oclc/268377>> [Retrieved: 27 August 2017].

Richard, C. K. & Nunan, D. (eds.). (1990). *Second language teacher education*. United Kingdom: Cambridge University Press.

Richards, D. A & Hallberg, I. R. (eds.). (2015). *Complex intervention in health: an overview of research methods* London: Routledge.

Rowley, J. (2016) (ed.). *ePortfolios in Australian universities*. Sydney: Springer.

Rubin, A. & Babbie, E. R. (2009). *Essential research methods for social work*. (2nd ed.). Australia: Brooks/Cole Learning

Rudd, R. D. (2007). Defining critical thinking. *Techniques*, 82 (7), pp. (46-49).

Sadlin, J. A. (2005). Andragogy and its discontents: an analysis of andragogy from three critical perspectives. *PAACE Journal of Lifelong Learning*, 14, pp. 35-42.

Saldana, J. (2011). *Ethotheatre research from page to stage*. California: Left Coast Press.

Salter, D. J. (ed.). (2013). *Cases on quality teaching practices in higher education*. United States of America: Information Science Reference.

Scales, P. (2008). *Teaching in the lifelong learning sector*. Berkshire: Open University Press.

Schellhase, K. C. (2006). Kolb's experiential learning theory in athletic training education: a literature review. *Athletic Training Education Journal*, 1 (2), pp.18-27.

Schön, D. A. (1983). *The reflective practitioner: how professionals think in action*. New York: Basic Books.

Schön, D. A. (1996). *Educating the reflective practitioner: toward a new design for teaching and learning in the professions*. San Francisco: Jossey-Bass, Inc.

Schutz, S. & Bulman, C. (eds.) (2013). *Reflective practice in nursing*. (4th ed.). United Kingdom: Blackwell Publishing.

Scott, I. & By, C. (2007). *Essential study skills for nursing*. London: Mosby Elsevier.

Sellars, M. (2014). *Reflective practice for teachers*. Los Angeles: Sage.

Sellars, M. (2017). *Reflective Practice for teachers*. (2nd ed.). Australia: Sage.

Shandomo, H. M. (2010). The role of reflection in teacher education. *School-University Partnerships*, 4 (1), pp. 101-113.

Sharma, S., Aglazor, G. N., Malewski, E. & Phillion, J. (2011). Preparing global minded teachers for U.S. American classrooms through international cross-cultural field experiences. *Delhi Business Review*, 12 (2), pp. 33-44.

Sherman, S. C. (2013). *Teacher preparation as an inspirational practice: building capacities for responsiveness*. New York: Routledge Taylor Francis Group.

Shosh, J. M. (2012). How teachers define and enact reflective practice: it's all in the action. *Action Researcher in Education*, 3 (1), pp. 104-119.

Shein, J. & Chen, C. P. (2011). *Work-family enrichment: a research of positive transfer*. Rotterdam: Sense Publishers.

Signh, S. K. (2016). *Roles of teacher in global scenario in the 21st century*. India: Red 'shine Studios.

Smith, M. K. (2002). *Malcolm Knowles, informal adult education, self-direction and andragogy: the encyclopaedia of informal education*. <http://www.infed.org/thinkers/et-knowl.htm>> [Retrieved 29 July 2015].

Smith, M. K. (2010). 'Andragogy', the encyclopedia of informal education. <http://infed.org/mobi/andragogy-what-is-it-and-does-it-help-thinking-about-adult-learning/>> [Retrieved: 25 August 2017].

Song, L. & Hill, R. J. (2007). A conceptual model for understanding self-directed learning in online environments. *Journal of Interactive Online Learning*, 6 (1), pp. 27-42.

South Africa (Republic). (2007). *The National Policy Framework for Teacher Education and Development in South Africa (Notice 367 of 2007)*. Pretoria: Government Printer.

Strauss, S. (2000). Theories of cognitive development and their implications for curriculum development and teaching. In B. Moon, M. Ben-Peretz & S. Brown (eds.). Routledge *International Companion to Education*, pp. 33-50.

Strong, R., Harder, A. & Carter, H. (2010). Agricultural extension agents' perceptions of effective teaching strategies for adult learners in the master beef producer program. *Journal of Extension*, 48 (3), pp. 1-7.

Swanepoel, C. (2009). A comparison between the views of teachers in South Africa and six other countries on involvement in school change. *South African Journal of Educators*, 29, pp. 461-474.

Taber, K. S. (2011). Constructivism and direct instructions, competing instructional paradigms: an essay review of Tobias and Duffy's construction: success or failure? *Education Review*, 13, pp. 1-44.

Taole, M. J. (ed.). (2015). *Teaching practice, perspectives and framework*. Pretoria: Van Schaik Publishers.

Taylor, B. & Kroth, M. (2009a). Andragogy's transition into the future: meta-analysis of andragogy and its search for a measurable instrument. *Journal of Adult Education*, 38 (1), pp. 1-11.

Tisdell, E.J. (1998). Post structural feminist pedagogies: the possibilities and limitations of feminist emancipatory adult learning theory and practice. *Adult Education Quarterly*, 48 (3), pp. 139–156.

Tomei, L. (2005). *Taxonomy for the technology domain*. Hershey: Idea Group Inc.

Tough, A. (1979). *The adult's learning projects: a fresh approach to theory and practice in adult Learning*. (2nd ed.). Toronto: Ontario Institute for Studies in Education.

Trilling, B. & Fadel, C. (2009). *21st century skills: learning for life in our times*. San Francisco: Jossey-Bass.

Valli, L. (ed.) (1992). *Reflective teacher educations: cases and critiques*. New York: State University of New York Press.

Van der Berg, S., Taylor, S., Gustafsson, M., Spaul, N. & Armstrong, P. (2011). *Improving education quality in South Africa. Report for National Planning Commission*. Department of Economics, University of Stellenbosch, Stellenbosch, South Africa.

Van Manen, M. (1977). Linking ways of knowing with ways of being practical. *Curriculum Inquiry*, 6, pp. 205-228.

Vaske, J. M. (2001). *Critical thinking in adult education: an elusive quest for a definition of the field*. Unpublished Doctoral Thesis, Drake University. Des Moines, Iowa.

Vhalemm, R. (ed.) (2012). *Estonian studies in the history and philosophy of science*. London: Kluwer Academic Publishing.

Vygotsky, L. S. (1978). *Mind in society: the development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Vygotsky, L. S. (1986). *Thought and language*. Cambridge: MIT Press.

Wan, G & Gut, D. M. (eds.). (2011). *Bring schools into the 21st century*. USA: Springer.

Warwick, P. (2007). *Reflective practice: some notes on the development of the notion of professional reflection*. Bristol: Escalate.

Weber, E. (2008). Cohomology, deformation theory, and phase space. *Abstracts of Papers Presented to the American Mathematical Society*, 29, pp. 359.

Wilkins, R. (2006). Personal job characteristics associated with underemployment. *Australian Journal of Labour Economics*, 9, pp. 37-393.

Witcher, R. (2005). The extended metropolis: urbs, suburbium and population. *Journal of Roman Archaeology*, 18, pp. 120-138.

Wu, W. H. & Kao, H. Y. (2008). Review of trends from mobile learning studies: a meta-analysis computers and education. *Computers and Education*, 59 (2012), pp 817-827.

Yilmaz, K. (2011). The cognitive perspective on learning: its theoretical underpinnings and implications for classroom practices. *The Cleaning House*, 84, pp. 204-212.

Yin, R. K. (2016). *Qualitative research from start to finish*. (2nd ed.) New York: The Guilford Press.

Yorks, L. & Kasl, E. (2002). Collaborative inquiry as a strategy for adult learning. *New Directions for Adult and Continuing Education*, 2002 (94), p. 1-104.

Zeichner, K. M. (2009). *Teacher education and the struggle for social justice*. New York: Routledge.

Zeichner, K. M. & Liston, D. P. (2013). *Reflective teaching: an introduction (2nd ed.)*. New York: Routledge.

Zhu, X. & Zeichner, K. (ed.) (2013). *Preparing teachers for the 21st century*. New York: Springer.

Zmeyov, S. I. (1998). Andragogy: origins, development and trends. *International Review of Education*, 44 (1), pp. 103-108.

ANNEXURE A: ETHICAL CLEARANCE**RESEARCH ETHICS APPROVAL****Date: 29 November 2016**

This is to confirm that:

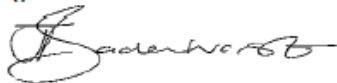
Applicant's Name	Mrs O Mpele 20392605
Supervisor's Name for Student Project	Prof JW Badenhorst
Level of Qualification for Student's Project	D.Ed
Title of research project	The role of critical reflective teaching in teaching practice for the 21st century: a case study of a university of technology

Ethical clearance has been provided by the Faculty Research and Innovation Committee [01/06/16] in view of the CUT Research Ethics and Integrity Framework, 2016 with reference number [D FRIC 16//3/10].

All conditions as approved by the FRIC meeting on 15 November 2016 (LS 262b) have to be met.

We wish you success with your research project.

Regards



Prof JW Badenhorst
(Ethics committee representative: Research with humans)
Prof AH Makura
Prof G Alexander

ANNEXURE B: CONSENT PRINCIPAL



Central University of
Technology, Free State

WELKOM CAMPUS

Email: ompele@cut.ac.za
Tel: 057 910 3638
Cell: 074 779 529

23 January 2017

Dear Principal

REQUEST FOR PERMISSION TO CARRY OUT EMPIRICAL RESEARCH AT YOUR SCHOOL

I am a lecturer at the Central University of Technology and a part-time PhD student. I hereby request your permission to carry out empirical research at your school.

The topic of the study is *The role of critical reflective teaching in teaching practice for the 21st century: a case study of a University of Technology*. The research will assist student teachers to improve the practice of critical reflection when executing their teaching practice. The research will be conducted by means of participant observation with CUT student teachers who have been allocated to your school for their School Based Learning.

Ten conveniently sampled student teachers from the second year of the B Ed (SP & FET) programme, the third year B Ed (FET) programme, the fourth year B Ed (FET) programme and students doing their Post Graduate Certificate in Education (PGCE) will each be required to present a lesson.

The research will be guided by a strict code of ethics and all data collected will be treated in a strictly confidential manner. Please find attached a copy of the proposed observation schedule and the letter of approval from the Central University of Technology for your convenience.

Thanking you in advance



MS OLGA SIZAKELE MPELE (PhD Student)



PROF JO BADENHORST (Promoter)

ANNEXURE C: CONSENT: OBSERVATIONS**WELKOM CAMPUS**Email: ompele@cut.ac.za

Tel: 057 910 3638

Cell: 074 779 529

Dear Student

Informed consent form: observations

I would like to invite you to participate in a study titled:

The role of critical reflective teaching in teaching practice for the 21st century: a case study of a university of technology

The purpose of the study is to assist student teachers to improve the practice of critical reflective teaching when executing teaching practice. You are hereby asked to be evaluated while presenting a lesson during your SBL at the school you have been allocated to. Your lesson presentation will be evaluated by a research colleague and myself (using participant observation), by making use of an evaluation schedule compiled for this purpose. The observation will include your teaching media (poster and/or 3-D model).

We do not anticipate any inconveniences or risks resulting from this study. If you feel discomfort or embarrassed at any stage, you are free to withdraw your participation from this study. Your participation is voluntary. Refusal to participate or withdrawal of your consent or discontinued participation in the study will not result in any penalty or loss of benefits. The results of this study will be presented anonymously, without disclosure of your identity. Permission was granted by The Central University of Technology to conduct this investigation.

If you have any questions about this study, please feel free to contact me at any stage.

Thanking you in advance



MS OLGA SIZAKELE MPELE (PhD Student)



PROF JO BADENHORST (Promoter)

CONSENT:

I, the undersigned, understand the nature of this study and agree to participate.

Participant signature_____
Date

ANNEXURE D: CONSENT: FOCUS GROUP INTERVIEWS

Central University of
Technology, Free State

WELKOM CAMPUS

Email: ompele@cut.ac.za
Tel: 057 910 3638
Cell: 074 779 529

Dear Student

Informed consent form: focus group participation

I would like to invite you to participate in a study titled:


The role of critical reflective teaching in teaching practice for the 21st century: a case study of a university of technology


The purpose of the study is to assist student teachers to improve the practice of critical reflective teaching when executing teaching practice. You are hereby asked to participate in a focus group interview that will be conducted after academic hours at the Central University of Technology, Welkom Campus. Your participation will be highly appreciated since you are currently studying as a student teacher which will serve valuable for this study. Your participation will involve answering open-ended questions. The session will be audio- and video-recorded and the duration of the session will be 45-60 minutes. Further, the consent includes the permission to use your reflective journal (portfolio).

We do not anticipate any inconveniences or risks resulting from this study. If you feel discomfort or embarrassed at any stage, you are free to withdraw your participation from this study. Your participation is voluntary. Refusal to participate or withdrawal of your consent or discontinued participation in the study will not result in any penalty or loss of benefits. The results of this study will be presented anonymously, without disclosure of your identity. Permission was granted by The Central University of Technology to conduct this investigation.

If you have any questions about this study, please feel free to contact me at any stage.

Thanking you in advance


MS OLGA SIZAKELE MPELE (PhD Student)


PROF JO BADENHORST (Promoter)

CONSENT:

I, the undersigned, understand the nature of this study and I agree to participate.

Participant signature

Date

ANNEXURE E: SCHEDULE: CURRICULA



Central University of
Technology, Free State

WELKOM CAMPUS

Email: ompele@cut.ac.za

Tel: 057 910 3638

Cell: 074 779 529

Analysis of curricula	
Unique document identifier	
Date of document	
Archival source	
Author of document	
Short summary of salient points	

Content analysis of curricula

- How does the curriculum adhere to high quality teacher education standards?
- Which media are proposed to identify and design instruction appropriate to learners' stages of development and learning styles?
- Which theories demonstrate and promote critical thinking and problem solving?
- Does the content model reflective practice to foster learner reflection?
- In which ways does it cater for a variety of instructional and assessment methods, including the use of technology?
- How does it actively pursue new knowledge of global issues in teaching practice?
- Does it focus on 21st century skills, content, knowledge and expertise?
- Does it facilitate which professional development experiences are related to effective teaching practices?

Add Unit here • Private Bag X20539 • Bloemfontein • SOUTH AFRICA • 9300 •
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ANNEXURE F: SCHEDULE: PORTFOLIOS



Central University of
Technology, Free State

WELKOM CAMPUS

Email: ompele@cut.ac.za

Tel: 057 910 3638

Cell: 074 779 529

Analysis of portfolio's	
Unique document identifier	
Date of document	
Archival source	
Author of document	
Short summary of salient points	

Analysis of portfolio's

Does the student teacher write a well-developed lesson plan?

Does the student teacher provide evidence of considering educational theory in developing his/her lesson?

Does the student teacher reflect on his/her previous lessons?

Are there indications that the student teacher questions established ways of doing things?

Are clear lesson objectives being set for each lesson?

Is there evidence of a well-developed personal philosophy of teaching?

Does the student teacher consider how his/her beliefs and values may affect his/her learners?

Is there evidence of effective formative and summative assessments?

ANNEXURE G: SCHEDULE: MEDIA

Central University of
Technology, Free State

 WELKOM CAMPUS

Email: ompele@cut.ac.za

Tel: 057 910 3638

Cell: 074 779 529

Analysis of media	
Unique document identifier	
Date of document	
Archival source	
Author of document	
Short summary of salient points	

Content analysis of a poster and model

- Is it appropriate to learners' stages of development and provide for different learning styles?
- Does it promote critical thinking and problem solving?
- Does it model reflective practice to foster learner reflection?
- Does it cater for a variety of instructional and assessment methods, including the use of technology?
- Does it focus on 21st century skills, content, knowledge and expertise?
- Does the student observe education theory as basis for developing his/her poster/model?

ANNEXURE H: SCHEDULE: OBSERVATIONS



Central University of
Technology, Free State

WELKOM CAMPUS

Email: ompele@cut.ac.za

Tel: 057 910 3638

Cell: 074 779 529

OBSERVATION SCHEDULE		Y/N	REMARKS
Lesson outcomes:	Does the student teacher explain the lesson objectives at the beginning of the lesson?		
Introduction:	Does the student teacher use an attention-grabbing introduction?		
Presentation:	Does the student teacher show a mastery of the content material?		
	Does the student teacher individualize the lesson for learners?		
	Is the student teacher's class learner-centred?		
	Does the student teacher manage the class effectively?		
	Is the student teacher flexible in his/her presentation approach?		
Teaching material:	Does the student teacher use a variety of materials in teaching?		
	Does the student teacher refer to resources outside classroom?		
Assessment:	Does the student teacher engage learners in higher-level thinking assessment?		

ANNEXURE I: SCHEDULE: FOCUS GROUPS



Central University of
Technology, Free State

WELKOM CAMPUS

Email: ompele@cut.ac.za

Tel: 057 910 3638

Cell: 074 779 529

Guide: Focus group questions

1. What do you think are the most important teaching skills, content knowledge and expertise for 21st century teaching?
2. What do you understand by the term 'reflective teaching'? (Have you learnt anything in your course about reflective teaching? *(You may have to explain to them what it entails, but first let them THINK)*)
3. How do you experience critical reflection in your teaching practice here at the university? (If any – or: Does this course prepare you to use the skill of critical reflection? How?)
4. Do you get opportunities to practice critical reflective teaching during your teaching practice?
5. What is your opinion about the role of critical reflective teaching in the teaching practice? (Why...?)
6. What, in your opinion, are the implications for using critical reflective teaching in your teaching practice?
7. Which challenges do you experience (when using critical reflective teaching) during your teaching practice?
8. How can you be assisted in improving the practice of critical reflective teaching when executing your teaching practice?

Let us now look at your portfolio:

9. How does the portfolio capture your personal learning experience?
10. What new learning strategies have you adopted as a result of the portfolio process?
11. What difference has the portfolio made to your intellectual, personal and ethical development?
12. How have products collected in your portfolio over time contributed to higher level learning?
13. Why is a portfolio valuable in the student teacher's overall professional development?
14. What has been most meaningful about the portfolio process?
15. In what way is your portfolio unique?
16. How, do you think, can a student teacher's ability to identify learners' particular learning styles, intelligences, strengths and weaknesses, be cultivated?

- *How does it cater for a systematic reflection on your own teaching practice and learning?*
- *Does it apply life experiences to teaching and learning?*
- *In what way(s) does it support teacher education in school environment?*
- *Which resources/media does it review designed to advance the teaching profession?*
- *Does it enable the use of innovative learning methods that integrate the use of supportive technologies, inquiry and problem-based approaches and higher order thinking skills?*

ANNEXURE J: PROGRAMME OUTLAY

(B Ed: FET) Bachelor of Education: Further Education & Training (phasing out)			
First year subjects:	Second year subjects:	Third year subjects:	Fourth year subjects:
<ul style="list-style-type: none"> • Education I • General subject Didactics I • Computer literacy I • English proficiency • Communication in English I • Communication in language Y I (choose one language) • Optional instructional offerings I (any two subjects) 	<ul style="list-style-type: none"> • Education II • General subject didactics II • Skills & Life orientation I • Computer literacy II • Communication in English II • Communication in language Y II (choose one language) • Optional instructional offerings II (choose two) 	<ul style="list-style-type: none"> • Education III • General subject didactics III • Practical teaching III • Extramural activity & coaching • Introduction to research • Communication in language X III (choose one language) • Optional instructional offerings III (choose two) 	<ul style="list-style-type: none"> • Education practice • Education IV • General subject didactics IV
(B Ed: SP & FET) Bachelor of Education: Senior Phase and Further Education & Training (new since 2015)			
First year subjects:	Second year subjects:	Third year subjects:	Fourth year subjects:
<p>Semester 1:</p> <ul style="list-style-type: none"> • Micro-teaching & observation • Education I: learner & learning • Education I: media in teaching & learning • Numeracy • Basic digital literacy • Life skills • One major subject for SP teaching I • Academic literacy and communication studies <p>Semester 2:</p> <ul style="list-style-type: none"> • Academic literacy and communication studies • Advanced digital literacy • School-based learning • Two major subjects for FET teaching I • One language that is not home language 	<p>Semester 1:</p> <ul style="list-style-type: none"> • Language of teaching and learning I • Micro-teaching II • Education II: working in classroom • Education II: curriculum studies • General subject methodology I • One specific instructional offering (methodology- SP I) • One major instructional offering for SP II <p>Semester 2:</p> <ul style="list-style-type: none"> • School-based learning • Language of learning and teaching II • Two specific instructional offerings (methodologies for FET I) • Two majors for FET teaching II 	<p>Semester 1:</p> <ul style="list-style-type: none"> • Micro-teaching III • Education III: being a teacher • Education III: learner-centred schools • General subject methodology II • One specific instructional offering (methodology- SP II) • One major instructional offering for SP III <p>Semester 2:</p> <ul style="list-style-type: none"> • School-based learning III • Two specific instructional offering (methodology- FET II) • Two majors for FET teaching III 	<p>Semester 1:</p> <ul style="list-style-type: none"> • Education IV: school administration • Introduction to research • One specific instructional offering (methodology- SP III) <p>Semester 2:</p> <ul style="list-style-type: none"> • School-based learning IV • Two specific instructional offering (methodology- FET III)
(PGCE) Post Graduation Certificate in Education			
One year subjects:			
<ul style="list-style-type: none"> • Education IV • Professional studies IV • Computer literacy II • Introduction to research I • School-based learning IV • Language & development communication II • Methodology 40AB (two subjects) 			

ANNEXURE K: TRANSCRIPTION FOCUS GROUP: 4TH YEAR GROUP

Moderator: Good morning Ladies and Gentleman, please let me welcome and thank you very much for being here. The purpose of the focus group is to get your views, opinions and experiences with regards to critical reflective teaching. Please feel free to participate using preferably English or any language of your choice. Please keep whatever is going to be discussed in this focus group confidential. Everyone is free to comment on each question or add on the comments from other students. You are welcome to discuss the question briefly between yourselves before answering. Remember that our interview will be recorded and that the voice recorder has got an application to transcribe, I hope it will be able to spell Sesotho, isiZulu or Xhosa, etc. *(Smiling)*.

Moderator: Please feel free to serve yourselves the refreshments over there and we will talk as you are eating no worries. Thank you guys for coming to this focus group, I really appreciate it. And I will start by saying that there is no right or wrong answer in this session, you just share with me what you still remember and know. And if you do not know anything please make up a story. *(Laughs)*

Students: *(Laughing)*

Moderator: I am quite aware that the old program students might not be familiar with or have forgotten about this content but there are a number of theories that you studied that are part and parcel of reflective teaching content that we are going to discuss. I know for a fact that reflective teaching is studied as a topic by the new programs, the new teaching programs that were incorporated as from the year 2015. So your input with regard to these questions will be highly valuable and important regardless of your programs status, old or new. I will try to keep this focus group brief and to the point because I know that some of you have other commitments and appointments as so forth. So my topic in brief is based on reflective teaching but I will not tell you what reflective teaching is since I have to hear that from you, but as we continue and go through these questions I will try to explain and detail difficult terms and unclear or confusing information. Okay, please let us look at

the first question; what do you think are the most important teaching skills, content knowledge and expertise for 21st century teaching? Yes, sir.

SM 4th (2): Firstly, I think we should talk about what the 21st century refers to? What I know is that we are now living in the 21st century, hence we should be doing the 21st century teaching.

Moderator: Thank you. Yes, Ma'am?

SF 4th (5): Ma'am, I think it is technology.

Moderator: So now the question to ask here is what do you think are the most important teaching skills, and the content knowledge and the expertise in the 21st century? Yes, sir.

SM 4th (4): Since we said that the 21st century involves the use of technology, then that means I as a 21st century teacher my teaching skills, content knowledge and expertise must be technologically-wise. So in the past the teachers would normally teach by using the chalkboard, chalk and so on, but now as modern student teachers we need to use alternative methods which are modern and technological.

Moderator: Thank you. Yes, sir.

SM 4th (4): Like projectors or transparencies.

Moderator: Yes, what else do you use? Yes, Ma'am?

SF 4th (3): The posters and 3-D models that we design.

Moderator: Thank you. Yes, sir?

SM 4th (4): Uhm, Ma'am, I think it is in Gauteng province where they have introduced the use of Tablets in their schools.

Moderator: Thank you. Okay moving on to question number two; what do you understand by the term 'reflective teaching'. Exactly, and what are you doing when you are reflecting? Yes, Ma'am.

SF 4th (5): When I reflect I check my mistakes or where I went right or wrong in my previous actions.

Moderator: Exactly. Anyone like to add... Yes, Ma'am?

SF 4th (3): So it means when it comes to the act of teaching, I might have taught for many years but only to find that I am still stuck in the sense that I am doing things the same way even though the teaching practices have changed.

Moderator: Thank you. Yes, Ma'am?

SF 4th (4): Reflective teaching is not only involved with my professional life, it also applicable to my personal life. If I perceive that a certain thing that I am used to doing is not working for me, then I must consider something new or a new approach and stop making excuses and being pessimistic about life. Because if I do not apply reflection in my life then I will keep on making the same mistakes over and over. I will be like many people who always complain about not seeing what they spend their money on. Which is something that I do not understand at all. (laughs)

Students: (Laugh)

Moderator: Thank you. So now, have you learnt anything in your course about reflective teaching?

Students: I think so Ma'am.

Moderator: Thank you. Yes, Ma'am.

SF 4th (3): Some of the things in life we can only learn them once we experience them. For example, once we experience our first heart break then we will understand what our parents meant when they said that love hurts. So even in the profession of teaching there are things that curriculum cannot teach us because life is constantly changing plus we cannot predict it. I may face situations at a school that I was not even taught about when I was a student at the university. That is when the reflective teaching will be of importance.

Moderator: Thank you. Yes, sir?

SM 4th (4): For some reason, I am of the impression that some people could only reflect to a certain point, since reflection is also affected by the intellect level of an individual.

Moderator: Thank you. Yes, Ma'am?

SF 4th (5): I might find that I have the same knowledge as my fellow student teachers, we are from the same university, maybe we even graduated with the same scores and we

were even in the same class but when it comes to the same situations that we may encounter the two of us later in life, the reaction will likely be different. So that is what reflective teaching is all about, I take whatever I have learnt or experienced and then I decide what I deem to be the best approach to the crisis or problem at hand.

Moderator: Thank you very much, so third question; how do you experience critical reflection in your teaching practice here at the university? Yes, Ma'am?

SF 4th (3): We were taught about reflective teaching at the university. If I'm not mistaken in 1st year of our studies.

Moderator: Thank you. Okay, alright, the next question, does this course prepare you to use the skill of critical reflection? Yes, Ma'am?

SF 4th (5): Not so Ma'am because some lecturers still use the notes and textbooks only.

Moderator: Thank you. Question four; do you get opportunities to practice critical reflective teaching during your teaching practice? Yes, Ma'am?

SF 4th (3): Yes Ma'am we do, during the six-month teaching practice.

Moderator: Thank you. Yes, Ma'am.?

SF 4th (2): During our methodology classes we try Ma'am.

Moderator: How so in the methodology classes? Yes, sir?

SM 4th (4): Because the lecturer gives us the time to express ourselves and share our views. And to also stand in front of the classroom and teach and then see our mistakes and that gives us an opportunity to be able to improve on them.

Moderator: By the way you are welcome to use any language or vernacular, please do not allow the English language to serve as a barrier or hamper you from sharing your opinions or views. Fifth question; what is your opinion about the role of critical reflective teaching in the teaching practice? If you do teaching practice, is reflective teaching important in that regard or not? Yes, Ma'am?

SF 4th (4): It is important Ma'am, because it is the only way that a teacher can improve on their teaching skills and everything else that is involved that has to do with the act of teaching.

Moderator: Thank you. Yes, sir?

SM 4th (3): If my learners are always failing, that calls for a critical reflection, I need to ask myself honest and clear questions. For instance; ask questions like: Is it really the learners own doing that makes them fail? Or am I the problem? (*Laughing*)

Students: (*Laughing*)

Moderator: Thank you. Yes, Ma'am?

SF 4th (4): Lol, it is true Ma'am once we become qualified we end up being arrogant and we are never at fault or wrong. Further, we never want to admit fault- only to find out that I am the problem in the end.

Moderator: Thank you, question six, in your opinion what are the implications for using critical reflective teaching in your teaching practice? Implications are the consequences of a certain action, for example if you leave the car with the windows open in the rain then the inside of the care will be wet. Yes, sir.

SM 4th (3): Absolutely, and I will be able to keep up with the changing times as we have already discussed how teaching changes with time. I am thinking of the different systems that have been applied by our education department- we had OBE, NCS and now we are using CAPS. So as a teacher if I do not use the skill of critical reflection I will find myself stuck with the teaching curriculum that has been replaced.

Moderator: Thank you. Seventh question; which challenges do you experience when using critical reflective teaching during your teaching practice? Remember that even though some of you are not familiar and not recall with the process of reflective teaching, but you now understand it a bit more and can try to identify the challenges that you may face when you are doing your teaching practice. Yes, /Ma'am.

SF 4th (1): Ma'am I think my learners will lack the interest of attending my classes and they will be demotivated in my classes and pay no attention when I am teaching during class. Because in the end my classes will just be annoying and boring them with the same things day in and day out.

Moderator: Thank you. Yes, Ma'am.

SF 4th (5): For example, Ma'am it is like if I have been using the teaching method of reading from the text book the learners will have no interest to attend my classes. Because I will be predictable and boring and I will not be able to captivate the class. Especially if I cannot even do the simplest action of at least reading the slides and trying to explain what I have read in my own words and giving at least some examples.

Moderator: Thank you. Yes, Ma'am.

SF 4th (3): Ma'am and then in the end no one is going to come to my classes and I am going to start taking things personally when it is in actual fact my own fault.

Moderator: Thank you. Yes, sir.

SM 4th (3): So those are the challenges that we might face if we do not use the skill of critical reflection. So this means that we should reflect and check what might be the problem if learners do not attend our classes. Or if the learners just come to our class to just sit and keep quite or be super disruptive. We should look at our learners' attitudes and responses and then create the suitable and required atmosphere.

Moderator: Thank you. Yes, sir.

SM 4th (1): That is why it is always important to make jokes and use real-life practical examples compatible with their level of development in our classes. It's not that we will be doing that just for fun but we will be doing that to help our learners study as well as to set an atmosphere in which we could build personal relationships with the learners so that they are all comfortable in class. And we cannot know much about our learners if we do not reflect.

Moderator: Thank you. Moving on to question eight, how can you be assisted in improving the practice of critical reflective teaching when executing your teaching practice? Yes, sir.

SM 4th (4): Ma'am even the mentor teachers at the school where we do our teaching practice should be on point, they should use the technological methods of teaching.

Moderator: Thank you. Yes, sir.

SM 4th (3): Exactly, because the 21st century teaching methods do not only apply here at the campus but apply everywhere else.

Moderator: Thank you. Yes, Ma'am.

SF 4th (4): I feel that if a teacher insists on using the same methods of teaching regardless of whether they are working or not then they are definitely not reflecting, but if some of the teachers have adjusted their teaching methods or even have changed them completely then I can see that they have applied the skill of reflective teaching.

Moderator: Thank you. Yes, Ma'am.

SF 4th (5): Ma'am but I have observed that because many of the teachers at the schools are too old and are not keeping up with the development in teaching education, they prefer to be comfortable and are stuck with old teaching methods because they fear change.

Moderator: Thank you. Yes, sir.

SM 4th (2): You find them being defensive and claiming that their old methods still work so they see no need in changing them, but the real reason why they will not change is because they fear the unknown, the unknown removes them from their comfort zone.

Moderator: Thank you. Yes, Ma'am.

SF 4th (4): So it is no wonder that the current learners at schools are so ill-mannered, impatient and have such a bad attitude towards learning new things. It is mainly caused by the constant boredom that they have to go through each and every day at the schools.

Moderator: Thank you. Yes, Ma'am.

SF 4th (4): I do not know if you guys have noticed how petrified the old fashion teachers are of computers, they are so intimidated, you would actually believe that computers eat people. *(Laughs)*

Students: *(Laughing).*

Moderator: Thank you. Yes, Ma'am.

SF 4th (4): But we cannot judge them too harshly because I have also seen people or students as young as us guys who are very intimidated by computers. (*Laughing*)

Students: (*Laughing*)

Moderator: Thank you. Yes, Ma'am.

SF 4th (1): Yes ma'am, you find yourself doubting yourself and asking the most stupid questions like how to turn the computer on or off.

Students: (*Laugh*)

Moderator: Thank you. Now we are going to look at our portfolios, in this second session everyone can share and participate because I am definitely sure that you all have compiled a portfolio before. The ninth question; how does the portfolio capture your personal learning experience? Yes, Ma'am.

SF 4th (4): Ma'am as we were saying earlier on that we can all experience a certain event at the same time but we will all definitely react in different ways. Let us say for instance, in a class a learner is being disruptive, maybe I will decide to throw the learner out of the class while another student teacher in the same situation with the same learner might decide to ignore the learner. So according to me that is basically the difference.

Moderator: Absolutely, anyone like to add? Yes, sir.

SM 4th (3): And when it comes to actually doing my portfolio I have to reflect back on what I was taught during class.

Moderator: Thank you. Yes, sir.

SM 4th (1): I think in real life it means that you must not underestimate someone based solely on how they look...

Moderator: Thank you, question ten; what new learning strategies have you adopted as a result of the portfolio process Yes, sir.

SM 4th (2): In my portfolio there are lessons that I have presented during school-based learning and I used the poster and the 3-D model.

Moderator: Thank you. Yes, Ma'am.

SF 4th (3): Oh Ma'am, we use the posters, the 3-D models and also the transparency or the overhead projector.

Moderator: Thank you. The eleventh question; what difference has the portfolio made in your intellectual, personal and ethical aspects of your life? The fact that you have a portfolio, has it changed anything about you in the end? Has it enlightened you in any way? Yes, Ma'am.

SF 4th (3): Ma'am the portfolio does help, it forces me to be punctual, to stick to the prescribed dates and deadlines which is going to be essential when I get a teaching post one day.

Moderator: Thank you. Yes, Ma'am.

SF 4th (4): And it also teaches me that there is always a right and wrong way of doing things, and that rules apply in everything that I do in life. I also know that there is a right way of dressing and grooming myself as a teacher and that there is also a way that is inappropriate.

Moderator: Thank you. Yes, sir.

SM 4th (2): It is like a person who is a criminal, they are not just a criminal in their personal lives but not intellectually, they are just criminals period. So if I am a professional it will be displayed in all the aspects of my, not in just one. And the ethical part or involves my morals, beliefs, values or views and so forth.

Moderator: Thank you. Question twelve; how have the products collected in your portfolio over time contributed to your higher level learning? Yes, Ma'am.

SF 4th (4): Preparing questions when you are preparing for the lesson is actually a brilliant idea because you will know what to emphasize at the time it's like killing two birds with one stone.

Moderator: Thank you. Moving on to the thirteenth question; why is the portfolio valuable in the student teacher's overall development? Yes, Ma'am.

SF 4th (2): Yes Ma'am even though we at times complain when the lecturers tell us that we need to make the posters and the model in the end it is really worth it and

beneficial to our overall development. We learn a lot of things from those two activities that may seem very simple.

Moderator: Thank you. Yes, Ma'am.

SF 4th (3): Yes, that is true, and when I look at my portfolio, poster or model at the end of the day it makes me feel very proud because I had invested the best resources and I had given my best.

Moderator: Thank you. Yes, sir.

SM 4th (4): And nowadays Ma'am designing a poster or a model is a very simple task because of the internet where we get a lot of ideas free of charge. No matter what my subject is, it could be mathematics and science included. I could get great ideas to use on introductions to capture the learners' interest and examples to use during my lesson presentations and conclusions, it is very nice (*laughing*)

Students: (*Laughing*)

Moderator: Thank you. Yes, Ma'am.

SF 4th (5): I remember when I was doing my model for micro- lessons, I enjoyed the process, I felt that my model was something gripping and controversial and I wanted it to be unique and to give me a lot of marks. (*Laughing*).

Students: (*Laughing*)

Moderator: Thank you. Yes, sir.

SM 4th (4): I like to use topics like politics and religion- these are topics that get learners thinking and talking and they stir up people's emotions. So I strive to be a trend-setter and I like such controversial topics.

Moderator: Thank you. Yes, Ma'am.

SF 4th (3): Lol we all strive to be the best and it will make us happy when we see our posters, models or posters being used for display in class or as an example and not being discarded with the rest- that way we will know that we have out done ourselves.

Moderator: Thank you, question fourteen; what has been most meaningful to you about the portfolio process? Yes, sir.

SM 4th (1): It made me appreciate and respect mentor teachers because the portfolio is nothing compared to the workload that teachers have to handle, have you seen how hard teachers must work? (*Laughing*)

Students: (*Laughing*)

Moderator: Thank you. Yes, Ma'am.

SF 4th (1): Lol we cannot ignore the fact that many teachers are teachers because they couldn't be admitted to other programmes, therefore, they teach us to just get paid, I for one like to do my job immaculately, I do not want to be annoyed and therefore I avoid by all means annoying other people. I will not like to be a problem teacher that all the staff members and the principal are always complaining about.

Moderator: Thank you. Yes, Ma'am.

SF 4th (4): Me too Ma'am I just want to work well with others and do my part to contribute in the group. But then again there are people who enjoy drama in their daily lives, but they make life interesting and they divert attention from everyone else (*laughing*).

Students: (*Laughing*)

Moderator: Thank you. Yes, sir.

SM 4th (3): Lol, unfortunately some people are even like that with their personal life; you find that you may have a girlfriend or boyfriend who always wants you to be always on guard- always watching what they are doing, when and with who? (*Laughing*).

Students: (*Laughing*).

Moderator: Thank you. Yes, sir.

SM 4th (1): Therefore, when I am at teaching practice I need to prepare my mindset that I am here to work and give my best and that I will relax when you get home. I always get inspired by some teachers who are HODs because of how professional they are, they are very organized and punctual and it very nice to work with such people.

Moderator: Thank you. Yes, Ma'am.

SF 4th (1): Ma'am it is true, even though we do not tell those teachers that set an excellent example how much of a commendable job they do, we however, respect them and take them with a very high esteem. But they have varying degrees of professionalism because they are different people in the end.

Moderator: Thank you, let us move on, in what ways will your portfolio be unique- just like you? The fifteenth question. Yes, Ma'am.

SF 4th (4): The portfolio will represent who I am ma'am, it will be as unique as I am.

Moderator: Thank you. Alright, question sixteen; how do you think, a student teacher's ability to identify learners' particular learning styles, intelligences, strengths and weaknesses can be cultivated? Yes, Ma'am.

SF 4th (3): Identifying that will help me understand that in some cases learners are not stupid it's just that they need some extra time to understand things or a master a new approach of learning.

Moderator: Thank you. Yes, sir.

SM 4th (2): This is true Ma'am especially as a language student teacher. I did my teaching practice at schools where learners came from all sorts of backgrounds and they had gaps in their knowledge and I had to take that into consideration every time that I prepared a lesson, so I would give the learners with gaps in their knowledge extra work and activities to help bridge their knowledge gaps.

Moderator: Thank you. Yes, sir.

SM 4th (2): So sorry to interrupt you Ma'am, but do you not think that the biggest problem of all lies with our entire education system? Because we take people from totally different backgrounds that have different advantages and disadvantages and then apply the same scale and then expect them to perform in the exact same way.

Moderator: What do you think guys? Yes, sir.

SM 4th (3): Yes, Ma'am I think he's absolutely right, it is very much unfair but as student teachers of the 21st century we are being equipped with different skills like the skill of reflective teaching to make sure that we have ways of handling or dealing with such.

Moderator: Thank you. Yes, Ma'am.

SF 4th (1): And the problem is made worse at schools because the learners get promoted even if they have failed and so the problems get bigger and bigger and end up being impossible to be solved in the end.

Moderator: Thank you. Yes, Ma'am.

SF 4th (5): And then we as teachers need to account hey? (*Laughs*)

Students: (*Laughing*)

Moderator: Thank you. Yes, sir.

SM 4th (4): So Ma'am which learners are you supposed to put more focus on as a teacher, the struggling learners or the bright ones?

Moderator: What do you think guys? Yes, sir.

SM 4th (1): We need to check and weigh the different solutions according to our personality and then choose the ones that we feel are the best. Sometimes I think we would also have to modify or change the solutions to suit and fit our persona. Although, the internet will not help us to know everything and solve everything but it sure beats just sitting with a problem and not trying anything. Other than sitting there and feeling sorry for yourself broaden out and hear what other teachers have to say.

Moderator: Thank you. Yes, sir.

SM 4th (3): Just do not forget to verify the sources though (*laughing*).

Students: (*Laughing*)

Moderator: Thank you. Moving on, the fifteenth question; how does the portfolio cater for a systematic reflection on your own teaching practice and learning? Yes, sir.

SM 4th (4): Sometimes when you are a teacher you must stand your ground and demand respect from the learners. The portfolio helps me to be decisive in this manner.

Moderator: Thank you. The other question; in what way does the portfolio support teacher education in the school environment? Yes, sir.

SM 4th (1): Reflection is essentially like intuition, whenever I feel that something is right or wrong regardless of what other people think then I should trust and follow my intuition in most cases. There are things that the teaching programme will not be able to teach us. That is where reflection comes in place; it can really help me solve any kind of problem. (*laughing*)

Students: (*Laughing*)

Moderator: Thank you. Yes, sir.

SM 4th (3): Ma'am I will first have to recall what I have been taught, for example, about managing a classroom and then I will make an informed decision and even use my intuition to get a solution to the problem at hand.

Moderator: Thank you. Yes, Ma'am.

SF 4th (2): Me too Ma'am that is what I normally do because I have noticed how sometimes students will be disruptive in class and tease you just to see how you will react...

Moderator: Guys that is it, we are done, thank you very much for coming I really appreciate.

Moderator: You know what, it is my pleasure guys. Thank you once again for coming to this focus group guys...I will forever be deeply appreciative of your efforts. I just wish to confirm that this focus group was about your opinions and experiences with regards to critical reflective teaching in teaching practice for the 21st century. Do you agree?

Students: Yes, Ma'am.

Moderator: How do you feel about the focus group session we just had?

Student: It was very interesting Ma'am.

Moderator: Do you have any questions?

Students: No Ma'am.

Moderator: Thank you very much for your invaluable contribution, I really appreciate. The focus group session is officially closed.