AN EXPLORATION OF MICRO-TEACHING SKILLS WITH DIGITAL TECHNOLOGY (CELL PHONE) IN B.ED. PROGRAMMES AT A WESTERN CAPE UNIVERSITY.

BY

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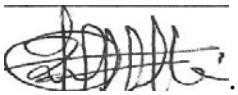
DECLARATION

I **Okuntade Japhet Omolere** declare that :- "*An exploration of micro-teaching skills with digital technology (cell phone) in B.Ed. programmes at a Western Cape University* " is my own work, that it has not been used or submitted for any degree or examination in any other university and all the sources used or quoted have been indicated and acknowledged by complete references.

.....  .....

Okuntade Japhet Omolere

December 2019

DEDICATION

I dedicate this research work to God Almighty the Author and finisher of my faith for giving me the opportunity to start with good health and completed it with a sound mind. This work is also dedicated to my late father **ELAJUMI STEPHEN OKUNTADE** who brought me to life and taught me the principles of success which lies in hard work and commitment. I dedicate the work to my lovely mother **OMOLADE SILIPANA OKUNTADE** who gave me words that uplifted my spirit to pursue my heart's desire. I also dedicated the work to my wife **ABIOYE** and my children **ODUN, OJO IGBA** and **INI** who bear the pains to stay alone and keep vigil for the past three years of this programme.

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Letter from the Editor

29 November 2019

TO WHOM IT MAY CONCERN

RE: AN EXPLORATION OF MICRO-TEACHING SKILLS WITH DIGITAL TECHNOLOGY (CELL PHONE) IN B.Ed. PROGRAMME

I hereby confirm that I, Michelle Chetty (Proof reader and Copy Editor), have edited the manuscript titled, AN EXPLORATION OF MICRO-TEACHING SKILLS WITH DIGITAL TECHNOLOGY (CELL PHONE) IN B.Ed. PROGRAMME by student OKUNTADE JAPHET OMOLERE with Student Number: 3775781.The manuscript was edited for typographical, grammatical, editorial layout and formatting errors.

Please contact me on chettymp@gmail.com for any queries related to the editing of the manuscript.

Sincerely,
Michelle Chetty
Proof reader and Copy Editor
PROOFIT

ACRONYMS

MRTEQ : Minimum requirement for teacher education qualifications

UWC : University of the Western Cape

WCED : Western Cape education department

DOE : Department of education

TPACK : Technological pedagogical and content knowledge

KACIT : Knowledge acquisition, construction and implementation with technology

CHE : Council on higher education

IOPs : Instructional operational plans

GA : Graduate Attributes

MRQ : Main research questions

SRQs : Sub-research questions

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KEYWORDS

Micro-teaching

Digital technology

Pre-service teacher

Higher education

MRTEQ

Practical learning

Reflection

ABSTRACT

Micro-teaching provides a framework for teachers' professional development with emphasis on the teach and re-teach cycle as a practical procedure for the development of micro-teaching skills. One fundamental element in this teach and re-teach cycle is the use of digital technology tools as a recording device which may help aid the understanding and application of micro-teaching skills. This study explores micro-teaching skills with the use of digital technology (cell phone) in B.Ed. programmes at a Western Cape university.

The study aims to merge the past and present strategies to initiate the development of a simple model to improve micro-teaching methodology using a simple and mostly available digital technology tool which can allow for self-evaluation and personal reflection. The study seeks to investigate how a digital technology, through a cell phone, can guide practical learning to support pre-service teachers in the micro-teaching presentation.

The underpinning theories that frame this study were Vygotsky's Socio-cultural Theory, Bandura's Social Learning Theory and Mishra & Koehler's Technological Pedagogical Content Knowledge (TPACK) Theory. These theories emphasize social interactions, modelling and the use of technological tools as a significant aspect of skills development. The combination of these theories informs the conceptually developed knowledge acquisition, knowledge construction and the implementation with technology (KACIT) model with the aim to encourage the construction and implementation of micro-teaching knowledge with available digital technology tools.

The study employs a sequential explanatory design, using a case study approach, which draws on both quantitative and qualitative methods as sources of data collection. The quantitative procedure adopted video recording as a form of data collection, using a conceptually developed teaching skills rubric, with a three level Likert-scale rating. SPSS version 25 was used to get the aggregated descriptive statistical values of each teaching skill. The qualitative procedure employed unstructured interviews, lesson plan observation, and thematic and content analysis was used to interpret and analyse the interviews and lesson plans respectively.

The sample size of this study is drawn from the B.Ed. students in the Faculty of Education at the University of the Western Cape (UWC). Two hundred and sixteen (216) participants were involved

in the quantitative data collection phase, while the qualitative data collection phase consisted of twelve (12) participants for the focus group discussion, five (5) school-based supervisors, five (5) pre-service teachers and (5) five lesson plans from the students-portfolio documents.

The findings attest to the general context of micro-teaching as a strategy for developing pre-service teachers‟ teaching skills. It further highlights the high theoretical knowledge levels of micro-teaching of the B.Ed. students, and the relative lack of practical knowledge of micro-teaching of the students. In addition, the findings reveal the high technological knowledge levels of the participants and the need to deepen the professional knowledge of the B.Ed. students along the lines of authentic teaching experiences within the university environment.

As part of the recommendations, the study emphasises the use of a digital video platform as a complementary strategy and as a form of reflective practice in micro-teaching presentations. Importantly, the study further recommends that the *Minimum Requirements for Teacher Education Qualifications* (MRTEQ) policy document, on the knowledge mixes for teaching competences in terms of the observation outcome, should be re-considered with a clear guideline for South African universities to have a uniform framework and a clear picture of its implementation.

CHAPTER ONE

1.1 INTRODUCTION

The teaching and learning process have metamorphosed from didactic methods to a more active involvement and engagement of learners over time. Previously, the schooling system was characterized by a teacher-centred, subject-based curriculum and memorization of content using the conventional approach, which focuses on reading and writing (Braine, 2003; Giles & Hargreaves, 2006). Traditionally, teachers were trained with more emphasis on theoretical application of content as there were no practical classroom management skills (Levine & Marcus, 2010; Ng, Nicholas & Willams, 2010). As more knowledge was acquired through innovation and theories evolving from educational research, teaching has become more dynamic in nature. Recently, the teaching and learning situation has transformed from an instructor-based model to a social learning model coupled with learning theories such as behaviourists' theory, cognitive theory, constructivism theory and these transformative theories are challenging the functionality of teachers (Kegan, 2009). The traditional ways of teaching could not meet up with the emergence of new theories like multiple intelligence theory, multimedia theory and connectivism theory, which places more emphasis on learning by using different functional areas of one's brain to connect and interact with the use of audio-visual resources and other information technology (Clark &Mayer,2016; Rashid & Asghar, 2016).

With the current educational trends, active learning has become the order of the day through the constructivism theory towards a modern era of innovation through technology. The pedagogical activities are also moving from inquiry–based and problem-solving to creative activities with the use of digital technology. The concept of the traditional classroom and the theoretical means of imparting knowledge have changed as the classroom has become more open, with interesting and challenging interactive learning activities. Online and virtual classrooms are now evolving; learning is becoming more interactive, and more attention is placed on the use of innovative technological tools (Chen, Chang & Chew, 2016; Wells, 2019). Past pedagogies has become irrelevant with the shifting weave of technological transformation and advancement (Chigona, 2015; Niess, 2015), and thus the schooling system has dramatically changed. Evidently, some developed nations such as the USA, Finland, Chile and others, have tapped into this with the use of multimedia resources which make the classroom a virtual environment.

Teaching is becoming more complex with the emergence of new classroom technologies and pedagogical methods are also changing by placing students at the centre of the teaching and learning process (Louis, 2013; Dede, 2014). The changes in the schooling system through diverse technological innovation is what Toffler (1970) referred to as "future shock" acknowledging the human inability to adjust to a great amount of rapid changes. From my experience, many teachers in Africa are now in the state of "future shock" and the present pre-service teachers need more training with innovative strategies to gather relevant experiences in order to avoid being caught up with Toffler's prediction of "future shock". It is common practice in Africa that many pre-service teachers are seldom challenged through exposure to innovative technological tools to assist with their classroom practice. According to Morris (2001) and Schwarz (2009), pre-service teachers are unable to transfer pedagogical understanding and practice learned in the universities teaching methodology classes to their practice in the field. These methods classes are classes where the pre-service teachers are exposed to the pedagogical principles and methods of teaching.

As educational systems internationally are moving away from the inherited strategy to more organized and innovative strategies with technological tools, the African nations should urgently develop competent teachers through modelling teaching using innovative digital technology to meet the 21st century demands. Studies have also shown that a change in the teachers' education has to take place, and there is a need to emphasise innovative and technological knowledge (Al-Husseini & Elbeltagi, 2015; Mincu, 2015; Chigona, 2015).Therefore, the current educational system should move towards more student-centeredness with reflective, interactive and supportive models of learning. The expected methods of training teachers in the 21st century should centre on skills competencies, which will allow learners to be actively involved in the learning process. Zepke and Leach (2005) opined that involving learners in learning activities would ultimately enhance retention, which would help learners to complete any given task. Pre-service teachers must model methods that support exploration, interaction, collaboration, and feedback mechanisms. Therefore, the theoretical means of educating pre-service teachers on how to teach needs changes that will accommodate innovation as technology is defining all aspects of human life. Clark and Mayor (2012) state that while instructional methods remain essentially the same, so does the learning, no matter which medium is used to deliver the instructions.

Globally, technology has become the order of the day. Industries are undergoing major transformations, as half of all jobs are lost due to the challenge of automation, while society is facing changes to humanity such as inequality and climate changes (Rosa, Rudel, York, Jorgenson & Dietz,

2015; Richta, 2018). With these changes, new technologies have to be integrated to prepare our students for new jobs (Roblyer & Doering, 2012). It is high time we prepared our youth, especially the pre-service teachers; for this uncertainty and we therefore need to assist this set of students to develop new skills for the 21stcentury, which can transcend to tertiary education. Therefore, as teachers and school leaders primarily drive schooling, they must be part of the transformation process. Teachers and school leaders must lead the transformation process particularly as teachers are the main drivers of learning and they are the most important school contributors to the students‟ learning (Zeichner, Payne & Brayko 2015; Strong, Ward & Grant, 2011).Notwithstanding that teacher trainers must change their methods of delivering the curriculum, which involves promoting 21st century skills. Consequently, the role of teachers and systems around them must be re-invented. The changes should be modelled in spaces where teachers are trained. The university should not only produce teachers but train teachers by giving more attention to practices through modelling with the integration of technological tools. They should incorporate more practical-based curriculum innovations during the university training.

Universities should be involved in practical teaching with special attention to micro-teaching. Micro-teaching provides authentic learning experiences with the ability to practice real teaching in a non-threatened environment. It is a practical procedure, which involves learning by doing, retaining and absorbing more knowledge, Remesh (2013), Göçer, (2015) and Molina (2012) posits that micro-teaching increases pedagogical content knowledge of pre-service teachers. According to Singh (2011) micro-teaching is a student-centred strategy, which helps pre-service teachers to develop confidence and effective communication skills. It is used to shape and develop specific teaching skills; with frequent practice errors being gradually eliminated (Passi, 1976). Adewoyin and Okuntade (2017) claim that micro-teaching, as an organized practice, makes it possible for pre-service teachers to focus on teaching skills and to practice the skills in a conducive environment in order to develop confidence in their teaching. Bell (2007) argues that micro-teaching empowers students with valuable teaching experiences by showing the relationship between theory and practice. In order to incorporate more practical learning experiences during micro-teaching, best practices can be modelled.

Scholars have not denied the significant benefits of the micro-teaching model in teachers' education programmes (eg. Zhao & Feng, 2017; Ike, 2017; Onwuagboke, Osuala and Nzeako, 2017; Tuluce and Cecen, 2017; Liu,2018; Reddy, 2019) but it is high time to start using simple, available and affordable devices to enhance micro-teaching presentation among pre-service teachers such as phones or palm tops. Reld (2011) proposes a practice turn specifically for teachers' education with

theory integrated into practice bringing together pedagogies of observation and pedagogies of reflection with pedagogies of enactment with specific contexts of particular students in mind. With new innovations in education, educators of the higher education institutions are to take cognizance of the importance of integrating technological innovation with a teaching model in the teacher education programmes to motivate the younger generations towards learning in a new way (Venter, 2017). The teacher education programmes in this 21st century needs an element of technology in its curriculum content particularly with micro-teaching practicum which are used to train pre-service teachers within the rudiments of learning how to teach. Therefore, integrating all processes of teacher education programmes with technology may assist the competencies of pre-service teachers as illustrated below:

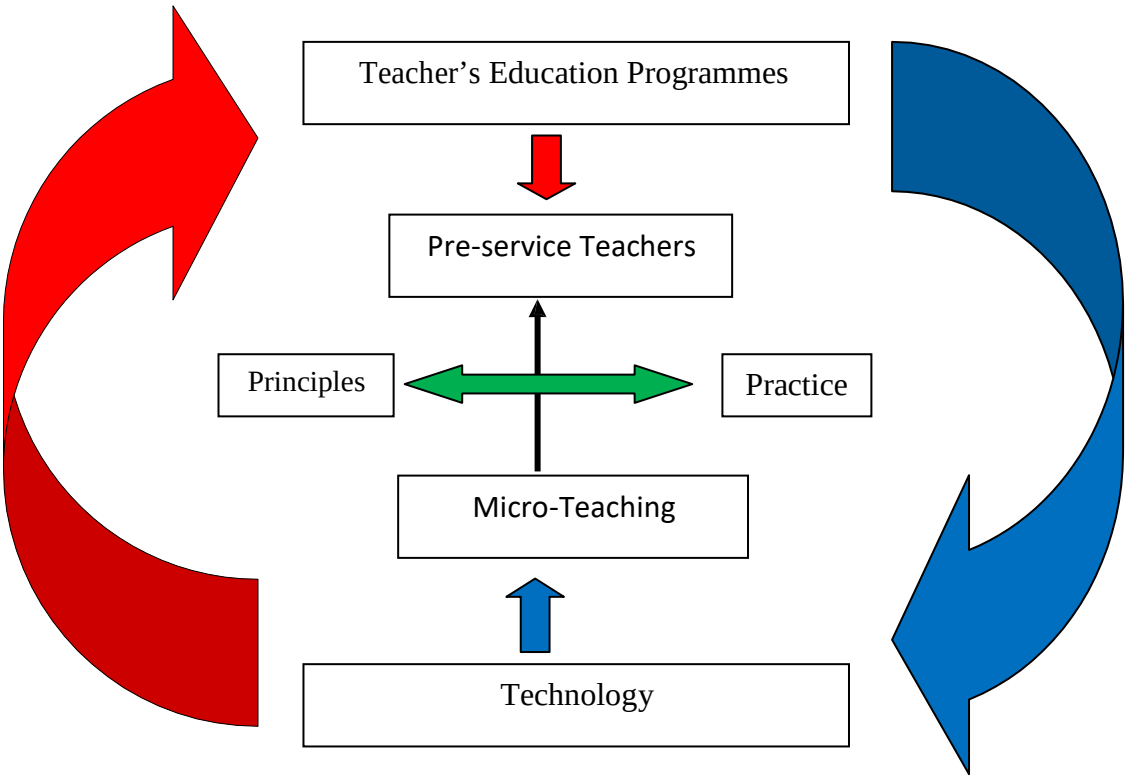

Figure 1. 1: Blending teacher's education programmes with technology through micro-teaching

From the above illustration, the teacher's education programmes should expose the pre-service teachers to the principles and practice of teaching through micro-teaching with simple technology, which may allow them to observe and model good teaching behaviours. Modelling best teaching practice has been shown to support teachers' training. It is a known fact that practice leads to perfection, if pre-service teachers are allowed to rehearse and model teaching via digital technology,

it will eventually improve their practice. Modelling permits students to learn a particular action and to exhibit specific behaviours (Bandura, 2001). Joyce and Showers (2002) emphasize modelling as a key element in the acquisition of new knowledge and skills. By modelling best practice during practical learning in micro-teaching, it can be blended using technology as seen in the above illustration because internationally technology enhances meaningful learning. Effective implementation of technology gives room for positive working relationships between teachers and learners (Bakir, 2016; Chigona, 2015). Technology motivates students to learn, it enhances individual instruction and it creates self-help resources for both the teacher and learners (Feist & Reid, 2018). Brenner and Brill (2016) opine that technology is used to design learning activities and it helps to engage students in learning. Using a digital technology as a platform where pre-service teachers will have access to practical models of teaching behaviour which are supported through images that are accessible before and during practice teaching at school, could guide the pre-service teacher towards more practical experiences to contextually relevant situations in South African schools.

However, given the massification of education, students often lack appropriate opportunities to be exposed to spaces to rehearse micro-teaching within a micro-teaching rehearsal loop – namely, performing the lesson, feedback from the lecturer, rehearsing (with continuous professional feedback from their knowledgeable facilitators) and rehearsing more to improve the micro-teaching skills. Most students find it difficult to effectively apply micro-teaching skills and teach by applying what they were taught at university. In fact, students need to interact, rehearse and practice teaching in a conducive atmosphere, a space where they can put into practice all theoretical and acclaimed practical skills learnt from their practical learning classes, Education Practice (EDC) 101, 201 and 301which are prerequisite to the final year course EDC 401. Thus, in this study the researcher seeks to explore how simple technology can be used to give such support to the final year B.Ed. students‟ micro-teaching skills in order to fill this gap.

1.2 BACKGROUND TO THE STUDY

Teacher education programmes all over the world have the same basic elements with little variations depending on their curriculum content. These basic elements are:- (1) Basic knowledge of educational foundations- these are courses or modules that are educationally related, including educational theories and its implication to education as it relates to the principles and practice of education, (2) philosophy of education, (3) educational policies educational management and psychology of education, (4) curriculum and instruction, educational research and sociology of

education. The educational theories provide an opportunity for the pre-service teachers to reflect on the acquired knowledge in order to articulate new ideas. Teacher education programmes also give more attention to the knowledge of basic subjects, such as the methods of teaching in different areas of specialization. The acquired knowledge and skills in the teacher education programmes includes the procedures and strategies of teaching, and evaluation and assessment of subject matter. Presently, emphases are placed on teaching skills, technology competences to improve teaching and the ability to work in the classroom effectively. In addition, the practical aspect of the programme which is an important and compulsory aspect of all teacher education programmes. This includes teaching practice, school observation and teaching rehearsals with peers, video demonstrations and other forms of educational practice that are supervised for evaluation purposes. This practice exposed the pre-service teachers to translate the conceptual knowledge of theory into classroom practice and help them to develop the professional competences required for the profession.

Micro-teaching is a teaching technique used in teachers' education programmes to train pre-service teachers to practice some professional teaching behaviour. Previously, the training of teachers is based on the conventional strategy without feedback mechanism. This lack of feedback and the inability of the pre-service teachers to practice the act of leaning to teach within the context of their understanding lead to the introduction of micro-teaching. Micro-teaching according to Fernandez and Robbison (2006), Fernandez (2010) and Remesh (2013), is a teacher training technique for learning teaching skills, it employs real teaching situations for developing teaching skills and help to get deeper knowledge regarding the art of teaching (Kim, 2014 and Fernadez 2010). Van sickle (2013) opined that micro-teaching deepens teachers' understanding of teaching skills with the ability to build confidence (Remesh, 2013; Bilen 2015; Darsinah, 2018; Reddy 2019). This serves as a mentoring procedure, guiding and helping new teachers to develop competencies in teaching (Mahmed & Shahriar, 2013). It has also helped in-service and pre-service teachers in the development of teaching skills thereby giving them the opportunity to teach effectively (Zeki, 2014). Deland and Nerland (2005) stated that micro-teaching facilitate the enhancement of the understanding reform-oriented teaching. Micro-teaching is a technique aimed at preparing teacher candidates to the real classroom setting (Brent & Thomson, 1996).

In 1994, Apartheid and racial segregation ended in South Africa. There was a significant change in the teacher education programmes. About 102 teacher training colleges were merged with the existing universities with a uniform and standard curriculum within the framework of the National System of Teacher Education (NSTE). During this period, the teacher education system was shifted from province-based to national competency-based structures. After independence in1994, different

policies were launched to improve the development of teachers in terms of knowledge, content and pedagogy, alongside the development of practical experience in learning to teach with information and communication technology (ICT) tools. The frameworks and policies are carried out by the government through the Department of Basic Education (DBE). Presently, the central government has been able to introduce the universal requirements for all teachers in South Africa called the *Minimum Requirements for Teachers Education Qualifications* (MRTEQ, 2011 and 2015) respectively.

MRTEQ focuses on the re-design of the curriculum based on technological innovation with particular emphasis on subject content knowledge, how to teach that content knowledge, and practicing the teaching component via the use of available technological tools. The pre-service teachers who prepare learners with the skills for the 21st century should realize that teaching for 21st century skills involves critical skills like creativity, complex decision-making, leadership and societal skills, working cohesively with others and collaborating across borders (Beetham & Sharpe, 2013). Therefore, the role of teachers and systems around them must be re-invented. The changes should be modelled in spaces where teachers are trained – at higher education institutions.

At a national level in South African teacher education, the MRTEQ (2015) document promotes practical learning that can be learnt at schools (learning in practice) and for practice at the university (learning for practice). Practical learning for school practice is commonly taught and modelled through micro-teaching. Micro-teaching allows pre-service teachers to be informed about each teaching skill, to the extent of having it demonstrated, and then giving the student an opportunity within a given time and space to carry out the skills. Usually the student would choose the subject matter to suit the learners. However, micro-teaching across different programmes should take into account the experiences of the student, for instance in the under graduate course, the B.Ed. students will be exposed to a number of skills within an increasing level of complexity across the four years' programmes. Nevertheless, students require more exposure to the rehearsal, teach and re-teach process, and in addition, practice teaching skills with technology. Thus, the university needs to align the theory with more practice that will improve the micro-teaching skills.

At the level of the university, the university Instructional Operational Plan (IOP) of 2016 -2020 has provided adequate strategic plans for teaching and learning with an emphasis on the infusion of technology. Students accepted for entrance by the university are often from educationally disadvantaged backgrounds. Moreover, most students in Faculty of Education are predominantly working class students who are unlikely to be exposed to technology from their previous schools.

One of the goals of UWC is to provide excellent education to their students with quality teaching and learning. The university, in line with the WCED policies on technology, has developed a strategy to improve teaching and learning through ICT (Institutional Operating Plan 2016-2020). Universally, technology has been solving educational problems, especially in developed nations as they have integrated technology into their curriculum. Technology allows students to learn better and faster, it helps students acquire multi-tasking skills and enable students to learn at their own pace (Robertson, 2019; May & Elder 2018). However, the pre-service teachers at UWC have not been able to integrate technology in line with WCED policies because of their socio-economic background. Most of the students came from educationally disadvantage areas, which perhaps might affect their technological life. Therefore, the university needs support strategies to infuse technology into the pre-service teachers' educational programmes to help them transit from university to the teaching profession.

Increasingly, pre-service teachers are using online platforms as a convenient source for blended learning (Hong, Hwang, Szete, Tsai, Kuo & Hsu, 2016). Teachers and students have wider exposure to technology for accessing information (WCED 2012). Therefore, the current cohort of pre-service teachers should have technology integrated in the teacher education programmes. In fact, because many pre-service teachers themselves were not exposed to being taught with technology integrated into their lessons, micro-teaching can be tool to support teachers in their practices with the use of cell phones. Cell phones are gadgets well used by students: - it is one of the simplest technological tools that can be adopted by educational institutions to enhance learning among students. In recent times, the cell phone has become student companionship for easy dissemination of information, ideas or opinions through one platform or the other, that is why it is referred to as a " vast library of global knowledge" (The World Development Report, 2016, p. 229). According to AlTameemy (2017), who stated that students love to use phones in their daily life, it can simply become the ideal tool through which learning finds its way to students who are usually less active and not interested enough in class. Khrisat and Mahmoud (2013), opine that mobile technology creates an active learning environment. Integrating technology such as the cell phone as an instructional strategy in micro-teaching classes may help in sustaining and improving students" knowledge level in the application of teaching skills. Thus, in the present study, the researcher seeks to explore how technology can be used as a tool in micro-teaching through a digital video platform using a cell phone: - that is, blending the theory and the practice together as stated in MRTEQ policy guidelines as illustrated below.

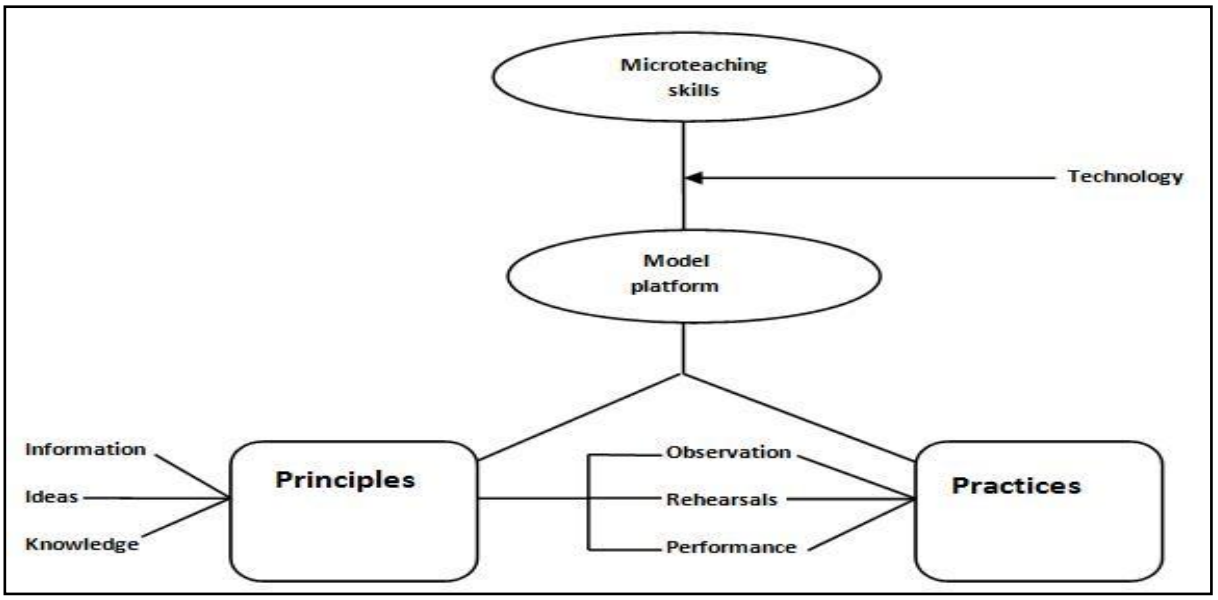

Figure 1.2: Blending the knowledge of principles and practice of micro-teaching with technology through model platform.

The micro-teaching skills can be practiced often with their cell phones as a technological tool, observing the process which will help develop self-evaluation leading to the growth of self-confidence and the competencies needed for the current situation transcending from learning through service. Much cannot be discussed about micro-teaching knowledge level of pre-service teachers in using their phones as a recording device to enhance their teaching experience but it is clear that many pre-service teachers themselves have not been exposed to technology as a tool in enhancing their teaching skills. Using digital technology through the cell phone where pre-service teachers will practice teaching behaviour supported through images that are accessible before graduation could guide the pre-service teachers towards more practical experiences to contextually relevant situations in South African schools. Gillwald, Mayo, and Stork (2015) encourage an online platform that will allow students to communicate with each other and their educators as well as share educational content and participate in discussion. Such a platform should mimic exposure to digital platforms that learners at schools will experience from social platforms in their daily technological lives.

Thus, transforming school education using digital technology would require an accompanied change in the training of teachers towards a more practical approach using technology. My interest in this research is that the 4th year students who has acquired so much experiences from their EDC courses from year one to year four and other influences of the pre-service teachers from the professional

community includes their supervisors, tutors, mentor teachers, fellow pre-service teachers and school observations should be put to test before graduating from the university, using the cell phone as a recording device in a group of five or six. This approach may help identify specific strengths and weaknesses of the pre-service teachers which may require recommendations or improvements before graduating. In addition, this may also help in measuring the preparedness of the pre-service teachers to teach at schools. This study aims to develop a micro-teaching platform using a cell phone as a technological tool to support the pre-service teachers in their practice to meet up with the 21st century teaching skills needs.

1.3 RATIONALE OF THE STUDY

The research seeks to introduce the integration of a digital video technology as an alternative strategy for improving micro-teaching methodology in order to engage students in active learning. The purpose of this research is to develop a model of a digital platform, which can be used as an instructional strategy in micro-teaching among pre-service teachers in their final year (year four). Through a process of using their cell phones as a recording device to record their teaching performance based on their past experiences in micro-teaching, school observation and teaching practice exercises, in order to gather pertinent feedback about their current practice. The feedback of the recorded video will be used to determine the effectiveness of the digital video platform on the micro-teaching presentation and the teaching practice exercise respectively and also to determine the micro-teaching knowledge level of the pre-service B.Ed. teachers towards using technology as a tool. The significance of digital technology in learning cannot be undermined: - Technologically tools such as cell phones as a media platform is one of the fastest means of communication which are widely used by young adults (Won, Evan, Carey & Schnittka, 2015). It serves as a means of learning and exchanging meaningful ideas. Ivola & Gachago (2012) and Bynum (2011) assert that social media platforms as an online and mobile technology increases students' engagement outside the classroom and creates a new innovative learning strategy. The aim of the researcher is to use the digital technology as a social platform to encourage pre-service teachers to value micro-teaching as a prerequisite to effective performance in teaching practice and to improve their knowledge level in using cell phones as a technological tool for learning to teach.

Therefore, the major purpose of this research is to determine the extent to which a digital technology, as a platform, will contribute to the efficiency of micro-teaching among the pre-service teachers. Presently, digital platform has become order of the day among young adult, it has serve as their major source of social interaction and it may as well influence the pre-service

teachers knowledge of micro-teaching. Importantly, the research will advance micro-teaching as a strategy at universities in developing a process where cell phones could be used as a recording device during micro-teaching exercises for self-evaluation, self-reflection and self-development. Consequently, the basis for this study is to structure the process of integrating a digital technology platform into micro-teaching by using cell phones in the bid for quality micro-teaching presentations to meet the professional standards required in classroom practice.

1.4 STATEMENT OF THE PROBLEM

Research shows that most pre-service teachers are struggling to teach well because the transition from theory to practice are often blurry (Teng, 2017). This shows that having a teaching qualification does not automatically make you a good teacher (CHE, 2015). Becoming a good teacher is characterised by knowledge, confidence and competence in lesson presentation. Competent learning is always a mixture of the theoretical and the practical skills (MRTEQ 2011). With particular reference to MRTEQ (2015), there has been a little digression from the policy guideline of training pre-service teachers in UWC particularly on the application of micro-teaching skills. Teaching is a purely skills- based approach, which relies almost exclusively on evidence of demonstrative outcomes as measures of success. The researcher intends to identify the lack of alignment between policy and practice in as much as the pre-service teachers are to learn how to model behaviours which will expose them to the practical process of the teach and re-teach cycle with technological tools in a laboratory.

Presently, there is attention on pre-service teachers about their teaching performance not minding their background knowledge or how they were taught. Most of the higher education teacher training institutes place emphasis on the theory of teaching. The theoretical knowledge is not challenging enough and also ineffective when it comes to supporting some critical components such as applying skills of teaching and fostering deep understanding of the concept (Bates, 2015). Harrington (2013) opines that the transfer of theory to practice in teacher education is not strong enough. The teacher trainers and the teachers' pedagogical expertise depend on the knowledge acquired at the training school (Kilinc, 2010). Research has shown that the way teachers are trained has not significantly changed from the way teacher trainers are trained in as much that the conventional lecture approach is still dominating teaching professions (Der Valk & Broekman, 1999; Adewoyin &Okuntade, 2017).

In lieu of the above, and from my personal observation in light of Kilinc (2010), many pre-service teachers lack adequate experience in micro-teaching presentations based on the strong emphasis of the theoretical aspect of teaching used by the teacher trainers. Teachers need to learn by modeling behaviours which will expose them to the practical process of learning to teach. Model demonstrations would allow students to acquire the mastery or knowledge of a concept and give them the ability to practically apply them within and outside the classroom (Baxter, 2016; Martins, 2016).

Therefore, the researcher seeks to infuse technology through the cell phone as an alternative strategy to enhance the micro-teaching methodology and to encourage students towards active learning. In addition, this study seeks to fulfil the gap in the literature, namely, vast research has been conducted on the use of cell phones to research in so many disciplines (Ng, Thang, & Noor, 2018;Tkach& Williams, 2018) but few has been conducted on the integration of cell phones in the application of micro-teaching skills for students to learn the practice of teaching in lieu of the micro-teaching laboratory. Furthermore, the focus of the current research is also to align the policy of MRTEQ (2015) on practical learning, particularly learning in service, preparing teaching and reflecting on lessons presented by oneself using cell phones as a recording device.

1.5 AIM OF THE STUDY

The aim of this study is to explore the application of micro-teaching skills using cell phone digital technology among 4th year B.Ed. students at a University in the Western Cape Province, South Africa.

1.6 OBJECTIVES OF THE STUDY

- To investigate the micro-teaching knowledge level and the application of teaching skills with digital technology among the 4th year B.Ed. students at UWC.

- To evaluate the use of cell phones digital technology as a micro-teaching presentation platform among the pre-service teachers.

1.7 RESEARCH QUESTIONS

The main research question of the study:

How does the 4th year B.Ed. pre-service teacher's at UWC apply micro-teaching skills with digital technology?

1.8 SUB-RESEARCH QUESTIONS

(1) What are the micro-teaching knowledge level of final year pre-service B.Ed. teachers, in general, and its relation to technology as a tool in micro-teaching presentation?

(2) How does cell phone as digital technology develop micro-teaching skills in 4th year pre-service B.Ed. teacher's programme at UWC?

(3) How does a digital video platform contribute to the effectiveness of the micro-teaching presentation?

1.9 SIGNIFICANCE OF THE STUDY

Micro-teaching presentation sessions provide opportunities for students at all levels to develop specific teaching skills and to practice teaching under controlled conditions. These conditions allow the pre-service teachers to develop teaching skill, to the extent of having it demonstrated, and then giving them an opportunity within a given time and space to carry out the skills. The findings of the study may help the Faculty of Education to see the need for a space – like a micro-teaching laboratory - where pre-teachers can practice authentic teaching.

The findings of this study is intended to augment current research on how to improve micro-teaching methodology using digital technology by means of cell phones to access videos on learning how to teach. It is believed that it will be of importance to pre-service teachers at UWC who may find micro-teaching presentations challenging. It may serve as a form of innovative strategy and may assist the pre-service teachers to value and have a positive mindset and in-depth knowledge towards the micro-teaching presentation. The digital video platform may serve as a guide to the pre-service teachers to reflect on their teaching performance and plan towards improving their micro-teaching presentation skills.

In addition, pre-service teachers can develop confidence and competence in micro-teaching skills thereby enhancing their teaching practice experience. The result of this research may be useful to inform curriculum planners to find a way of intensifying the integration of technology into teacher education programmes. This study may also be relevant to teacher educators in using innovative strategies to inspire their students to use digital technologies as an alternative way of using their cell phones for meaningful learning as opposed to unprofitable daily chatting.

1.10. SCOPE AND LIMITATIONS

The scope of this study is limited to the use cell phone digital technology as a platform in micro-teaching presentations among the pre-service teachers in the Faculty of Education at the University of the Western Cape. Moreover, UWC is a national University in Western Cape Province, South Africa and is committed to excellence in teaching and learning with a unique academic contribution to the development of the province. The university is one of the four universities in the province producing qualified teachers from the faculties of education to various schools within the Province. The scope of the study will only cover 4th year students that have passed through micro-teaching presentation in their 2nd and 3rd year. This will help them to deepen their knowledge and understanding about the teaching skills and help them to reflect on school observation and teaching practice respectively. The 4th year students were selected because of their background knowledge in micro-teaching and also based on my personal observation of the general pre-service teachers' level of commitment to micro-teaching.

1.11 CHAPTER SUMMARY

In this chapter, I have discussed the introduction of the study by looking through the transformative processes of teaching and learning toward the current technological era. I discuss the background of the study in line with teacher education programmes with the context of the study focusing on UWC strategies of training the pre-service teachers in relation to MRTEQ and micro-teaching assumptions. I have also discussed in brief the history of teacher education pre-Apartheid and after independence, along the rationale of the study, I have discussed the statement of the study, aim and objectives of the study, stated the research questions, the significance of the study and the scope of the study. In the next chapter, I will be discussing the theoretical framework that underpinned the study. I discuss the constructivism theory, the social learning theory including the TPACK theory and the rationale for using the theories. I also discuss the model that guides this study along the principles of MRTEQ and micro-teaching assumptions

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CHAPTER TWO

THEORETICAL FRAMEWORK

2.1 INTRODUCTION

This chapter is a build-up to the previous chapter which provides an orientation of the introduction and the background of the study. The context of the study, the statement of the problem and the rationale were discussed. The aims and the objectives of the study along the research questions and the significance of the research study within the context of teacher education and their professional development at UWC and South Africa were also discussed in the last chapter. Micro-teaching is one of the fundamental core modules in the development of teachers, it is a procedure that is used by the teacher educators to prepare and develop the pre-service teachers towards becoming a professional. As seen in the literatures, micro-teaching is not a new concept in teacher education programmes, it has been used both locally and internationally, albeit differently in varying contexts, some using it more effectively than others. In addition, with the current technological challenges in the teaching and learning process, the strategy of teaching has gone beyond mere explanation of concepts without the integration of creative and innovative strategies. These creative and innovative strategies are technologically-driven which may help the present pre-service teachers to model the acceptable teaching behaviours.

In this chapter, the theories that underpin this study were discussed in relation to micro-teaching. I discuss the application of Constructivism theory, social learning theory and Technological pedagogical and content knowledge (TPACK) theory with their significance to teacher education programmes. Importantly, this chapter explains the key components of the research study with a self-developed model called the *Knowledge Acquisition, Construction and Implementation with Technology* (KACIT) model. The KACIT model describes the conceptual framework of the study in light of how pre-service teachers can develop the act of learning to teach alongside three primary theories mentioned above. The concept of the KACIT model in this study is to help the pre-service teachers conceptualise the key skills of micro-teaching in order to build up the participants‟ knowledge level of micro-teaching and how the keys skills can be applied during the teaching and learning process. The three theoretical frameworks used in this study were germane to the teaching and learning process, and particularly the professional development of teachers.

2.2 THEORETICAL FRAMEWORK

This study is based on the theories surrounding effective micro-teaching leading to the preparedness of teachers within a B.Ed. programme. It is the conceptual frameworks of Vygotsky's socio-cultural theory and Bandura's social learning theory that frames the current study. I discuss these two theories along the principles that can enhance learning. These theories show how pre-service teachers can effectively develop the knowledge of micro-teaching along the context of this study and how micro-teaching can guide and support the preparation of the pre-service teachers. Supporting the modelling of teacher behaviour during micro-teaching is an additional use of technology during their teaching. Here, I draw extensively on TPACK (Technological Pedagogical and Content Knowledge) as a useful model in this research study because it emphasises the use of digital tools as strategies to support teaching and learning processes. This model developed by Mishra and Koehler in 2006 and the combination of Vygotsky and Bandura's theories in line with micro-teaching assumptions in Teacher's preparation programmes informed the KACIT model illustrated below.

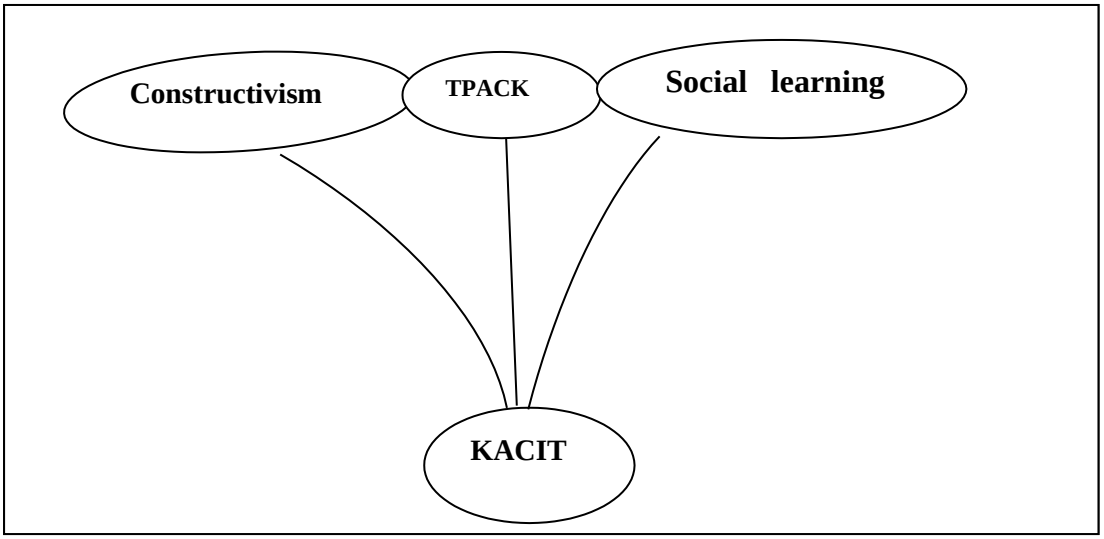

Figure 2.1: Showing the theories that underpinned KACIT model

From the above diagram, it is evident that this study saw the significance of constructivism theory, social learning theory and the technological pedagogical content knowledge framework on teacher education programmes which focused on teaching competencies as a yardstick for professional development. The ideas of giving pre-service teachers an opportunity to model and practice how to teach with digital technology as a demonstrative outcome for professional competencies as stated by the *Minimum Requirements for Teacher Education Qualifications* (MRTEQ) assumptions and the ability to exhibit the expected graduate attributes allows this study to come up with the model called

Knowledge Acquisition, Construction and Implementation with Technology (KACIT). This model is hinged on TPACK framework due to the nature of this study and the technological challenges of the 21st century teaching skills. The KACIT model emphasizes how the content and pedagogical knowledge of micro-teaching can be put to test through a digital technological tool to determine how acquired knowledge has helped to inform the understanding of micro-teaching skills with the implementation and usage of technology.

The above illustration shall be discussed in phases, firstly, starting with the theoretical frameworks of constructivism Vygotsky's (1978) social cultural theory, Bandura's (1977) social learning theory and the technological pedagogical content knowledge TPACK of Mishra and Koehler (2006). In the discussion, the researcher placed emphases on the relevant aspects of these theories in light of the micro-teaching assumptions in relation to the study and how they have helped inform the development of the KACIT model. Secondly, the KACIT model was later used to describe how the pre-service teacher could construct and model expected teaching behaviours from their prior knowledge with simple technology tools, as a process of enacting the acclaimed knowledge of micro-teaching which was used to answer the research questions. Finally, the key components of MRTEQ, graduate attributes and reflective practice were also discussed in this chapter.

2.3 CONSTRUCTIVISM THEORY

Many argue that the constructivist model of learning reflects the best understanding of the brain during learning. There are, however, issues regarding this model that is widely debated (Phillips, 1995). The arguments about constructivism mainly stem from the fact that it is not a unified theory, but rather a conglomeration of different positions with varying emphases (Tynjala, 1999). But there are four areas of agreement, namely, constructivists believe that knowledge is actively constructed, and rejects the passive acquisition of knowledge (Brooks and Brooks, 1999); constructivists value prior knowledge; there is no external reality as knowledge is subjective (von Glasersfeld, 1999); and constructivists believe that if teachers accept constructivist tenets, then it leads to the adoption of constructivist pedagogy. The reviews on constructivist theory show that there are generally two forms of constructivism, the individual and social forms. Some authors emphasise the individual forms of constructivism (e.g. Kelly, 1955; Piaget, 1972 and von Glasersfeld, 1989); while others emphasise the social forms (e.g., Gergen, 1995; Vygotsky, 1978). The movements or groups focused on in each form related to individual constructivism are cognitive constructivism, personal

constructivism and radical constructivism. On the other hand, the movements or groups for the social forms are social constructivism and the socio-cultural theory.

I focused on the social forms of constructivism for this study, social forms of constructivism emphasise the importance of the social during learning. It specifically focuses on how individuals develop cognitively through social interactions largely influenced by their cultural experiences. Human development is socially situated and knowledge is constructed through interaction with others. Conceptual growth comes from the sharing of various perspectives and the simultaneous changing of our internal representations in response to those perspectives as well as through cumulative experiences (Cunningham and Duffy, 1996). Fernandez and Robinson (2006) perceive learning as a social interactive process whereby ideas are exchanged between teachers and students or any other relevant materials in the classroom. Vygotsky (1978), the developer of this social constructivism theory opine that learning is a social and collaborative activity where people create meaning through their interactions with others. According to Screlber and Valle (2013) ideas can be created through interaction with peers, teachers and learning materials during the teaching and learning process. The social constructivism theory believes in the social interaction that exist in the classroom and the primary goal of using this theory is that students can learn by giving them the training to take initiative for the learning experiences. Vygotsky (1978) highlights the convergence of the social and practical elements in learning by saying that the most significant moment in the course of intellectual development occurs with speech and practical activity, through practical activity, a child constructs meaning on an intra-personal level, while speech connects this meaning with the interpersonal world shared by the child and her/his culture.

This theory emphasizes learning as an apprenticeship procedure through imitation of the actions, collaborate the real learning experiences, and using the tools available to solve problems. The learning activities that are interactive and student centred-approach can only be possible if students are allowed to be more involved actively, rather than be passive listeners (Cunningham &Duffy, 1996). This theory gives room for group work in the classroom where learning and knowledge can be more interactive and dynamic. In the constructivist philosophy, knowledge is not given but gained through a real experience that is purposeful and meaningful to the students (Piaget, 1969; Vygotsky, 1978). This philosophy gives opportunity to students to make meaningful connections between new materials and previous experience. This is a learner-centred instruction, where students must be actively involved in learning activities that gives them an in-depth understanding of the concept in order to construct their meaning. The researcher believed this constructivist approach might help

to address individual challenges of the students' social categories, and their cultural meanings, and provide an important first step in a pedagogical dialogue.

Although, the pre-service teachers under investigation has been guided to acquire much of the micro-teaching knowledge before and during their training period that might have shaped their level of understanding (mentoring and academic knowledge). However, rarely in line with micro-teaching assumptions of the teach and re-teach process, interacting with peers within a social environment. Mcleod (2014) opines that the social environment influence what students think and how they think. The theory was useful to this study because it emphasizes the importance of prior experiences that precede the process of developing cognitive knowledge and see learning as a social interaction. In addition, with the zone of proximal development (ZPD) of Vygosky, which allow students to develop knowledge independently through interaction in order to put into action what they have acquired (head knowledge) with little or no support from expert. The pre-service teachers in this study will have access to interact as a group of six (6) putting together all acquired knowledge to produce a micro-teaching video on a topic of their choice as a team. The teams have great opportunity to collaborate and exchange ideas that may help them to grow independently. In this research, the pre-service teachers will be taking part in practical activities and using their cell phones as tools to solve teaching problems.

2.4 SOCIAL LEARNING THEORY

The social learning theory, which is also relevant to this work, has its roots in Edwin Holt and Harold Chapman. The duo in 1931 predicted that human learning is based on imitation. In 1941 two scholars, Neal Miller and John Dollar also supported this assertion. They revised the Edwin Holt social learning and imitation theory by emphasizing that learning occurs in four phases that include drive, cues, response and reward. Miller and Dollar argued that for someone to learn better, he must imitate an observed behavior. Albert Bandura later expanded the social learning theory in 1961 when he conducted a series of experiments that demonstrated the value of modelling behaviour.

Bandura explained that there is a direct correlation between a perceived self-efficacy and behavioural change. In 1986, this theory was expanded and renamed by Bandura as the social cognitive theory. The theory opined that knowledge could be acquired through direct observation. Observing someone's behaviour can be influenced by the environment through experience or media in a social

interaction. This theory is of the opinion that an individuals' knowledge acquisition can be directly related by observing others within the context of social interaction or experience (Bandura, 2002). The social cognitive learning theory's emphasis is based on learners‟ observation in order to imitate the observed behaviour. When people observe a model performing behaviour and the consequence of that behaviour; they easily remember it and can use it to guide themselves. It is clear that observing a model can prompt viewers to engage in behaviours that they already learnt (Bandura, 2002). The act of imitating and observing actions by students can form a basis for the understanding of a concept better than hearing. The survival of humanity is dependent upon the replication of the actions of others (Bandura, 2001).

Miller and Dollard (1941) argued that if someone is motivated to learn a particular behaviour, then that particular behaviour would be learnt through clear observation. Human behaviours are caused by personal behaviour and environmental influences (Bandura, 1986). The social learning theory is based on the idea that learning can occur by observing other people's activities. Social psychologists are of the view that environment can influence and contribute to behaviour. An observed behaviour can change a person's ways of thinking (Bandura, 2011). The social cognitive theory expresses how the individual learner acquires knowledge and skill by direct and symbolic terms. The symbolic capacity is that learning cannot only be direct experience but can also be indirect. Human beings are able to symbolically perceive events conveyed in a message, construct possible solutions and evaluate the anticipated outcome (Bandura, 2002).

Social cognitive theory opened up the scope of learning mechanisms by introducing observation as possibility. The ability of modelling serves as a means for students to represent actual learning outcomes symbolically. This theory reciprocates determinism; explains that students' or individual's behaviours are determined by the environment which serves as an influence on the individual behavioural patterns. According to Bandura (1977), knowledge acquisition is correlated to the observation model that can be interpersonal imitation of a media source. Bandura (2011) opined people could learn how to perform behaviours through media modelling. People can imitate behaviour through what they watch and act either positively or negatively. Media representations gain influence because what people see and hear help the social construction of reality. Social cognitive theory suggested that frequently repeated images presented in mass media could be potentially processed and encoded by viewers (Bandura, 2011).

Modelling does not only permit students to learn a particular action or exhibit a specific behaviour but also assists in inhibiting unwanted behaviour (Bandura, 2001). When students or teachers observe

a well-trained model, there will be increases in experience, knowledge and understanding. Modelling can be helpful for incorporating innovative strategies in training pre-service teachers. Observational learning occurs when instructions are given in the class to help students to see the outcome of a particular behaviour that are meaningful and valuable to the student to bring about self-efficacy in mastering the particular skill. In order for students to reproduce an observed behaviour, the observer must be able to remember the behaviour that can be of influence to its nature.

Modelling in the teaching and learning process can assist students to learn new ways of thinking and behaviour. The social cognitive theorist believes that any effort to change people's beliefs or attitudes must be directed to the society and practice of the social system; media can help to create social change. The principle of the social learning theory can enhance students' knowledge and retention. When students are allowed to imitate and reproduce an action, it aids retention (Bandura &Water, 1963). This principle of Bandura allows students and teachers to share learning responsibility. Classroom behaviour can be shaped by the teachers' model approach with appropriate behaviour. Teachers can be a model as to encourage students to adopt the observed behaviour, knowledge and practice which can be explicit to enhance the students' learning outcomes. With reference to social cognitive theory, behavioural competencies, social competencies and cognitive skills are acquired through observational learning. The individual observes the modelled event and forms a cognitive construct, which shapes future behaviours.

Since this study concerns micro-teaching, its theoretical framework is based on the social cognitive theory of Bandura (1977) which had previously been termed "observational learning" or "modelling", and was built on behaviourist learning theory. This study inclined itself to the aspect of observation and modelling. This theory suggests that people learn from one another through modelling, observing and imitating (Bandura, 1977). The pre-service teachers in this study who have been mentored before and during their training are expected to construct and model acceptable teaching behaviour as role- modelling was significantly associated with skill development (Yost 2002). Modelling a mentors skills and practices appears to play an important role in influencing first time teachers.

In the social learning theory Bandura (1977) states behaviour is learned from the environment through the process of observational learning. In addition, new patterns of behaviour can be acquired through direct experience or by observing the behaviour of others (Bandura, 1977). Research has shown that people learn from seeing other people in social settings and that learning involves a relationship between people and their environment (eg Marsick & Walkins, 2015; Jones & Gallen,

2016; Cunliffe & Mark 2017).Additionally, pre-service teachers that admire their mentors and view them as role models may be more observant on their mentor's behaviour and then more likely to try behaviours that they observed their mentor accomplished successfully (Bandura, 1977). Bandura (1977) believes that humans are active information processors and think about the relationship between their behaviour and consequences. Observational learning could not occur unless cognitive processes were at work (Bandura, 1977). Individuals that are observed are called models for example a pre-service teacher observing a mentor. These models provide examples of behaviour to observe and imitate (Bandura, 1977). Pre-service teachers usually observe their mentors and later they model or imitate the behaviour they have observed.

According to this theory, individuals learn by observing the consequences experienced by others. In essence, this theory explains that teachers may observe how different behaviours in other colleagues or their mentors are either rewarded or punished and ultimately follows behaviours that are rewarded. In addition, there is a link between mentoring and social learning, the link is evident in the fact that mentoring is an intentional process designed to support the process of self-learning and learning through self-actualization, making it a social learning process as explained by Bandura's (1977) social learning theory.

In conclusion, the researcher believes that these theories best explain the nature of the research. From the above discussion, it suggests how teachers must endeavour to make learning as real as possible because drawing on the students' experiences make them identify with learning while the teacher acts as a facilitator. Teacher educators should allow the students to construct knowledge through experience and reflect on the pedagogical and technological knowledge in order to model toward acceptable teaching behaviours. The pre-service teachers in this study has been exposed to a variety of experiences from their practical learning courses and all other acquired pedagogical knowledge from schools observation, teaching practice, mentors and supervisors which can also be reproduced using available technological tools to determine their level of understanding of the technological and pedagogical content before graduation. The outcome will help to determine how to restructure the micro-teaching modules within the B.Ed. programmes.

2.5 TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE (TPACK)

The TPACK framework is a useful model in this research study because it emphasises the use of digital tools as strategies to support the teaching and learning processes. Mishra and Koehler developed this model in 2006. The model builds on Shulman's Pedagogical Content Knowledge

(PCK) of 1986, a process where content and pedagogical knowledge is combined in the teaching and learning process. The emphasis of the model is based on the fact that it is essential for teachers to have technology knowledge in relation to their understandings of pedagogy and content knowledge. This model was designed with the idea that content and pedagogy knowledge ought to be the foundation for any technology that will be used by teachers to enhance learning. In the TPACK model, Mishra and Koehler identify six kinds of knowledge that may influence teachers‟ strategies and this six were later combined and expanded to include:-Pedagogical content knowledge (PCK), Technological Pedagogical Knowledge (TPK) and Technological Content Knowledge (TCK) as seen in the model below:

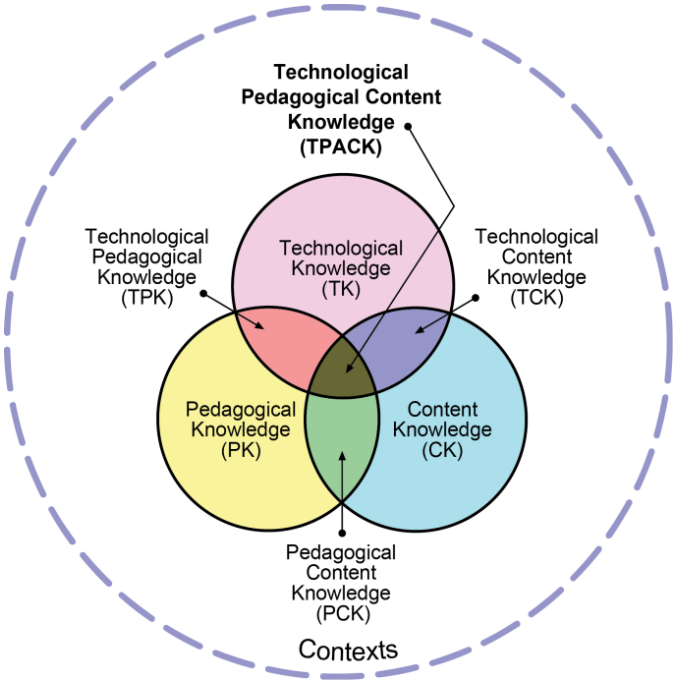

Figure 2. 2: TPACK model Mishra and Koehler (2006)

From the model above, TPACK framework contains six levels of domains that includes; the technological knowledge (TK), this is the awareness and understanding of an existing technology and its usefulness to enhance effective teaching and learning processes. The pedagogical knowledge (PK), involves having an in-depth knowledge and understanding of various instructional strategies for effective content delivery and selecting appropriate methods and evaluation procedures. The content knowledge (CK), this is the understanding of the relevant ideas and information of the subject matter and the ability to apply concepts and theories for development of more knowledge on the subject matter.

These were later entwined into another three important components for the effective instructional delivery of a particular content. The Technological Pedagogical Knowledge (TPK) is the understanding and application of the appropriate technological tools alongside the instructional strategies to deliver the content in the bid to enhance learning.TPK emphasises a set of skills that teachers develop to identify the best technology to support a particular pedagogical approach. In with this study, pre-service teachers will be allowed to collaborate as a group and share ideas using a digital tool. During the collaboration process, students interact and reflect on what they have learned using the tool to present what they know.

The Technological Content Knowledge (TCK) is the understanding of how technology may be used to enhance the content that indicates the ability to select suitable technology for a particular content. The TCK on the other hand, is the set of skills that teachers acquire to help identify the best technologies to support their students as they learn the content and it gives the students a better understanding of the concept.

The Pedagogical Content Knowledge (PCK) is the combination of instructional strategies and content knowledge to enhance effective learning of a particular concept. It involves a variety of instructional strategies and techniques suitable to deliver the subject matter for the student to understand. PCK is the knowledge of content, which the teachers possess, and the knowledge of how to teach that specific content. The in-depth understanding of knowledge allows teachers to use the most effective methods for teaching specific content.

TPACK has created an effective connection of purpose and proper interaction of each component that can produce meaningful and effective learning in the classroom. There should be a mix between teacher's content knowledge, what the teachers actually knows, teacher's pedagogical knowledge, how the teachers actually want to teach and the teachers‟ technological knowledge, what appropriate tool is relevant to what the teacher actually wants to teach, all these elements must be effectively integrated. It is obvious that good knowledge of technology may adequately enhance familiar strategies that the teacher is to use in the classroom. Therefore, effective content delivery is characterized using all aspects of the TPACK theory in a constructive way to enhance meaningful learning.

TPACK is of great significance to the teacher education curriculum in terms of the principles and practices, and particularly their professional development in this 21st century. Moreover, as we move towards the 4thindustrial revolution era where digital innovative tools can be used to empower current generations of students, there is a need for rapid integration of technology into the teaching and

learning process where content will be technologically driven along the pedagogical strategy. Effective teaching competencies, and in particular, competencies in applying teaching skills requires special types of knowledge which can support an existing strategy in content delivery, and act as a catalyst in understanding the concept being taught. Shulman (1986) proposes that effective teaching is the act of combining content knowledge and pedagogy knowledge through instructional technology to enhance familiar strategies that are used in the classroom. Teaching and learning should be content-driven and activity-based to encourage interaction amongst students with the support of innovative technology that can support teacher's productivity.

Tusiime, Johannesen and Guðmundsdóttir (2019) opine that despite the influx and challenges of digital technology in the classroom, it is not being fully incorporated into pedagogical content delivery. In addition, with the innovative technology challenging the effective teaching and learning processes, the teacher education programmes should start being given opportunities to pre-service teachers to gain more experience in technology application in order to enhance their performance and to effectively combine content knowledge and pedagogical knowledge through technology. In this study, the ability of the pre-service teachers to effectively mix the content and pedagogy knowledge with technology may possibly transform their teaching process and facilitate meaningful learning in light of the assumptions of MRTEQ. The uses of this technological tool among the students may give opportunities for transforming their knowledge level in micro-teaching and valuing the use of technology as a platform of learning more about the application of teaching skills. This was supported by Brush and Saye (2009) that pre-service teachers are concurrently learning content through technology.

Although all aspects of the TPACK model is relevant to this study, but more attention is given to the technological knowledge, particularly the significant aspects of "re-purposing" technology to achieve an objective. This idea is about teachers using the different digital tools that are available at their disposal to enhance learning, owing to the fact that most technological tools were not deliberately developed for education. This aspect in the TPACK model is highly related to the focus and intention of the researcher. The researchers' belief on the idea of re-purposing in teacher education programmes is necessary in this 21st century where technology has taken over all facets of life. Currently, cell phones are common digital technology tools available in the hands of students and teachers in the classroom. Moreover, with the versatile nature of cell phones, there is a need to integrate cell phones as a tool to assist the present pre-service teachers to develop the professional act of teaching, and to have an in-depth knowledge of how to integrate technology into micro-teaching presentations.

Thus, developing the ability to select their choice of technology in relation to pedagogy and content of any lesson may enhance the pre-service teachers technology level, in as much that cell phones can function as a form of instructional aids for teachers and students, as well as tools for interaction between teachers and students (Prensky, 2005; Ciu & Wang 2008).

This study tapped from the knowledge of TPACK in emphasizing the infusion of technological knowledge into B.Ed. programmes. The pre-service teachers are all familiar with simple digital technology, which are commonly used tools to chat, watch videos, text messages and mostly for making calls. TPACK theory is based on a student-centred approach. In relation to teacher education programmes, this study is creating a space for students to learn through interaction with technology-enhanced learning which may also encourage teamwork with a demonstrative outcome using the digital technology tool to support their understanding of the micro-teaching skills. The students were allowed to put together their pedagogy and content knowledge using digital technology tools as a platform for audio-visual representations through Google drive. Visual representations with technological tools may transform conceptual understanding of some students in learning better (Angeli & Valanides, 2009; Angeli, 2015).

According to Gudmundsdottir and Hatlevik (2018) students and teachers use various digital resources and social media networks to enhance the teaching and learning process. In this regard, this study sees digital technology as an opportunity that will enhance the fourth year B.Ed. students who may still be struggling to effectively apply micro-teaching skills alongside the content and pedagogical knowledge. By exposing the fourth year B.Ed. students to interact with technological tools may serve as an alternative strategy to learn and practice teaching at their convenience. These students may as well develop more knowledge in micro-teaching and also develop the ability to value the use of digital technology to advance the act of learning to teach. The idea of applying TPACK theory is due to the fact that the concept of micro-teaching is practical in nature with the process of the teaching, reflecting and re-teaching cycle, and this can only be effective with the infusion technology. This study, in line with TPACK theory, can easily assist in developing the professional qualities of B.Ed. students to integrate technology in micro-teaching presentations and develop the ability to effectively use teaching skills in accordance with content and pedagogy knowledge. If properly

Another reason for using the TPACK model in this research is that, the model is going to provide an initial understanding of the kind of knowledge that the pre-service teachers will need to effectively integrate technology using their phones as a recording device while presenting their teaching. It is obvious that there may be some challenges in integrating technology in to micro-teaching classes by the pre-service teachers due to lack of commitment, lack of basic knowledge of ICT, lack of technical support and a host of others. However, if the university encourages and supports the effective use of technology for teaching, it may help the pre-service teachers' competency in integrating technology as a tool for micro-teaching presentations in light with the assertion of Bower (2019) that teachers and students should select and integrate appropriate tools which can facilitate interaction that will lead to productive learning.

Furthermore, the social learning theory and the TPACK theory has been tested and have been found very significant to learning, particularly in teacher education programmes, where modelling is necessary as a way of developing authentic teaching behaviours for the pre-service teachers' professional development. The teacher's developmental programme is characterised by effective instructional practices through content and pedagogical knowledge of the teachers in alignment with the technological knowledge as stated by the TPACK theory. Wilton and Brett (2019) used the TPACK model to recommend the integration of technology in the curriculum of Canada, and that teacher's need to structure and modernize their instructional practice through digital resources. The use of digital resources is emphasised in micro-teaching assumptions as a way of developing practical knowledge of teaching with the ability to reflect on what has been learnt. The pre-service teachers may easily conceptualise the act of authentic teaching through experience that are modelled with technology. Yeh, Lin, Hsu, Wu and Hwang (2015) opined that teacher's practical knowledge improved with teaching experience along the line of technology.

In addition, using the TPACK model in teacher education programmes has helped the pre-service teachers develop self-efficacy (Jen, Yen, Hsu, Wu & Chin, 2016). Investigating the micro-teaching knowledge level and competence in the application of teaching skills amongst the pre-service teachers at UWC in light of the norms of micro-teaching is the focus of the current study. Several researchers have also used the TPACK model to improve teacher education programmes (e.g, Gill & Dalgamo, 2017; Yeh, et al., 2014; Pamuk, 2012; Jang & Tsai, 2013; Joo, Park & Lim, 2018; Aleksandra & Irinla 2019; Tunjera & Chigona, 2020).

The TPACK model has been used as an instructional observational strategy to examine teachers observed behaviour and to identify different types of teacher's technological knowledge needed for effective content delivery and their professional development. Teacher educators, as well, need to give adequate attention and embed modern digital technology and tools into their instructional delivery.

The concept of re-purposing from TPACK theory is what the researchers intends to integrate into micro-teaching which may help the pre-service teachers observe and create their own style in the act of learning to teach using digital tools to accomplish their goals. This digital technology with the cell phone in light with the TPACK may develop social interactions among participants by creating a bond that will encourage collaboration amongst participants to develop creative ideas on the best teaching behaviours in line with the assumption of constructivism theory. The digital video technology tool may also serve as a teaching and learning resource to the pre-service teachers to model expected teaching behaviours in light of the social learning theory of Bandura. Generally, it may as well serve as a complimentary strategy of developing teaching culture, and may enhance the act of learning to teach with the opportunity to access the video and reflect on the acquired knowledge anytime and anywhere. The ideas of KACIT came from the link of the three theories as illustrated in Fig 2.1 above.

2.6 KNOWLEDGE ACQUISITION, CONSTRUCTION AND IMPLEMENTATION WITH TECHNOLOGY (KACIT)

The basic assumption of the TPACK model in the teaching and learning process is the integration of technological tools into content knowledge to engage students in active learning. Content knowledge is the teacher's knowledge about the subject matter to be taught (Koehler & Mishra, 2009). Constructivism as a learning theory that appeared in the field of education over a century through Dewey (1938) was greatly elaborated through many renounced scholars. This school of thought is of the view that knowledge is built by the individual, and that the construction and adaptation of knowledge constitutes the idea that interactions is necessary in learning. In this way, knowledge grows in both composition and coherence. Constructivism elaborates that knowledge should not be passive but actively built up by collaborations and interactions to construct and model a process through a structured and organized learning environment using tools. In this research study, the

researcher is using the TPACK theoretical lens to examine the pre-service teachers" content knowledge in micro-teaching, along the application of key skills, in relation to their technological knowledge as stated in the research questions. The constructivism theory and Bandura's (1977) social theory was used to model the behaviour of the pre-service teachers to take initiative for their learning experiences and their pedagogical knowledge with a focus on knowledge construction in relation to technology, as shown in Figure 2.3 below.

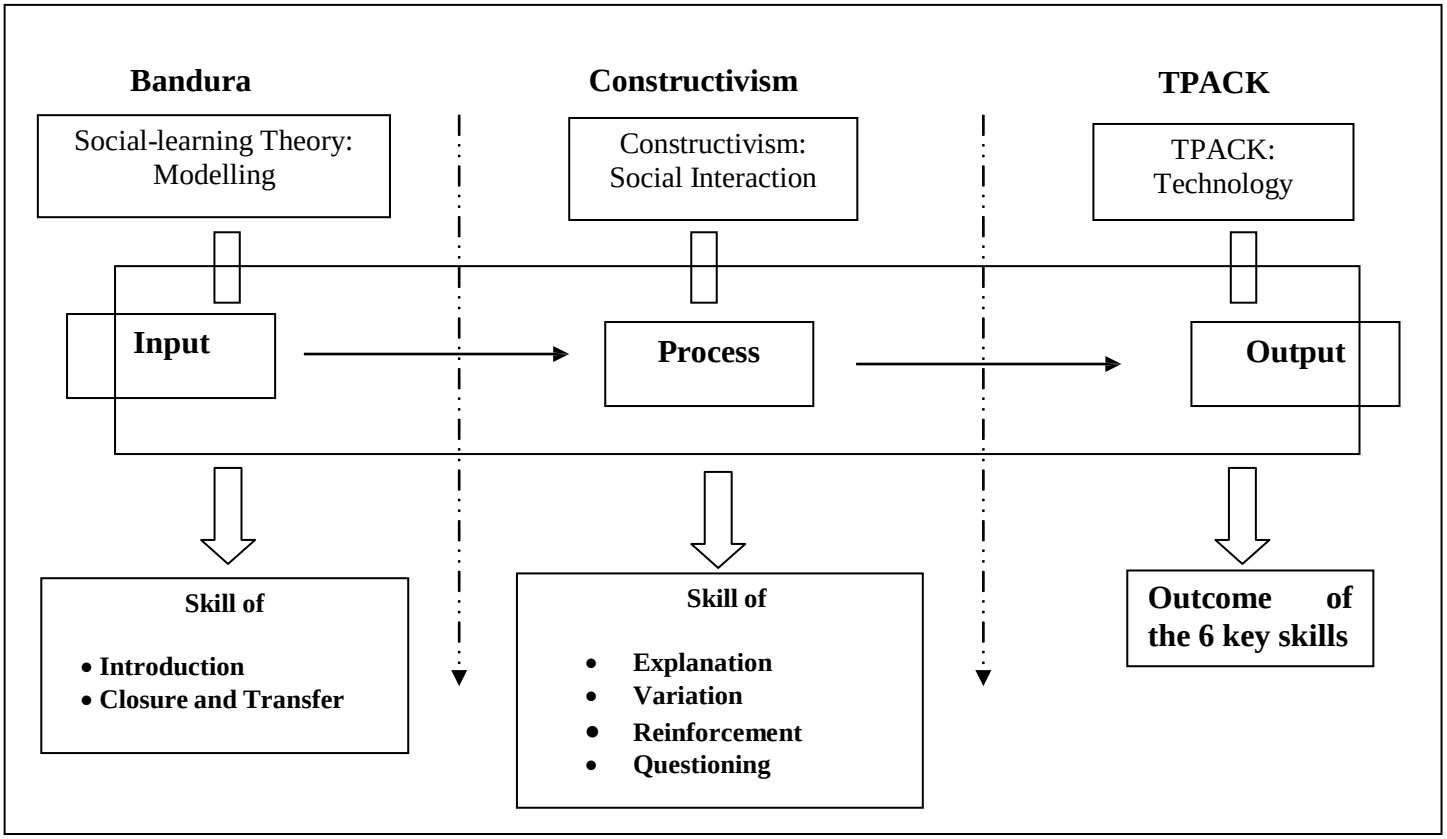

Figure 2. 3: Showing how the key skills were generated from the theories along the KACIT model

From the above illustration, the theories are used to unpack the actual micro-teaching knowledge level of the pre-service teachers in order to examine the application of the key skills. These six key skills are generated from the assumption of the theories due to the nature of the teaching profession. From inception, the nature of the teaching profession is characterised by modelling a practical experience through observation in order to conceptualize and construct acceptable teaching behaviours within ones domain (Bandura, 1977). Mastering the concept and application of the six teaching skills in the micro-teaching process among the pre-service teachers as reflected in constructivism theory and the TPACK assumptions is based on collaborative activities with technology as asserted by Piaget(1969) and Vygotsky (1978)that knowledge can be gained through meaningful experiences.

Learning activities that are designed and developed with an interactive technology within a teacher's education programme, may give the students an opportunity to construct meaningful connections of the content knowledge and pedagogical knowledge which may help to model their behaviour in developing a constructive classroom. Media representations gain influence because what people see and hear help the social construction of reality (Bandura, 2011).Tools can change students' participation within the classroom learning environment by constructing new knowledge and taking active roles in initiating their learning styles (Sun & Yang, 2015).

Conversely, teaching is a social interaction. The teaching profession, unlike other professions, is beyond theoretical explanation of concepts, by its nature, it involves theory-practice divides, and the professional practice should not be limited to teaching practice schools (Darling-Hammond, 1994; Chance, 2000). This professional practice should at least start from the institution where teachers are trained with special attention given to micro-teaching as a way of developing the act of teaching before school practices. It should be noted that the teaching exercise is also characterised by three fundamental phases that includes the introduction of a lesson, body of the lesson and conclusion of the lesson. Teaching skills are intricately embedded into these phases, these three phases can effectively be carried out through a model of micro-teaching with emphases on teaching skills that can be observed and learnt by the pre-service teacher during their professional development as stated in this study. Therefore, the justification of the key skills is based on the nature of teaching itself, which will be enacted by the students through micro-teaching with a focus on the vital aspects of the theories as previously explained.

The 21st century classroom has witnessed continuous use of technology; the knowledge needed for teaching in this present situation is dynamic in nature rather than static. The wave in this 21st century teacher education programmes is based on effective teaching skills as the present pre-service teacher's education programmes have embraced innovations through technology. Digital technologies enable instant information access and global communication (Gunn & Hollingsworth, 2013). The 21st century teaching emphasized content mastery with skills acquisition through knowledge transmission from teacher to student (Greenhill, 2010; Fisher & Frey, 2010). In addition, the 21st century effective teaching skills can only be observed in students that demonstrate deep knowledge of understanding of the concept of creativity, flexibility, and information fluency (Dede, 2010; Fullan, Langworthy & Barber, 2014). Collaborative learning and teamwork in line with the

constructivism theory and the effective integration of technological tools into the content knowledge as stated by TPACK are the focus of this research.

In this present 21st century, the researcher believes that no knowledge can be acquired meaningfully without an element of technology. Therefore, theoretical and practical acquisition of knowledge, the construction and the implementation of knowledge are based on the experiences of the students. Knowledge can easily be distributed among peers through a variety of digital tools; hence, the below concept of Knowledge Acquisition, Knowledge Construction and Implementation with Technology (KACIT) was developed as a model for this study to examine how the six key teaching skills were used during micro-teaching presentations by the pre-service teachers along the context of the three fundamental stages of teaching which are characterized by teaching skills.

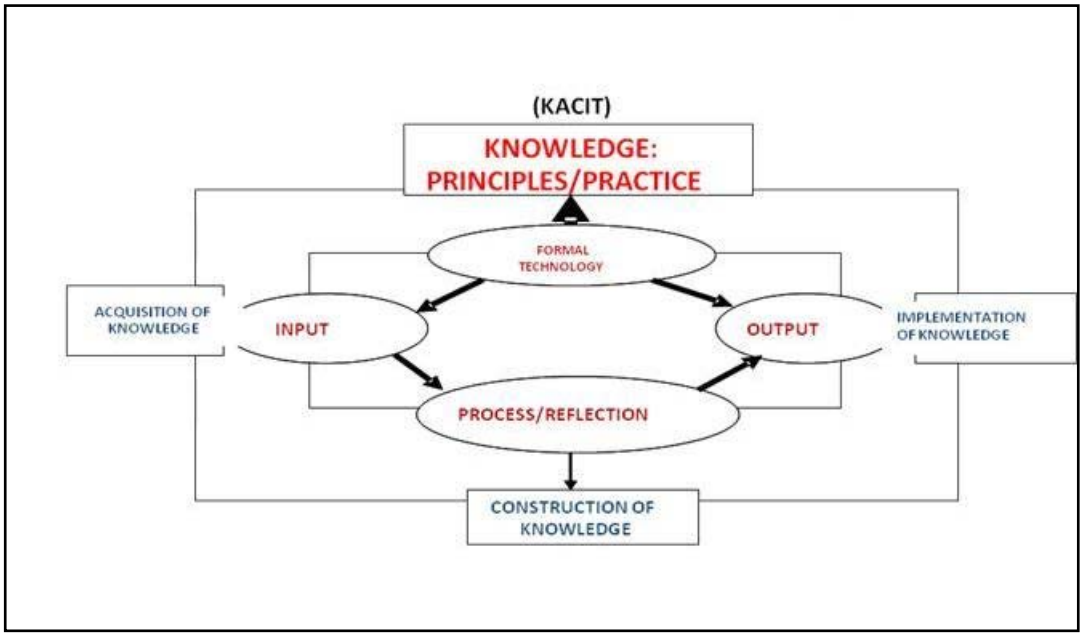

Figure 2. 4: Showing the integration of all knowledge in KACIT model

In lieu of the above illustration in Fig 2.4, the KACIT model tends to account for all kinds of knowledge whether theoretical or practical that is acquired by students before or during the teaching and learning process, how the knowledge were constructed and implemented through technology. It was also designed to describe how the conceptual framework could be justified with the 6 key skills of micro-teaching examined in this study. The model tend emphasizes how the professional knowledge of teaching are acquired through past experiences including knowledge from the high schools, teaching practice, school observation, micro-teaching and other modules within the university, how these acquired knowledges can be reflected upon, re-constructed and implemented by the pre-service

teacher using simple technology in order to determine their technological knowledge level and micro-teaching knowledge level in relation to the application of teaching skills.

From the structure of the KACIT model amid the three theories, it is categorized into three stages that include the knowledge acquisition (input), knowledge construction (process) and knowledge implementation (output). These stages inform the basis for the skills observed. Although, the skills of micro-teaching had been developed from inception, and is constantly in use by advocates of micro-teaching (eg, Aubertine,1963; Passi, 1976; Olson, 1982; Fernandez, 2010; Remish, 2013) due to its significance in teacher's education programmes. The six (6) key skills that are identified, observed and measured in this study through the use of the KACIT model which includes *skill of introduction, skill of variation, skill of explanation, skill of questioning, skill of reinforcement and skill of closure and transfer;* are generated from the existing micro-teaching skills in line with the assumptions of the three theories discussed in the study.

From the first stage in the KACIT model, is the knowledge acquisition and construction that focused on the acquisition of knowledge embedded in the constructivism theory described earlier. The theory emphasises the significance of prior knowledge in learning and that experience can enhance the understanding of a concept. The knowledge acquisition in this model in light of the constructivism theory is based on prior knowledges of the pre-service teachers, what the pre-service teachers learnt at school before choosing the teaching profession as a career and what they learnt all through their training period. The experience acquired in school is regarded as apprenticeship of observation (Lortie, 1975). This serves as the process of acculturation and a socialization process that informs the pre-conception of the pre-service teachers in the act of learning to teach. Several other knowledges that the pre-service teachers possess from the past before their arrival at the university, including their background and belief system, need to be untangled and disengaged by the university in order for the students not repeating undesirable teaching behaviours. This stage was used to generate the skill of introduction and skill of closure and transfer in line with some sub-skills that emphasizes the significance of prior knowledge to new learning as seen below:

Teacher did review of previous learning
Teacher used common and relevant examples
There was a link between the last topic and the new topic
Teacher gave the learners home work on…

In addition, the pre-service teachers needs more support to acquire new learning experiences within the university community through online tutorials, new knowledge and complementary materials in support of the practical learning modules and method modules that are contextually relevant to build the interest of the students using technology that is pivotal as it is within their construction of reality. The influence of all these knowledges from within and outside the learning community that the students has acquired overtime need to be applied in light of their prior knowledge level as emphasized by constructivism apprenticeship behaviours and Bandura's social learning theory of imitating an action. Conversely, the pre-service teachers need to be taught micro-teaching through constructively aligning their skills during their study at university with the process of allowing the students to reflect on these skills using the teach-re-teach cycle in building the students reflective skill through some elements of technology that may help students to be self-sustaining in the act of teaching. The KACIT model sees all knowledge acquired as the micro-teaching knowledge level of pre-service teachers as stated in the research questions which is the content knowledge analysed with an interview schedule (see Appendix 7).

The second stage of the KACIT model is the process of knowledge acquisition and construction, which highlights the complex interplay of reflecting on all, acquire knowledge within the context of designing lessons independently together using the acquired knowledge to construct new knowledge as true reflection of their learning experience. It is a stage of social interaction which involves putting together all ideas and acquired knowledge from within and outside the university by planning on the best way it can be replicated in a more structured and organized manner. This is the process of "HOW", how to apply the accumulated knowledge of micro-teaching. Re-activating and reconstructing the knowledge acquired as a team, transferring all relevant information and ideas independently together to strengthen their performance. Consequently, the university needs to build learning environments that will promote the knowledge construction such as aligning the constructivist views of learning environments that stimulates meaningful learning in the context of authentic practice rather than abstract instruction, which may be out of context. The authentic practice that encompass social interaction and collaborative activities within and outside the university environment may challenge the pre-service teachers to take initiative from their learning experiences in line with social learning theory of observational learning and modelling as a form of authentic learning for reflection.

However, the pre-service teachers must, as well, develop their cognitive knowledge in the key micro-teaching skills through reflection along the context of independent knowledge, collaborative activities, lesson plan design and material design. This stage was used to generate the skill of variation, skill of explanation, skill of questioning and skill of reinforcement in line with some sub-skills that emphasises students‟ contribution and active participation, all these activities are at play during the knowledge construction stage among the pre-service teachers in the sub-skills below:

Class is interesting to students with relevant resource material
Teacher allow student to actively participate in class
Asking clear, short and simple question
Teacher used easy flow of ideas from known to unknown
Teacher acknowledged learners contribution

Conversely, the learning environment that the university should develop must promote the key 21st century skills to support the building of technological knowledge. Technology is central in the KACIT model as one of the vital elements of 21st century teaching skills that allow pre-service teachers to master effectively how to prepare for successful learning activities in a constructivist classroom. It is obvious in this present century that meaningful learning activities barely take place without any technological tools. Consequently, the pre-service teachers learning environment should not only promote the 21st century skills but emphasises technological tools as an element to support effective teaching presentations. In the KACIT model, the process of acquiring knowledge and constructing the knowledge for implementation require the use of a simple technological tool. In light of the TPACK assumption of content and pedagogical knowledge and the exposure of technology in the UWC teacher education programmes, it is expected that the pre-service teachers present their teaching using the cell phone as a recording device and sending the video presentations through Google Drive for review and feedback.

As previously stated, the researcher is using TPACK theory lens to examine the pre-service teachers‟ micro-teaching knowledge level on the application of teaching skills in relation to their technological knowledge. Moreover, as stated in the research questions, the constructivism theory and Bandura's (1977) social learning theory was used to model the behaviours of the pre-service teachers to take initiative for their learning experiences, and their pedagogical knowledge, with a focus on how technology can develop micro-teaching skills. The TPACK theory deals with the compartmentalization of three fundamental aspects of knowledge in solving educational problems. The integration of these aspects of knowledge is to enhance educational competence of the teachers

with particular reference to technological skill, instructional skill and subject matter skill that is also an important aspect to be considered when observing micro-teaching presentations.

The implementation stage, which is the output in this model, is an enactment stage of bringing out the cognitive knowledge into action. This includes putting together the total pedagogical knowledge, content knowledge and technology knowledge into use. The knowledge implementation stage is an outcome of the pre-service teachers' teaching performance to prove their knowledge level of micro-teaching in line with the acclaimed knowledge as it has modelled their behaviours. This stage cut across all the 6 key skills because it helps to expose the knowledge level of micro-teaching and the application of the teaching skills. This outcome stage helps to understand what pre-service teachers claimed to have acquired during their stay in the university. The outcome is connected to their competence in line with knowledge acquisition and knowledge construction stages along the integration of technology in the application of teaching skills for their reflection. The stage informs the knowledge of the 6 key skills as it helps expose the specific shortcomings that needed urgent attention in light of the ways the knowledge are acquired and constructed. The process of observing the outcome through the technological tool and given the feedback through the same medium helped to determine the technology knowledge of the pre-service teachers in relation to their micro-teaching knowledge level which will also help in answering the research questions using the teaching skills rubric see(Appendix 9).

Generally, the KACIT model examines the developmental processes of pre-service teachers in UWC and tries to identify in their practice how knowledge is acquired in micro-teaching, and are able to meet the needed proficiency in their chosen career while employing the conceptually useful and simple technology. The research questions that guided this study are: - How does the 4thyear B.Ed. pre-service teacher at UWC apply micro-teaching skills with digital technology? What are the micro-teaching knowledge level of final year pre-service B.Ed. teachers, in general, and its relation to technology as a tool in micro-teaching presentation? To what extent does technology develop micro-teaching skills in 4th year pre-service B.Ed. teacher's programme at UWC? How does a digital video platform contribute to the effectiveness of the micro -teaching presentation? To answer these questions, the researcher came up with the KACIT framework that will help examine how pre-service teachers were able to apply teaching skills to construct their knowledge in attempting to understand the concept of micro-teaching and how it has helped model their behaviour.

Conclusively, the conceptual understanding of the KACIT model in light with the TPACK principles is the creative application of technology as an alternative strategy. This would allow the student to reflect on what has been learnt, and to visualise their intention to teach (content knowledge), and how to teach (pedagogical knowledge), with the understanding of adapting appropriate technological tools (re-purposing) in order to achieve this goal. The KACIT framework was used to unpack the procedure that supports student preparation for work that replicate what they are trained for. Using the framework to examine and moderate pre-service teachers on their professional practices. Practice in this situation is bringing together their accumulated content knowledge, putting in their contextual community influences, past experiences and other acquired knowledge using a mediated tool for knowledge constructions which were examined with the interview schedules and portfolio observation rubrics (see Appendix 8). The implementation of the acquired and constructed knowledge as an outcome was examined through video presentations using the micro-teaching skills rubric to answer the main research question. This outcome would be the development of a holistic pre-service teacher, shaped by the influence of MRTEQ, university graduate attributes, teacher's reflection in action, which are discussed as part of the literatures below.

2.7 SIGNIFICANCE AND ASSUMPTIONS OF MRTEQ 2011 AND 2015

The *Minimum Requirements for Teacher's Education Qualifications* of 2011 and 2015 were introduced to replace the Norms and Standards for Educators (NSE, 2000). The establishment of the MRTEQ 2011 was to create uniform standards and to have definite procedures, appointments and requirements for all teachers in the country that was revised in 2015 with slight changes. These changes provide provisional options for professional Master's and Doctoral degrees. It explains a minimum set of agreed-upon competences for the pre-service teacher education programmes emphasizing the minimum credit values for the learning programmes that can lead to qualifications in terms of the knowledge mix. The aim of this policy is to ensure that the higher education system produces quality and competent teachers in line with the needs of the country. The introduction of the MRTEQ framework has helped to re-define and re-design the teacher education programmes by addressing the challenges facing the country in term of pedagogical content knowledge and teacher competency.

MRTEQ explains the nature of knowledge-mixes for every level and the minimum credit values leading to appropriate levels of teacher qualifications and teaching competencies. According to the MRTEQ assumptions, knowledge and skills, competency is always the combination of the theoretical and the practical learning acquired by students. The adequate knowledge of students in principles and practice of education accumulate toward competent learning through various knowledge acquisition, integration and application, which, in turn, implies the mastering of specific related skills.

Competency of B.Ed. students is connected to the knowledge acquisition, knowledge integration and knowledge application that can be achieved when incorporated into teacher education modules through the following learning disciplines: Disciplinary learning, pedagogical learning, practical learning, fundamental learning and situational learning. Disciplinary learning is the knowledge of subject matter relevant to the area of a discipline; it involves the study of education and its foundations.

Pedagogical learning is the principles, practices and methods of teaching, it is how content should be learnt and presented. This is the process of developing specialized pedagogical content knowledge creating in the learners an appropriate learning opportunity to understand the curriculum and instructional, resource materials, assessment strategies and evaluation procedures. Practical learning's emphasis is on learning "from" and learning "in" practice. Learning from practice is the ability to learn through relevant resource materials as a guide for better understanding of a skill. It is also the ability to analyse the learning materials and practice learning through observation or demonstration videos.

Learning in practice is the process whereby the students observe and reflect on lessons taught by another person. This process may help the students to develop critical thinking skills with the ability to teach and reflect on lessons they presented by themselves. Fundamental learning as part of the disciplines allows teachers to communicate in one of the second official languages of the country and develop the ability to use Information and Communication Technologies (ICTs) competently. Situational learning is the background knowledge of all learning situations involving the background knowledges of the immediate environments, the educational system, school system like the classrooms, communities, policies political and economic situation of nation and globally.

Conclusively, it is worthy to note that the MRTEQ assumptions on teaching competencies is based on knowledge mixed which, and focused on the five fundamental learning stated above. Disciplinary

learning, pedagogical learning and particularly the practical learning that constitute the foundation for all educational qualifications. Practical learning is an important condition for the development of implicit knowledge that is an essential component of learning to teach and the acquisition of teaching skills. The practical learning is the major assumption of teaching competency, learning "FROM" practice and learning "IN" practice will expose students to acquire in-depth knowledge in understanding and analyzing demonstrated observed videos, and other relevant knowledges from expert teachers, mentors teachers, peers and a host of others. The pre-service teachers will be given the opportunity to draw inference on how to practice teaching in a conducive and stimulating classroom with the ability to reflect on their personal teaching skills as stated in the micro-teaching assumptions. The learning in practice gives the students the knowledge of feedback of seeing oneself as they see others, this definitely may enhance a reflective practice for their professional development.

2.8 GRADUATE ATTRIBUTES (GA)

The graduate attributes is a bench-mark which a graduate of any discipline should be able to demonstrate as it relates to their area of specialization. The skills and level of competency of a graduate is a yardstick for comparison to other graduates in the same field. According to Bowden, Hart, King, Trigwell, & Watts (2002) graduate attributes is what the university community agrees that the students should possess during and after their stay in the university. It includes qualities, skills, understanding and other acquired knowledge that goes beyond discipline and technical competences that will be useful to the graduates in the future. Graduate attributes is an exhibited attitude that is observed in a person or group of people as a university graduate. A well-organised curriculum and well-structured learning experience for an effective teaching and learning process is able to produce qualified and successful graduates.

Two policies in South Africa promote the production of quality graduates, namely, the Education White Paper 3-A Programmes for Higher Education Transformation 1997 and the National Plan for Higher Education of 2001. The White Paper expected all universities to produce skilful and competent graduates who can build strong foundations for lifelong learning, intellectual and critical thinking abilities with high level problem-solving and communication skills, coupled with the ability to adapt to societal diversity. The South African Qualifications Authority (SAQA, 2002) which serves as a regulatory body to evaluate the standard of certification in accordance with the types of

training acquired before becoming a graduate gave some expected graduate attributes which includes the following:

- A graduate should be able to demonstrate the ability to identify and solve problems and be reasonable to take good decision at the right time;
- A good graduate should be able to think critically and creatively to solve problems and to work effectively with others as a team in an organization or community;
- A qualified graduate should be able to analyse, organise and critically evaluate information at his/her disposal;
- A competent graduate should be versatile in using science and technological tools effectively;
- A well-trained graduate should be more responsible to the society and health of others with the ability to tolerate and demonstrate high levels of understanding.

From the above graduates‟ attributes and some that are not mentioned, it is expected that the outcome of well-trained graduates from universities is to be a responsible and employable citizen of the country. It should be noted that feedback from learning activities, instructional programmes, university culture, evaluation procedures, available facilities, in addition with the feedback from the workplace and relevant professional bodies enhance the development of graduate attributes. Graduate attributes is of great significance to the university especially to renew, review and align its teaching and learning activities, including methods, strategies, evaluation procedures and learning outcomes. The university graduate attributes document is a guide to teaching and non-teaching staff in all faculties and other centres within the institution.

With the nature of teacher education programme, most universities now encourage innovative technology among the staff and students, supporting professional development of students through practical learning using the micro-teaching, school observation and teaching practice in light with MRTEQ assumptions of knowledge-mixes: -learning IN and learning FROM practice when students learn in the lecture room and from school while on teaching practice. The knowledge-mix is the combination of theory and practice of teaching through technology that helps the pre-service teachers to demonstrate the competencies that will be seen as part of the graduate attributes. The diagram below illustrates the holistic framework of the study by showing the inter-relationships of the key components that will allow students to exhibit effective teaching competencies as a demonstrative outcome of success in line with the expected graduate attributes.

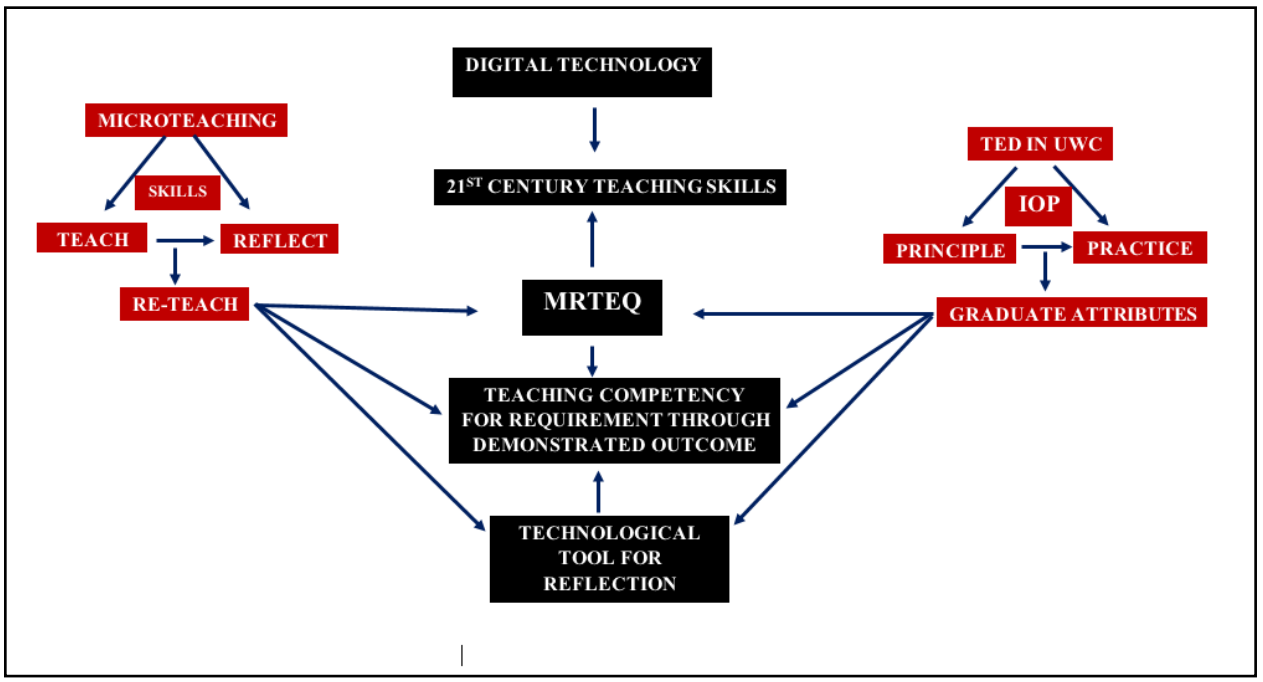

Figure 2. 5: Showing the holistic overview of the conceptual framework of this study

The holistic overview of the above conceptual framework helps to identify the key concepts of the study and the significant relationship of these concepts working independently together to achieve the 21st century teaching skills. The illustration above explains how each key concept can proactively connect to optimize the academic performance of the pre-service teacher. The central focus of the framework is that, to meet the demand of the 21st century teaching skills, there is need to integrate digital technological tools as platform for reflection on micro-teaching skills towards achieving effective demonstrative outcomes stated by MRTEQ 2015. The significant role of micro-teaching via digital technology in teachers education qualifications as already been proposed by MRTEQ that teaching is a purely skills-based approach which relies absolutely on the evidence of demonstrable outcomes as measures of success.

From the previous discussion and the illustration above, there is need for the connection of purpose because each key concept will not effectively provide the needed professional development and teaching competency as expected. The effective collaboration of the key concepts may adequately enrich the knowledge of the pre-service teachers to demonstrate the qualities of a graduate. These qualities can only be exhibited thoroughly with a well-coordinated, integrated and comprehensive professional training from the university with each key concept complimenting one another to develop

the B.Ed. students with the comprehensive knowledge towards becoming a professional with the ability to demonstrate the university graduate attributes.

Finally, the focal point of the conceptual framework is that for pre-service teachers to appropriately exhibit the graduate attributes of meeting the teaching competency of a professional standard as demanded by *the minimum requirements for teacher education qualifications* (MRTEQ). Hence, the principles and practices of teacher education programmes should constantly be adhered to by aligning the entire key concepts, putting into practice the micro-teaching procedures with digital technology. These may possibly lead to self-directed learning, self-evaluation and self-reflection that may give room for critical thinking and self-confidence in demonstrating the expected graduate attributes in line with the university standards. The graduate attributes may be well exhibited if the students are guided to constantly reflect on action during the training programme as discussed below.

2.9 REFLECTIVE PRACTICE

Reflective practice is the basis for qualitative teacher education programmes, the basic act of teaching leading to confidence and competence as a visible demonstrative outcome of success as reflected in the South Africa MRTEQ (2015) depends on constant reflection from the teacher educators and students during the training programmes. Developing the knowledge of critical thinking and engaging in a constant reflective practice may help the pre-service teachers develop adequate mindsets to reflect-in-practice as they observe and learn the act of teaching from their mentors and school-based supervisors. Reflection is the ability to reflect on one's action critically with the view of knowing the what, the why and the how of doing things, and developing the right practice within a lifelong learning (Habib, 2017). Reflection is a strong motivating drive, which serves as mirror of self-evaluated, self-directed and self-regulated learning, and it is an important element for personal improvement. Reflective practice is fundamental to teacher's education as a process of enhancing and developing the pre-service teacher's confidence and competence. Effective competency in teaching involves reflective practice (Jones & Jones, 2013).

The confidence and competence in teaching is characterised by continuous reflective practice on personal performance with the understanding of one's action without bias. Reflective practice deals with good value judgment of one's performance, creating the ability of self-critique with a re-think on how best to improve. Having the experience of reflection-in-practice may be valuable to the pre-service teachers to improve their skills with a comprehensive understanding of the relationship

between theory and practice. Reflective practice can also be learnt and mastered from the teacher educators by developing the mindset, and encouraging the pre-service teachers to continue the practice of the reflection skill as they grow in their professional career. With the nature of the teaching profession that involved the act and science of learning the rudiments of teaching, creating the positive mindset of reflective practice may enhance the ability of the pre-service teachers to re-think on their personal teaching exercises after each lesson which is the main assumption of micro-teaching.

In addition, several scholars have provided ways in which teacher educators can assist pre-service teachers to develop good habits of reflective practice. Lane, McMaster, Adnum and Cavanagh (2014)and Gelfuso and Dennis (2014) opines that the development of good reflective practice includes: observing a model and commenting on it, engaging students with dialogue on their self-assessment, giving students opportunities to practice on the reflection process, interviews or essay writing about personal teaching experiences, formative and summative questions of students teaching experiences and encouraging and motivating student teaching performance. In addition, some benefits of reflective practice in teacher education were identified by Rolheier, Bower and Stevahn (2000), who claim that reflection encourage constant learning, it engages students to think critically, it deepens students‟ learning, it supports the transfer of skills, it acts as a source of feedback, it develops new skills and help to improve learning experiences. All these benefit the micro-teaching exercise, particularly the teach and re-teach cycle as a way of developing the competences of the pre-service teacher.

In lieu of the above and with the nature of the teaching profession in accordance with Bandura's social learning theory that emphasises practical training as a way of modelling teaching behaviour, there is need for a simple procedure of reflective practice within the teaching exercise during the pre-service teachers training period. This may be useful for professional standards and help to develop the pre-service teachers' teaching competences. The university should develop the mindset of the pre-service teachers to constantly reflect along the lines of their chosen career during the training exercises with particular reference to each element of the conceptually developed reflective wheel illustrated below. In addition, the pre-service teacher should be guided to constantly reflect on all the knowledge acquired within and outside the university community in relation to the teaching profession. Every element of the wheel below has one knowledge, or the other, that the pre-service teacher can reflect on in order to build their competency.

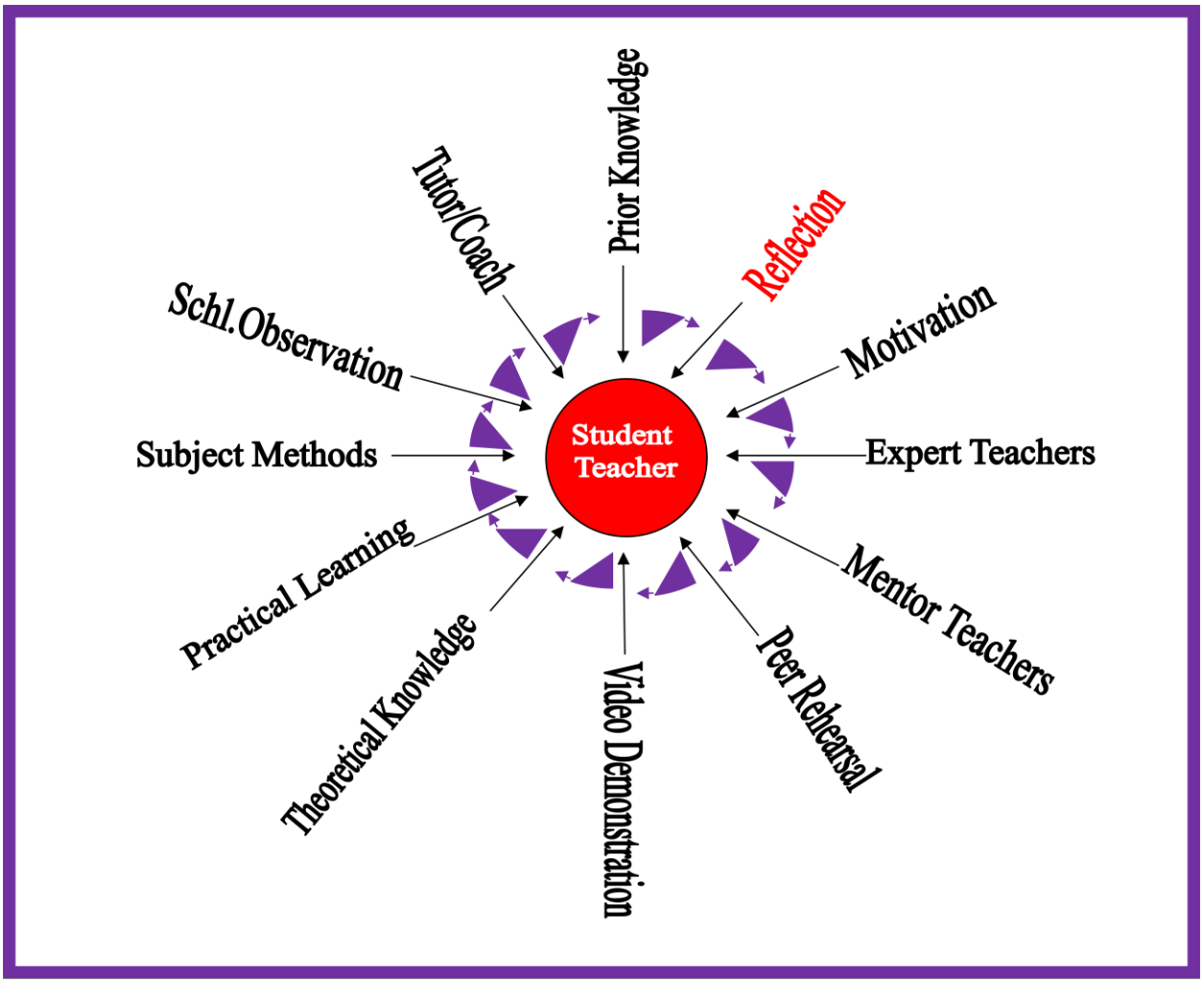

Figure 2. 6: Simple competency wheel for reflective practice

From the above illustration, the professional training of pre-service teachers should centre on these simple elements in order to get the expected teaching behaviour. The professional practice may be characterised by these elements as student reflect on action during training. It should be noted that the fundamentals of the teacher education programmes is the ability to demonstrate perfectly the act of the professional competency and confidence in teaching. Constantly reflecting on all relevant knowledges as stated above may help build up pre-service teachers' levels of professional competency as required by MRTEQ.

2.10 CHAPTER SUMMARY

In this chapter, the resercher discussed the significance of the theories that underpinned this study, the constructivism of Vygostky (1978) to build the knowledge level of the pre-service teachers, the social learning theory of Bandura (1977) that can be used to model the acceptable teaching behaviours and the TPACK theory of Mishra and Kohler (2006) to integrate technology into content knowledge. He also discussed how the skills that were generated in line with the stages in the KACIT model which explained the processes involved in constructing knowledge and how the knowledge could be implemented through the use of simple technology. Furthermore, the study also discussed the concept of graduate attributes along the assumptions of MRTEQ. In the next chapter, I discuss the related literature to the concept under investigation by giving a brief introductory orientation of innovative strategies that has characterised education. I sub-divided the literature review into three sections by looking at the concept of teaching along micro-teaching skills; the second part is about South African policy on teacher education along the modules of the teacher education programmes. The last section dealt with digital technology, cell phones and it uses to teaching and learning.

CHAPTER THREE

LITERATURE REVIEW

3.1 INTRODUCTION

In the previous chapter, the theories that were discussed, emphasizing the significance of interaction and role-modelling as a fundamental element in the teaching and learning process in order for the pre-service teachers to replicate acceptable teaching behaviours using simple technology. These three theories led to the development of the KACIT model and the conceptual development of 6 key skills to examine micro-teaching, shaped by the influence of MRTEQ, graduate attributes and reflection in practice. In this chapter, I discuss related literature sub-divided into three facets. The first aspect is the concept of teaching along micro-teaching skills; the second part is about South African policy on teacher education and the alignment of B.Ed. modules to MRTEQ, concluding the chapter is the digital technology, cell phones and the application of Google Drive as a digital platform.

The field of education has been characterized by innovation and change (Adedoja, 2016). Different technological devices are now introduced into the teaching and learning process to make learning more creative and resourceful due to the development of new learning theories (Kucey& Parsons, 2012). These learning theories have changed the teaching roles of teachers that are now more demanding due to the complexity of innovations in the teaching and learning process. With the present technological challenges facing the teaching and learning situations, the universities and teacher training institutes are now adopting innovative technologies to accommodate the digital native learners (Jones, Ramanau, Cross & Healing 2010). These innovative technologies can be integrated into micro-teaching presentations as a strategy to motivate the pre-service teachers' in the act of learning to teach. Students should be allowed to interact with strategies that will motivate their interest (Dumford, Cogwell & Miller, 2016).

3.2 CONCEPT OF TEACHING AND MICRO-TEACHING SKILLS

Teaching can be regarded as an act of knowledge production, a process of knowledge-getting and knowledge reflection. Gary (2014) opined that teaching is the art and science of contributing to the knowledge of the people with the aim of developing their understanding. In education, teaching is the

concerted effort of sharing knowledge and skill; it is usually a planned activity within an area of specialization. It is a process of imparting knowledge, ideas or skills to learners. Teaching is viewed from different perspectives; it can be seen from the teacher-centred perspectives and the learner-centred perspectives. Teaching from the teacher-centred perspectives is the process of knowledge acquisition, a situation where knowledge is disseminated from someone who is skilled and has acquired the professional knowledge and training to help learners. From the learner-centred perspectives, teaching is seen as knowledge creation, a process where the teacher guides the learners and encourages them in their active and independent creation of new knowledge. Teaching is a deliberate action intended to facilitate meaningful learning through combinations of strategies and devices. The act of learning to teaching can be learnt and practiced through effective micro-teaching processes.

The concept of micro-teaching skills has been in existence for over 50 years and embedded in the teacher education curriculum over this period. Micro-teaching promotes and supports the latest and the most important practical techniques in teacher education programmes. Though the concept has been in existence for a long period of time, various higher education institutions (HEIs) have been implementing it differently and inconsistently. One might argue that all HEI"s ensure that the teacher-trainees acquired specific teaching skills useful in the normal classroom situation, but they vary in their approaches, some more successful than others. Teaching skills involve putting together the pedagogical knowledge, content knowledge and professional skills acquired through training, observations and practices. The knowledge acquired from teaching skills expose pre-service teachers to diverse techniques and strategies of planning an effective lesson and the best way of imparting the lesson with an appropriate method. Different skills are learnt such as designing lesson plans, the skill of introduction, the skill of explanation, the skill of reinforcement, the skill of repetition, the skill of effective illustration, the skill of effective classroom management, the skill of preparation and the use of instructional materials, communication skills, effective assessment closure and a host of other teaching skills (Grossman, 2018).

The content knowledge of different educational theories in psychology of education, sociology of education, philosophy of education and educational technology enables pre-service teachers to have a sound basic knowledge of applying the teaching skills in the classroom. The combination of teaching skills, pedagogical content knowledge would help create the right knowledge, confidence and competency in a teacher's professional development. The benefits of using teaching skills in a classroom is to enable the teachers to be more competent in teaching, it helps in making the class

interesting, it enables the teacher to develop the confidence in teaching and also helps the teacher to understand individual differences in learning, and their learning styles. Teaching is a complex task that can be broken into practicable components called teaching skills. Some teaching skills are vital in order to achieve the stated instructional objectives while some are also embedded in others. These teaching skills can be observed, imitated, learnt, practiced, rehearsed, evaluated, and applied where necessary. All teaching skills are important to the lesson but the selected key skills are germane to this study. These skills are the key elements that can be used to guide any beginners in the act of learning to teach. The skills and sub-skills are illustrated in the diagram and table below:

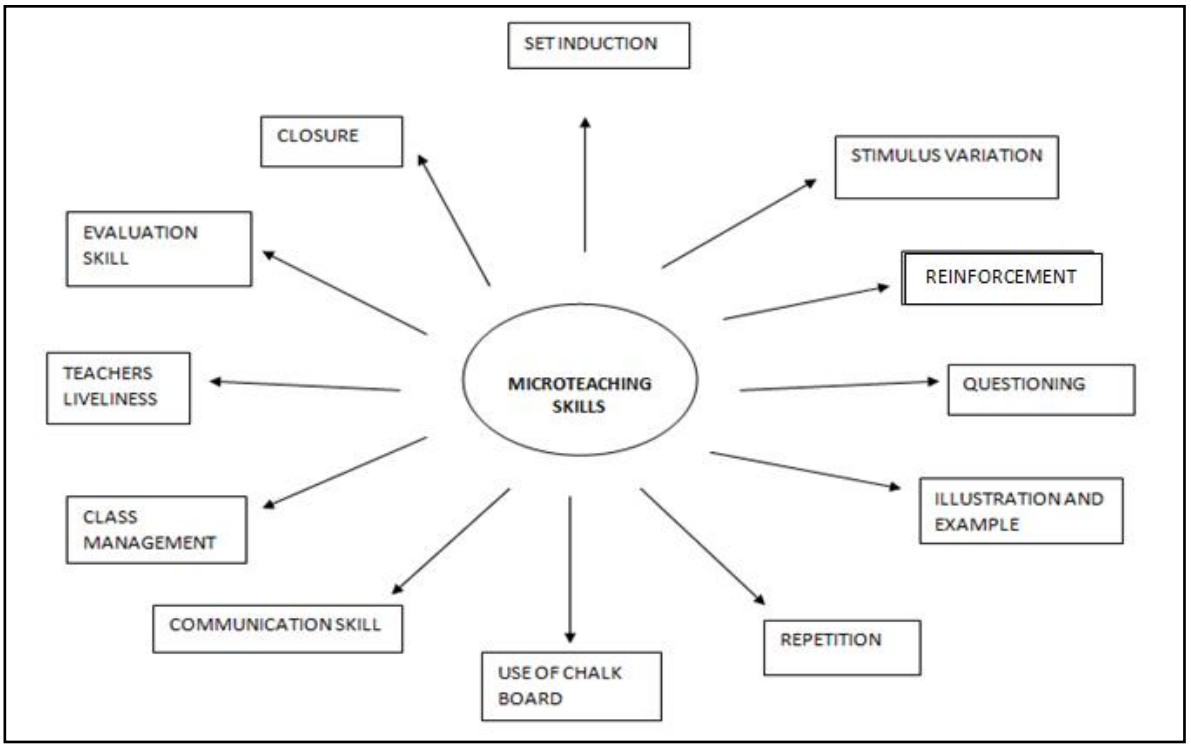

Figure 3. 1: Showing Skills of Micro-teaching

Table 3.1: Showing Key Micro-teaching skills and sub-skills

S/N	Key skills and Sub-skills
1	**Skill of Introduction**
	Teacher did review of previous learning
	Stating the instructional objectives at the beginning of the class
	Teacher used common and relevant examples
	There was a link between the last topic and the new topic.
2	**Skill of Variation**
	Teacher moved around the class while teaching.
	Teacher used some gestures such as hands, head ,face etc
	Teacher varied speech while teaching as tone, pitch, pause
	Teacher allow student to actively participate in class
3	**Skill of Explanation**
	Lesson is well explained with clarity
	Explanation of content is relevant to stated objectives
	Class is interesting to students with relevant resource material
	Teacher used easy flow of ideas from known to unknown.
4	**Skill of Re-enforcement**
	Teacher praised the learners verbally
	Teacher used non-verbal praise; smiling or nodding of head
	Teacher praised learners with extra-verbal statement ;Hum
	Teacher acknowledged learners contribution e.g Yes or I see
5	**Skill of Questioning**
	Asking clear, short and simple question
	Teacher ask questions before calling any name
	Teacher spread questions to every corner in the classroom
	Teacher asked questions while answers were still on the board
6	**Skill of Closure and Transfer**
	Teacher summarized the lesson verbally
	Teacher list the important points on the board
	Teacher appreciate the students for their contributions in the class
	Teacher gave the learners home work on the topic;

3.3 BRIEF OVERVIEW OF KEY MICRO-TEACHING

3.3.1 *Skill of Writing Lesson Plans*

Planning is one of the most fundamental skills in the concept of learning to teach (Fawole, Akinkoutu & Okuntade, 2017; Sharma. 2018). The skill of planning a lesson shows that one can organise a lesson by orchestrating how and what you intend to teach. Planning is a clear communication of ideas on what is supposed to take place in terms of reaching a specific objective with your learners and the procedure it will take for a relevant presentation. Moreover, it is a comprehensive indicator of the content a teacher intends to teach, the methods to be used, the procedures and other activities that are recorded in the lesson plan. Consequently, lesson plans are fundamental when learning the craft of teaching because it assists the inexperienced teachers to effectively organise their subject-matter, materials, and methods (Kizlik, 2004). A lesson plan can be defined as a systematic organisation of the content of the unit of a course (both in scope and sequence) in such a way that it would guide the user and any other specialist in the discipline (Fawole, Akinkoutu & Okuntade 2017). The lesson plan is developed by a teacher to guide classroom learning and elaborates, in detail, the students and teachers' activities. However, the details of a lesson plan differ depending on the preference of the teacher, the subject being covered, and the needs of the learners.

The lesson plan is structured so that it includes the objectives (what the learners are supposed to achieve), how the objectives will be achieved (procedure), what can be used to achieve the objectives (the method) and a way of measuring how well the objectives were achieved, the evaluation(Jonathan, 2015). In particular, one primary element of the lesson plan is the objectives; it guides the choice of the methods and helps to give direction to the lesson. Objectives must be stated using simple action verbs e.g., list, mention, state, identify, name, contrast, write, recite, enumerate, compare, etc., in order to have a successful lesson plan. No matter what the form of a lesson plan, there are fundamental components of all lesson plans that must be included in any lesson plan write up, which will be discussed in detail later. Ultimately, a lesson plan is a reflection of the needs and interests of the learners.

3.3.2 *Skill of Introduction*

Introduction is a pre-planned arrangement to stimulate learner's interest and to "catch" or hook the learners' attention (Eng, 2017; McDonald, 2019). A set is a device which induces a learner to attend and learn. Set induction may take the form of an action, statement or stories as it relate to learners

and teachers' experiences in order to achieve the objectives of the lesson. The effectiveness of a set depends on the situation to which it is applied. Hence, the teacher must find those kinds of sets most appropriate to their purposes.

Effective introductions encourage learners' interest and solicit their involvement in the main body of the lesson (Adewoyin, 2017).The most effective sets are those that capture the learner's attention and sustain the interest of the learners as the lesson progresses creating an atmosphere of relaxation. The establishment of a set usually occurs at the beginning of a class, and it may occur during the lesson presentation especially when switching over to another objective. Set induction is appropriate whenever the activity, goal and idea of the content are changed so that it will modify the frame of reference that is needed. Set induction is used to build continuity from lesson to lesson and from unit to unit.

According to Ughamadu (1992), set induction in educational practice is a pre-planned action by the classroom teacher to arouse the interest of his students, creating an atmosphere of curiosity and motivation in a classroom, thereby energizing, directing and sustaining the learners throughout the lesson. In other words, all the activities, which the teacher performs in order to get the learners ready for the new topic, may be referred to as set induction. Teachers induce the students in the class with activities such as the use of previous knowledge, suspense, silence pictures and movements of the body, and a host of other strategies. If the beginning of a lesson is not catchy and interesting, the class tends to be boring and the students becomes passive learners. Introduction is significant to classroom instruction because it provides a smooth conversation from the known to unknown; it helps to develop students' interest by visualizing the content and prepares the learners mind towards the objectives of the lesson.

3.3.3 *Skill of Stimulus Variation*

The concept of stimulus variations as an instructional skill in the teaching and learning process has proven to be useful in helping learners to respond positively to learning activities. Stimulus refers to an action that is used to elicit psychological action. Variation is a way of changing the pattern or strategy in a lesson to explain content in a lively manner. Stimulus variation is seen as a deliberate action or changes in behaviour or pattern of a lesson presentation in order to secure and maintain students' attention as the class is progressing. Maheshwari (2011) in Barzun (2015) stated that it a way of enhancing students to learn by paying more attention to what is being taught. It is an attention

gaining strategy that is deliberately planned by the teacher to generate student interest. This is the ability to carry students along by sustaining the interest of the students throughout the lesson.

Teaching and learning becomes interesting when a teacher makes use of different strategies to keep the learners alive. The purpose of stimulus variation as a skill is to arouse their attention and to focus it upon the content of the lesson. A particular method of teaching will not yield much result if variation is not included, sameness of classroom strategy may make learners lose interest in a lesson (Adewoyin, 2014). Students may be bored by a long lesson and may be carried away with other activities if variation is not added. However, with stimulus variation, it will help the students to remain actively interested in the lesson because changes in the perceived environment attract student's attention and stimulate mental activity. An effective teacher varies the learning experience through the effective use of stimulus variation in order to motivate learners‟ interest and maintain the attention of the learner to grasp the concept of the lesson. The attention producing behaviours, which can be incorporated into the classroom situation, are as follows: gesture, movement, pacing, silence, teacher inaction, and teacher voice, different modes of communication and sense of humour.

3.3.4 *Skill of Explanation*

Explanation skill is one of the most important skills in teaching. This skill is central in the teaching and learning process because it determines the competency of the teacher in giving clarity to the content. It focuses the mind of the learners on what is being taught. Explanation skill gives meaningful clarification to concepts and help learners to understand the content of the lesson. Generally, the skill of explanation is complex; it involves so many actions and activities carried out in the class such as talking, singing, describing, use of gesture, etc., which will help to explain the ideas for better understanding of the concept. It leads from the known to the unknown, it bridges the gap between a person’s knowledge or experience and new phenomena, and it aims to show the interdependence of phenomena in a general stable manner. It assists the learner to assimilate and accommodate new ideas or experiences. In a classroom, an explanation is a set of inter-related statements made by the teacher relating to a phenomenon or an idea in order to bring about or increase learners’ understanding about the topic under discussion. Explanation skill is used to describe “how” ,“why‟ and sometimes the “what” of a concept, a phenomenon, an event, an action or a condition. It can be described as an activity to bring about an understanding and clarity in the learning of a concept.

The concept of explanation is necessary for effective content delivery; it helps the teacher to present the subject matter in a simplified manner. The fluency of a teacher can be determined by this skill, the selection of words used in explaining the concepts for clarity of meaning. In the absence of the explanation skill, the presentation of the subject matter is not possible and meaningful learning will be difficult to achieve. Consequently, the skill of explaining relies upon the teacher and learners' past experiences, the nature of the new knowledge and the relationship that exists between the new knowledge and the past experiences.

Explanations can be made more effective by using simple and clear language for clarity, uses of simple illustration and examples, visual materials for better understanding and appropriate linkage words to relate the concepts. The purpose of explanation in the teaching and learning processes is to describe and give meaning to abstract ideas, to give momentous introduction to the subject being taught and to describe the usefulness of the topic in a simple and complete manner and to draw attention needed for the class. Hence, an effective explanation should be simple, clear, concise and interesting.

3.3.5 *Skill of* ***Reinforcement***

Reinforcement is an essential element in the teaching and learning process, it is a tool that can be used to manage behaviour. This theory was developed by B.F Skinner, which is called operant conditioning, the process of encouraging patterns of behaviour. It is like a propelling force that can increase desired behaviour. To reinforce is to encourage, to support or to motivate. Reinforcement is the act of eliciting stimuli that increase the learners' tendency to make the right response. Reinforcement is a skill used to describe any techniques, which modify or change behaviour (Cairns, 2018; Kumar 2018).It is supposed to bring about a change in behaviour; it is to encourage learners to contribute to the discussion of the lesson. It may be verbal, non-verbal or an extra verbal statement; verbal statement such as lovely, very good, fantastic, examples of non-verbal communication are smiling, nodding, shaking of hand and the extra verbal such as: - ahaa, hun, hum. It is good strategy that can promote friendliness between the teacher and the learners.

Reinforcement involves doing things or exhibiting an action that can help to increase the expected behaviours from the learners during the lesson. The deliberate act of responding to learner's behaviour in order to make the learner behave in a way that is expected and acceptable. Reinforcement strengthens and encourages learners to commit in the class; it helps to increase the

frequency of an expected desired behaviour by allowing the students to make a positive contribution during the teaching and learning exercise. It also involves the act of giving a gift or withdrawing benefit from a student, thereby increasing the chances of the students to repeating the acceptable actions or a new behaviour. Reinforcement is a good tool in promoting effective teaching and learning, it assists learners' to develop alternative and more functional acceptable behaviour. Learner behaviour can be controlled in the class by rewarding the types of behaviour that are desirable. Reinforcement helps to develop confidence and a positive self-image in the learner and helps learners become more motivated (Kumar, 2018).

Reinforcement can be positive or negative. By positive reinforcement, it is the release of benefits to increase appropriate behaviours while negative reinforcement is the withdrawal of benefits, which also increases appropriate behaviour (Oshodi & Aremu, 2015). Positive reinforcement motivates learners to contribute to the classroom discussion and it increases the strength of some desirable behaviours. These occur when the teacher uses a rewarding stimulus such as praise or gift to motivate some act or behaviour in the student. Negative reinforcement involves withdrawing reward or applying corrective feedback. When a negative reinforcement is used, the response to be learned serves to terminate the aversive stimulation. Generally, reinforcement is an effective means of carrying learners along as well as to contribute immensely to the classroom discussion. Reinforcement is very important in the teaching and learning process because it is used to encourage learner's performance, it can be used to capture learners' attention, it is also used by the teachers to elicit responses from the learners and as well used to motivate and encourage learner's active participation.

3.3.6 *Skill of Questioning*

Questioning is an important tool which teachers have at their disposal. A question is any statement that has an interrogative form of function and is a natural feature of communication (Yu, Landrum, Bonawitz, & Shafto 2018). Questioning is crucial to the way teachers manage the class, engage learners with content, encourage class participation and increase understanding (Sulthon, Tasnim & Khutobah. 2018). Questioning is an effective tool in the art and science of teaching. Every question demands a response (except in the case of request and suggestion). However, the quantity of questions asked needs to be considered in relation to the timing of the response, and to regulate learner contribution. It helps to clarify misconception, measure classroom control and motivate

learners to pay attention. Teachers must know when and how to ask good questions and how to handle students' answers.

Questioning could be applied at various stages of the teaching-learning process (Handayani, 2018). For instance, questions at the beginning of the class (introductory questions) help to determine the knowledge of the learners about the new topic and arouse the desire for knowledge by stimulating the interest and curiosity of the learners. Questions can be asked during the course of teaching (formative questions). These are useful in directing the thoughts and efforts of learners and the teachers‟ ability to determine readily, where his work has been too difficult or too vague to avoid misconceptions. Questions could also be asked at the end of the lesson (summative questions) which helps to give emphasis to the salient or important points.

Some questions are open-ended questions that require students to use both concrete and abstract thinking to determine for themselves appropriate responses (Handayani, 2018). This type of questions allows for many correct responses, such as questions dealing with opinions, hypotheses and evaluations. Some questions demand that students expand superficial responses. These are questions intended to stimulate logical or critical thinking to enhance deeper understanding and to increase students' participation. Probing questions also force the students to think thoroughly beyond their initial response. There are questions that deal with our cognitive thinking, the lower and higher order questions. The lower order cognitive questions require the student to recall factual information. On the other hand, higher order cognitive questions are those that cannot be answered merely by memory. It allows students to go beyond recall or factual answers and begins to generalize, relate, compare and contrast, analyze or rationalize. Hence, the importance of questions cannot be over-emphasized. Questioning make the lesson lively, it ensures full participation of learners in the lesson. It helps to know how learners are following the lesson and to access the achievement and mastery of the objectives of the lesson.

3.3.7 *Skill of Closure*

When a lesson starts well in order to captivate students' attention, it must be able to end well so that the efforts at the beginning will not be in vain. Closure as a skill is as important as other teaching skills. It is used to draw attention to the end of a specific learning sequence by focusing attention on what has been learnt so far (Miltz, 1975). Closure is seen as the ability of the teacher to put together the major parts of a lesson or unit of instruction to establish the cognitive link between the familiar

and the new and to provide students with a feeling of accomplishment. Teachers, who want to establish a relationship between the new area of knowledge and the previous knowledge, can use closure. Teachers can make use of closure to reinforce major points and form coherent pictures in order to consolidate and eliminate any confusion in the topic discussed.

Closure involves actions or statements by a teacher that are designed to bring a lesson or a presentation to an appropriate conclusion (Adewoyin, 2014; Orungbemi, 2016). It is used to help students bring things together in their own minds, to make sense out of what has just been taught. Closure needs to be carefully planned and executed. It can occur in many different points during a lesson or at the end of the lesson with different learning activities like questioning the pupils on the major point of the lesson, giving the pupils class exercises to find solutions or take-home assignments. However, the closure skill can take various forms like the instructional or teacher-based closure or the student-based closure. The teacher-based closure is a systematic link between the salient points and recapitulating, revising, or reviewing the lesson. Link between the previous knowledge and the new topic to indicate the summary of the major points convened in the lesson. The student-based closure is referred to as cognitive closure, which is attained when students make the link between what they have learned and the previous knowledge or summarize by themselves the major points of the lesson in a logical order.

The social closure can be used by the teacher after a difficult session to give learners a sense of achievement so that despite any difficulties they encounter during the lesson, they are encouraged and motivated to continue striving (Orungbemi, 2016). Social closure can be used to motivate and sustain the students in the present and future lesson by the use of rewards, praises and encouragement. In summary, closure is the act of reviewing and clarifying the key points of a lesson, tying them together into a coherent whole, and ensuring their utility and application by firmly securing them in the student's conceptual framework. The skill of closure gives the learners a good feeling of achievement in the class. It is an important skill to help the learners to retain the important points of the lesson. Teachers can use it to clear up misunderstandings or misconceptions in the lesson, in order to give the learners a sense of satisfaction.

3.4 BRIEF HISTORY AND PROCEDURE OF MICRO-TEACHING

The concept of micro-teaching is, in principle, supported by the South African teacher education curriculum in MRTEQ (2015), but is not new in teacher education programmes as it has been in existence for over 50 years. It is a procedure used to train pre-service teachers to enact the method of teaching. Micro-teaching can be traced to a group of concerned lecturers in 1960's at the Stanford University; prominent among these lecturers are Dwight Allen and Robert Bush of the Stanford University in the United State of America (USA). It was an offshoot of a research process geared towards improving the quality of the teacher training programmes. It is essentially focused at providing prospective teachers with teaching encounters prior to the actual teaching in a normal classroom. Micro-teaching was developed as an answer to the questions, how best can teachers be prepared for the teaching profession? How best can teachers develop teaching skills? Moreover, how best can pre-service teachers develop self-confidence and competence in their teaching presentation? This procedure was seen as an improvement over the conventional classroom demonstration lesson by the Stanford Secondary Education project staff. It was later discovered that there was a missing link and lack of direction in the teaching technique in terms of the teaching skills which can be learnt, practiced, evaluated, controlled and understood.

In 1963, Horace Aubertine later developed the technical teaching skill "How to begin a lesson" as part of a research study. Because of this experience, the practice of focusing on one skill at a time evolved and proved to be quite successful. By this process, the pre-service teachers are to practice teaching skills systematically to make them develop teaching competencies. Micro-teaching breaks down the teaching exercise in terms of content, class size, skills and time durations. It was designed for training both pre-service and in-service teachers with the purpose of providing vital information about how teaching could be done, how methods could be applied, how questions could be asked, how a classroom could be managed and controlled, how the chalkboard could be used and managed and the application of other teaching skills to enhance quality teaching. Passi (1976) in Fernandez (2010) identifies three phases in the procedure of micro-teaching as a knowledge acquisition phase, skills acquisition phase and a transfer phase.

The knowledge acquisition stage is the first stage that deals with the process whereby the pre-service teacher is exposed to the component of micro-teaching and teaching skills through lectures and demonstration by expert teachers. The second phase is concerned with the central presentation of skills; it is the process where the pre-service teacher prepares a lesson plan on the application of some

teaching skills for classroom demonstration. This stage gives more insight to the pre-service teacher on how these skills are applied. The transfer phase is a stage of putting into practice what they have learned and observed by integrating these skills from the simulated teaching situation to a real classroom setting. Mostly, micro-teaching is used to shape and develop specific teaching skills, with frequent practice while errors are gradually eliminated.

Generally, the procedure of micro-teaching includes; planning stage, teaching stage, observation stage, re-planning stage, re-teaching and re observation stage. These stages makes it possible to concentrate on some specific teaching skills (usually between 1 to 2) with a class size of about 5-12 students and to practice teaching between a limited period time of about 10-15 minutes in a conducive atmosphere with the opportunity of getting feedback from observers. This feedback mechanism has proved to be useful to the pre-service teachers in the process of reflecting on what works well and what needs adjustment in their presentation.

3.5 MAIN ASSUMPTIONS OF MICRO-TEACHING

In the words of Allen and Ryan (1969), micro-teaching is an idea at the core of which lie five essential assumptions:

1. Real teaching: Micro-teaching is more or less real teaching. Although the teaching situation is a constructed one in the sense that teacher and students work together in a practiced situation, nevertheless, authentic teaching does take place which develops learner's experience.
2. Reducing complexities: Micro-teaching lessens the complexities of normal classroom teaching in terms of skills used, time allocated, class size and scope of content and as well helps reduce expected tension and stress.
3. Focus on training: Micro-teaching focuses on constant practice for the competency of specific tasks. These tasks may be techniques of teaching, the mastery of certain curricular materials, or the demonstration of teaching skills.
4. Increased control of practice: Micro teaching allows for the increased control of practice. In the practice setting of micro-teaching, the rituals of time, students, methods of feedback and supervision, and many other factors can be manipulated. As a result, a high degree of control can be built into the training program.
5. Expanding knowledge of results: Micro-teaching greatly expands the normal knowledge of results or feedback dimensions in teaching. Immediately after teaching a brief micro-lesson,

the trainee engages in a critique of his performance, to give him a maximum insight into his performance.

3.6 SIGNIFICANCE OF MICRO-TEACHING IN TEACHER EDUCATION PROGRAMMES

There have been great significance of micro-teaching in teacher education programmes; several institutions have attested to this with the outcome of their graduates. Much attention is now given to micro-teaching in some universities and colleges due to the impacts seen in the life of their students. It has made teacher education programmes to be more purposeful, goal-oriented and helps to decide common objectives for the programme. Micro-teaching is seen as an excellent way to build up teaching skills, competence and confidence in the pre-service teachers in order to improve their performance. The experience that can be gained in micro-teaching modules ranges from lecturing, tutoring, modelling, learn and practice, giving constructive feedback with the ability to reflect on ones mistakes. These ranges of knowledges will definitely help pre-service teachers to improve and develop in their careers. The pre-service teachers have the opportunity to learn and interact with their colleagues within a small group, observing other group members, commenting on their performance that may influence their performance.

Micro-teaching in teacher education programmes allows the pre-service teachers to put themselves under the microscope, and reflect on their performance and develop their teaching behaviour (Ata & Kozan, 2018; Pandey, 2019; Ledger & Fischetti 2020).Integrating technology such as video recording in micro-teaching, the pre-service teachers have chances to see oneself the way they see others and this helps them see what works well and the mistake they need to rectify. The most important aspect of micro-teaching is modelling the expected teaching behaviours. Through observation of demonstrated videos, expert teacher demonstrations, teaching and re-teaching procedures, the pre-service teachers can adopt new teaching skills, strategies and methods and as well develop the best way they reflect on their expected roles. The place of micro-teaching in teacher education has given the pre-service teacher an avenue to practice and learn with the feedback mechanisms which will help eliminate some of the complexities of learning to teach in the classroom situation. The pre-service teachers would have developed the courage of facing the learners and the pressure of teaching in a relatively long duration of time. In conclusion, with digital video micro-teaching may help pre-service teachers to learn individually either through observation or personal presentation, thereby improving their competencies as seen in the advantages below:

Table 3.2: Showing the advantages of micro-teaching in teacher's education programmes

Advantages of microteaching
• Micro-teaching is a useful technique for developing teaching efficiencies in pre-service and in-service teacher education programmes
• Micro-teaching helps to eliminate some of the complexity of learning to teach in the classroom situation such as the pressure to teach for a relatively long time or face large numbers of students
• Micro-teaching gives student teachers an opportunity to have first-hand teaching Experiences
• Micro-teaching is also relevant in the sense that it enables the teacher trainee to grow Professionally
• Micro-teaching helps the student teachers to change their undesirable mannerisms and as well to help to develop positive attitudes
• Micro-teaching allows students teachers to experience supervision with an opportunity to get constructive feedback
• Micro-teaching is a teacher training techniques which helps the teacher to master the teaching skills
• Micro-teaching encourages the trainee to develop critical minds and promote learning of some specific skills.

Extract from Adewoyin and Okuntade, 2017

Micro-teaching has given teacher education programmes more value and it has helped build the pre-service teacher's confidence (Huber & Ward, 1969; Passi, 1976; Elliot, 1982; Ananthakrishnan,1993; Remish, 2013; Kumar,2016; Pandey, 2019). Research has shown that the performance of the pre-service teachers who are trained with micro-teaching is better when compared to those that were not exposed to the concept (Wei, 2015; Shanu, 2016; Dhananjaya & Nusrath, 2018; Reddy, 2019). Through micro-teaching, the pre-service teachers can adequately develop deep understanding of their expected roles and what the teaching profession entails. The knowledge of micro-teaching helps pre-service teachers to experience the actual teaching cultures as part of their professional development. Although the significance and advantages of micro-teaching is enormous, there are also some disadvantages facing the proper implementation of micro-teaching as outlined below:

Table 3.3: Showing the Disadvantages of micro-teaching in teachers education programmes

S/N	**Disadvantages of Micro-teaching**
1	Micro-teaching is said to be unreal in terms of the number of pupils and the skills taught as well as duration of the lesson
2	Micro-teaching is student teacher-centred rather than participant-centred. This emphasis is on how the student teacher performs and not the reaction of the pupils
3	Micro-teaching may raise administrative problems while arranging micro-lessons because deviates from normal classroom teaching
4	Micro-teaching may be difficult to practice with a large number of trainees who may not be given the opportunity for re-teaching and re-planning exercises
5	Micro-teaching alone may not be adequate. It needs to be supplemented and integrated with other teaching techniques
6	Micro-teaching requires competent and suitably qualified teacher educators for its successful Implementation
7	Micro-teaching is a time-consuming technique that requires special classroom settings

Extract from Adewoyin and Okuntade 2017

3.7 CHALLENGES OF MICRO-TEACHING

Micro-teaching is a core course in teacher education programmes (Remesh, 2013: Otsupius, 2014) and it is a pre-requisite for participating in teaching practice in some institutions. Any student who does not pass the course cannot be deployed to schools to teach. Teaching practice is a compulsory course which helps to develop the competency of the pre-service teachers. A lot of time is required for micro-teaching to be learnt thoroughly to enable all pre-service teachers to gain the required skills before they are posted out on teaching practice. This underscores its importance in the professional training of teachers; in fact, micro-teaching is capital intensive and time-consuming.

Nevertheless, micro-teaching is fraught with problems, primarily resource related, like the shortage of well-equipped micro-teaching laboratories. Finding suitable spaces to serve as laboratories in most institutions is not an easy task. Where such spaces are adapted, it is not easy bringing them up to the required standard. Those that cannot attain spaces to adapt for such purposes have to build new blocks and often there is no provision or finances. To bring this into the annual budget of most institutions requires much time and logistics. Hence, most institutions now occupy only available

spaces at universities or colleges, thereby compromising standards. Even, where makeshift micro-teaching laboratories are in place, to tool up the laboratories with necessary equipment and materials require huge capital outlay which is often not available.

The challenges facing micro-teaching in some institutions is due to the quality of available teaching staff. Since micro-teaching entails breaking up the class into smaller units of between 5 to 10 or at most 15 students, it requires a large number of qualified teaching staff. Involving all the staff in the Faculty of Education for effective supervision not minding whether they are curriculum methodology experts coupled with their tight schedules, is another challenge. In relation to this challenge, is the inadequate technical and professional staff available to handle laboratory equipment and to guide students in their practice. This is also a major problem affecting micro-teaching sessions; there are seldom experts to handle the recording aspect of the student's performance and to provide easy feedback mechanisms.

Underlining all these challenges is the shortage of funds. If adequate funding were available, it would not be difficult to build new micro-teaching laboratories, purchase necessary equipment and materials, recruit qualified members of academic staff by government and institutions. In addition, the pre-service teachers are financially challenged in getting the necessary resources for effective micro-teaching. During the planning and presentation of their lessons, trainees are required to use relevant and appropriate instructional materials. Besides, each student is expected to make photocopies of assessment sheets to evaluate their peers at each session. The attitudes of the pre-service teachers sometimes during the evaluation process, may affect the objectivity of the programme. Some pre-service teachers can be biased when assessing their colleagues. This may not provide an objective view of each trainee's performance.

3.8. THE TEACHER EDUCATION POLICY IN SOUTH AFRICA

3.8.1 *South Africa: Policy Framework on Teacher Development*

Following the Apartheid era, the national teacher education curriculum was re-designed to meet the needs and aspirations of the South African society. The South African government values education and considers teachers as the most important component in the development of the nation. There have been various policy statements to improve the development of teachers. The Integrated

Strategy Framework for Teachers Education Development (ISPFTED) was launched in 2011 with the aim to improve the quality of teacher education and development in order to improve the quality of teachers and their teaching strategies. This policy framework for teacher education and development was planned to adequately equip the teaching profession to meet the needs of a democratic South African society in the 21st century. This framework guides activities of teacher education in terms of teacher preparation, qualification, and recruitment and teacher professionalism. The framework promotes the following aims:

- To properly equip teachers to undertake the essential and demanding tasks of this noble profession.
- To enhance the professional competence of teachers and their ability to perform effectively.
- To help teachers acquire the appropriate qualification to fill available vacancies at schools.
- To be highly regarded and respected in South Africa and develop a high level of professional standards.

In South Africa, pre-service teacher education programmes are expected to prepare teachers who have the capacity to develop conceptually strong, responsive and inclusive teaching practice (Rusznyak & Bertram, 2015). The extent to which pre-service teacher education programmes have been successful has been questioned both internationally (e.g. Lancaster & Auhl, 2013) and within the South African context (Council on Higher Education, 2010). The CHE review noted that tensions around academic depth and contextual relevance were particularly prominent in programmes where a conceptual framework was not adequately implemented. Since these findings the pre-service teacher curriculum has been strengthened and more guidelines were introduced to guide teacher educators to design a curriculum which should be conceptually strong and contextually responsive (Islam, 2012).

The pre-service teachers curriculum in South Africa has evolved from the first national policy governing the provision of teacher education, the Norms and Standards for Educators (Department of Education, 2000), stipulating that pre-service teacher education programmes should prepare prospective teachers for seven different "roles of the educator", and expanded to the new *Minimum Requirements for Teacher Education Qualification* (MRTEQ) (DOE, 2015). By the end of their pre-service training, qualifying teachers should have achieved 10 exit level outcomes, verified against a set of 89 assessment criteria (Rusznyak & Bertram, 2015). South African teacher educators thus find themselves grappling with how to organise coursework and practicum expectations around these (extensive) lists of discrete roles, outcomes and competences (e.g.Fraser, Killen & Nieman, 2005).

Currently, many universities are using the guidelines of MRTEQ to re-design, re-align and strengthen their programmes.

MRTEQ promotes various types of knowledge that must underpin teachers‟ practice, while encapsulating all of these in the notion of integrated and applied knowledge for teacher education (Luckay, 2018). The focus of the integrated and applied knowledge is that it enables teachers to be able to draw on a reservoir of knowledge, mixing the theoretical and practical, to guide their decisions in the moment of practice. This focus places an emphasis on the "what‟ and "how" of learning with careful scrutiny of which knowledge should guide one's action within a given moment of practice (Luckay, 2018; Kimathi & Rusznyak, 2018). Further, the ideal is that reflection, connection of variety knowledge and synthesis of knowledge and practice should be centred in every decision made. To this end, the MRTEQ describes clear and specific requirements for the development of teacher education learning programmes, as well as guidelines regarding practical and Work Integrated Learning (WIL) structures. MRTEQ specifies different types of knowledge that are required for the acquisition, integration and application of knowledge for teaching purposes, listing them as: disciplinary learning, pedagogical learning, practical learning, fundamental learning and situational learning (MRTEQ, 2015). These five types of learning and knowledge should provide the basis for the curriculum, with different minimum credits assigned to a specific course throughout the programmes. Each of these knowledge areas within pre-service teacher's education programmes is important in order to develop a conceptually coherent and contextually responsive teacher. The university has aligned with MRTEQ to promote more practical learning through micro-teaching.

3.8.2 *Teacher Education modules in alignment with MRTEQ*

Teacher education modules are designed to produce dynamic and disciplined educators of the highest quality who can promote excellence in learners. The module are designed to develop the pre-service teachers in different areas of specializations with special attention given to core areas of teacher's education programmes such as; basic knowledge of educational foundations, basic knowledge of subjects disciplines in different grade levels and the education practice (teaching practice exercise). In a bid to develop the competence and to strengthen the professional understanding of the B.Ed. students, emphasis were placed on practical learning as a major module and also there are collaboration with the primary and high schools within the geographical location for the school

observation and teaching practice exercise to hone the students' teaching skills. The modules are designed to reflect the significance of practical learning in teacher education programmes in relation to teaching competency as acknowledged in MRTEQ principles. Apart from the practical learning in the B.Ed. curriculum, other core foundation modules such as psychology, sociology, curriculum and pedagogy and as well as teaching methods in each discipline were also part of the B.Ed. programmes.

Conversely, the competency of B.Ed. students in teaching depends on the solid foundation of teacher education programmes in relation to the modules content, pedagogical skills and technological knowledge in line with MRTEQ and micro-teaching principles. MRTEQ (2015) emphasises that teaching competency is based on the application of skills which rely exclusively on evidence of the demonstration or performance outcome as a measure of success. It should therefore be noted, that every module in teacher education programmes is not physically seen as the case that may be in the lives of the students trained, if not well-rehearsed and demonstrated by the pre-service teacher during micro-teaching modules, it may look unproductive. In addition, the teacher education programmes, no matter how rich and comprehensive the curriculum content may be, it can only be noticed through demonstration of competent teaching reflecting from effective application of teaching skills as described in the diagram below. The implication of the diagram below is that all knowledge acquired by the pre-service teachers, both theory and practice during the training exercise, are hidden from the surface, and can only be well enacted by the pre-service teachers through the teaching skills as a demonstrative outcome of a rich curriculum content.

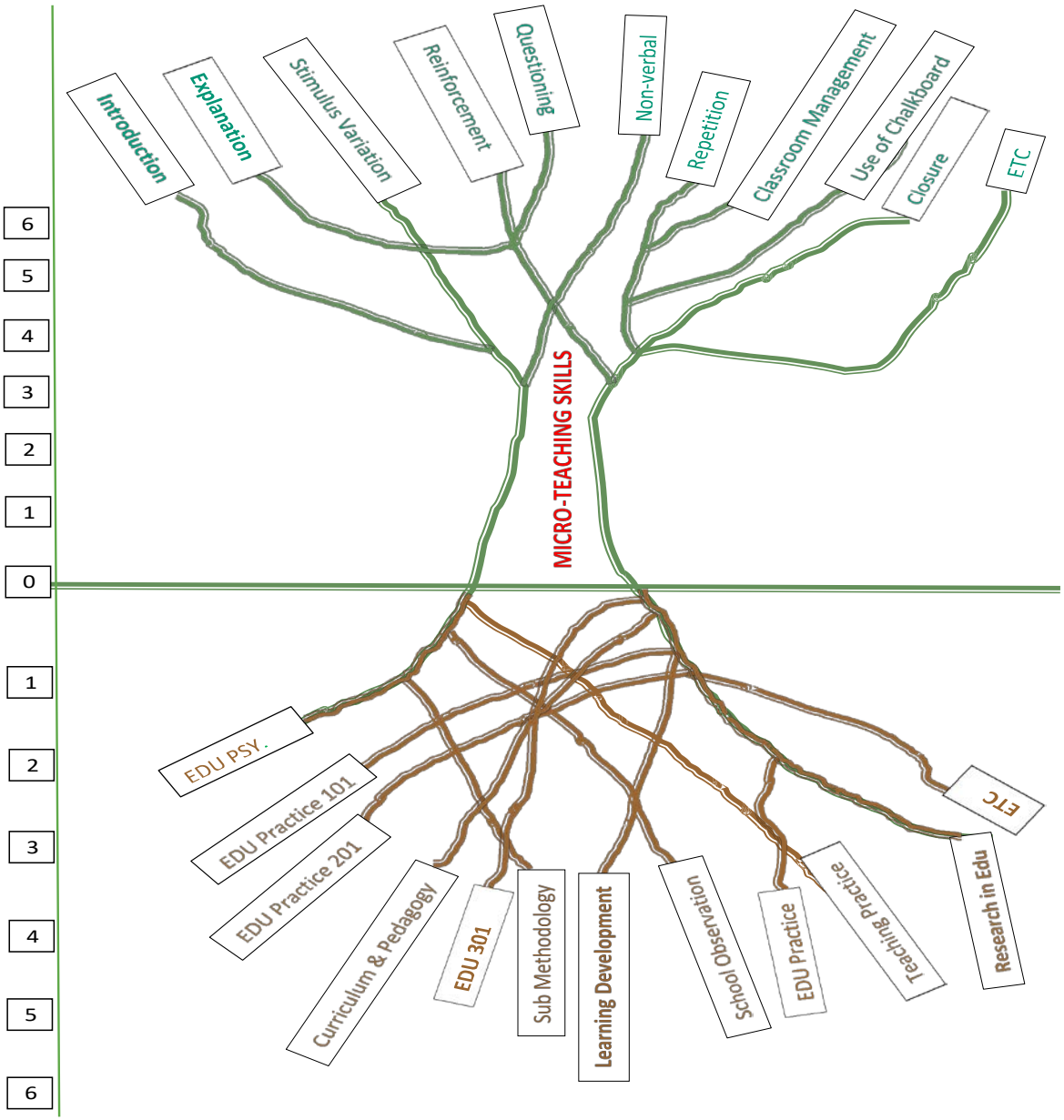

Figure 3. 2: Showing teaching skills as a demonstrative outcome of hidden knowledge in teacher education programmes.

3.9 CONCEPTUALISATION OF TECHNOLOGY AND ITS USES

The world has become a global village through technological advancement; all facets of life have witnessed some form of technological innovation and the educational system is not left behind. Technology has transformed the teaching and learning process, it has assisted both the teachers and the learners in the process of making teaching and learning more meaningful. Technology is the process of creating tools, which involve actions in order to solve problems. Technology can be

defined as the application of scientific knowledge in finding convenient and meaningful solutions to problems through tools (Herschbach, 1995: Salomon, 1984). The concept and application of technology is integral to all facets of our life, it has become part of our daily routine, from the use of electricity, home appliances, work equipment, communication, business, teaching and learning and to all auto and mobile facilities. Technology is involved in the application of human knowledge with tools, materials, and systems to gain a positive result for the benefits of the human race (Ramey 2013).

Presently, the use of technology has become competitive in creating and developing new ideas, rendering effective and efficient services in an organization (Ramey, 2013). The schooling system now uses technology to deliver services to their students in making the teaching and learning process more interactive and engaging. Different technological devices are now introduced to the teaching and learning process in order to enhance effective learning. A good example of such technology includes multimedia projectors, electronic board computers, overhead projectors, slide projectors, mobile phones and some other electronic devices. Technology has helped to create new ideas in learning, challenging the student to be more active in class and making the teaching and learning more interesting. In education, teaching and learning is becoming more creative and entertaining through the advancement of new technology devices. The dynamic nature of technology has kept teachers and learners on their toes; creating a greater demand in making learning easier and more convenient to the 21st century learner.

The 21st century teaching skills is technologically driven, the needs and demands for new technology has moved teaching from the Stone Age (conventional methods) to an information age (Akorede, 2014; Kivunja, 2015). Technological advancement has created active and challenging learning strategies, which depends on a teacher's competence in the usage of innovative technology. Technology has enhanced the process of transmitting information, ideas or knowledge from one person to another. Without minding distance barrier, ideas are conveyed, information are exchanged, feelings and emotions are expressed through technological devices like phones, computers or emails. It has helped the teacher to stay in touch with the students. Schools uses digital technology devices to facilitate the flow of information in the classroom and to promote new ideas in teaching and learning processes targeted towards the students for better understanding of the topics.

In addition, methods and strategies are changing, the use of technology devices like, computer-aided design, and computer managed instruction, computer managed, learning virtual learning and online tutorials (Aktaruzzaman, Shamim & Clement, 2011).These strategies and devices along with many

others help teachers to complete their work efficiently within a short period of time, minimizing learning difficulties of students. Currently, the classroom is becoming paperless with the advancement of modern technology, assignments are submitted and marked electronically, with access to digital phones and other technological devices such as video presentations, visual animations, and computer simulations can make the classroom-learning environment interactive with so much fun.

3.9.1 *Digital technology*

Digital technology is borne out of the quest for the fastest means of getting immediate solutions to problems. This dynamism in technology and the search for a quick means of getting results has changed human conceptual understanding of technology. Digital technologies have transcended helping people in finding solutions to problems but getting a faster and better way of finding an answer to a problem. Digital technology is the advancement in innovative technology turning the world to a globalised society. Digital technology are kinds of electronic devices, tools or systems used to generate, store and process data, it's the quickest means of transferring and exchanging information. This includes social media, applications (apps), multimedia devices, productivity applications, cloud computing and mobile devices(Buckinham, 2015; Selwyn,2014).Digital technology is becoming universal in all works of life like the infrastructural facilities and presently altering the functions of organizational systems and how people work (Brynjoifsson & McAffe, 2014).

The quest for fast access to information has allowed the scope of human activities to increase profoundly in electronic space (Applegate, Cash Mills, 1998; Adu & Galloway, 2015). Digital technology is used to describe any electronic resources that can effectively be used to create, communicate, and exchange information. This includes the use of web tools, multimedia tools, programming tools applications software and other digital devices. Giones and Brem (2017) explains digital technology as any devices that breakdown information in the communication process between the sender and the receiver using binary code. Digital technology is closing the gap between people by overcoming physical limitations and has created a space where people can interact through simple and complex technological tools.

Presently, the simplest, most widely used and available digital technology is the cell or mobile phones, it is a codeless communication device which help to transmit messages, voice or video call from the sender through a radioactive motion into the receiver's cell phone (Dorji, 2019).The benefit

of the radioactive motion is that the process of information being faster, effective and very reliable (Dorji, 2019). Cell phones is now replacing most gadgets because of its efficacy, such as easy operation, camera facility, expanded memory capacity coupled with other functions which has shifted the main purpose of cell phones from a verbal communication tool to a multimedia tool. The multi-functionality of cell phones from communication tool to a more complex and effective multi-faceted gadget of checking email, snapping photos, recording videos, uploading or downloading information, chatting with friends and family making video calls, and updating our social media status makes the cell phone a digital technology.

3.9.2 *Cell phone and its uses*

The history of the telephone dates back to 1842, invented by Alexander Graham Bell with the purpose of easy communication, to shorten the barriers of travelling and getting quick feedback from the process of communication. Knowledge exposure and the advancement of technological innovation led to a quick means of transmitting information. In 1973, Dr Martin Cooper and a team of experts who worked at Motorola invented the cell phone, and by 1983, cell phones were recognized and widely accepted as a cordless portable phone used to transmit information from one person to the other. A cell phone is a small electronic wireless device used to receive and send text, voice and video messages (Simon, 2004). It is seen as telecommunication devices that allow calls to be transmitted wirelessly without a limited mobility boundary. Ever since the invention of portable cell phones, it has become one of the most essential means of communication, educating and entertainment. There have been various development and innovation on this device due to the increase in its demand and usage as a resourceful device (Nathan, 2016).The multi-functional purpose of cell phones has made people to constantly refer to it as a “mobile device”, it is a device that allows users to transmit and receive information anyplace and anytime in the world.

From inception to date, cell phones have been so significant to all and sundry. The purpose and the usage have gone beyond the communication tool. The act of sending and receiving messages, building an intimate relationship with distance families and friends, accessing emails, access to news and events around the world and research has increased the usage and the significance of cell phones in our society. The versatility of cell phones with access to the internet, video recording, storing of information and other functions has made the device universally acceptable. Cell phones can factually do what a computer system can do; people’s lives are now attached to cell phones with all contact and vital information stored in the memory of their cell phones. The functions of cell phones are numerous, according to Wie & Lo (2006) and McCoy (2016). Cell phones allow for quick and

constant information sharing; used to watch and send video information and serves as learning and entertainment tools. It can be used to transact business and as well help users to be organized in carrying out their daily activities.

3.9.3 *Social media and social platform*

The term "social media" became known in 2004 to date, it has gone beyond imagination with its evolution of various types and they are becoming viable tools to supplement the traditional learning environment. The overwhelming usage of social media has surged globally in recent years. It has not been easy to come up with a definite definition that could be universally acceptable. Merriam Webster dictionary (2015) defines social media as a form of electronic communication through which users create on-line communities to share information, ideas, personal messages and other content. Social media is seen as a convenient method of communication, which provides the ability to stay connected with friends and family at the discretion of the user's own rate and time (Whiting & Willaims, 2013). Social media provides educators with opportunities to engage learners online and in the virtual classroom, as well as to the support and development of learner skills and competencies (Blaschke, 2014). It is one of the fastest means of communication, utilised widely and quickly. Social media includes technology that facilitates social interaction, collaboration, and enables deliberation across stakeholders. These technologies include blogs, wikis, media (audio, photo, video, text) sharing tools, networking platforms and virtual worlds (Boyd & Ellison, 2007).It can serve as a means of learning and exchange of meaningful ideas.

Social media is used to connect and express feelings beyond geographical locations. It also plays a valuable role in facilitating co-operative and collaborative engagement of teachers, students and other stakeholders in the educational system. It has made information more accessible through one medium or the other. With social media, people are able to share ideas and information either on-line or off-line. It is a form of electronic communication that can be broadcast via the internet with a large audience and allows users to interact with each other and become part of an on-line community exchanging information, ideas, personal messages and other content (Kane, Alavi, Labianca & Borgotti, 2014). Social media is one of the inexpensive media to communicate, exchange and interact with people, having quick access to information and expressing ones feeling to another.

Social media can serve as a learning tool among students in the process of exchanging meaningful ideas with peers and teachers. According to Ivala and Grachago (2012), social media increases

Students' engagement outside the classroom and create new and innovative ways of learning. Students are using the internet to search for information and to learn new things in relation to their career. However, a balance between social media use and academic effort is imperative to improve student's grades (Brydoff, 2007; Wang, Chen and Lian, 2011). The social media are methods of communicating electronically, it is a social interactive platform, and these tools are of varieties used by students or individuals to meet their needs in one social platform or the other. The usage of social media has grown across cultures and countries and has risen above expectations especially with online communication (Arli 2017; Arli & Dietrich, 2017). The social media has been a daily routine for young adults using the phone to connect, to advertise or buy products on-line and as well share information in one social platform or the other.

3.10 GOOGLE DRIVE AS MICRO-TEACHING PLATFORM

The Google drive is one of the most versatile online storage platforms used to sustain information. It can be used as personal cloud storage where large and vital information can be stored and accessed with the use of computer or mobile devices. Google drive is a free cloud back up storage server that enables users to store and access files or confidential documents online or offline. Google created Google drive in 2012 as a file storage and synchronised server, which allows users to share information across devices. Files like videos, photos, images, documents, etc., can be stored on Google drive and can be retrieved any time and any place using an internet connection or Wi-Fi facilities via a mobile android, iPhone, iPad or PC device. Information or images can be sent to family and friends through Google drive, and by sharing this information to family or friends, permission is given for easy access to the information. The information in Google drive can be edited by adding comments to get immediate feedback from others that have access to the information. It gives room for collaboration and easy communication among group members. Google drives encompass Google Doc, Google sheet and Google slides. Empty folders can be created to store more information and users can download local information directly from the website. Google drive is a good storage device, which helps users to keep and retrieve information, but it is not without some disadvantages. Information on Google drive can be hacked, confidential, and important information could be remove. Downloading and uploading information can sometimes be slow due to multiple users.

Google drive was used to collect information from the pre-service teachers in order to create social interaction among team members. It has been discovered that social pressure may force some learners

to learn and interact with technology (Teo, Sang, Mei & Hoi 2019).Social communication among learners has become easier with cell phones; learners now participate more freely in this modern life (Williams & Yerby, 2019).From observation, eight out of every ten students is having cell phones as a means of communication and interaction with peers. The digital technology that is obviously seen and used by young adults is the cell phone because it is capable of conveying and explaining content and ideas in a variety of ways, which enables natural learning styles and stimulates interest (SU & Cheng, 2015). Learners watch videos, share comments and upload pictures on social media platforms with their phones more than adults do (Powell, Jacob, Chapman, 2012).

The simplicity of Google drive as social platforms with the use of cell phones may create a dynamic engagement among the pre-service teachers. Social platforms have changed how people communicate, interact and acquire knowledge (Fuchs, 2014). In lieu of this, motivating the pre-service teacher to use the cell phones as a digital platform may help enhance their knowledge, to gather information, interact and educate one another. The cell phones serves as second companions when alone, and this made the researcher to reflect on the TPACK concept of re-purposing by choosing the media as an alternative strategy that may help the personal need of the pre-service teachers to reflect on their teaching performance. Therefore, integrating social platforms like digital videos into micro-teaching presentations may likely improve students' performance. According to Giro, Bell and Mishra (2007), digital video motivates, inspire and engages students when it is incorporated into student-centred learning activities. Exposing the pre-service teachers to digital videos in a micro-teaching class can serve as an innovative technique in helping them to gain more insight and in-depth understanding of the concept. Hence, creating a platform for improving the method of presenting their lesson with innovative devices which students enjoy using, may boost their performance.

3.11 SUMMARY OF CHAPTER

In this chapter, I have discussed the concept of teaching, teaching skills, micro-teaching, importance of micro-teaching, problems of micro-teaching with the advantages and disadvantages of micro-teaching. I also discussed the concept of teacher education, the development of teacher education in South Africa along with the policy document and the development of teacher education programmes. I discussed the teacher education modules in alignment with MRTEQ. I also discussed the concept of technology, the relevance of technology to the teaching and learning situations, I discussed the concept of digital technology and its functions to the teaching and learning processes. I conclude this

chapter with the concept of the social media platform using cell phones as a second companion to reflect on the act of learning to teach. In the next chapter, I will discuss the methodology procedure in line with the research design using the mixed method paradigm. The population and the sample procedure were discussed; I discuss how video presentations and interview schedules were used for data collection in line with the data analysis procedure.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 INTRODUCTION

From the previous chapters, the concept of micro-teaching and the key teaching skills have been discussed. The national and international perspectives of micro-teaching show the significant role of the teacher education programmes towards the development of pre-service teachers' competencies. Furthermore, the national and international literatures support that technology may enhance the professional development of pre-service teachers. The main research question, namely: *-How does the final year B.Ed. pre-service teacher at UWC apply micro-teaching skills with digital technology?* This MRQ is to examine the extent to which pre-service teachers use the key teaching skills during micro-teaching presentations. The sub-research questions give depth to the extent to which the pre-service teachers' knowledge of micro-teaching influenced the application of the key teaching skills. In addition, the pre-service teachers' knowledge of technology was examined to understand how they were able to use technology to achieve their objectives. Thus, the research questions create a multi-faceted understanding of how the pre-service teachers apply their micro-teaching skills within their contexts.

This chapter focuses on the research design and how quantitative and qualitative data were collected using a mixed methods approach. In the first phase, priority was given to the quantitative data collection. The data collected quantitatively was used to examine the video presentations of the key teaching skills. In the second phase, the qualitative approach was used to analyse the interview data and the portfolio documents. The instruments used for data collection were purposely developed for the pre-service teachers. Two experts in the field of micro-teaching assisted with the development and validation of the instruments. The quantitative data collected through video presentations were ranked in accordance to the usage of the sub-skills using the statistical programme SPSS version 25. While the qualitative data collection is based on interviews and lesson plans observation, this was also analysed to triangulate the quantitative findings using the thematic and content analysis. The chapter furthermore describes the population under investigation, how they were selected, the sampling procedure, construction of instruments along validity and reliability were part of the discussion as well as the ethical considerations. Being a descriptive explanatory study the advantage

is to identify and describe the phenomenon under investigation in order to provide avenues for further research towards the improvement of teaching skills of the pre-service teachers. The method with the procedure of data collection and analysis within the context of mixed methods were described.

4.2 METHODOLOGY

Method is the procedure of doing things; it is sometimes seen as a way of carrying out a project in order to achieve a stated objective (Howell, 2013). Methodology is a strategic plan or procedure under which research work is carried out-: it is the description and the structure of the research study (Creswell, 2014). Methodology is the philosophical framework within which the research is conducted or the foundations upon which the research is based (Kittel, 2006). The research methodology explains the design of research in detail by justifying the options of the researcher based on the topic. Research methodology gives an outline on how research will be conducted with emphasis on the sub-outlines such as research design, sampling procedure, data collection, data analysis procedures, validity and reliability of the study (Howell, 2013).

4.3 MIXED METHOD APPROACH

This research study made use of a mixed method approach, a situation where quantitative and qualitative approaches were used to collect and analyse data on the issue under investigation. However, there has been a controversial debate on the superiority of each method by their advocates and stating why both methods should not be mixed (Johnson & Onwuegbuzie, 2004). Recently, scholars have proven the potentials of mixed methods as a method suitable for more comprehensive and authentic results (Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2003). Ivankora, Creswell and Plano (2007; 261) states that " mixed-method is a procedure for collecting, analyzing and mixing both quantitative and qualitative data at some stage of the research process within a single study to understand a research problem more completely". A mixed method study is a research design that systematically combines the quantitative and the qualitative data within a single investigation (Wisdom & Creswell, 2013). The mixed method approach helps to understand the concept better by looking at the study from two perspectives. The purpose of using a combined approach is to help strengthen the research design because a single approach may not give the required comprehensive and convincing evidence when compared to the two approaches. Another purpose of using the mixed method approach is to understand the complex nature of the phenomenon, which cannot be easily understood using only the quantitative or the qualitative

technique.

In addition, one of the characteristics of the mixed methods is the integration of the two approaches that bring out the uniqueness of the methods. The advantage of the mixed method is that, it helps the researcher to collect comprehensive information with the capability of providing a broad view of the issue under investigation. Another good advantage of the mixed method approach is the ability to triangulate and compliment the result in order to reduce the biased opinions of the researchers. The shortcomings of mixed methods are it consumes a lot of time, energy and resources during the data collection and analysis process. The combination of these methods by the researcher in light of the advantages is for collection of multiple data in order to get rich and complete information that may provide a solution to the issue under investigation. Another reason for using these methods is to clearly see the pre-service teacher's level of understanding of micro-teaching skills and how the skills were utilized along the sub-skills in order for the researcher to identify new areas where further research study is needed.

Therefore, this study used the sequential mixed-methods strategy (Creswell & Poth, 2016), a process where the researchers organizes and regulate how the data will be collected. The sequential order in this study is that priority was first given to the quantitative data, which helps to determine the pre-service teachers' knowledge of micro-teaching and the application of the key skills during the video presentation using the skills dimension rubric developed from the models of micro-teaching in line with the constructivism theory. The qualitative data collection process was later considered and analysed to triangulate the results of the quantitative findings and helped to get the holistic view of the research under investigation. The process and procedure of each of these methods were discussed below, starting with quantitative method.

4.4 QUANTITATIVE METHOD

In this study, the quantitative approach was used to explore the application of teaching skills with digital technology by evaluating how the key skills were used alongside the sub-skills during the pre-service teacher's micro-teaching presentation. It was used to uncover the understanding of the pre-service teachers on the application of the micro-teaching skills. The quantitative approach is an orderly investigation of an observable phenomenon through the statistical tool (Given, 2008). This type of research approach employ mathematical expressions and the data are analysed with statistical tools in order to interpret the results objectively without any form of prejudice. In a quantitative

research design, data are gathered in a numerical format that can be easily ranked or measured. Denzel and Lincoln (2005) opine that the researcher in this category may try to observe things in their natural setting and interpret the phenomenon with the expression given to it. Consequently, this approach is significant to the study in as much that the pre-service teachers are in their natural setting (within the university).One of the advantages of this method is that the data collected are reliable and accurate, providing a clear picture of the phenomenon. The disadvantage of this approach is that results are sometimes very limited, it supplies mathematical descriptions rather than comprehensive and complete accounts of the phenomenon.

4.1.1 *Development and administration of quantitative data*

The quantitative approach in this study commenced with the development of research instruments that was used to collect data. As part of development process, six (6) key skills were generated and four (4) action statements were also generated along each skill to develop a teaching skill rubric. The content and statement of the conceptually developed rubric was validated by micro-teaching experts. These statements were drafted to reflect the expected action that could be carried out when teaching lessons. The rubric was developed using the skills dimensions from the model on micro-teaching, it consisted of three Likert-scale ratings with a pattern of *exceed expectation (3), meet expectation (2) and need improvement (1)* that were used to measure the way the skill were applied during the presentation. Two hundred and sixteen participants (216) were grouped as teams of six (6) totalling thirty-six (36) groups to produce a short video of about 10-12 minutes using the cell phone as their recording device. Producing a short video is based on the concept of the research main question and the procedure of micro-teaching that is, teaching on a small scale so that the participants may demonstrate teaching behaviour in a short period.

The reason for using 216 participants is to accommodate all pre-service teachers in this level in order to examine their micro-teaching knowledge levels in relation to their technology knowledge level. The recorded videos were submitted through Google drive that serves as the main data collection of the quantitative data. Using Google drive as a platform for submission is to create more awareness for the pre-service teachers on the significant role of Google drive as a technological platform of storing large sets of information and for the pre-service teachers to pay more attention on the existing university technology platform (Ikamva) as a means of developing their technological knowledge. The data was analysed in line with the rubric to get the aggregated responses from the 36 groups of

the video presentations. SPSS version 25 was used to generate descriptive statistics and the mean scores for each sub-skill which in turn were used to rank the six key skills.

4.5 QUALITATIVE METHOD

To further triangulate this research study, qualitative data was also collected. Qualitative research is concerned with understanding the subjective explorative reality from the view of an insider (Vos, Strydom, Fouche & Delpot, 2011). In this study, the qualitative approach will enable the researcher to gain a holistic understanding and interpretation of how the participants were able to apply technology to demonstrate their level of understanding in micro-teaching skills during the presentation. According to Glesne (2011), a qualitative researcher deeply enquires into particular experiences, with the purpose of describing and exploring meaning through text, narrative, or visual-based data, by developing themes exclusive to that set of participants. Denzin and Lincoln (2011: 3) describe qualitative research as "an interpretive naturalistic approach to the world". This means that qualitative researchers study activities or events in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them." The usefulness of qualitative research is that it gives the researcher a chance to probe beyond initial responses and rationales. Another advantage of qualitative research is that they generate rich and detailed data that leaves the participants' perspectives intact and provide multiple contexts for understanding the phenomenon under study (Anderson, 2010). Qualitative research creates an in-depth understanding of the attitudes, behaviours, interactions, events, and social processes that compose everyday life. In this study, pre-service teachers are allowed to interact in their natural environment, using their previous experience from school observation and teaching practice exercises to present teaching as a team, integrating digital technology to demonstrate their knowledge of micro-teaching skills.

4.5.1 *Development and administration of qualitative data*

In this qualitative approach, the unstructured interview schedules and lesson plan observation schedule were developed by the researcher using some guided questions validated by experts. During the development process, four (4) relevant leading questions were raised and ten (10) subsidiary questions were also developed to generate more responses from the participants. The interview questions were used as the data collection procedure, five (5) students and supervisors, were purposively selected and twelve (12) students were conveniently selected for the focus group session. The individual session took place at different times within the university premises as well as the focus groups session. All these participants were exposed to the same guided questions at different

times and the interview session varies between 15-35 minutes. The collected interviews data was collated, transcribed and coded in their responses, using a thematic analysis procedure to generate themes relevant to the research study. In addition, content analysis analysed the selected lesson plans in order to see any relationship in their pattern of writing lesson plans.

4.5.2 *Integration of quantitative and qualitative data*

This research sequentially mixed these methods as discussed above and as well illustrated in the diagram below (see Fig 3.1). The QUAN rubric was first developed and administered to the pre-service teachers. The QUAN, which serves as the major part of the study, helps the researcher to understand how the participants practically demonstrated the key teaching skills along the sub-skills with the use of digital videos. The video presentations of the QUAN data was collected from the participants through the Google drive platform. Although the participants submitted the video presentations differently at convenient times within the time frame while some of the participants submitted late. The video presentation were later analysed using the SPSS version 25 to rank the usage of each teaching skill. The QUAL instruments developed (the interview schedule and lesson plans observation sheet) were also used to generate more information on the knowledge of the pre-service teachers about micro-teaching. During the QUAL data administration, the interview session with the selected participants took place at different times and the focus group session was not consistent as some members did not meet at the agreed times. The supervisors were interviewed at different times within the working hours in their offices while the lesson plans were selected from the moderated portfolios. The QUAL data were analysed using the thematic and content analysis as described above. In addition, in order to maximize the validity and reliability of the data, the data were triangulated and combined for interpretation and presentation. These data were used to come up with a comprehensive and authentic result without bias as illustrated below in the flow chart in Fig 4.1.

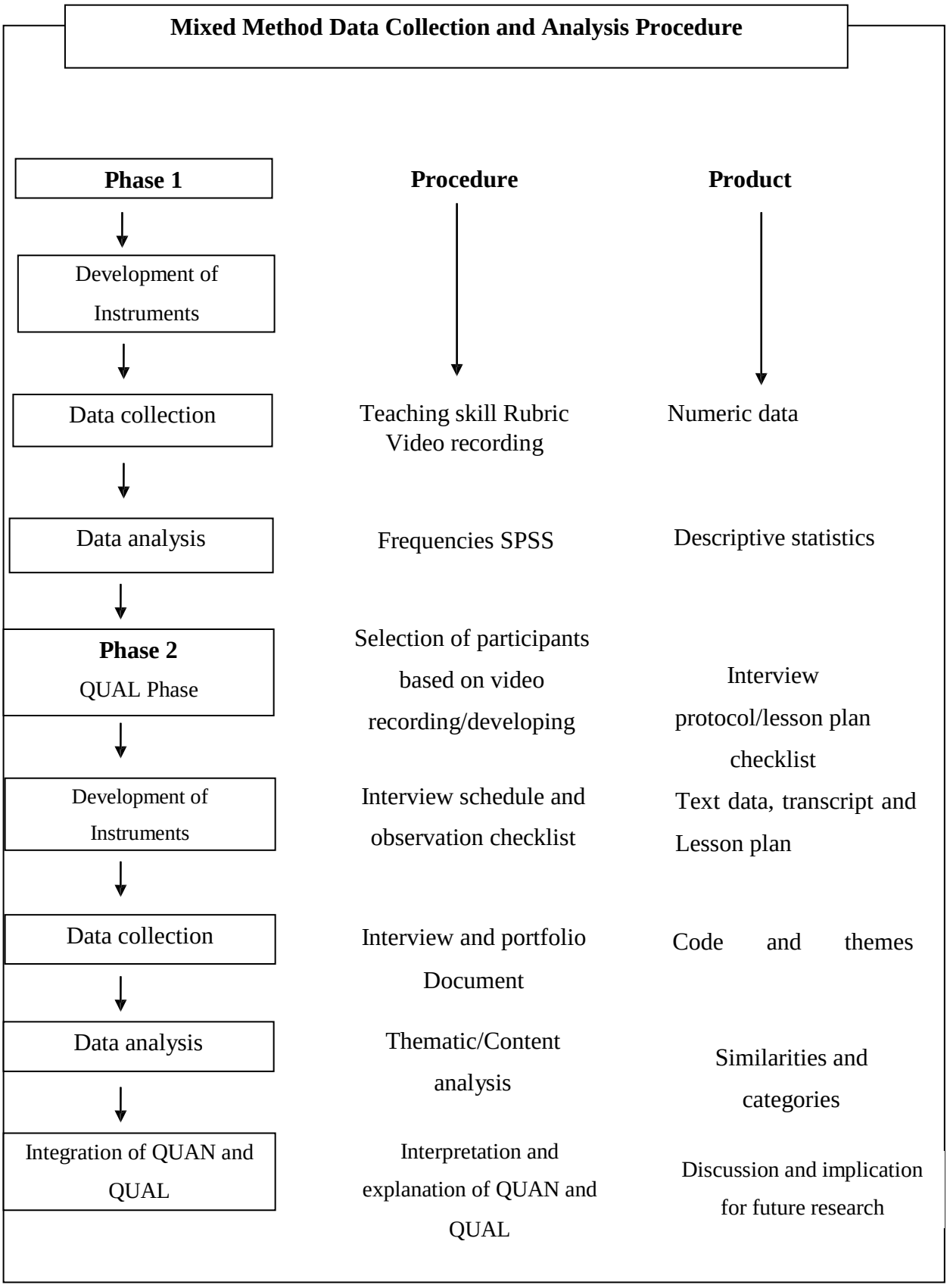

Figure 4. 1 Showing the flowchart of the mixed method of data collection and analysis

4.6 RESEARCH DESIGN

A design is a plan or structure that explains how things will be, while a research design involved the overall structural plan for conducting a research study (Creswell, 2012). Monette, Sullivan and DeJong (2008) define research design as an outline plan of how observation will be made and the research will be carried out. A research design is a basic step-by-step plan of a piece of research which includes four main ideas: the strategy to be used, the conceptual framework, the questions to study and the instrument, the collection of data and the procedure of analysis (Punch,2011:63).

This study employed a sequential explanatory research design using a case study approach. Sequential explanatory is the process where the qualitative findings are used to conceptualise the quantitative data. The aim of using this design is to get detailed information about the phenomenon or to explore the results in detail (Creswell 2014).This research explores the micro-teaching skills with digital technology in a B-Ed. programme. The process of exploring the key teaching skills is to identify how the participants use the six key skills in order to have a better understanding of the situation on the ground. In this study, the qualitative data serve as a build up on the result and was used to elaborate the quantitative results. The rationale for this approach is that the quantitative data provide a clear understanding of the main research problem while the qualitative data helps to explore, in detail, the participants‟ views on the issue under investigation (Teddlie & Tashakkori, 2011; Creswell, 2003). The advantages of this design are the truthfulness and opportunities to explore the quantitative results in detail.

This sequential mixed method relied on multiple sources of evidence, starting with the video presentations of key teaching skills, followed by interviews of students and school-based supervisors, focus group discussion with the pre-service teachers and documentary analysis. The combination of these data helps to capture the complexity of the real life situation of the pre-service teachers in order to have versatile knowledge of the phenomenon under investigation. Merriam (2002) opine that the case study approach is based on the idea that knowledge is socially constructed by individual interaction with their world. In this study, the researcher employed this strategy in order to allow the pre-service teachers to construct their own knowledge as teams with the ability to interact together in their world in light with the constructivism approach that sees learning as a social interaction.

The strength of the case study approach is the ability of the researcher to gain in-depth understanding of the problem with versatile information to analyse what exactly happened without bias. This will help the researcher to critically reflect on the result and possibly draw implications for wider generalization. One major weakness of case study is the belief that it cannot be generalized if depending on a single case (Hancock & Algozzine, 2011). To have a wider generation of the results in this study, the quantitative result and qualitative results will be triangulated to get a vivid picture and to clear any doubt of the reliability of the results. Triangulating the results is also to get the holistic overview of the issue under investigation.

4.7 TRIANGULATION

As part of the procedure for reliability in this study to improve the analysis, triangulation was applied. Triangulation is a method of validating the data collected through different methods. It is an appropriate evaluation technique to improve the credibility of a result and is used to minimize bias in a research study (Denzin, 2012; Coles & McGrath, 2010). Cohen, Manion, and Morrison (2013) opine that triangulation is a data validation procedure through cross confirmation from multiple sources. It is used to test the consistency of the findings obtained from diverse tools that increase the reliability of the result. In this study, multiple data were used by the researcher that includes: video presentations, interview schedules and document analysis which are all combined data to increase the confidence of the results. Bryman (2004) says that triangulation is used to demonstrate the dependability of the findings by examining the data from multiple viewpoints. It serves as a good procedure of evaluating separate data of findings to look for reliability or inconsistency. Carvalho and White (1997) identify the purpose for using triangulation in a research, stating that triangulation enriches the data and helps to add more value to the result. It helps to give credibility to the result as it sheds more light to the multiple viewpoints.

4.8 PILOT STUDY

The research instruments for this study were pilot tested. The teaching skills rubric used for the quantitative data collection was first given to all participants for six weeks to study the items of the sub-skills and to determine the appropriateness of the language used. Twenty-one (21) participants representing 10% of the targeted population were involved in the pilot study to discuss and to identify whether the items and language used are adequate in relation to the micro-teaching skills. Before the commencement of the pilot test, the participants were encouraged to express their

displeasure on any items that are not well-understood and more detail were given to the participants on how the scale will be ranked alongside the sub-skill. During the pilot process, the participants were allowed to interact and reflect on the items in the rubric and from their responses some items were re-framed while the majority of the items were appropriate and well-understood. The discussion and little results generated from the quantitative data necessitated the questions used for the qualitative data collection that was also pilot tested with another set of twenty-one (21) participants consisting of 11 girls and 10 boys. Another reason for pilot testing is to ascertain the basic knowledge of the participants on micro-teaching.

The interview questions were audio-recorded on a phone with the permission of the participants, the participants were also given the opportunity to interact with the questions and share ideas with colleagues for clarification of terms. From the responses of the participants on the rubric and interview session, the word "set induction" was replaced with introduction skill, while the skill of explanation was added to the rubric. During the interview session, we also came to the conclusion on the term digital video platform and social platform as against social media. It was therefore concluded from the pilot study that the participants fully understood the items in the rubric and as well the interview questions before it was extended to rest of the groups.

4.9 POPULATION, SAMPLES AND SAMPLING

Population in a research study refers to a group of people that possess the same characteristics within the coverage of a research study while samples deal with selected respondents within the population sharing the same characteristics (Emerson, 2015). Sampling in a research study is a process where a set of individuals are selected within a population (Gravetter & Forzano, 2003:455). Lankshear & Knobel (2004) and Mertens (2014) refer to sampling as a method and process of selecting a given number of people from the population. Sample of the research explains the selected number of people or the population that is involved in the study. The population for the study was all 4th year B.Ed. students in the Faculty of Education (216 participants), at the University of the Western Cape (UWC). These students were chosen because one might argue that they have developed micro-teaching skills from their first to their fourth year of study, alongside the theory, teaching practice at schools and observations at schools. A culmination of these skills over time would suggest that these students have developed enough knowledge and skills toward micro-teaching.

Purposive sampling was used to select the participants for the interviews and focus group discussions of this study. Twenty-one (21) participants were originally selected for the focus group discussion with Ten (10) male and Eleven (11) female to represent 10% of the population but only 12 participants were available for the group discussion with three (3) male and Nine (9) female. The goal of purposive sampling, according to Bryman (2012), is that participants are strategically chosen, in as much as the y are relevant to the research questions. In this study, two hundred and sixteen (216) participants submitted videos as a team of six (6) totalling thirty-six (36) video presentations, which was collected in addition to those who made themselves available for the interview which includes; twelve (12) students for focus group discussions, five (05) students and five (05) school-based supervisors for the interviews. Five (5) students' portfolios and reflection files were randomly selected for lesson plan observation. The reason for using the focus group discussion is to get the general view of the participants and the reason for using five pre-service teachers and the five supervisors is to get an in-depth understanding of the phenomenon from individual perspectives. The pre-determined criteria for this sampling depend on the availability and willingness of the participants. Those students living on campus or close to the campus have a higher chance of being selected. This type of sample is based entirely on the judgment of the researcher. A sample is composed of elements that contain the most characteristic, representative or typical attributes of the population that serves the purpose of the study (Strydom & Delport, 2011).

The entire two hundred and sixteen (216) B.Ed. final year pre-service teachers were grouped as a team of six (6) each with the sum total of thirty-six (36) groups to interact and reflect on their previous experience in micro-teaching, method courses, school observation and teaching practice. Each team worked together, exchanged ideas and practiced how to teach and produce short videos applying micro-teaching skills on the topic of their choice using their cell phones as a recording device. The recorded videos were forwarded through Google drive to the lecturer-in-charge and the researcher for review, constructive criticism and feedback. The feedback was given to the participants to serve as an opportunity to the B.Ed. pre-service teachers to see their specific shortcomings and try to reflect on their performance for further improvement in micro-teaching and teaching practice respectively and for other job interviews before and after graduation.

Interview questions were used to collect data from the school-based supervisors on the issue under investigation. The school-based supervisors are the lecturers teaching micro-teaching modules, and they were interviewed in their offices to collect more facts on the micro-teaching modules.

The reason for involving the supervisors is to get an idea on how the students are exposed to micro-teaching in their modules and other reasons for interviewing the supervisors is to gather information on what they observed as challenges to the students in teaching practice and their view on the use of the digital video platforms to support micro-teaching. In addition, the participants' portfolios were used as a source of data collection. The portfolios are the documented materials developed by the participants which help them to reflect on all activities carried out during the teaching practice exercise. Some moderated portfolios were selected as additional data from the participants in order to observe how lesson plans were written and another reason for using the student portfolios is to further probe what informs the participants‟ actions during video presentation. The sampling procedure is illustrated below:

Table 4. 1: The summary of the samples of participants

S/N	PARTICIPANT	POPULATION	TECHNIQUE OF SELECTION	CRITERIA FOR SELECTION
1	Fourth year pre-service teachers	Twelve (12) from the population that volunteer to participate in the study three focus groups Five students (05) for interview	Purposive and convenient sampling technique	Students must have passed Micro-teaching and must have submitted observation report. The students who are staying around the school or within the campus for convenience.
2	School-based supervisors	Five (05) lecturers from the faculty of education	Purposive sampling technique	Lecturers in the Faculty of Education from the University of the Western Cape
3	Recorded video Analyses	Thirty-six (36) recorded	Purposive Sampling	All submitted videos within the timeframe
4	Portfolio and Reflection	Five (5) pre-service Teachers	Convenient Sampling	Lesson plans

4.10 DATA COLLECTION

Data collection is the process used in putting together all information which enables the researcher to answer the research questions. Several instruments can be used to collect information in a research study. The methods used in this research study were unstructured interviews, focus group discussion, and documentary analysis of videos and students portfolios. The interview questions were unstructured. Questions were raised from the responses given by the participants in the course of the interview

However, about ten leading questions were prepared to initiate responses on micro- teaching knowledge level of the participants, and the application of technology in micro-teaching presentation and the use of digital technology as a support for micro-teaching presentation (see Appendix 7). The researcher purposively interviewed pre-service teachers and some school-based supervisors. The interview questions were asked in a similar way to gather relevant information and to clarify issues for the purpose of triangulation. According to Bryman (2012) interviews gives the researchers an opportunity to explore interviewee's perspectives and perceptions on the issue under investigation.

4.10.1 *Interviews*

Interviewing is an interactional event designed to gather information, ideas or knowledge between a participant and the researcher. Interviews capture direct quotations about people's personal perspectives and life experiences (Aderson, 2010). The interview process is a data collection procedure that allows the researcher to interact face-to-face with the participants; it is a planned conversation where the researcher asks questions to get information in relation to the issue under investigation. Interviewing is the process of obtaining information through direct interchange with an individual or a group of individuals that is known or expected to possess the knowledge they seek (DePoy & Gilson, 2008). The goal of the researcher during the process of interview is to get participants to express their ideas about the particular issue clearly. The benefit of interviewing in a research study is that, it allows the researcher to develop an in-depth understanding and probe if responses are too brief. Another benefit particularly for the unstructured interviews is that it is flexible in producing interesting comprehensive and meaningful results. Despite the benefits, interviews can be time-consuming as well as very expensive and sometimes interviewees may not be too open to divulge some relevant information due to fear or favour.

Selected pre-service teachers who submitted their videos were interviewed on how technology has helped develop micro-teaching skills and their knowledge level on micro-teaching. The pre-service teacher's interview questions begin with;

- How do you understand the concept of micro-teaching?
- What type of experience do you gain in micro-teaching classes?
- Is there any way technology has helped to develop your teaching skills?

- What advice will you give to the university on how they help pre-service teachers grow professionally?

School-based supervisors who are micro-teaching lecturers were also interviewed. These school-based supervisors are lecturers teaching practical learning modules and those that are involved in teaching practice supervision from the Faculty of Education in the University of the Western Cape (UWC). The purpose of interviewing the supervisors is to identify the stance of the university on micro-teaching and their personal views on how the pre-service teachers could be trained to be more competent in the application of teaching skills. The supervisor's questions were similar to the student's questions but asked in different ways.

4.10.2 *Focus group interviews*

Focus group interviews were used in this research study as part of the data collection process. Three focus group sections were organized to determine participant opinions about the issue. Participants were allowed to share perceptions and experiences and reach consensus on the topic. During the group discussion, participants' contributions constitute essential data. A focus group is a carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment (Kingry, Tiedje & Friedman, 1999). The guided questions that were prepared for the unstructured interviews were also used for the focus group discussion and several questions that arose from the discussion were used as essential data. The interview questions were validated by taking the view of the experts with regards to content, language and clarity in relation to the study. Necessary corrections were made in line with the experts' opinions.

4.10.3 *Documentary analysis*

Documentary analysis was used in this research to seek answers to the research questions. Documents are information or ideas recorded in black and white, available either as photographs or electronic or any artefact including video-recorded files that could supply facts and related information on the phenomenon under investigation (Bowen, 2009). In this study, available and existing documents were used to gain understanding of key concepts and relevant information needed for this research. The participants as a team of six (6) recorded videos of teaching performance of about 10-12 minutes and was submitted through Google Drive. The self-constructed teaching skills rubric validated by micro-teaching experts with a 3-point scale of *exceed expectation,*

meet expectation and need improvement were used as measuring instrument on the usage of teaching skills in the recorded videos. The videos were not based on the knowledge of subject matter but on the application of the key teaching skills.

4.10.4 *Student portfolios and reflective journals*

Portfolios and reflective journals are documents that describe the structure and activities carried out by a teacher in order to reflect on what, why and how they teach (Loughran & Corrigan, 1995). Portfolios help the pre-service teachers to accurately recollect the activities that took place in the class and as well assist teachers to reflect on their practice. Reflective practice is the ability to establish a meaningful relationship between theory and practice of teaching (Bolton, 2010). In this study, the researcher used the pre-service teacher portfolios and reflection journals as additional data. Some lesson plans were selected as it served as valuable documents to the researcher because it revealed some relevant information which helps to reveal some actions exhibited by the participants.

4.11 DATA ANALYSIS

In this sequential mixed method strategy, the qualitative data was used to explore the quantitative findings. Although priority was given to the quantitative data, the qualitative data built on quantitative data. Data analysis is a process for obtaining raw data and converting it into information useful for decision-making by users (Judd &McClelland 1989). It is seen as a process of evaluating the raw data in order to come up with a definite result. The data were analysed quantitatively and qualitatively based on the methodology.

4.11.1 *Quantitative Data Analysis*

The quantitative data on the video presentation were coded in line with the rubric (see Appendix 9). Coding is the process of reorganizing data in a systematic format that is machine readably (Kreuger & Neuman, 2006). Although the video materials could be treated as qualitative data using a pie chart to get the frequency each skills but quantitative approach was considered because the sub-skill statements that summed up a skills will be better coded numerically to get the values attached to the 3-point scale of; *Exceed expectation* which is also being referred to as above average (3-point), *Meet expectation* synonymous to average (2-point) and *Need improvement* regarded as below average (1-point).

All the coded data were classified and transformed into nominal scores for easy computation and then analysed using the statistical programme of SPSS version 25 which is known for its swift execution of statistical analyses. Using a descending order of priority, each of the six skills were measured by thirty-six respondents. A well used skill along with the sub-skills is regarded as *above average*, this includes the ability to accurately use the four (4) or three (3) out of the sub-skills that make up a skill, when two (2) out of the four (4) sub -skills are used it is regarded as moderately well used skills and considered as *average* whiles the inability to apply the skill adequately by making use of only one (1) sub -skill from the four (4) items in the sub - skill that make up a skill it is regarded as *below average*. With the SPPS programme, I calculated the frequencies of occurrence of each sub-skill to describe the overall picture of how the participants applied each skill to generate the mean scores.

4.11.2 *Qualitative Data Analysis*

Thematic analysis was used for the qualitative data. Thematic analysis focuses on identification of a theme and pattern of behaviour (Aronson, 1995). The interview responses and contributions of the participants were carefully examined to understand their views. The audio recordings were transcribed into text, and were read thoroughly and repeatedly to get important information, the texts were coded with different colours to search for categorization and similarity of fact and ideas in their responses. The related categories were labelled in order of importance and similarity as major and minor categories in order to conceptualize the themes. The emerging themes in connection with the research questions serve as the main result of the study. The researcher analyzed the portfolios and reflection using content analysis to find out comparative information from the participants to ensure information consistency in agreement with the study and this was also coded in line with the themes for categorization. The coding pattern also extended to the participants identity, all the five (5) students are represented with the code (ST.1-5), the five supervisors are coded with (SU.1-5), focus group participants were coded with (FG1:1-5, FG2:1-4 FG3:1-3) and the five lesson plans are coded with (LP1-5). This coding pattern is to protect the confidentiality of the participants and for easy illustration during data analysis and interpretation of research findings. The coding is illustrated in the tables below:

Table 4. 2: Coding pattern of participants

S/N	CODES	MEANING	S/N	CODES	MEANING
1	**ST 1**	Student 1	1	**SU 1**	Supervisor 1
2	**ST 2**	Student 2	2	**SU 2**	Supervisor 2
3	**ST 3**	Student 3	3	**SU3**	Supervisor 3
4	**ST 4**	Student 4	4	**SU 4**	Supervisor 4
5	**ST 5**	Student 5	5	**SU 5**	Supervisor 5

Table 4. 3: Showing the coding pattern for the focus groups participants and lesson plans

S/N	CODES	MEANING	S/N	CODES	MEANING
1	**FIP-1**	Focus group 1 participant 1	1	**F3-1**	Focus group 3 participant 1
2	**FIP-2**	Focus group 1 participant 2	2	**F3-2**	Focus group 3 participant 1
3	**FIP-3**	Focus group 1 participant 3	3	**F3-3**	Focus group 3 participant 1
4	**FIP-4**	Focus group 1 participant 4	4	**LP1**	Lesson plan 1
4	**FIP-5**	Focus group 1 participant 5	5	**LP2**	Lesson plan 2
6	**F2P-1**	Focus group 2 participant 1	6	**LP3**	Lesson plan 3
7	**F2P2**	Focus group 2 participant 2	7	**LP4**	Lesson plan 4
8	**F2P3**	Focus group 2 participant 3	8	**LP5**	Lesson plan 5
9	**F2P3**	Focus group 2 participant 4	---	-----	----------

4.12 VALIDITY AND RELIABILITY

The concept of validity deals with exactness of any good report as it reflects the value of such a report. Validity is used to describe the genuineness of a given instrument or data, and the extent to which the instrument are able to measure correctly what they are designed for (Leung, 2015). Bernard and Bernard (2012) define validity as the accuracy and trustworthiness of the instruments, data, and research findings and that validity is related to the concept of reliability, precision, and accuracy in relation to instruments. Validity is seen as the degree to which the interpretation of the concept has mutual meanings between the participant and the researcher (McMillan & Schumacher, 2014). In this study, I linked the research questions to the instruments, the validity of the self-constructed rubric and interview schedule was ensured. The teaching skills rubric was given to two micro-teaching experts professionals from different universities to validate the statement in the sub-skills and the

interview questions were given to an expert in the micro-teaching field to scrutinize the items to ensure that they are related to the variables in the study and can adequately generate accurate responses from the participants. The professional and expert contributions serve as checks to the instruments to eliminate bias in the instruments used for data collection. Monette, Sullivan and DeJong (2002) states that for a good reliability there is a need for "jury opinion" which is superior to individual ideas.

Reliability is seen as a degree to which an assessment tool produces stable and consistent results. Reliability is the consistence of any given instruments that is capable of performing the same result any time it is used (Kumar, 2019; Crewell & Miller, 2000). This is the ability of the instrument to measure the attribute of a variable (Lobiondo-wood & Haber, 2014). Generally, reliability is the extent to which the instrument used consistently yields the same result when it is repeated (De vos, Strydom, Fouche & Delport, 2011). Reliability is concerned with consistency, accuracy, stability and homogeneity, anything reliable means it is trusted. Rudner and Schafer (2001) stated that reliability is the extent to which the test measurements are the result of properties of those individuals being measured. In ensuring the reliability of the instruments used in this study, the interview questions were clearly written and were asked in different ways for the participants to understand the concept under investigation. In addition, in order to avoid compromise. Reliability instruments was also ensured, I made audio recordings of responses of a smaller group different from the sample selected with the items raised during the interview and the focus group discussion on two separate occasions, in order to determine the consistency of the instruments. The trustworthiness of this research was participants or respondents validation. Results were returned to participants to check for accuracy and resonance with their experience.

4.13 ETHICAL CONSIDERATION

The concept of ethics is paramount to this research study in as much as it has to deal with student's participation. Ethics deals with values or moral standard of a profession, while value deals with what is good and moral, as it indicates what is right or wrong (Babbie 2001: 470). Strydom (2005) defines ethics as a set of widely accepted moral principles that offer rules for, and behaviour expectations of, the most correct conducts towards experimental subjects and respondents, employers, sponsors, other researchers, assistants and learners. Ethics deals with how one treats those individuals with whom one interacts and is involved in the study, and how the relationships formed may depart from someones conception of an ideal (Smith, 2005). The Ethical Research Policy of UWC (2009) was

strictly complied with during the process of the research. During process of the research, I was very mindful to maintain the rules that guide confidentiality, putting into consideration participants" anonymity and confidentiality. All participants were duly informed and their consent was required before carrying out the research. Written informed letters were given to the participants to understand the detail of the research before the interview session and to avoid infringement on their rights. Bell and Bryman (2007) opines that involving participants in a project without their consent, it is prejudice to their right to self-determination.

The participants were guaranteed assurance of their privacy and confidentiality in any information that will be discussed. They were free to withdraw from the study since the participation is voluntary as asserted by Rubin and Babbie (2005) that participating in a research or project should be voluntary and not coerced. The ethical requirements of the university were adhered to strictly in line with the ethical practice of the university. The ethical clearance was obtained in accordance with research procedures before the study. I explained to the participants my role as a researcher and made it possible for them to contact me and my supervisor for further clarification and reflexivity. The researcher also accounted for diversity by putting into account individual differences in respect of the differences that exist between my origin and the participant's cultural values, religion, traditions and other sensitive issues. Participants' identities were secured and their names were not disclosed in line with the ethical principles (see Appendix 6). The participants were assured that the data were used for research purposes only and their information remained confidential when reporting the findings of the study. Due to the ethical implication of video materials, the video data were kept and stored on the Google cloud and the access was not shared with any participants while the transcribed interviews data was kept for the purpose of anonymity in line with the ethical agreement.

4.14 CHAPTER SUMMARY

In this chapter, I have discussed the methodology and the design of the research study along the procedures of data collection. I discussed the sampling within the population of the study and how the data were collected and analysed within the ambit of quantitative and qualitative approaches. In addition, validity and reliability of the study were also discussed along the lines of triangulation and this chapter ended with ethical consideration of the study. In the next chapter, I discuss the data analysis and interpretation of my findings along the mixed-method paradigm. The result of the data

collected were discussed in three-fold starting with the quantitative aspect of the video analysis, followed by the qualitative aspect of the focus group and the individual interviews and the portfolios analysis of the lesson plan observation.

CHAPTER FIVE

DATA ANALYSIS AND INTERPRETATION OF FINDINGS

5.1 INTRODUCTION

In the previous chapter, I discussed the methodology within the context of mixed-method approaches, using the sequential explanatory design. The data were collected within the paradigm of the mixed method approach, were analysed and triangulated. In addition, in chapter two of this study, the framework described the TPACK model of re-purposing with the use of available digital tools to enhance learning. Micro-teaching bridges the gap between theory and practice of teaching and helps to create an opportunity for pre-service teachers to learn the act of teaching. Micro-teaching modules are sacrosanct to the professional development of teachers and must merge theory and practice. The theory and practice of teaching deals with the procedures and processes of good practice that are universally acceptable for the professional development of teachers. In fact, micro-teaching experts have begun to examine the integration of technology as an alternative strategy in order to achieve realistic feedback about teaching competency (Ekpo-Eloma, Arikpo & Ebuta 2014; Savas, 2012; Van de Westhuizen, 2015; Shanu, 2016; Magbo & Nsofo 2015; Pandey, 2019; Ledger & Fischetti 2020). Specifically, the purpose of the study is to explore the application of micro-teaching skills with digital technology among 4th year B.Ed. students.

In this chapter, I present an analysis of data collected through digital video presentations of 216 participants (6 in a group), students and supervisor's interviews, focus group interview sessions and lesson plan observations. The organization of this chapter is categorized into three sections. Firstly, a quantitative analysis of video presentations, in order to answer the main research question (MRQ) of the study with the help of the instruments that I described in my Chapter 3 (see Page, 100). The quantitative analysis helps to provide a picture of the frequency of occurrence of how each sub-skill were applied during the course of the video presentation. To support the study and to acquire deeper information from the participants; the researcher qualitatively examined the data collected through the unstructured interviews conducted with focus groups, supervisors and students using a thematic method, which entailed transcribing, coding, categorization and generation of themes. This qualitative analysis helps to substantiate the results of the video presentation in light with my

objectives and sub-research questions (SRQ). In the section, The study presented the data of the transcribed interviews that are relevant to the study which forms the major themes that are briefly discussed in the section. The third section of this chapter is the content analysis of portfolio documents of students' lesson plans. Five lesson plans were randomly selected for observation with the view of looking at the structure and pattern of their writings. In this section, only the elements of the lesson plans were observed and presented according to the way they were written. These lesson plans were also coded like the interviews, for the purpose of anonymity as seen in the interpretation below.

Table 5. 1: Coding pattern of the participants

CODES	MEANING
F1P-1 to FP1-5	Focus Group 1, participant 1 to participant 5
F1P-2 to FP1-4	Focus Group 2, participant 1 to participant 4
F1P-3 to FP1-3	Focus Group 3, participant 1 to participant 3
ST-1 to ST-5	Student 1 to students 5
SU-1 to ST-5	Supervisor 1 to supervisor 5.
LP-1 to LP-5	Lesson plan 1 to lesson plan 5.

Hence, in the analysis and further discussion it is possible to come across the above codes to explain the results of the interviews as it relates to the themes generated, therefore this analysis is presented sequentially, starting with the quantitative analysis of video presentations of the pre-service teachers below.

5.2 QUANTITATIVE ANALYSIS OF VIDEOS

Teaching competencies can only be measured by the level of understanding and appropriate use of teaching skills. In this study, 216 students, grouped in teams of 6 students, used their personal cell phones as a recording device to produce a video presentation of about 10-12 minutes per lesson. Of the 36 video presentations uploaded, 31 groups used Google Drive as an online platform, while 5 groups used WhatsApp messages to upload their videos. Each video presentation were carefully observed, and assessed, based on the 6 key teaching skills in an assessment rubric conceptually developed for the purposes of the present study, and outlined in Chapter 3. The six skills are, namely, (1) Skill of Introduction, (2) Skill of Variation, (3) Skill of Explanation, (4) Skill of Reinforcement, (5) Skill of Questioning and (6) Skill of Closure and Transfer. Each of the six dimensions described by sub-skills, were listed in Table 5.2 below.

The assessment rubric (see Appendix 9) guided the quantitative analysis of the 36 video presentations based on the 6 key skills argued conceptually in Chapter 3 to be needed by a teacher to function effectively in the classroom in line with their professional development. This quantitative analysis was pivotal to determine the extent to which the student teachers used the 6 key skills in their classroom practice, and to rank which skills was used the most and which was the least. The data were analysed using the statistical programme SPSS version 25 that is known for its swift execution of statistical analyses. Each skill was carefully observed based on the items on the checklist to determine the level of understanding of the concept of micro-teaching and the application of the skills in the video presentations (see Appendix 9).

In the next section, the analysis of each of the 6 skills will be reported as a mean score to explain which items best explain the process and usage of the teaching skill in accordance with three scale levels as seen in the rubric. The table reveals the hierarchy of skills on the level of ranking as the skills were perfectly applied, while Table 3 shows skills that *exceed expectation*, *meet expectation* and those that *significantly need improvement*. The results are reported in the following order, namely, (1) Skill of Introduction, (2) Skill of Variation, (3) Skill of Explanation, (4) Skill of Reinforcement, (5) Skill of Questioning and (6) Skill of Closure and Transfer.

5.3 MICRO-TEACHING SKILLS AND MEAN SCORES

The six key micro-teaching skills, namely, (1) Skill of Introduction, (2) Skill of Variation, (3) Skill of Explanation, (4) Skill of Reinforcement, (5) Skill of Questioning and (6) Skill of Closure and Transfer, were further described by the sub-skills summarized in Table 5.2 below. The data were analysed using the statistical software package SPSS version 25, and the frequency of each skill, as displayed by the 36 groups. The 216 participants were grouped as teams of 6 per group in the cohort and were analysed per key skill, and the mean scores for each skill recorded in Table 5.2. During the analysis process, different stages of the KACIT model were employed to examine the presentation of the lesson.

Table 5. 2: Mean scores of students (N=36) summarizing key Micro-teaching skills

Skill	Key skill and items	Mean Score
1	**Skill of Introduction**	
	Teacher did review of previous learning	1.6389
	Stating the instructional objectives at the beginning of the class	1.5556
	Teacher used common and relevant examples	1.6944
	There was a link between the last topic and the new topic.	1.6382
2	**Skill of Variation**	
	Teacher moved around the class while teaching.	1.7550
	Teacher used some gestures such as hands, head ,face etc	1.9167
	Teacher varied speech while teaching as tone, pitch, pause	1.0833
	Teacher allow student to actively participate in class	2.3611
3	**Skill of Explanation**	
	Lesson is well explained with clarity	2.1667
	Explanation of content is relevant to stated objectives	2.0000
	Class is interesting to students with relevant resource material	1.7778
	Teacher used easy flow of ideas from known to unknown.	1.6944
4	**Skill of Re-enforcement**	
	Teacher praised the learners verbally	2.0278
	Teacher used non-verbal praise; smiling or nodding of head	1.0833
	Teacher praised learners with extra-verbal statement ;Hum	1.1111
	Teacher acknowledged learners contribution e.g Yes or I see	2.0556
5	**Skill of Questioning**	
	Asking clear, short and simple question	2.2222
	Teacher ask questions before calling any name	1.6111
	Teacher spread questions to every corner in the classroom	2.0556
	Teacher asked questions while answers were still on the board	1.1111
6	**Skill of Closure and Transfer**	
	Teacher summarized the lesson verbally	1.6667
	Teacher list the important points on the board	1.1389
	Teacher appreciate the students for their contributions in the class	1.6944
	Teacher gave the learners home work on the topic;	1.5300

For each of the six skills, a short description and a summary of the mean scores will be discussed below:

5.3.1 *Skill of Introduction*

The skill of introduction is based on a planned procedure, which the teacher prepares in order to get the student ready for the lesson. The teacher should prepare pre-planned activities to arouse the learners‟ interest in the topic to be taught. Some attention gaining strategies, in line with the sub-skills described in Table5.3 below, should be applied in the execution of the students‟ lesson.

Table 5. 3: Showing the range of mean scores of each sub-skill

Sub-Skill	Skill of Introduction	Mean Score
1	Teacher did review of previous learning	1.6389
2	Stating the instructional objectives at the beginning of the class	1.5556
3	Teacher used common and relevant examples	1.6944
4	There was a link between the last topic and the new topic.	1.6382

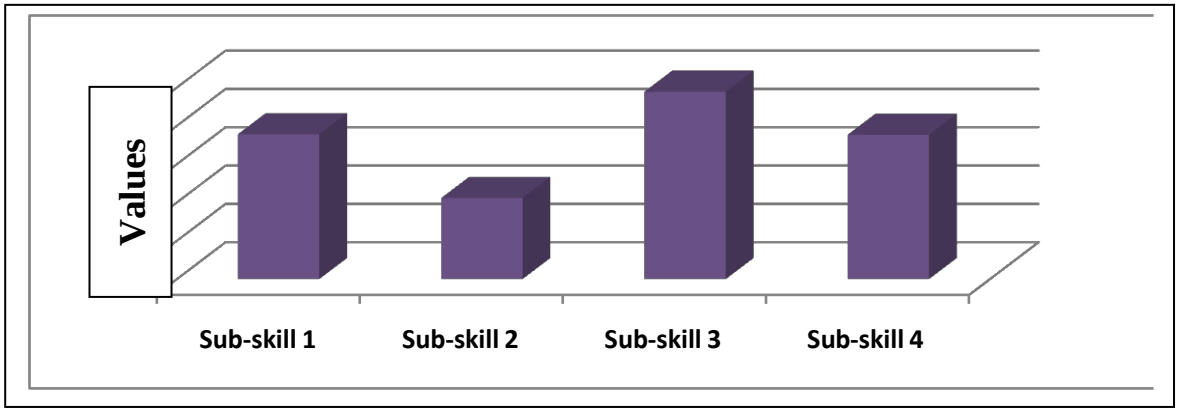

Figure 5. 1: Bar Chart showing the physical appearance of the sub-skill

In Table 5.3, it is evident that for the key skill (*Skill of Introduction*), where the student introduces the lesson, the mean scores for the descriptive sub-skills range from 1.5556-1.6944.This range is narrow as they are within the range of 1.5 and 1.6 from the table above. For the item mean scores on the item *Stating the instructional objectives at the beginning of the lesson*, it displays the lowest mean score (1.5556), whilst the mean scores increases for the other items, as follows: *There was a link between the last topic and the new topic* (1.6382); *Teacher did review of previous learning* (1.6389), *Teacher used common and relevant examples* (1.6944).

The results suggest that the student teachers were challenged with engaging learners at the beginning of the lesson because the pre-service teachers commonly did not *State the Instructional Objective at the beginning of the lesson* (mean score: 1.5556) and *There was a link between the last topic and the new topic* (mean score: 1.6382). On the other hand, once the lesson was progressing, it was evident that they could make connections during the lesson by commonly *Teacher did review of previous learning* (mean score: 1.6389) and during the lesson they were able to use good examples to try to engage the learners during the lesson, *Teacher used common and relevant examples* (mean score:
1.6944). The results suggest that losing initial engagement time at the beginning of the lesson could potentially hamper learners‟ engagement as the student teacher could lose the learners‟ interest completely if these skills are not developed during their teacher training.

5.3.2 *Skill of Variation*

The skill of variation is one of the central skills for an effective teaching and learning process, it a skill used to sustain the interest of the learners as the lesson progresses. Teachers are expected to use a wide variety of strategies, tools and approaches to sustain and maintain the learners' interest. The application of variation strategies as seen in the Table 5.4 below (*Skill of Variation*) is to make the class more interactive by giving room for active classroom participation.

Table 5. 4: Showing the range of mean scores of each sub-skill

Sub-skill	Skill of stimulus variation	Mean sore
1	Teacher moved around the class while teaching.	1.7550
2	Teacher used some gestures such as hands, head ,face etc	1.9167
3	Teacher varied speech while teaching as tone, pitch, pause	1.0833
4	Teacher allow student to actively participate in class	2.3611

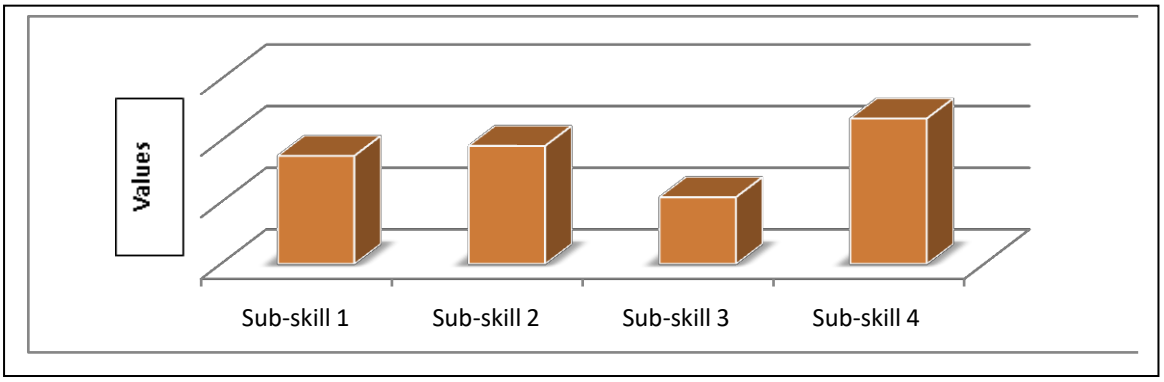

Figure 5. 2: Showing Bar Chart showing the physical appearance of the sub-skills

In Table 5.4, it is evident that for the key skill (*Skill of Variation*) where the student teacher uses a variety of strategies, tools and approaches to engage the learner, the mean scores for the descriptive sub-skills, range from 1.0833-2.3611. This range is moderately wide as seen from the table above and from the physical appearance of the bar chart (Fig 5.2). For the item mean scores on the item *Teacher varied speech while teaching as tone, pitch, pause* displays the lowest mean score (1.0833), whilst the mean scores increases for the other items, as follows: *Teacher moved around the class while teaching* (1.7550); *Teacher used some gestures such as hands, head, face, etc.* (1.9167); *Teacher allow student to actively participate in class* (2.3611).

The results suggest that the pre-service teachers would allow students to actively engage in class *Teacher allow student to actively engage in class* (mean score: 2.3611) and use gestures when communicating with the learners *Teacher used some gestures such as hands, head, face, etc.* (Mean score: 1.9167). On the other hand, the students teachers should continue working on developing skills where they move around the classroom in order to effectively monitor the students *Teacher moved around the class while teaching* (mean score: 1.7550) and vary their communication to maintain the interests of the learners throughout the lesson *Teacher varied speech while teaching as tone, pitch, pause* (mean score: 1.0833). The results suggest there is a wide gap in skills that require the student teachers to draw on the various tools for them to add variety to the lesson, and this key skill needs further probing.

5.3.3 *Skill of Explanation*

The ability to explain a difficult concept clearly and concisely makes and promotes meaningful learning. Good explanations smooth the progress of discussions and helps create interactive sessions that are meaningful to learning. The skill of explanation is used in a lesson to improve

conducive classroom environments placing the student at a better advantage to understand the concept and helping them to have a sense of satisfaction. Explanation is characterized by different actions or activities that can create the flow of ideas given the learners and a direction toward the stated objectives. The application of explanation strategies as seen in the Table 5.5 (*Skill of Explanation*) is to develop meaningful learning amongst the learners.

Table 5. 5: Showing the range mean scores of each sub-skill

Sub-skill	Skill of Explanation	Mean Score
1	Lesson is well explained with clarity	2.1667
2	Explanation of content is relevant to stated objectives	2.0000
3	Class is interesting to students with relevant resource material	1.7778
4	Teacher used easy flow of ideas from known to unknown	1.6944

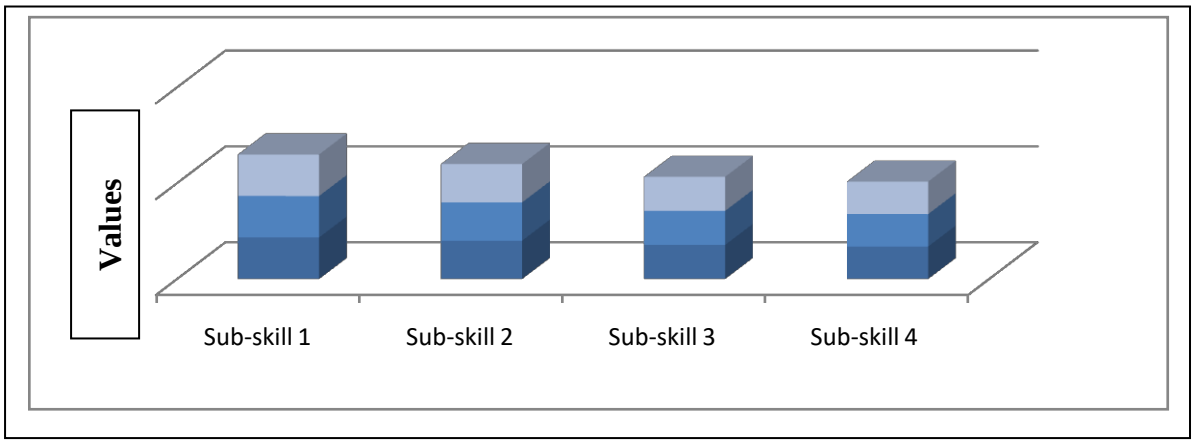

Figure 5. 3: Showing Bar Chart showing the physical appearance of the sub-skills

In Table 5.5, it is evident that for the key skill (*Skill of Explanation*) where the student teacher explains work to promote meaningful learning, the mean scores for the descriptive sub-skills, range from 1.6944-2.1667, this range is moderately narrow as seen in the physical appearance of the Bar chart (Fig 5.3). For the item mean scores on the item *Teacher used easy flow of ideas from known to unknown* displays the lowest mean score (1.6944), whilst the mean scores increases for the other items, as follows: *Class is interesting to students with relevant resource materials* (1.7778); *Explanation of content is relevant to stated objectives* (2.000); *Lesson is well explained with clarity* (2.1667).

The results suggest that the pre-service teachers explain lessons to engage the learners because they can explain content with clarity *Lesson is well explained with clarity* (mean: 2.1667); *Explanation of content is relevant to stated objectives* (mean: 2.0000) and *Class is interesting to students with relevant resource materials* (1.7778). However, it is evident that student teachers are challenged by developing ideas to flow and make lesson topics develop from the known to the unknown *Teacher used easy flow of ideas from known to unknown* displays the lowest mean score (mean score: 1.6944). Thus, it is evident that the pre-service teachers are relatively confident with explaining the content to students but need to be trained more effectively in applying their pedagogical content knowledge.

5.3.4 *Skill of Reinforcement*

Reinforcement is an action applied to strengthen the students' immediate and future behaviour or to act in a particular way during the teaching and learning process. It is seen as anything that increases the learner's response or encourages active participation and classroom contribution. A good reinforcement strategy create behavioural changes, it increases and strengthens the response thereby creating a positive classroom environment and allow learners to work collaboratively together (Green, 2014). Different actions can be incorporated as a form of reinforcement strategies that may increase the frequency of a desired response in the class. The application of reinforcement strategies as seen in the Table 5.6 (*Skill of Reinforcement*) is to develop skills that learners can use to reinforce solidify their understanding of a topic.

Table 5. 6: Showing the range mean scores of each sub-skill

Sub-skill	Skill of Re-enforcement	Mean Score
1	Teacher praised the learners verbally	2.0278
2	Teacher used non-verbal praise; smiling or nodding of head	1.0833
3	Teacher praised learners with extra-verbal statement ;Hum	1.1111
4	Teacher acknowledged learners contribution e.g Yes or I see	2.0556

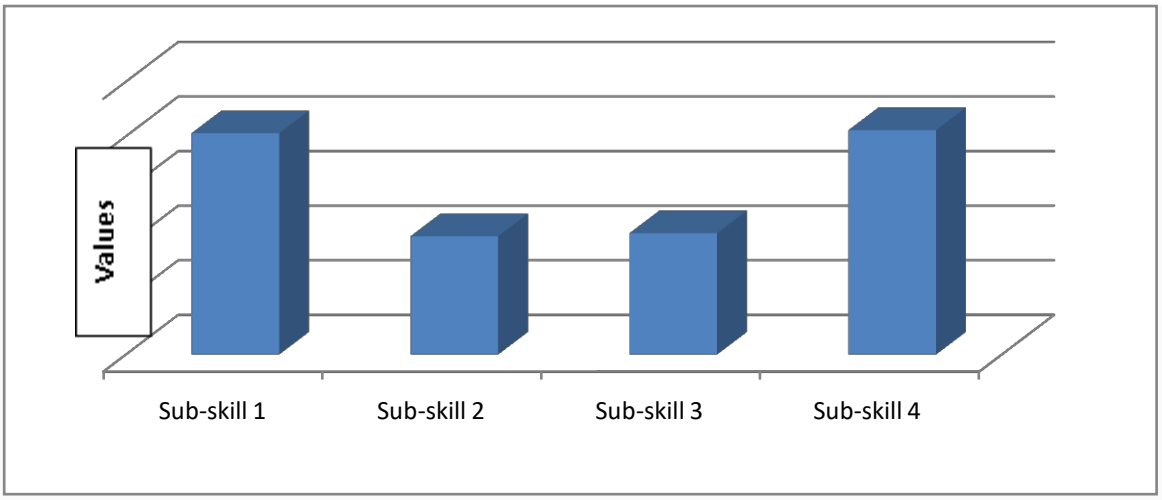

Figure 5. 4: Bar Chart showing the physical appearance of the sub-skill

In Table 5.6, it is evident that for the key skill (*Skill of Reinforcement*) where the student teacher explains work to reinforce meaning, the mean scores for the descriptive sub-skills, range from 1.0833-2.0556, this range is moderately wide as displayed in the Table 5.6 above and the physical appearance in Fig 5.4. For the item mean scores on the item displays the lowest mean score *Teacher used non-verbal praise; smiling or nodding of head* (1.0833), whilst the mean scores increases for the other items, as follows: *Teacher praised learners with extra-verbal statement (1.111)*; *Teacher praised the learners verbally* (2.0278); *Teacher acknowledged learners contribution, e.g., Yes or I see* (2.0556).

The results suggest that the pre-service teachers actively used verbal gestures to reinforce learners' understanding, for instance, [*Teacher acknowledged learners contribution, e.g., Yes or I see* (mean: 2.0556)] and [*Teachers praised the learners verbally* (mean: 2.0278)] but were more challenged to engage with non-verbal gestures, for instance, *Teacher used non-verbal praise; smiling or nodding of head* (1.0833) and *Teacher praised learners with extra-verbal statement* (1.111). Thus it is evident that the student teachers more likely to use verbal gestures to reinforce learning than non-verbal gestures.

5.3.5 Skill of Questioning

The heart of good teaching is questioning, it is a statement that has an interrogative function. The skill of questioning in a teaching and learning process engages learners in the content of the lesson in order to actively participate in the discussion. It is used to check the clarity of learning materials and give meaning to any difficult concept in the teaching and learning situation. Good questioning

techniques provide feedback from the learners and help to strengthen their level of understanding. The progress of the lesson can be checked by using questioning skills and by applying relevant strategies or activities to access the achievement and mastery of learning objectives. The application of questioning strategies as seen in the Table 5.7 (*Skill of Questioning*) is to develop skills that learners can use to question their understanding of a topic.

Sub-skill	**Skill of Questioning**	**Mean Score**
1	Asking clear, short and simple question	2.2222
2	Teacher ask questions before calling any name	1.6111
3	Teacher spread questions to every corner in the classroom	2.0556
4	Teacher asked questions while answers were still on the board	1.1111

Table 5. 7: Showing the range means score of each sub-skill

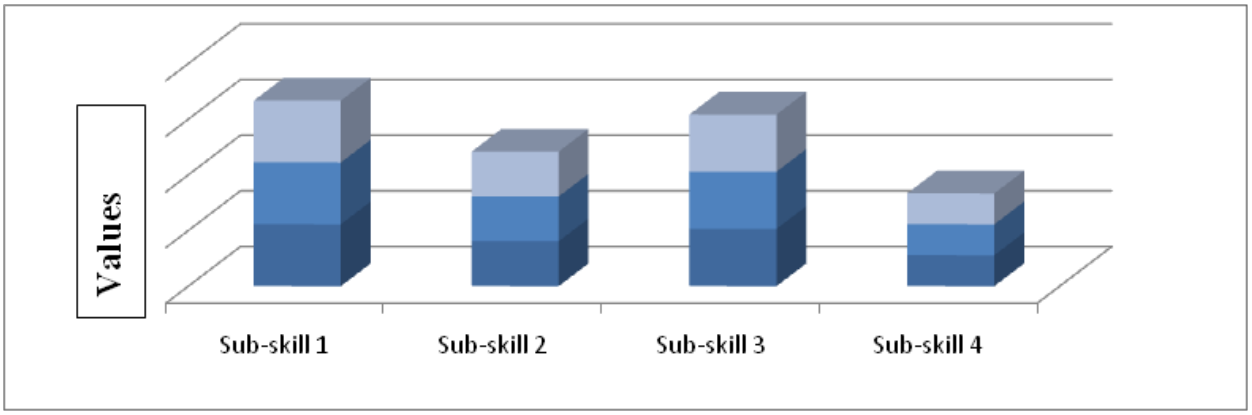

Figure 5. 5: Bar Chart showing the physical appearance of the sub-skill

In Table 5.7, it is evident that for the key skill (*Skill of Questioning*) where the student teacher probes through questions in order to monitor learners‟ understanding of the class work topic, the mean scores for the descriptive sub-skills, range from 1.1111-2.0556, this range is moderately wide as seen in the physical appearance of Fig 5.5. For the item mean scores, the item displaying the lowest mean score *Teacher asked questions while answers were still on board* (1.1111), whilst the mean scores increases for the other items, as follows: *Asking clear, short and simple question* (2.2222), *Teacher ask questions before calling any name (1.6111)*; *Teacher spread questions to every corner in the classroom* (2.0556).

The results suggest that the student teachers need to engage with more questioning techniques during their teacher training. It is evident that though the pre-service teachers' awareness of questioning technique is quite low but were able to engage widely with the learners within the class [*Teacher spread questions to every corner in the classroom* (mean score: 2.0556)], they were challenged with simple probing questions in the classroom [*Asking clear, short and simple questions* (mean score: 2.2222)]; [*Teacher asked questions while answers were still on the board* (mean score: 1.1111)]; and [*Teacher as questions before calling any name* (mean score: 1.6111)]. Thus, it is evident that the pre-service teachers were more likely to avoid engaging with learners through simple and engaging questions, most likely because it would have to align with their pedagogical lesson plan.

5.3.6 *Skill closure and transfer*

Closure and skill of transfer is used to draw learner's attention to the end of any teaching activities by focusing on the salient points of the lesson. It gives the learners the ability to establish a link from what has been learnt in the class and assist them to understand the purpose of the lesson. The skill of closure and transfer is an action designed by a teacher to conclude a lesson. The teacher and the learners can enjoy the level of accomplishment of a lesson if closure and transfer skill are well-organized with strategies and other relevant activities as seen below. The application of lesson closure strategies as seen in the Table 5.8 (*Skill of Closure and Transfer*) is to close the lesson and sure that the learners understand the topic.

Table 5. 8: Showing the range score mean of each sub-skill

Sub-skill	Skill of Closure and Transfer	Mean Score
1	Teacher summarized the lesson verbally	1.6667
2	Teacher list the important points on the board	1.1389
3	Teacher appreciate the students for their contributions in the class	1.6944
4	Teacher gave the learners home work on the topic;	1.5300

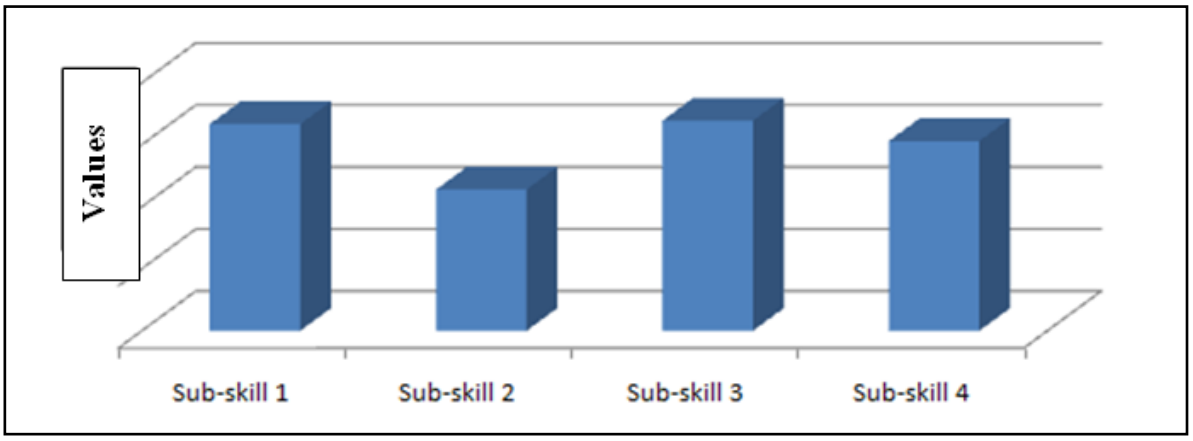

Figure 5. 6: Chart showing the physical appearance of the sub-skill

In Table 5.8, it is evident that for the key skill (*Skill of Closure and Transfer*) where the student concludes the lesson by engaging the learners in order to monitor learners' understanding of the class work topic, the mean scores for the descriptive sub-skills, range from 1.1389-1.6944, this range is narrow with a close gap, they both fell within 1.3 and 1.6. For the item mean scores on the item that displays the lowest mean score *Teacher lists the important points on the board* (1.1389) whilst the mean scores increases for the other items, as follows: *Teacher gave the learners homework on the topic* (1.5300); *Teacher summarized the lesson verbally* (1.6667), *Teacher appreciate the students for their contribution in the class* (1.6944).

The results suggest that while the student teachers ended the lesson with verbal praise and summarized the lesson verbally, they were challenged with giving the learners direction through written instruction, techniques that should be reinforced during their teacher training. It is evident that though the student teachers' verbal engagement in closing a lesson was strong [*Teacher summarized lesson verbally* (mean score: 1.6667)] and [*Teacher appreciate the students for their contributions in class* (mean score: 1.6944)], but they were challenged with written instruction to end a lesson [*Teachers have learners homework on the topic* (mean score: 1.5300)] and [*Teacher list the important points on the board* (mean score: 1.1389)]. Thus, it is evident that the pre-service teachers are more likely to give stronger verbal than written instruction during lesson closure and transfer.

5.5.7 *Summary on the usage of the key skills*

In summary, based on the six key skills, it is evident that the knowledge of the pre-service teachers in the usage and application of teaching skills on is average overall. Going by the results from the

analysis, three of the skills namely *Explanation, Stimulus variation* and *Questioning technique* were above average while the other three skills *Introduction, Reinforcement* and *Closure and transfer* were below average as seen in the tables below. The significance of the results is that the pre-service teachers need to improve the skills where they are weak to be able to function well in their classroom practice.

Table 5. 9.: Showing the hierarchical application of skills

Skills	No of respondents	Total	Mean	Rank
EXPLANATION	36	275.00	7.6389	1st
STIMULUS VARIATION	36	256.00	7.1111	2nd
QUESTIONING TECHNIQUE	36	252.00	7.0000	3rd
INTRODUCTION	36	235.00	6.5278	4th
REINFORCEMENT	36	226.00	6.2778	5th
CLOSUREANDTRANSFER	36	217.00	6.0278	6th

Table 5. 10: Showing the summary level of skill as stated in the rubric

Skills	**Total**	**Level**
EXPLANATION	275.00	Exceed expectation
STIMULUS VARIATION	256.00	Meet expectation
QUESTIONING	252.00	Meet expectation
INTRODUCTION	235.00	Need improvement
REINFORCEMENT	226.00	Need improvement
CLOSURE ANDTRANSFER	217.00	Need improvement

From Table 5.9 above, it shows the ranking of the most well used skill that exceeds expectation as seen in the summary of Table 5.10. Table 5.10 displays the total score of how each skill was used in relation to the sub-skill in each skill as seen in the rubric. The total score column was derived as it explains all the aggregated responses from the thirty-six respondents for each of the six skills measured. The 3-point scale type of *Exceed Expectations* (3-point), *Meet Expectations* (2-point) and *Needs Improvement* (1-point) (see chapter 3) classification was transformed into nominal scores for easy computation. Using a descending order of priority, each of the six skills were measured by thirty-six respondents and for the first skill of explanation, an aggregate score of 275 was derived as the highest, skill of variation have a second aggregate score of 256, the third skill of Questioning technique have an aggregate of 252 responses, the fourth skill, Introduction have an aggregate value of 235 responses, the fifth skill have a score value of 226 while the sixth skill have a score value of 217 respectively.

From the hierarchical placement of skills, as displayed by the participants during their micro-teaching presentation using personal phones as technological device, it was revealed that participants were able to use the digital technology to produce a video depicting their level of understanding of micro-teaching concepts and the application of the teaching skills which show the levels of accumulated experience of the participants. Going by the KACIT model of the input stage in alignment with the constructivism framework, prior experience can be reflected upon in order to model the accepted teaching behaviour as supported by social learning theory of Bandura. The participants also display high levels of understanding in the usage of this digital technological tool as seen in the way the video was submitted for evaluation with 31 out of 36 groups who used the online platform Google drive to submit their video presentation while just 5 used the alternative means (WhatsApp). This reveals good manipulative skill in the usage of simple technology by the pre-service teacher as seen in the implementation stages of the KACIT model where the participants presented their lesson.

From the analysis Table 5.9 above, the use of E*xplanation skill* has the highest mean value of 7.6389; this particular skill exceeds expectation in line with the rubric as seen from the summary of Table 5.10. It reveals the mastery level of the participants in the application of the skill as this is an important skill in the teaching and learning situation which help build the learners level of understanding of the concept in the classroom. The result also reveals high levels of confidence exhibited by the pre-service teachers, which is one of the most important qualities of a good teacher. The second skill (*Variation*) and third (*Questioning*) from the ranking above *meets expectation* as the participants were able to use the skill of *Stimulus Variation* and *Questioning* skill adequately as the mean values is above average with 7.1111 and 7.0000 respectively as seen in Table 5.9. Participants were able to demonstrate the skill of *Stimulus Variation* to sustain learner's interest in the course of their presentation and using *Questioning* techniques to checkmate and control the class for perfect understanding of the content. In addition, this result reveals that, through questioning strategies, certain underlying learnt materials could be re-evaluated; hence participants placed more value on questioning skill because it is seen as the heart of teaching.

However, the fourth skill (*Introduction*), fifth skill (*Reinforcement*) and the sixth skill (*Closure and Transfer*) in the hierarchy as seen in the Tables 5.9 & 5.10 above fell *below expectation value and need improvement* as observed in the participant's presentations and as seen from the mean score. Starting with the skill of *Introduction*, this skill seems to be an important skill in the art of teaching but the result reveals that participants seems to deviate from the expected norms by making introduction strategy uninteresting to learners. This shows that the participants are not mindful of the significant roles of startle statements or suspense in gaining learners attention and to draw their interest to the lesson hence it's fourth in the hierarchy of skills that need improvement with a mean value of 6.5278. The fifth skill in the hierarchy table is *Reinforcement*. The participants in their teaching presentation, despite its importance, did evidently consider this powerful skill important. The mean score revealed the knowledge of the participants in the usage of the skill is not well demonstrated accordingly as it has its mean value as 6.2778. Perhaps the participants are aware of value of this skill as a strategy used to motivate other learners to contribute to the lesson. The sixth and least used skill in the table of hierarchy is *Closure and Transfer* which has a mean value of 6.0278. *Closure and Transfer* is as important as any other skill because without proper closure, the lesson becomes incomplete and possibly the participants may not understand the value of this skill, thereby given less attention to the skills as seen from the mean score.

The result revealed that the participants lacked the mastery of this skill; hence, there is a need for

improvement because the summary of the lesson gives the learners a good sense of satisfaction of the lesson progress. In conclusion, I have presented the results and analysis of the video presentations with the emergence of new innovative technologies, which are challenging the teaching profession. From the overall result, the presentation of the lesson reveals the pre-service teachers would have done better if they are exposed to model teachers on YouTube's. Therefore the results suggest there is a need for technological alignment in the theoretical content and practices of micro-teaching as seen from the quantitative analysis which revealed how pre-service teachers used personal phones as digital technology to produce a video depicting their level of understanding on the application of micro-teaching skills.

5.4 ANALYSIS AND INTERPRETATION QUALITATIVE INTERVIEW DATA

From the above analysis, it was revealed that the pre-service teachers were able to use simple technological tools as expected and the results revealed that knowledge of the participants on the application of micro-teaching skills ranged from average to quite good as seen in the previous section. This section focused on the data obtained and the presentation of the results as related to the sub-research questions of the study. The section presents an intense account of the qualitative data analysis of this study.

The research employed qualitative analysis using the thematic analysis strategy. The interviews were transcribed into words and with colour variations of red, orange and blue, relevant and salient information that were enlisted. The colours were used to categorise the following important information enlisted below:

- Red- was used to get the opinion of the participants
- Orange- was used to gather the facts from the participant's statement
- Blue- was used to draw out ideas that may be useful in the course of the analysis.

The colours was categorized and correlated as major and minor categories that were compared according to its relevance in relation to the aim and the research questions. The major categories are the factual statements or key words from the participants while the minor categories are the supporting statements given to explain the key words. These categories form the basis for the themes, patterns or concepts with basic similarity features, which were used to find answers to the sub-research questions. According to Neuman (2006), a qualitative analysis organised data into themes, concept patterns of ideas for similar features.

After analysing the transcribed data, a coding pattern, as described in Chapter 3, emerged. This process involved three main steps, namely: (1) sifting through data, (2) finding out re-occurring statements or words relevant to the study and (3) classifying into themes. As part of the process, the course of classifying segments of data with message, expressive words are referred to as coding (Johnson & Christensen 2012). The unstructured interview questions used in this study was to evaluate the knowledge level of the participants on micro-teaching, to determine the effectiveness of digital technology as a platform among the pre-service teachers and to examine the application of micro-teaching skills with digital technology as seen from the objectives of the study. Four main questions aligned with subsidiary questions that were raised to find answers to the research questions. In the presentation, interview responses of the focus group sessions were slightly paraphrased while the students and the supervisor's responses were considerably reported verbatim to avoid inconsequential statements, while meaningful segments from the transcribed texts were finally coded and arranged into categories of themes as presented below are:

(1) Perception of micro-teaching theory and practice;

(2) Understanding the effective roles of technology in the teaching and learning process;
(3) Social media platforms as a form of technology of participation for reflective learning;
(4) Deepening the professional knowledge of prospective teachers with good practices.

In the section below, the themes will be briefly discussed as it relates to the major and minor themes in each table as revealed by the responses of the interviewees.

5.4.1 Perception micro-of teaching theory and practice

The perception of micro-teaching theory and practice in teacher education programmes determine the value of the modules. Perception is a way in which an individual observe, examine and respond to information, it is sometimes characterised by intellectual understanding of an individual. Perception also can be seen from the psychological viewpoint which is subjective to individual's responses to similar information. People react and behave in a certain manner based on the way they perceive information, ideas, concepts events or situations. The view and interpretation of information or ideas can be judged by the understanding of the concepts (Rivera, 2018). What we perceived is determined by what we do and how we do it.

The way the pre-service teachers regard and interpret micro- teaching is likely to be the way the module is presented to them during the university lectures. The understanding of the micro-teaching concept determines their perception and the knowledge level of the students during their studies at the university. The attention and time given to the modules is also likely to determine the perception of the students towards micro-teaching. The table and the interview responses below reveal the knowledge and understanding of micro-teaching as perceived by the students.

Table 5. 11: The participant's perceptions illustrated by the major and minor themes

Group being interviewed	**Major categories**	**Minor categories**
Focus Group	Form	Materials Participants Observation
	Content	Explanation and Information Model & Guidelines Actual Teaching Experience
Students	Theory & Practice Divide	**Financial constrains** Not enough resource material
Supervisors	Teaching Practice Logistics Organisation	

The evidence in Table 5.11 suggests that the major categories, elaborated in the minor categories, expressed by the three groups interviewed, namely, the students in their focus groups, individual students and the supervisors were primarily how the module was taught and how the module was organized. They perceived that the shape of the course (*form and content)* required strengthening given the importance of the module as a whole. First, the focus group interviews revealed that the students were questioning whether the form in which the module was presented to them were indeed appropriate given that this is a core module which students were obligated to pass if they were to proceed to the next level. For instance, the students revealed the following:

F1P-3 *I think as first time teachers they can guide us in the way we should deliver the content"*

F1P-5 *Show us first how to do it and what to expect from us*

F1P-3 *More exposure to classroom activities*

F1P-1 *It only make sense to also have our own place to practice. It would give us an easier pass*

F2P-1 *I think they can give us feedback, we did an introduction teaching skill in first year, which was okay*

F2P-1 W*e didn't get a holistic idea in a lecture*

2PT-*3* *I think it was last year that we did a micro teaching lesson. It wasn't very well structured or the guidelines were not really good especially last year when we were introduced to it.*

F3P-1 I *think actually I heard about what's happening at Stellenbosch they use learners when the students do the micro teaching here, it is in front of other students*

It was further revealed that the content of micro-teaching is not intense enough to build their expertise. They felt strongly that the structure of the module and the information given by the lecturers during micro-teaching classes were not showing the pre-service teachers what they are expected to do while on teaching practice at schools. Specifically, the students felt that the content was not explicit, or one might argue constructively aligned for clarity, and hence they expressed that they need more modelling, guidance and support in order for them to understand the content. They would have liked more modelling of practice and model guidelines to give them an idea of what exactly is expected from them. Finally, with regard to their guidance from the experts or facilitators, they felt that there is little actual teaching experience gathered from them. They alluded to the fact that they could be acquiring more experience from their peers who, they emphasized, are also still learning to teach. For instance, the students suggested the following during the interview:

> **F1P-4** *If given a set of all instructions on how to go about doing, I think they should actually expose us more to the micro teaching*
>
> **F1P-1** *If you can show us a model of a person who has good habits in micro-teaching so then we at least have a frame of reference*
>
> **F1P-2** *I think that micro teaching evaluation sheet provides us guidelines for what is expected, we obviously need more training*
>
> **F2P-2** I *think the guidelines need to be clearer*
>
> **F2P-3** *It is not training us to like what do you in this situation how to teach, what you mustn't say, what you must say, it's just like the laws are laws*

Further probing during the individual student interviews suggested that the lack of understanding and the compartmentalised approach to the lectures lead the students to being unable to apply the skills being taught in lectures, and hence leading to a theory/practice divide. They further claimed that they are not exposed enough times during the course as a whole to practical teaching and did not have in-depth knowledge of the micro-teaching practical skills. Theoretically, what they are able to understand, they felt was sufficient, but they argued that learning how to teach is more than what can be explained theoretically. Learning how to teach should be demonstrative action and not only theoretical explanation. For instance, the students suggested the following during the interviews:

ST-1 *I feel like micro-teaching is not something that you can learn from a book*

ST-1 *I feel like you can only implement micro-teaching in class and then have a feel of how the learners learn; there is no specific way that they can teach me, basically it not easy to read up practical aspect.*

The supervisors, in general, echoed the students' sentiments on both the issue of course content and theory/practice divide, for instance:

SU-2 *I know that it is something that is really on the cards because everybody does understand that there is a need for it. Micro-teaching in itself is too limited, it's not done sufficiently and thereby I know that is something that is becoming a focus point*

SU-5 *Makes micro-teaching more practical, with more time and the classroom situation. The only way I think we can go to being more practical.*

However, similar to the students' concern, the supervisors expressed that the logistics and organisation of micro-teaching should be of concern to the faculty as the issue of space to practice and time for more exposure to micro-teaching was a concern. The supervisors are also aware that the Faculty of Education is putting micro-teaching on the agenda to try to address some of the issues the students raised, for instance these were the issues that they expressed:

SU-5 M*ake micro-teaching more practical, with more time and the classroom situation. The only way I think we can go to being more practical*.

SU-1 *We're doing micro-teaching in a different way. I think they are working on it, but for now the micro-teaching was focused on the PGCE students.*

SU-2 *I know that it is something that is really on the cards because everybody does understand that there is a need for it. Micro-teaching in itself is too limited, it's not done sufficiently and thereby I know that is something that is becoming a focus point*

SU-3 *I'm going to be frank, of all the bureaucratic nonsense that we hear, we do not have money making these groups smaller won't entail getting more expertise. This university and its Education Department, particularly teaching practice, they are suffering tremendously with the little resources*

SU-4 *Up until this year, it wasn't considered very important, and not lots of effort was put into helping the lecturers with micro-teaching. But our emphasis at this university for the last many, seven years, or eight years, was on the theory of the subject. It has now considered important more emphasis put on the micro-teaching and teaching the students the skill of writing on a board and using OHP and making posters.*

On the whole, it is evident that for the theme *Perception of Micro-teaching – Theory and Practice*, the results reveal that the students and supervisors perceive that the structure of how the university lecturers teach the course (form and content), as well the general planning logistics (organization), compounded by the financial and resource constraints, together widening the theory/practice divide of the course.

5.4.2 Understanding the effective roles of technology in teaching and learning process

Technology has characterized our day-to-day activities, given us quick access to information delivery in the field of education. The classroom is becoming an interactive learning space with technology as a significant game changer (Geist, 2011). Presently, the students have taken ownership of their learning through digital technology making the class more interactive. The significant role of technology to learning in this 21st century is that of transformative learning. Transformative learning is the process of developing learners experience in order to fit into the current belief through critical thinking and self-reflection. Technology enhances effective content delivery and provides easy access to learning. The purpose of technology in the teaching and learning situation is to change how teachers and students effectively interact and transmit relevant instructional information in classrooms in order to achieve their learning objectives.

With innovative technology, the roles of teachers and learners have changed from information disseminators to facilitators and the student from passive listeners to active contributors, technology encourage collaborative, interactive and cooperative learning in the classroom. Technology provides great connections even beyond the classroom setting and it makes communication and information easier for both teacher and learners. Technology has caused systemic changes in the teaching and learning process with high-speed connectivity on digital devices that are available to teachers and students. The significant role of technology in the teaching and learning process has made teaching and learning more functional because it has been considered essential for the learning environments as discovered in the below themes:

Table 5. 12: Showing the participants responses on technology

Group being interviewed	Major categories	Minor categories
Focus Group	Appealing	Gain understanding Stimulate interest
	Teaching motivation	Gain experience Evaluation for reflection
Students	Self-formation Motivation	Self-evaluation Development of skills Supporting teaching and learning
Supervisors	Balance technology	Reflect and improve Learning engagement Development of skill
	Logistics Availability	

The evidence in Table 5.12, as revealed in the major categories, which were elaborated in the minor categories, articulated by the three groups interviewed, namely, the students in their focus groups, individuals and the supervisors were primarily emphasizing how technology has been useful to enhance the effective teaching and learning process. They acknowledge the versatile nature of technology as a teaching resource material which appeals to some senses of learning and as well serving as a means of strengthening the development of the teaching skills. The focus groups and the student's interviews revealed their improvement in teaching skills through technology as a creative way of gaining more understanding of the concept. From the question asked, the interviewers agreed that with appropriate integration of audio-visual resources, students might derive and develop more knowledge of micro-teaching skills. They felt strongly that learning and understanding the teaching skills in the context of micro-teaching is a function of digital technology which gives them opportunity to interact easily with one another and serving as a source of inspiration when learning difficult concept For instance, the focus groups and the students revealed the following:

FG1PT-1 *I would say very helpful. It saves a lot of time. Help to Interact with one another and with the teacher.*

FG1PT-2 *I think when there is a camera on you, you know what is expected of you and you going to be evaluated and it can be repeated over and over so you obviously try to do your best in presenting a good decent to your ability.*

FG1PT-3 *And I think with the video we can look back and see what we have done wrong or what we can improve on*

F3P-1 *Oh yes I just love the fact that we can use videos and songs and picture*

F2P-1 *Yes definitely because you can use like videos to help you*

F2P-3 *In terms of aids like visual aids definitely because posters are great, but it can't only do so much it can't show a moving thing*

FG2P4 *If we have a colourful video that is visual stimulation so in that way technology helps a lot*

ST-1 *Yes, like teaching videos like videos whereby you actually watching someone actually teach a class*

ST-2 *I am so proud about the use of technology the first time I had to use the laptop was when I was doing first year here and the first time I knew how to create an email and access things from the mail but most of my technological skill were not developed at the university*.

ST-2 *Very much it give an opportunity to explore and develop those pedagogical skills which include the use of ICT in the classroom*

ST-3 *Yes I've learned a few things about technology that I've yet to apply in a classroom and I'll see how those go. PowerPoint is useful and videos because videos allow you to see visual things in terms of in the classroom, and PowerPoint is useful because it's the way that allows you to present information*

ST-4 JA, *a lot. I've learned a lot since I came into this place and the video and the knowledge, I've learned a lot. All the knowledge I've gained, all the practical experiences I've gained, I think I know more now I love it, because it's, I don't know how to explain it, but it's convenient man, and technology is always the way to go so that is the one plus I had, and it's more efficient than coming into class*

It further revealed the value of technology as a supportive strategy in the teaching and learning process. The focus group and the students explain how it can easily help to develop and to gain more understanding of teaching skills. Specifically, the student's emphased that technology is beyond exposing them to skills facilitation but exposing and developing the right attitudes and application of

the teaching skills. They believed that interest can be developed and their confidence can be built on how to prepare a lesson with an in-depth understanding of instructional content. In terms of meaningful learning and understanding of skills, it has facilitated an effective teaching and learning process. Technology has really helped arouse their interest to build self-formation with deep understanding and experience in teaching activities as seen in their response below:

> **F3P-2** *It has also helped me because I think when you prepare your lesson plan you actually preparing yourself over and over again*
> **F3P-3** *It's like reflecting there is only it's also good you can laugh at yourself.*
> **F2P-2** *I will prefer learning better watching something*
> **F2P-2** *I have watched on video in my LO class where they let us watch a lesson like being done in a class*
> **F1P-4** *we have to teach and reflect, it helps you to grow and be confident*
> **ST-3** *I believe that technology is there to support teaching and learning, it's a tool to help learners of this generation engage in the learning process. Technology is ultimately here to stay and so if you remove technology from the classroom it would be a grave error*
> **ST-5** *Yes, it actually has, yes. Like especially in the way you structure your lessons. Definitely for me technology made teaching so easy because you can incorporate so many things, and learners learn visually mainly, they love seeing things, hearing and touching. So yes, technology gives me that platform of adding variety of things to my lesson, and it makes it just more interesting because the youth of today are just interested in technology devices*.

However, the supervisor in their view agreed with students in the area of technology but emphasizes a balanced approach. Using any technology in the development of pre-service teachers should not be a sole strategy of engaging the students but as a complementary tool. Balanced technology entails the incorporation of technology to the practical demonstration of the teaching skills by expert teachers to compliment any technological tools used in engaging the pre-service teachers. Creating an appropriate avenue along the versatile nature of technology enhance the development of teaching skills in the area of observable behaviour for self-evaluation. Despite the high priority for technology, logistically, the lecturers are challenges and incapacitated in use of technological facilities as revealed in the responses of the supervisors:

> **SU-1** *Technology allows you can pause in the middle. So you play, you pause, and helps to engage the learners with what has happened*

SU-1 *We're taking students now to CTLI so that they can also be schooled in the use of technology in the classroom. But I maintain that that technology can never be a substitute for the teacher. There must be a balance.*

SU-2 *Technology helps to evaluate the performance, it gives an opportunity to look at it and say what was the teaching style, what could have been done differently and they have critical thinking*

SU-2 *I think the observation on how they do things, learn and develop their skills. to me is developmental teaching*

SU-4 *Oh we do teaching skills in, but that is only presentation skills, but other teaching skills, like writing on the board and using different equipment and technological equipment, we need to train our students in all of those things. Call it the traditional equipment whatever, how to use the traditional teaching aids, the chalkboard…*

SU4 *I think the technology part is a high priority and the smart board obviously They more modern ones is the smart board will be of help*

SU 4 *Yes when you record yourself and you reflect and then you can improve on. I can only think of that one right now and also to use the equipment. They must know, we must teach them, we must tell them, or we can tell them about some applications, but these students are so clever, they also know about lots of applications anyway*

SU-5 *I am a proponent for technology, I believe in incorporating technology but our capacity is very limited and also resources-wise, I think we must brush up. We need to teach our student and to move beyond from power point, I will prefer a module in this course technology in teaching*.

In conclusion, it is evident that for the theme of Understanding the Effective Roles of Technology in teaching and learning process, the result reveals that the students and supervisors believed that technology is significant to the development of teaching skills but supervisors were incapacitated by its availability.

5.4.3 Digital video platforms as a form of technology of participation for reflective learning

In recent times, diverse digital technological tools make learning activities more interactive and entertaining, but on the other hand, are challenging teaching strategies and approaches to learning. The current strategies and approaches to the teaching and learning process were compelled by rapid changes in knowledge and innovative technology, and this shift in education has placed learners in

the center stage where the technology of participation is needed. The concept of social platform as a form of technology of participation is a form strategy that may allow active participation among learners to collaborate in order to achieve a meaningful result. The technology of participation may incorporate collaborative and cooperative learning using digital technology tools to create a social space where learning can take place effectively.

Creating a social space in a learning environment may enable learners to personalize learning in order to organise and prepare their own ideas through reflection. A reflection is a form of feedback that helps deepen learners understanding with the ability to review what has already been learnt. Social platforms as a technology of participation for reflective learning is a process of collaborating and sharing learning experiences with colleagues using personal digital technology which may enable collaborative thinking and group creativity. Digital technology may bring high levels of participation in the teaching and learning process when using simple and available devices to create a specific platform, which may generate the spirit of commitment, and positive attitudes to learning as discussed below:

Table 5. 13: Showing the summary of participant's response on digital videos

	Group being interviewed	**Major categories**	**Minor categor**
	Focus Group	Motivation	Reflective feed Gain more exp
		Beneficial	Useful and help Evaluation for
	Students	Source of inspiration Personal assessment	Self-evaluation Development o Gaining and ex Experience
	Supervisors	Positive attitudes	Justification attitude
		Regret / unsatisfactory	

The evidence in Table 5.13 revealed the major categories, elaborated in the minor categories, expressed by the three groups interviewed, namely the focus groups, individual students and the supervisors primarily described digital videos as a motivating resource material. The digital technology tool such as the mobile device has become learners' companion whenever they are alone. The focus group and the students agreed that the digital video as a tool for learning is a motivating and stimulating source of learning to interact and exchange ideas with colleagues. It allows for easy connection and sharing positive ideas with one another no matter the location. The versatility of digital devices creates an opportunity for video platforms as tools to advance learning and to motivate learners as seen from the categories above. The Table 5.13 revealed the significant nature of digital videos (*beneficial and personal assessment*).The focus group and the individual student's interviews revealed the usefulness of digital videos as the students were questioned whether they would prefer using digital video platforms to any device in micro-teaching owing to the significant nature of the concept for their professional development. The students expressed and identified the usefulness as it helps them to pick up the actual context of teaching in as much that visual reality arouse learning and make students understand a concept better than oral descriptions. For instance, the students revealed the following:

F1P-1 *Yes definitely, it's a good thing*

2P-1 *Yes, I would prefer that for… like the feedback you have to get feedback for your teaching we can reflect back on what we didn't teach in practice*

F2P-2 *I'm sure I think that will be nice.*

F2P-3 *It sounds like it can be useful*

F2P-4 *Yes because that is the only way of gaining experience. Yes, definitely wouldn't mind watching a video to learn*

F3P-1 *Yes I also thinks it is fine it should be encouraged*

F3P-2 *Because we are living in a modern world that is changing and teaching can't stay the same it must change with the world.*

ST-3 *Yes I would because I've recently been to a CTLI seminar from where they've introduced new technologies to me as a student to use in the classroom, and how to use E-beams and better use COBOL platforms and forms for learning. You can pick up from the videos that the way, how teaching would be in the actual context of a classroom.*

ST-4 *Yes, I think that is really good thing to reflect like ja, I know why that didn't work, because I did that it would actually be ok because you can learn a lot from other people*
Yes, I love technology. Because to me I think learners are visual, seeing that I'm a visual person, and in the modern world we are as well.
ST-5 *I think that would be a good idea. A video of a teacher teaching? Yes. I think that would be very helpful actually different teacher teaching. I feel that it's a very good thing to use technology tools, but you must be careful not to be too dependent on it.*
SU-3 *Sir, we have been doing that at the previous institution where I was at for many, many years, and it worked that will definitely help Sir, I can guarantee you, and we will, as I said, it will grow just exponentially*

It was further revealed that digital video platforms could serve as a source of inspiration to students giving them an insight to what is expected. They felt strongly that digital videos which appeals to the sense of hearing and seeing should be incorporated into the modules in order to inspire learners towards what to do and how to do it. In particular, the students believed digital videos could help students to gain more experience in the development of skills by creating an avenue for reflective feedback and self-evaluation with the ability to trace their mistakes. They prefer the digital video rather than being taught or given a theoretical explanation, believing that digital visuals clarify ideas better than mere words and as well to shift attention from listening to seeing. They further expressed their concern that they are hardly exposed to instructional videos that may serve as a source of encouragement as a way of enhancing their performance as suggested in the following interview:

FIP-2 *I think we need sufficient videos on YouTube that shows us a lot about teaching.*
F3P-3 *In order for you to see the difference and to see how you improve or what you can do about the situation.*
ST-1 *Yes, I think so if like we share ideas because as much as I think I know everything I feel I am good at teaching there is always something that I can learn from someone that can help me be a better teacher*
ST-2 *Yes. I personally feel so rather being taught because one thing about the video that I like the most is the fact that after the teaching when you are doing the teaching you don't think about mostly about how you do things and how the reaction is going to be from the learners but when you watch the video it is only then that you start doing an introspection you start reflecting on the lesson. When I look at the video I can easily track my mistake and get*

to fix them.

ST-4 *I love it. I'm for, I love technology more than oral explanation. Yes, that's what for me I think there should be kind of a module or so incorporated into the programme where each teaching. Like in the practical module.*

However, in relation to the students view, the supervisors emphasises the need for digital videos as a good platform for students to reflect-in action. They felt that reflection for the self-critic might lead to positive attitudes to micro-teaching. They felt strongly that digital videos would be a useful tool for the justification of positive attitudes among pre-service teachers because it helps the pre-service teachers to see themselves and adjust their mistakes. The supervisors are in agreement with the students that digital videos is lacking and it will be better if a digital video platform could be incorporated into their module in order to shift the attention of the students from power point presentations to other forms of technological tools as revealed in the following interviews:

SU-4 *Yes, I think that's a great idea if we start now earlier with our second year students, to play it back, it's good to constructively criticise what you are doing, because you're actually seeing yourself. Yes. Videos platform, good to improve on, to reflect on and improve on their teaching*

SU-2 *That is something that is very important and it's lacking in South Africa, because if you are going to try and get any clips on actual teaching, it will be European, it will be Australian. So there is a need for it..And then you are going to have a critical thinking, so yes, definitely there is a need for a platform like that to be created but ethical issues*

SU-5 *I ask them do take of yourself because I believe in reflective practices. So we need to constantly reflect and we need to teach our students. So you have to do self-assessment, self-critique so I believe in for micro-teaching, I, I really feel we need to move beyond PowerPoint incorporating technology and especially that kind of thing*

SU-3 *With the approach to micro-teaching, in fact we would take the lesson and say look at its introduction, look at its development and look at its conclusion, and that is for me in fact micro-teaching It's already a daunting experience to stand there in front of people, and now you can do it in front of cameras, and you critique yourself*

SU-1 *I think we do need, we definitely need you see because we must remember we have artificial intelligence nowadays, and that these learners, they are on their phones all the time, and they're looking videos on their phones and so on*

Overall, it is evident that digital video platforms as a form of technology of participation is useful. The results reveal that both the students and the supervisors felt that there is need for digital videos as a means of justifying positive attitudes, given room for constructive criticism for good reflective practice.

5.4.4 Deepen the professional knowledge of prospective teachers with good practice

Professional development of teachers is a continuous process that needs constant attention with an element of reflection on content, pedagogy and skills competency. The heart of professional development is based on learning what to teach and how to teach with the ability to effectively put into practice the acquired knowledge for the benefit of the students. Professional knowledge of prospective teachers is referred to the holistic development of teachers in the theory and practice of teaching towards effective content delivery with confidence. The pre-service teachers should be exposed to current ideas with new approaches to instruction that will help deepen their understanding in the profession. Deepening the knowledge of good teaching is the process of exposing the pre- teachers to principles and practices of professional teaching. It is characterised by pedagogical principles on effective application of teaching skills to deliver the content with good ability to make learning more meaningful in order to achieve the learning objectives. Effective professional knowledge must involve an adequate opportunity for skills competency through constant practice, workshops and seminars, observing expert teachers and mentors, teaching practice exercise, school observation, video demonstration and feedback mechanisms with collaboration between all stakeholders in the teaching industry in order to retain high-quality professional standards.

Table 5. 14: Showing the participant's responses on what the university should do

Group being interviewed	Major categories	Minor categories
Focus Group	Practical experience Documentation	Prospective teachers" Preparation
		Organisation Teaching practice Prospective teachers" Preparation
Students	Documentations Organisation	
Supervisors	Education and training Theoretical strategies	Practice /techniques Procedures/strategies Practical strategies

The evidence in Table 5.14 implies that the major categories, elaborated in the minor categories, expressed by the three groups interviewed, namely, the students in their focus groups, individuals students and the supervisors is primarily on the professional development of the pre-service teachers. They felt that the (*documentation of practical experience*) within the faculty required strengthening in terms of the practical instructional content determining the complex nature of the module (balancing theory and practice). From the question what the university could do to develop the pre-service teachers professionally, there was a similarity of responses from the major and minor categories as revealed in the focus groups, students and supervisors results in the Table 5.14, the general consensus of opinion revealed practical experience as a necessity to professional competency. For instance, the students suggest the following:

> **F1P-1** *We need a lot of practice before going out to the schools .It means education practice as the profession and you need practical experience practice.*
>
> **ST-1** *If they can like create like a teaching practice experience where like an atmosphere Whereby it's like you are on teaching practice but it's just the normal class. I think be more practical incorporate more practical stuff that they can do and maybe bring in like actual teachers from actual high schools*

ST-2 *To encourage professional teaching, they should focus on the content. I feel like most of us are not well equipped to be the teachers in terms of the content. The practical content that we need to know, to understand the practical of these things in the field.*

It's useless to tell me how to teach but not showing me how to teach the modules that they offer us does not really teach us the practical ,here at the university they must give us a space like a lab where two or three let me say students are being assessed in their practical presentation of any lesson.

ST-4 *But for me I think where they should improve, seeing that I've met students from CPUT and other places, I'm not comparing, but seeing that I've met them and I see how they do things, I think more practical, then I do more. Because we're so concerned with theory, theory, yes I understand theory is a must; it has to be done, but prepare us for the outside world. Prepare us for the classroom. Prepare us to be realistic in that classroom. So to me I think that the university should do more practical. The practical things for me are a big issue*.

ST-5 *Constant practicing, I think that's the best way. Not more theory, not more practical, but not also too little practical. You can keep the theory as is, but just add a little more practical,*

ST-3 *I understand that the university is theory oriented, and I do not have an issue with that. What I have an issue with is how it prepares its teachers, and is the preparation sufficient? And in my answer it's no, it's not sufficient, but sufficient theoretically, actually excellent theoretically in many cases. But practically it's lacking in many ways because for example, just one example, at CPUT they teach you how to handle admin. In the UWC education module that is not a topic that's ever mentioned, how to handle admin, which is a big part of practical teaching is how to handle the marking, how to handle this, how to do that. So these things, if they were just added to our modules, it will do a lot of benefit to us*

It was further revealed from the student interviews, the focus groups and the individual students that modules of micro-teaching should have clear guidelines and a demonstrative teaching models within the faculty that will help pre-service teachers understand the structure on how to plan and to teach with special attention to a proper feedback mechanisms. They felt the university should give content layout and outsource outdated modules. Specifically, the students felt that to understand the complex nature of micro-teaching particularly the practice, there is a need for smaller groups and early exposure to teaching scenarios. Finally, with regards to teaching practice the students felt that the

faculty should re-structure modules to reflect practice in schools and going to teaching practice schools regularly to familiarize themselves with the practical environment as seen from the responses below:

> **FIP-2** *A simple way outsource the modules which are not required for the education faculty to teach, the science faculty let them teach the subject content let the education faculty focus on teaching the students how to teach and pedagogy*
>
> **F2P-2** *And if they are going to give us group micro teaching they must give us proper feedback on everything*
>
> **F2P-4** *There should be a guideline of how it must be planned and structured, what should be expected from us*
>
> **F3P-1** *I think that they should have smaller classes and let there be more group interaction especially the smart classroom I suggest especially for micro teaching maybe you can have a class in a real classroom where the desks are the same, the blackboard, the wipe board*
>
> **F3P-2** *They should go out more on a regular basis like for teaching practice because like other universities they go out more so they became more familiar with the school environment They should start teaching practice from first year with you fourth year and third year you have more confidence because you have been there from first year so you will know what to do*
>
> **F2P-1** *The practical laboratory, and practice need to be there from year one until the end of year four*
>
> **F3P-3** *Let there be a model about the content we have to teach the learners. I know in Afrikaans they have a nice layout..I would advise them to teach us about smart board in depth how to use it and use of other technology*

Further probing into the students' interviews regarding the professional development of prospective teachers as revealed in the above table, both the major and minor categories in respect to (*organisation*) required re-structuring of pedagogical content in the modules with more exposure to practical teaching exercises and skills assessment along constructive criticism for a reflective practice. The result also revealed more attention to be given to teaching practices by adding more practical to the theory that will help to develop the culture of teaching. They felt that the faculty should encourage weekly practice with practical demonstration, and give supportive learning activities in terms of seminars and workshops to acquire more experience as seen in the example below:

ST-1 *Maybe if we can have like a teaching class basically whereby we get assessed on our teaching skills like basically you have to teach a class on your own. Could have a teaching class like maybe in the time table have maybe like two classes a week whereby students are required to stand in front of the class and actually teach something, basically have like a real classroom situation, with more practical*

ST-2 *The first thing that they must do is to instill the teacher culture in each and every learner in each and every student within the university*

ST-3 *I feel like we lack of exposure, we want the classroom reality. But if you did that in your EDC 101, EDC 201, you'd be better prepared. Even if it was just for a week or two weeks, that exposure would be good*

ST-4 *Ah, there's a lot. But where can I start? With them I really think preparing us for schools. University doesn't teach us like board writing skills. Teaching us, like the small things that matter, understand, board writing skills you must do this the third year and the fourth year, but how do I do it, they don't specific way.*

We want a consistent guidance throughout the thing when we're there, the consistent, when someone comes and checks in and tell us okay, this is what you should be doing, step by step that kind of a thing.

ST-5 *Workshop! How to teach and how to manage classrooms. Yes we learn in class how to do all these things, but the workshops bring a different, they bring the object, they bring the example there, whereas when we learn how to manage the classroom in the lecture, it's just theory.*

However, the supervisors were of the same opinion with the students in regards to theoretical and practical strategies (*procedures and strategies*). Indeed, they agree that this also strongly requires adjustment in the curriculum to reflect practice; modules should reflect the progression of skills, creating a space for professional acts in bridging the gap between theory and practices. Moreover, they felt that in the aspects of education and training, there is a need for holistic practical knowledge of teaching, incorporating teaching demonstrations with adequate attention to the practical content of the teaching profession with the involvement of expert teachers. They also felt that it is time for the university to always reflect on past practices, imitate and adapt workable ideas to help develop prospective teachers in act of teaching. For instance, the supervisors suggested the following during the interview:

SU-1 *There is so much we must teach them, they must know the content, yes they must know the content, it is content knowledge, it's subject knowledge and also knowledge of the curriculum, the current, let's say the official curriculum, but also knowledge about the learner as a human being, as a child, holistically*

It should be we must have those demonstrations and I think, you know there are lead teachers at schools. If we can bring them also in, and also let them just teach a demonstration lesson, but then I would say not only the teachers, but also the learners

SU-2 *We must build a progression of skills from module to module, and that is that we need to be realistic we can call it practice teaching. We need to train them here; we need to work in alliance with the schools."We send out students that have brilliant marks, but are not competent teachers" So we are focusing on marks and we're forgetting that we are supposed to be training them on skills*

SU-2 *The module needs to be structured to reflect more practical, we must prepare our students for the classroom, Not only with theory, but through practice*

SU-3 *Students come into the university ill-prepared, they can hardly read, they can hardly write, they can hardly think, unable to coherently pen their thoughts, and here in we need to develop those skills as well. So we need to be aware of what our students come in with. We must develop confidence in them.*

SU-4 *We should lay more emphasis on other teaching skills, like writing on the board and using different equipment and technological equipment, we need to train our students in all of those things. Call it the traditional equipment whatever, how to use the traditional teaching aids. Oh a professional course, I think Professionalisation courses. But it's not enough. So perhaps in the second year, third year and fourth year, we can have something again on professionalism.*

SU-5 *My advice would be to re-visit the module descriptors, to revisit and to go back to the drawing board and see what we did 3, 4 years ago, like I said reflect on what are we doing that is not working? We should start developing a workable model. We should look at best practice, go to other universities maybe, and see what they are doing and take out what is going to work for us.*

To further probe into the supervisor's views, interviews suggested that practical demonstration is a yardstick for the professional development in accordance to the principle of micro-teaching. They strongly felt there is an urgent need for a micro-teaching laboratory. In addition, the supervisors claimed that they need to work in unity with the modules and methods lecturers as ways of building

close relationships with a uniform procedure of developing the prospective teachers. All experiences should be annexed within the context of micro-teaching both from module and methods lecturers. The supervisors were also aware that the faculty is challenged by space with other logistics that needs urgent attention:

> **SU-1** *I think if it is possible, then the university maybe can have a link with a school, there are many schools nearby here. And then engage, let some of those learners come here and the students can practice to teach on them, and the lecturers can also give demonstration lessons with the learners there, and we can get teachers also to do that, and then I think the students would be much better prepared when it goes into the classroom, because it has worked with learners.*
>
> *There must be a laboratory where they're going to practice, and I think we must, our curriculum must also be in a way we must adapt if we must adapt it so that there is more time for them to go to the practical practice in the laboratory. They can be allowed to go for practice in year two for reflection purpose.*
>
> ***SU-2*** *I feel that, and I'm going to make reference to the way in which it was done in colleges and if you allow, that in colleges, from the first year they start going to schools to observe and start teaching in second year with a reflective practice so they have a good arsenal of such a lot information and experience by fourth year.*
>
> *My suggestion would be that we need to get together with the method lecture's we work together in unity, we're going to produce a better trained and prepared teachers my very strong opinion that sometimes there's too much of a gap between us as the academic staff, and the school and we need to reconnect.*
>
> **SU-5** *And I think also more cooperation between the different modules lecturer and methods teachers to have a common technique I think we should really take micro-teaching practice, education practice more seriously if we want to deliver that kind of teaching.*
>
> **SU-3** *University needs a place where student can practice teaching, writing or sketching there needs to be space, and a laboratory of that kind where they can work and observe themselves. Would suggest on second year level, minimally to start going for school practice we would increase the intensity, from the end of the second year and then in the third year level very, very seriously and more, and even in the fourth year level. We also need to be very sympathetic and very supportive of our students. This is about developing, it's about establishing a relationship, it's about establishing trust.*

SU-4 *The first year just to go out and perhaps observe. At the moment we're doing it in our second year to go to a school for ten days and observe, five days at the primary school, five days at a high school, just to observe what is done in the classroom.*

I think we should bring in experts that with the facilitators who must be ex-teachers, and who must have been good ex-teachers. They can do in their micro-teaching little sessions for those 15 to 20 students, they can concentrate on those different micro-skills will also advise the need for a micro-teaching laboratory.

SU-5 *In my experience here at the university, I've learned that the students want more practical experience. Unfortunately time and other logistics do not allow for that. So we have to look at a model where if a model is the vice, so developed that we look at finding the synergy between the different models and operation is the word, is the key.*

Overall, it is evident that from the theme deepening the professional knowledge of prospective teachers with good practice, the results reveal that both the students and the supervisors agree that, with regard to practical experiences, they felt a strong need for the micro-teaching laboratory to support practical knowledge application. Further, the organization problem is exacerbated by the lack of physical space and the need for qualified personnel.

5.4.5 Brief summary of the results

The above interpreted results is in relation to the sub-research questions to support the main research question which intended to determine the effective application of micro-teaching skills with digital technology among the fourth year B. Ed students and the effective contribution of digital technology to the micro-teaching presentation. In conclusion, I have presented an analysis of the data that were collected from the students and supervisors interviews. I have presented the results on how micro-teaching can be presented to pre-service teachers; the study also presented the analysis and results on the way in which technology has helped to improve teaching skills, as well as how the digital platform can contribute to teaching skills. The study also presented an analysis and the results of how the pre-service teachers can be trained professionally. In the next session, I will be discussing the lesson plan observation.

5.5 OBSERVATION AND INTERPRETATION OF LESSON PLAN

To strengthen the study further, portfolio documents were also analysed. Lesson plans were chosen in the student's portfolios owing to the significance of the lesson plan in any lesson presentation. The researcher believes that the lesson plan may be useful to give relevant information about the way the skills are used in the presentation and it may help expose the functionality of the teacher as seen in the videos. Five lesson plans were randomly selected from the moderated portfolios submitted to the teaching practice office. From these lesson plans, we carefully looked at the structure and organisation alongside the elements, although all elements of the lesson plan are necessary but not all elements are important to the study.

I therefore pay critical attention to four vital elements in the lesson plans. An element in a lesson plan gives vivid clarification of how teachers can effectively use words or actions to meet the stated objectives. The four (4) elements observed include **Objectives, Introduction, Teachers activity/Content and Conclusion**. The reasons for picking these four (4) elements is to determine how they were written and applied in the lesson since the lesson plan is a guide for effective lesson presentations and to see the similarity that exists in their write up. These elements perhaps may have informed some actions exhibited in the basic skills we observed in the video presentation as reflected in our aims and objectives. The data from the lesson plans were drafted exactly the way it was written for critical observation and analysed based on each element as seen below:

Table 5. 15: Participants pattern of writing lesson plans

ELEMENTS	LESSON PLAN 1	LESSON PLAN 2	LESSON PLAN 3	LESSON PLAN 4	LESSON PLAN 5	OBSERVATION/
Topics	Gender & inequality	Volunteerism	Data	Types of conflict	Decimal fractions	**COMMENTS**
OBJECTIVES	At the end of this lesson the learners should develop in: 1.gender, gender roles, gender inequality, power struggle, abuse of power 2.interpretation,identifying gender bias, identifying unequal circumstance,	At the end of this lesson the learners should develop in: 1.Leaners will know what volunteerism is 2.They will understand the importance of volunteer in order to make the world a better pl	At the end of this lesson the learners should develop in: 1,Their understanding and interpretation of data 2.Their ability to represent data in different forms	At the end of this the learners should: 1.Will know the definition of conflict 2.Learners will understand the three types of conflict	At the end of this lesson the learners should 1,To understand the difference between common fractions and decimal fractions 2. To know how to convert the percentage to decimal fractions	Objectives not well phrased Wrong use of verbs
INTRODUCTION	Educator will place two cards on the board (male and female) The educator will then show learners various characteristics related to both males and female	Ask learners what is volunteerism means Write the correct definition on the board Play a video of a volunteer organisation	Consolidate data handing through questions about terminology	Ask the learners what the meaning of conflict to them Allow learners to share their conflict experience with the class	Revise the calculations of common fractions Use knowledge of equivalent fractions to add and subtract fractions	No revision of last class No Startle statement Proactive questions Use revision Good link
CONTENT	Why can't male and female share the same characteristics Educator should expose learners to terms eg Power	Learners write the definition of volunteerism Discuss ways in which learners can volunteer	Demonstrates the construction of a tally table as well as the important aspect of drawing graph and highlighting the difference between a bar graph and a histogram	Start the power point and show learners various clips of conflict Ask learners to group up and think of the three types of conflict	Convert mixed numbers to common fraction in order to perform calculations with them Explain to learners how to multiply fractions	No explanation of content Outline activities
CONCLUSION	Learners need to provide feedback with regards the lesson and class activities	Round up/consolidate the lesson with the learner at the end	Learners are questioned in order to see if lesson objectives have been achieved	Ask learners as a recap about three various types of conflict	Summarise the whole lesson by asking question Give home work	No summary Use recap Used evaluation

From Table 5.15 above in the objectives column, it shows how the aims of the lesson were stated based on the students understanding. Aims are the justification of the lesson and it emphasizes the expected achievable outcome before the end of the lesson. This element is important because it helps to determine what the learners should be able to do at the end of the lesson. From the table above, the observation reveals that all the participants phrased their aims wrongly by using ambiguous verbs that are not easily achievable within a short period. Perhaps using the ambiguous verbs "to understand or to know" is seen from the word "AIMS" which is broad in nature instead of specific objectives. The wrong uses of appropriate verbs in stating the aims/objectives might be based on how the students were exposed to the lesson plan as seen from both the supervisors and students responses below:

> **SU-1** *I've given them an example of a lesson plan, how do you plan a lesson? You see, so we have a uniform lesson plan now, and also, I didn't want to sound like I know everything, but I wanted to show them these are now the objectives, train a student to write objectives, because they have no idea what an objective is*.
>
> **F2P-1** *We didn't know about the right verbs so we have different perspectives on lesson plan, it confusing but that shouldn't be in, but our perspective is in there because we were taught that way and we didn't get a holistic idea in a lecture how to then create a lesson plan.*
>
> **SU-1** *The how to teach is very, very important. Yes, they must know about planning and all the others, they must know that and Blooms taxonomy of objective all that, but to me it is important how, and then they must also have the content knowledge of the subjects.*

The second element in the table is the introduction of a lesson. Introductions should be catchy to engage the students‟ attention with various activities that can create curiosity and suspense before unveiling the topic. From the observation in Table 5.15 above participants **LP2, LP3** and **LP4** used questions as an introductory statement but not as to review what the students know or have previously learnt. **LP1** did not use any challenging statements in his introduction, it was only **LP5** who introduced the lessons, by reviewing prerequisite learning and providing a link to the topic. Consequently, the observation shows that the B.Ed. students perhaps are seldom exposed to how to start a lesson with an interesting introductory statement or using attention-gaining strategies as seen from the interview response below.

F2P-2 *When during micro-teaching in year two the lecturer doesn't critique you like this that is what we need to be told, you need to tell me that introduction it needs to change you can't do it like that.*

SU-1 *I always say to them never start a lesson with: Now class, today we are going to do… The moment you say today we're going to talk about the frog, the learner will say so what about that frog, in his mind. You see, you've already lost him. It must be an introduction, a wow introduction, that the learner wants to know, you see?*

The third element in the column of Table 5.15 is the content that is a detailed account of a lesson, it contains all ideas or notes on the topic of discussion while teacher activities are the step-by- step guide of what teachers intend to do and how he planned doing it. Description of each activity may also include an outline of what the learners will do during the lesson. From the table above, it was observed that all the participants were able to show their step-by-step presentations of the activities planned for the lesson but none of the participants gives any explanation on the content of the topic in the lesson plan. Therefore, the observation reveals that participants are not well- informed about the significance of writing out comprehensive content in lesson plans and this may not be good for other teachers to make use of the lesson plan in their absence.

SU-1 *If they are going to teach geography, they must know geography, the content, and then they must know the methodology, the pedagogy, the content that I have, how do I transfer it to the learner? And what prior knowledge must that learner have so that we can match that knowledge and my knowledge. And the focus should be very much on learner centred, where with the knowledge that I have about the subject I'm going to teach, or the topic I'm going to teach, how am I going to involve that learners, so that the learner is part, so that I don't just talk, but that the learner is engaging with the work, with the content.*

The fourth element is conclusion, it is a known fact that the ends justify the means as closure and transfer is a re-statement of the intended learning outcomes. Appropriate closure and transfer help learners and teachers to reflect on what they have learned with a sense of satisfaction. Several activities can be incorporated to conclude the lesson in order to make it more meaningful and rewarding. From the table above, the observation reveals that some participants applied the proper rules of closure and transfer by the use of recap as seen in the

write-up of **LP2, LP4** and **LP5** respectively, while **LP1** and **LP3** did not summarise their lesson at the end of the class. In addition, evaluation, which is a good component of closure and transfer, was evident in**LP1, LP2, LP3** and **LP5,** to end the lesson respectively, while **LP4** did not use evaluation at the end of the lesson. It is clear, as revealed from the observations, that the majority of the B.Ed. students were aware of the significant function of evaluation as a means of ending the lesson in order to get feedback.

From the results, it was revealed that the university is also aware of these challenges and presently working towards having a uniform lesson plan as a means of helping the student to understand the rules guiding proper planning of the lesson stated in the interview below:

> **F2P-1** *How to do our lesson plan because we all have different perspectives on how to do a lesson plan because we have different supervisors. So with that because my supervisor also told me about*
>
> **F2PT-3** *We all get a different Ideas of lesson plans as we are with each other so like for instance I'm with them now I know a certain way to do my lesson plan, but it differs to his, like she says she learnt different things from her supervisor so I think that maybe all the subject teachers or lecturers should come together and like say okay tell them they can do their lesson plan this way so we are not left with unanswered questions because I know we had to present that without getting any real like consolidation before that, like we didn't know and we had no guide.*
>
> **F2P-4** *I would prefer that we get like the feedback you have to get feedback for your teaching and your lesson plan, not just the physical thing that you are teaching your lesson plan must also be critic which I don't think that happens with the lecturer and tutors that I had for EDC she didn't*
>
> **F2P-3** *Lesson plans have vaguely been touched.*
>
> **F2P-2** *He didn't even mentions it.*
>
> **F2P-2** *It hasn't even been touched.*
>
> **F2P-3** *We were given a template do your template… we didn't even know… many people take out the KSV part and the only reason why I initially third year I also took it out, but my supervisor told me what goes where that is how I know but I know a lot of people take KSV out because we don't know what it is.*
>
> **F2P-4** *And a lot of supervisors tell you to take it out. I have heard of supervisors that say you must take it out.*

F2P-2 *For example they gave us a template I'm talking about the template but an empty template. If the lecturer did this is the lesson plan and what is involved in it.*

F2P-4 *Don't you also agree with us where you think a lesson should be taught in this in EDC 301 or 401, Tell us how or what*

SU-1 *But then it must be uniform in diversity, because your language lesson would perhaps not be the same as the Mathematics lesson, but there is some things uniform, you see? It's uniformity in diversity, or diversity in uniformity, however one puts it. But ja so you have the lesson plan, and for Mathematics you will have these objectives, and your exposition will be this body, so your introduction, I will introduce Maths in this way, I will introduce Geography in this way. You see? So they have their unique way of teaching the skills, but there must be some uniform plan that all of us work on.*

The lesson plans has revealed the pre-service teacher's knowledge, and it is obvious from the results that the students are writing the lesson plans from the ideas acquired from the different supervisors. The result also reveals the structure and organisation of the lesson plan is of good standard because all necessary elements are available in the template as seen in Appendix 10, but the understanding of how each element will be drafted with the appropriate statements and use of words, becomes a challenge to the B.Ed. students. It is believed that the university should have a uniform and acceptable format that will serve as a guide to the students, not just a plain template, as claimed by the respondents.

5.6 SUMMARY OF CHAPTER

This chapter has dealt with the presentation and interpretation of results based on the data collected quantitatively and qualitatively. The results revealed that the pre-service teacher needs a lot of practical experience for their professional development, and that lecturer seems to be limited by the availability of resources. The analysis also revealed the significance of technology in micro-teaching classes. In addition, my analysis of the data shows that digital video platforms may be useful in developing teaching skills and this type of platform was not available for pre-service teachers to reflect on their teaching exercises. The results also revealed how the prospective teacher can experience good professional practice and the ways the university can give adequate attention to micro-teaching with a modern and well-equipped laboratory. In the next chapter, the results were fully discussed in accordance with the specific themes that were generated to provide more insight into the significance of digital technology

to micro-teaching presentations. The chapter discusses the results in sections starting with the sequential arrangement of the skills as they were used. The second section explains the knowledge of technology of the participants. The last section of the discussion combined the three skills that are well-used and the other three skills which need improvements.

CHAPTER SIX

DISCUSSION OF FINDINGS

6.1 INTRODUCTION

The preceding chapter discusses the presentation of research findings along the mixed method paradigm. The video presentation, the interviews and the lesson plans used as a source of data collection exposing the significance of technology to micro-teaching in line with the aim and objectives of the study. The aim of this study is to explore the application of micro-teaching skills with digital technology among 4th year B.Ed. students at the University of the Western Cape. The study intends to find out effective applications of teaching skills using personal cell phones as recording devices in order to identify the strengths and the weaknesses of the pre-service teachers in the application of micro-teaching skills. The outcome of this study may help to recommend possible solutions that will contribute to the professional development of the pre-service teacher education programmes. In line with the aim and objectives of the study, which sought to answer the main research question MRQ: -*How does the final year B.Ed. pre-service teacher in UWC apply micro-teaching skills with digital technology*?

In my attempt to answer this main question, I addressed the three sub-research questions SRQs:

1. *What are the micro-teaching knowledge level of final year pre-service B.Ed. teachers, in general, and its relation to technology as a tool in micro-teaching presentation*?

2. *How does cell phone as technology develop micro-teaching skills in final year pre-service B.Ed. teacher's programmes at UWC*?

3. *How does a digital video platform contribute to the effectiveness of the micro-teaching presentation?*

Three relevant theories guided the study. The three theories provided the appropriate theoretical orientation that is needed to understand the study under investigation. The social-cultural theory of Vygotsky (1978) and social learning theory of Bandura (1977) discussed in Chapter 2 emphasises how best pre-service teachers can model teaching behaviours. The arguments and

belief of these theories is that knowledge is constructed actively through observation learning which represent the core values of micro-teaching. The advocates of these theories argue that students should be engaged actively in learning and be given the opportunity to collaborate in specific practice using an appropriate tool. Supporting these models is the TPACK theory (2006) which emphasises the use of digital technology tools as strategies to support the teaching and learning processes. These theories informed us in light of the aims and objectives of the study that ideas can be created during interaction between the teacher, learners and learning materials via technology that may enhance reflective practice leading to self-learning.

The crux of the theories is based on knowledge development and its application in learning and the focus of this study is to identify the knowledge level of the pre-service teachers on micro-teaching and to investigate how they can construct and apply this knowledge based on their cumulated or prior knowledge as a form of reflection-in-practice. The practice of reflective learning in line with the assumption of MRTEQ and micro-teaching informed the development of the six key skills used in this study. Since teaching is a perpetual exercise that needs constant practice, there is a need for pre-service teachers to reflect on past knowledge that they have seen through observing a role model in line with the social learning theory of Bandura (1977).

In addition, the fundamental principle of the theories is how students can learn better with the ability to reconstruct the knowledge in order to solve problems. In lieu of this, the appropriate construction of acquired knowledge on micro-teaching can only be justified with the skills of introduction, variation and explanation embedded in the assumption of constructivism theory which place emphasis on the significance of prior knowledge and social interaction as a way of developing skills. The skill of questioning, reinforcement and closure are entrenched in social learning theory that focused on learning through modelling and observation of perceived behaviour. Constructing acquired knowledge of micro-teaching using the TPACK theory of re-purposing to model the content knowledge along the pedagogical knowledge in alignment with the technological knowledge of the pre-service teachers.

Micro-teaching is a student-centred module which involves the interaction of students in groups to model acceptable teaching behaviours. The construction of new knowledge in groups can be developed from the accumulated experiences of the students. Mvududu and Thiel-Burgess (2012) opines that teachers should consider the knowledge that the learner must put into

practice. Practicing and constructing micro-teaching knowledge in active learning situations may influence the process of self-understanding of concepts. The need to exploit the wider conceptualization of the pre-service teachers' micro-teaching knowledge, in light with the theories that underpinned this study, led to the development of KACIT model. The model allows the pre-service teacher to work collaboratively to reflect on their previously acquired knowledge on micro-teaching, interact as a team to construct and modify the knowledge within the context of their understanding towards professional practice and to reproduce this knowledge as learning outcomes through available digital devices.

The research design is mixed methods. A descriptive explanatory mixed method study provided an in-depth understanding of the issues under investigation. In the quantitative phase of the study, I collected 36 group video presentations of 216 participants from the 4th year B.Ed. students. In the video, I observed the application of 6 key skills which includes *(skill of introduction, variation, explanation, reinforcement, questioning and skill of closure and transfer*). In the qualitative phase of the study, the interview data was collected from 5 school-based supervisors, 5 B.Ed. final year students, 3 focus group discussions and 5 randomly selected lesson plans from the students' portfolios. As part of my instrument, I developed a micro-teaching skills rubric, validated by micro-teaching experts from two universities. This rubric was used to examine the application of teaching skills in the video presentations, unstructured interviews was used to gather information from the participants in light with the sub research questions (SRQs) while content analysis was adopted to examine the lesson plans. This mixed method study ensured triangulation using multiple data collection procedures of video presentations, focus groups discussion, supervisors and students interviews and portfolio observations. Triangulation is the process of using multiple perspectives on a phenomenon to validate the research findings. Triangulation aligns various views that lead to a more comprehensive understanding of the phenomenon (Salkind, 2010). The strength of qualitative data is the ability to collect data from many sources rather than relying on a single data source.

The results and analysis presented in Chapter 5 relate to the main research question aligned with the three sub-research questions of the study as described in the Table 6.1 below. The table shows the connections that exist between the leading questions, research questions and the generated themes. The fourth interview leading question "*What advice will you give to the university on how they can help pre-service teachers to grow professionally*" is a general question that responds to all the research questions. This question helps elaborate and clarify the professional expectation of the university in order to strengthen the professional development

of prospective teachers with good practice. The findings of the discussion were based on the quantitative analysis of the video presentation in light with the MRQ "*How does the final year B.Ed. pre-service teacher at UWC apply micro-teaching skills with digital technology*" in alignment with the qualitative analysis of the interviews and lesson plans observation. The leadings questions in alignment with the SRQs and the generated themes from the qualitative analysis in the previous Chapter were outlined below. In the next section, I discussion my data analysis as presented in Chapter 5 of this study with relevant literatures on the subject matter to aid better understanding of the issue under investigation.

Table 6 1: Alignment of interview questions to the research questions and the generated themes

Research Questions	**Leading Interviews Questions**	**General Themes**
How does the final year B.Ed. pre-service teacher in UWC apply micro-teaching skills with digital technology?	How best do you think micro-teaching can be presented to you	Perception of micro-teaching theory and practice
What are the micro-teaching knowledge level of final year pre-service B.Ed. teachers in general, and its relation to technology as a tool in micro-teaching presentation?	Is there any way technology has helped to improve your teaching skills	Understanding the effective roles of technology in teaching and learning process
How does cell phone as digital technology develop micro-teaching skills in final year pre- service B.Ed. teachers Programme at UWC?	Would you prefer using digital video platform to any device in micro-teaching?	Social platforms as a form of technology of participation for reflective learning
How does a digital video platform contribute to the effectiveness of the micro-teaching presentation?	What advice will you give to the university on how they can help pre-service teachers to grow professionally? (Relate to all research questions)	Deepen the professional knowledge of prospective teachers with good practice

6.2 DISCUSSION

The teaching profession is unique in its nature: - as the professional development of potential teachers involves various activities during the process of training. The training process includes the theoretical presentation of ideas, practical demonstration of skills, research and assignment, school observation, teaching practices and other challenging pedagogical activities. From observations, it was evident that apart from the training acquired in teacher training colleges and universities, improving teaching competencies alongside the good application of teaching skills depends on individual passion for the profession, constant practice, and observation of expert teachers. Generally, most universities have not recognised the place of micro-teaching as a core module in teacher education programmes, and it has not been given adequate placement in terms of training the pre-service teachers with practical demonstrations (Adewoyin & Okuntade, 2017). They argue that effective teaching can easily be measured by appropriate application of teaching skills with practical demonstration of skills that will enhance effective content delivery. According to Lewis (2010), thorough knowledge of the subject matter is no longer the basis for effective teaching.

The findings of the results revealed that there are vast research on micro-teaching (e.g., Fermandez 2010; Remish, 2013; Wei 2015; Ike 2017; Onwuagboke et al, 2017; Shaw, 2017; Tuluce and Cecen, 2017; Unlu, 2018; Yan and He, 2017), but very little has been written on the application of micro-teaching skills in South Africa. Out of nine 9 research studies conducted on micro-teaching in South Africa, the most recent research was carried out in1999, approximately 20 years ago, conducted at the University of Stellenbosch. This study compared micro-teaching in some selected colleges in Eastern Cape Province. Regardless of the training and development of pre-service teachers over the years in the Western Cape Province, particularly at UWC, no research was carried out on micro-teaching as a way of strengthening the teacher education programmes at the universities in the provinces. Generally, from the numerous studies conducted on micro-teaching, there was no South African research carried out with the cell phone as a recording device in order examine the application of teaching skills among the pre-service teachers for personal reflection on their professional development.

In the current study, I elaborate the findings of all the results in three sections. Firstly, I discuss each skill individually alongside the sub-skills ranked from the best-used skill to the least used skill. In the second section, a summary of the findings of the skill of explanation, skill of stimulus and skill questioning, which meets expectations in line with the self-constructed rubric were

discussed together in light with the MRTEQ document. The other three fundamental skills, which includes; introduction, reinforcement and closure were also discussed extensively together in alignment with MRQ : ***How does the final year B.Ed. pre- service teacher in UWC apply micro-teaching skills with digital technology*** as an aspect of practical learning in the teacher education programme. In the third section, I discuss each SRQ in alignment with the MRQ based on three skills, which meet expectation, and the other three skills that were below average as shown in the table below amid the bar chart 6.2.

Table 6. 2:Showing the summary of total score of each skill

skill	**Introduction**	**Stimulus variation**	**Explanation**	**Reinforcement**	**Questioning Technique**	**Closure and Transfer**
Total Score	235.00	256.00	275.00	226.00	252.00	217.00

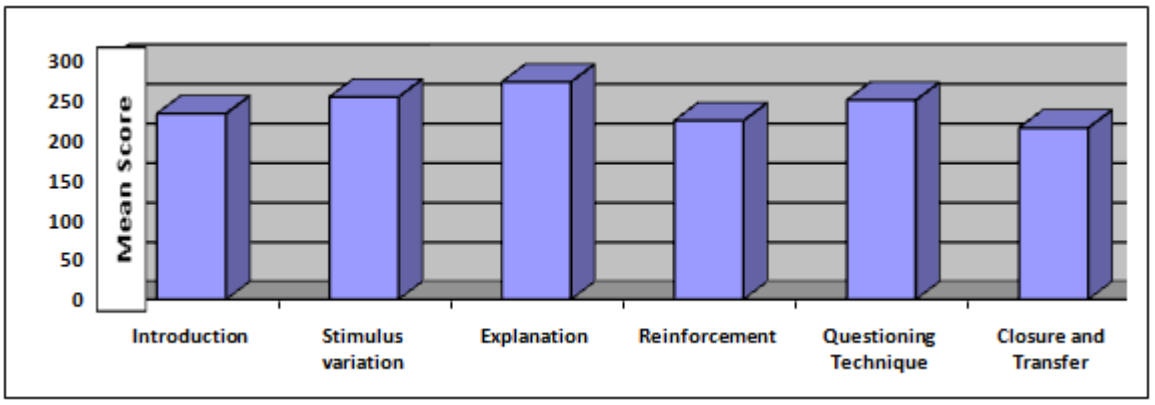

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Figure 6. 1: Chart showing the physical appearance each skill

6.2.1 *Skill of explanation*

Good lesson presentations are characterized by teacher content knowledge which is expressed through lucid communication (Tang, 2018). A well-taught lesson is seen from the way the content is arranged and presented in a convincing and logical manner with a description relevant to the stated objectives. Evidently, the results reveal the knowledge level of the pre-service teachers were above expectation see (Table 5.10) with regard to the skill of explanation. The explanation skill is a vital aspect in the act of teaching and learning process. Explanation is used to reveal and give meaning to abstract ideas by communicating the ideas with meaningful illustration and examples as opined by Eng (2017) and McGuire (2015), that examples helps students to understand what is expected of them.

Conceivably, the proper use of the skill may be due to the knowledge acquired from the lecturers or their exposure to pedagogical knowledge within the university, given that it has a strong theoretical thrust. The pre-service teacher's ability to explain content with clarity was good evidence that the participants are relatively confident with the skill of explanation owing to the fact that the university lecturers possess this kind of quality emulated by the students.

This result corroborates with the work of Yost (2002) in his study mentoring of the first time teachers shows that role-modelling was a significant factor in skills development. The finding is also in tandem with the work of Apling, Sri and Elianawati (2019) on the analysis of micro-teaching to improve the teaching skills of physics teachers, in their findings physics pre-service teachers‟ explanation skill was excellent. The socio-learning theory by Bandura (1977) emphasises observational learning that suggests that people learn from one another through modelling, observing and imitating of others. Since micro-teaching is a practical-oriented and student-centred activity, the pre-service teachers can easily develop teaching skills through observation as advocated by the social learning theory.

There was a clear theory-practice divide, and this was evident in the video presentations and observed in the lesson plans presentation. Indeed, from the lesson plan observation, it was revealed that pre-service teachers are challenged in transferring the theory to practice developing a free flow of ideas in making the lesson topics develop from the known to the unknown, particularly capturing the prior knowledge of the learners into the lesson.

The social constructivist theory advocates making knowledge personally relevant as this would capture the learners' interest. The interest of students can be aroused and developed when learning material is more relevant to their previous knowledge. Students' prior knowledge in any learning situations allows them to comprehend the concept in order to make meaningful connections. When content is not incorporated with experience, students hardly remember much (Eng, 2017). From the lesson plan observation, it is evident that the participants lack the skill of writing a comprehensive content on their lesson plans that will help to guide their pedagogical content knowledge. This corroborates the students' view that there were no clear guidelines during lectures for them to understand the usefulness of writing full content in the lesson plan, and by implication, it will not be explanatory to novice teachers who may intend to use the lesson plan on their behalf as ideas were only written in bullet form. The students claimed they were only given a blank template, without a guideline, and not explicit enough to understand the significance of content and what lesson plans entails as seen from the evidence in the Lesson Plan (see Table 5.15 in Chapter 5).

This suggests that the lecturers guide the pre-service teachers' understanding of lesson plans, particularly the modelling of how to complete it. Bandura (1977) strongly supports modelling as a way of developing student knowledge with the ability to model acceptable behaviours. Bandura (1977; Collum, 2014) states that behaviour is learned from the environment through the process of observational learning. Students learn from an experienced person within a social setting through observation or imitation. Moreover, it was revealed during one of the supervisor interviews that students were not really taught the skill of writing lesson plans. This provides evidence that possibly the constructive alignment of modules needs to be assessed by the Faculty of Education and requires urgent attention. Otherwise, as this aspect of writing a good lesson plan is left for the methods lecturers, who in turn feels it is the responsibility of the teaching practice module lecturers and because of this non-accountability leaves the pre-service teachers to levels of misunderstanding with no option but to write the lesson plan in the way they feel is correct.

In summary, the knowledge level on the skill of explanation as revealed in the video presentation emphasises clarity of the concept taught, the relevance of the content to the objectives, making the class interesting with relevant resource materials and using easy flow of ideas starting from the known to unknown. The participants proved mastery of the skill and were able to apply it by exceeding expectation (see Table 5.10 in Chapter 5).

The participants must have identified the fact that effective learning can only occur if the teacher recognises that ideas are drawn from the known to unknown, simple to complex, as a way of helping the learners understand meaningfully. The study of Tang (2018) support this, with a focus on the acquisition of soft skills that teacher communication or explanation skill can improve the quality of teaching which may enhance learners' achievement. In addition, from the video presentations, the pre-service teachers apply the skill confidently. In conclusion, the evidence suggests that the knowledge level of the pre-service teachers on the skill of explanation can be regarded as a good.

6.2.2 *Skill of stimulus variation*

Teaching and learning activities need a lot of variation in making the classrooms more lively, interactive and interesting. The lesson becomes more interesting and captivating when interests are sustained during the teaching and learning process because the learners pay more attention when learning activities are varied using attention producing behaviours. A good lesson will not be interesting if variation strategies are not properly added (Adewoyin & Okuntade, 2017). The result reveals that the knowledge levels of the pre-service teachers were adequately good. The skill of variation came second in the hierarchy table see (Table 5.9 in Chapter 5). It shows that the performance of the participants were more than average as seen in the summary table which signify that the participants meets expectation as shown in Table (5.10 of Chapter 5).

The result reveals that the pre-service teachers were able to apply variation strategies moderately during the teaching presentation which correlate the statement that changes in the perceived environment attract the student's attention and stimulate academic and creative activity (Adewoyin, 2014).

This was evident in the video presentation as seen from the mean score (see Table 6.2) in the way the sub-skills were applied has proved the knowledge level of the pre-service teachers on the skill of variation. A lesson is regarded to be good when the teacher to elicits active participation of students that help to reduce boredom putting all attention-gaining strategies into use. In a good lesson, there should be diversification of learning activities as a process of motivating the students to learn (Hotaman, 2010; Adewoyin & Okuntade, 2017). The skill of variation is of significance to meaningful teaching and learning processing because it adds energy to teaching. This was evident in the ways the pre-service teachers outline the uses of resource materials and power point presentation to add variation to their lesson presentations as

seen from the video and lesson plans (see Table 5.15).From the lesson plan observations, there was a clear outline on how the participant intends to involve their learners as a way of varying their teaching through interaction in order to achieve the stated objectives. Vygotsky (1987) opine that learning interaction does not exist in a vacuum but intricately relates to social events involving people or objects within the learning environments.

The participant's ability to adequately use this skill shows the knowledge level of the pre-service teachers which could have been informed by their exposure to mentor teachers during teaching practice or university based supervisors. Bandura (1977) argues that observation learning is essential to model the behaviour of learners to take initiative for their learning experiences and to develop their pedagogical knowledge. The participants recognized the significance of variation skill as an effective way of managing the class during the teaching and learning process as argued by scholars (e.g Passi, 1976; Fernandez, 2013; Adewoyin, 2014) that a lesson is considered good when different strategies are used to sustain and maintain learners' attention. Effective application of variation skill in a lesson depends on usage of the sub-skill. The result, as revealed in Table 5.2, suggests that the participants recognised the significant role of class participation. Indeed, perhaps as a way of making teaching and learning more meaningful to the learners and getting them involved in the lesson. This corroborates the view of Ifegbo (2012) that an active participation of the students in the lesson makes the classroom lively and it will give room for better understanding of the concept.

Evidently, the video presentation and the lesson plans results show how the sub-skill was adequately used to add meaning to the oral information. The non-verbal cues are another means of communication that includes the gesture and facial expressions that conveys the emotions and feelings of the teachers. The participants adequately used these. It helps to motivate learners and keep them in a more relaxed mode. In addition, it is quite unfortunate from the video presentations that the participants were unable to exhibit their level of mastery in moving around the class while teaching. Indeed, forgetting the fact that those that are far from them will not participate actively as asserted by Eng (2017) that standing in a spot while teaching, put those close to your line of vision under pressure to participate while those at distance pay less attention. The inability of the participants to use the sub-skill of movement may probably be that the participants are not well informed by the university.

Notwithstanding that, they understand the vital rules of getting learners attention by using movement to checkmate the learner's activities during teaching. However, this could as well be learnt from the mentor teachers during school observation and teaching practice exercises, as the case may be participants may not pay attention to the significance of the skill during school observation. According to Adewoyin and Okuntade (2017) movement during the teaching and learning process induce the learners to make sensory adjustment. The results reveal that the student teachers did not realise the vital role of the sub-skill moving round the class as a means of sustaining the interest of the learners and as a technique of managing the class. Lemov (2015) asserted that moving around the class while teaching enhances classroom management and active participation.

The most worrisome aspect of the sub-skill is the inability of the pre-service teachers to understand the uses of speech variation like silence, pause, tone tempo pacing, etc., as a strategy to gain attention. Silence and pause is a good device of the skill of variation used to hold attention, which helps learner's expectation while tone and tempo is the changes in speed of talking which renew the attention of the learners (Oshodi & Aremu, 2011). Generally, the summation of these sub-skills as used by the participants revealed that the skill of variation meets expectation. The assumption here is that, the pre-service teachers understand the significant impact of the skill as a useful strategy to enhance meaningful learning based on their teaching practice experience and possibly imitating the lecturers they observed in the lecture hall. In conclusion, the evidence suggests that the knowledge level of the pre-service teachers on the skill of variation can be regarded as moderately good.

6.2.3 Skill of Questioning

Questioning is natural to communication and it is a vital aspect of the teaching and learning process that is used to gain attention and can be used to manage the class during the teaching and learning process. Questioning is at the heart of good teaching, it is used to start a lesson or used during the teaching and learning session or used at the end of the class. Questions are used to determine the progress of the lesson (Luísa, Pedro Iněs & Rosário, 2019; Singh, Lebar, Kepol, Rahmad & Mukhtar 2017). It is also used to clarify misconceptions that give the learners opportunity to understand the concept. The result on the knowledge level of the pre-service teachers on the use of questioning skills both in the video presentation and the lesson plans were moderately good (see Table 5.9 and Table 5.15 respectively).

Hence, good teaching is characterised by good questioning techniques that allows learners to be actively involved in order to increase their level of understanding of the concept. The results reveal the knowledge level of the pre-service teachers on questioning skill meets expectation see (Table 5.10).The findings corroborate with the current study of Apling, Sri and Elianawati (2019) on analysis of micro-teaching to improve teaching skill on physics teachers, in their findings, the physics pre- service teachers questioning skill was good but the teachers were unable give their students time to think.

In addition, the findings correlate the assertion of Çalık and Aksu (2018) that the questioning skill is crucial to the teaching and learning process, it has helped to encourage continuous conversation between the teacher and the learners. It is a central skill used by teachers to assess the progression of the lesson in relation to the stated objectives. Questioning skills, as observed from the video presentations, in line with the guided sub-skills includes: asking clear, short and simple questions, asking questions before calling a name, spreading the questions to all corners of the classroom and asking questions while answers were still on the board. Combining these sub-skills in respect to the findings it was adequately used by the pre-service teachers in line with the assertion of Gehlbach &Robinson (2016) and Chamblish (2014) that calling learners by their names enhance the bond between the students and the teacher and helps to motivate attention.

From the video presentation and particularly the lesson plans observation, the participants were able to show high levels of understanding of this skill as seen in the introduction, content and conclusion of the lesson plans (Table 5.15) despite claiming that they were only given a template as seen from the interview session in Chapter 5.It is evident that the pre-service teacher were guided, well-mentored and as well observe the usage of this skills during classroom lecture from the supervisors in line with the assumption of the socio-learning theory and later expanded to socio-cognitive theory that Bandura (1999) emphasising that learning occurs during observation. The guiding principle of questioning were applied at the begin of the class from the lesson plans observed, perhaps the participants exposure to the questioning skill by their lecturers at the beginning of the class may have informed their knowledge and it is obvious that questioning is a good component of communication. Questioning skills can enhance continuous communication processes and active classroom interaction. The supervisors perhaps used questioning to actively involve the pre-service teachers during lectures in light with Vygotsky (1978) who emphasises collaborative activities where people learn through active interaction with other people.

This action may have induced the level of understanding of the pre-service teachers in the application of the questioning skill. Good knowledge of the skill makes teaching and learning more interactive, challenging and thought- provoking.

The pre-service teacher's knowledge of the questioning skill is not doubted as a result of the significant role of the technique which was well-utilised as observed in the video presentations and the lesson plans. As observed from lesson plans, introductory questions are used at the beginning of the class to test the understanding of the learners about the concept to be discussed and summative questioning approaches is employed in concluding the lesson. These approaches are perhaps due to the fact that the pre-service teachers could not avoid engaging with learners by using simple and stimulating questions and the questions have to align with their pedagogical content in order to enhance learners participation as seen in the lesson plan in Table 5.15 of Chapter 5.Thus it is evident that the video presentations reveals that the pre-service teachers need to engage with more questioning techniques during their teacher training programme considering that questioning gives meaning and clarification to difficult concepts. There was evidence that the pre-service teachers‟ awareness of questioning techniques as a means of engaging the learners is encouraging, this is in line with the assertion of Tofade, Elsner & Haines (2013) that questions helps students to be active participants in the classroom. The participants understand the vital role of this technique within the class as a means to stimulate creative thinking that can help increase learners participation and a better understanding of the concept.

In summary, the result as seen in (Table 5.9 of Chapter 5), the participants were able to apply this skill appropriately both in the video and in the lesson plan (Table 5.15) which meets expectation as seen in (Table 5.10). The summation of the sub-skills shows that the participants recognise the significant role of questioning as an inevitable element in the communication process. The good usage of this skill by the participants suggests adequate understanding of the skill and perhaps the university lecturers might have exposed the students to this skill right from the previous correction on micro-teaching exercise or they might have seen the usefulness during the school observation from the mentor teachers in their teaching practice exercise. From the results, supervisors believe the pre-service teachers should be good in the questioning skill in as much as they were adequately exposed to teaching practice and school observation as part of their professional development.

Evidence also abound from the students interviews that they were exposed to excess workload sometimes without directives but they are forced to look for clarification through questioning, this might also inform their knowledge about the skill.

In conclusion, the evidence suggests that the knowledge level of the pre-service teachers on the skill of questioning can be regarded as moderately good.

6.2.4 Skill of Introduction

Introductions stimulate students to thinking and see the simple nature of the lesson, if it relates to past experiences linked with the present learning situation using analogy, scenarios, stories, questions or suspense it captures students attention. If introduction is well-planned, it gives room for active participation and allows students to see through the contextual lens of understanding. Westervelt (2016) opines that right from the introduction, when subject matter is directly connected to learners‟ experiences; they give attention and seek to master the subject matter. Good introductions with a startle statements provides appropriate and relevant experiences while weak background knowledges of introduction will foster and guarantee boredom and resentment (Mann & Robinon, 2009). According to Aubertine (1967) the introduction is a powerful tool that can determine the type of learning that will take place in a classroom.

From the results in Table 6.2, it was revealed that the knowledge level of the pre-service teachers on the introduction skill is moderately low as it came fourth in the hierarchy (Table 5.9) which needs improvement as seen in the summary in Table 5.10 in Chapter 5. This result is contrary to the findings of Apling, Sri and Elianawati (2019) in their finding the performance of the physics pre-service teacher in opening of lessons, which was good, but the participants failed to gain attention of their students. Evidence from the interview responses suggest that the skill of introduction was not properly modelled to the participants to build their level of understanding. With the assumption of the social learning theory of Bandura (1978), using the vicarious reinforcement the knowledge level of the pre-service teachers would have been more developed in the skill of introduction if they were allowed to reproduce observable behaviour which can be motivated or reinforced after observation. Modelling an acceptable behaviour according to Bandura (1977) allows students to take initiative for their learning experience. Having good knowledge of this skill might help the pre-service teachers to reflect and practice the application of the skill as advocated by constructivism theory that thoughtful reflection on learning experiences can enhance knowledge reproduction(Jonassen,1994).

The competency of pre-service teachers in the usage of the skill of introduction was lacking in the video presentations, most participants failed to link and capture learner attention by reviewing the main ideas of the topic from learners‟ experiences. Tanner (2013) opines that learner's prior knowledge needs to be activated with experience which may help them internalise the content of the lesson in accordance with the constructivism belief that student's knowledge and interpretation of ideas are constructed through past experiences and cultural factors (Mascolol & Fischer, 2005).

The video presentations also revealed that the participants lost initial engagement time at the beginning of the lesson not knowing that gauging the interest of the learners from the beginning of the lesson increases the learner's attention. According to Eng (2017) learner's attention is at its peak from the commencement of lesson. From the video presentations and lesson plan observation (see Table 5.15) it was a challenge for the pre-service teachers to link the previous topic to the new topic and as well stating the objectives of the lesson at the beginning of the class. However, from the field observation, this skill was practically introduced to the pre-service teachers in their first year. The inability of the participants to demonstrate mastery of this skill in their final year despite all micro-teaching experiences in year two and three coupled with school observation and teaching practice experiences is convincing enough that the pre-service teachers were seldom interacting and reflecting on previous micro-teaching knowledge to construct and develop their knowledge on the skill of introduction. Constructivism theory is of the view that knowledge is built by the individual, and that construction and adaptation of knowledge constitutes the idea that interactions is necessary in learning and that knowledge grows in both composition and coherence. In addition, perhaps the university has not given much attention to the progression of teaching skills as part of practical learning owing to the claims of the supervisors that there is no funds and adequate resources to continue the process in other modules.

From the participant's interviews, (see Table 5.14 in Chapter 5) the pre-service teachers have little ideas about this skill, and it reveals insufficient experience from practical demonstration that could inform their knowledge on how the skills can enhance their lesson. It was also obvious in the lesson plans that it seems difficult for the participants to state aims and objectives of lessons using the achievable verbs by Blooms taxonomy as seen from their lesson plans (see table 5.15 in Chapter 5).

Evidently, both the students and the school-based supervisors emphatically stated students were not taught how best to write lesson plans either from the module lecturers or methods lecturers. These and other factors could potentially hamper learners‟ engagement as the pre-service teacher could lose the learners‟ interest completely if these skills are not developed during their teacher training.

From the interview responses, demonstrating the skills of introduction appropriately might be partially difficult due to the fact that it was introduced just at the beginning of their career. There is no room for continuation to build on the memory of the pre-service teachers in creating a new understanding of the concept in order to apply the introduction skill during their lesson presentation. In conclusion, the evidence suggests that the knowledge level of the pre-service teachers on the skill of introduction can be regarded as moderately low.

6.6.5 Skill of Reinforcement

Reinforcement is an essential social skill in the process of human communication (Cairns, 2018). It a strategy used to encourage and motivate students to participate in the teaching and learning process. This skill is used to increase the tendency of the learners in making the right response. The reinforcement skill in the teaching and learning process helps the teacher to elicit positive attitudes in learners. It gives room for healthy rivalry among learners and increase learners‟ verbal responses (Green, 2014). The reinforcement skill as observed from the video presentation in line with the sub-skills entails: the use of verbal praise, using the non-verbal praises such as smiling at students responses or nodding of the head, praising the learners responses with the extra verbal statements that could prompt the student to contribute to the subject matter and acknowledging the learners personal ideas in relation to the topic discussed.

Evidently, the results reveal that the knowledge level of the pre-service teachers were below expectation which needs improvement see (Table 5.10) with regard to the skill of reinforcement. Although from the video presentation, most participants were actively using the sub-skill of verbal gestures to reinforce learners‟ understanding this is because verbal reinforcement is part of regular communication processes (Porter, Gregory & Richard, 2003).However, most of the participants were more challenged to engage with the sub-skill of non-verbal and extra verbal reinforcement as a way of reinforcing the learners.

Again, perhaps the skill has not been modelled to the learners and enough possibly not emphasized in lectures, especially to compliment verbal statements as seen from their interview responses that there were no demonstrations of any teaching exercises during their training in the university. The findings also corroborate the current study of Apling, Sri and Elianawati (2019) on the analysis of micro-teaching to improve teaching skills, their findings on reinforcement show that the physics pre-service teachers were unable to apply reinforcement strategies and they fail to reinforce or praise learner responses. Conversely, from the supervisor interviews, sending the pre-service teachers for school observation and teaching practice exercises is to gain practical experiences on their professional development. This may as well compliment the efforts of the university in exposing the pre-service teachers to gain practical experiences from the mentor teachers, but the question is how these mentors were trained?

The skill of reinforcement is a powerful tool used to encourage learners' positive actions. (Whitney & Trosten-Bloom, 2010). The non-verbal and extra verbal reinforcement helps to convey the actions of the teacher during teaching. The actions of the teachers communicate feelings, emotions and sometimes the hidden thoughts of the teachers. Albert (1981) stated that 93% of social meaning is carried through the non-verbal actions. Thus, it is evident that the student teachers are more likely to use verbal gestures to reinforce learning than non-verbal gestures, probably it is hardly to separate gesture from verbal communication. Generally, as seen from the final summation in (Table 5.3 of Chapter 5), the participant's lacks appropriate knowledge in the application of reinforcement skills which could have been modelled to them since modelling was significantly associated with skill development (Yost, 2002). According to Bandura (1977) the first time teachers admiring mentors, view them as a models by observing their behaviours and most likely replicating the behaviours.

These skills, which are classified as below expectation, signify there is a need for improvement, which could suggest that there is a limited practical demonstration of the reinforcement skill from the teachers educators during training. The reinforcement skills could have been modelled to inform the knowledge of the pre-service teachers on the value of this skill. However, these skills are possibly ignored due to the influence of extrinsic factors like limited physical space and lack of funds. In conclusion, the evidence suggests that the knowledge level of the pre-service teachers on the skill of reinforcement can be regarded as moderately low.

6.6.6 Skill of Closure and Transfer

Closure and transfer reinforce what has been learnt (Green, 2017). It gives a sense of accomplishment and a kind of feeling to help learners make sense from what they have learnt. Closure and transfer is the act of summarising the main concept of the lesson to consolidate learner's level of understanding and eliminate misunderstanding or misconception. Closure and transfer helps teachers summarise, evaluate, clarify and tie learners‟ perspectives to the objectives of the lesson (Adewoyin & Okuntade, 2017). The concept of closure and transfer in the teaching and learning process is more than just a skill; it establishes a relationship between the new areas of knowledge and the previous knowledge thereby forming a coherent picture of the whole concept by giving a great feeling of achievement to both the learners and the teacher.

The skill of closure and transfer as observed from the video presentation in line with the guided sub-skills includes: summarising the lesson verbally, listing the important points on the boards, appreciating the learner's contributions during the class and giving out assignments on the topic discussed. The results suggest that the knowledge level of the pre-service teachers on the skill of closure and transfer is moderately low see (Table 5.9) which needs improvements as shown in (Table 5.10.). The result is contrary to the current findings of Apling, Sri and Elianawati (2019) in their finding the performance of the pre-service teacher in the closure skill was good, this may be due to the number of pre-service teachers involved in the study compared to the present study of 216.

Although the pre-service teachers ended the lesson with verbal praise and verbal summary of the lesson, they were challenged with giving the learners direction through written instruction. Instruction is a powerful statement that guides actions (Knight. 2010; Skowron & Danielson, 2015). It is evident in the video presentation that the student teachers‟ verbal engagement in closing a lesson was strong but they were challenged with written instruction to end a lesson.

Thus, it is evident that the student teachers are more likely to give stronger verbal statements than written instruction during lesson closure and transfer which is also seen from the lesson plan in Table 5.15 in Chapter 5. The ability of the participants to give strong verbal statements can be likened to their observational learning of Bandura, the students may learn from the behaviour of their lecturers. Bandura (1977) opines that the model provides samples of expected behaviour.

The lesson plan observation (see Table 5.15) reveals good knowledge of closure by the participants due to the manner in which questions were raised to evaluate the lesson contrary to the video presentation. Although from the interview responses, the students claimed that plain lesson plans were given as a template but they were able to write the evaluation and conclusion aspect of the lesson plans in a manner that show they were well-trained (see Table 5.15). Perhaps the participants were able to reflect on previous experiences, several corrections received from tutors, mentor teachers, and the school based supervisors. The central ideology of the constructivism theory is that human learning is constructed and that learners build new knowledge upon the foundation of previous learning. In addition, the field observation suggests that participants were exposed to practical training of this skill but the interviews and video presentations reveals they were not well guided to take it seriously when this skill was exposed to them in year two and three in the micro-teaching modules. The inability of the participants to value and understand the application of the skill of closure and transfer may be seen from the fact that pre-service teachers had no opportunity to re-learn this skill from the module and subject lecturers as a form modelling the appropriate act in line with Bandura's social learning theory.

In conclusion, the summation from the sub-skills shows that participants were not skilled in using closure and transfer, the evidence suggests that the knowledge level of the pre-service teachers on the skill of closure and transfer can be regarded as moderately low even though it was well written on their lesson plans.

Generally, the results presented above were discussed on each skill, with evidence from the video presentation, interviews and lesson plan observations. The findings revealed that the prospective graduates from the university were struggling to apply some teaching skills in their lesson presentation, despite their exposure to micro-teaching theory and practice from the 2nd-4th years in the programme. The result suggested that some skills gained were stronger than others were; see the mean score in Table 6.2 and the physical appearance of the Bar chart (Fig 6.1). Out of the six teaching skills observed in the video, three of the skills were well-demonstrated while the other three were below expectation (see Table 5.10 in Chapter 5).

The inability of the prospective graduates to demonstrate good mastery of some vital teaching skills call for immediate concern. One would expect some level of competency in the application of teaching skills as stated in their graduate attributes for the 21st century; "to be responsible members of professional communities with the ability to demonstrate professional skills through knowledge in their disciplines" (UWC Graduate attribute 2016-2020). The pre-service teacher's performance fall short of this, as the participants are lacking in the application of some teaching skills in their micro-teaching lesson presentation. Although, each skill have been discussed extensively, there is a need to discuss the summary of this finding in light with other previous findings on the application of the skills which meets expectation, and the other three skills which are below average, in the next section. Following this, I also discuss the findings of each SRQ in alignment with the MRQ in the next section.

The three skills that meet expectation and are well-demonstrated in the video are *explanation, stimulus and questioning* skills see (Table 5.10). The competence of the participants in the application of these skills perhaps is tied to the experience acquired in the university, school observations and teaching practice. Constructivists like Piaget (1967; Vygostky 1978; Brunner, 1966) believe in learning as a product of prior experience. The pre-service teachers reflect on past knowledge that they have seen through observing a role-model in line with the social learning theory. Spending four years in a programme with rich curriculum content is enough to develop some professional skills that the university expects from their graduates. The participants have proved their level of understanding of micro-teaching by the way they applied the three skills in the video presentations. Although it is expected to exceed the three skills with all the experiences acquired from within and outside the university, coupled with years spent in this programme. Perhaps the pre-service teachers were not properly mentored during the period spent in the observation and teaching practice schools in year two and three or the period two weeks may be too short to grasp more ideas on the application of the teaching skills. Bandura (1977) opines that the process of mentoring development of skills is by learning and imitating the people you see. According to McCollum (2014) learning occurs in a in a social setting within the context of a community of practice, which signify that the pre-service teachers could have learnt better if given enough time to learn from practice.

The explanation skill was well articulated by the participants, this is because of pre-service teachers trying to demonstrate good knowledge of subject matter in the process of achieving their goal. In addition, the pre-service teacher's good knowledge of subject matter has been well reinforced in the university or this attitude is copied from the university lecturers which the participants intend to emulate. In addition, the skills of variation and questioning were adequately used as seen in the hierarchy (Table of 5.9 and the Bar chart 6.2) which meets expectation. The participants demonstrate good knowledge of these skills in the lesson and were able to use the skills to actively engage the students owing to the fact they might have been informed about the significance of the skills during one of the micro-teaching modules or it has been modelled to them during teaching practice exercises. The constructivism belief students can learn when given the training to take initiatives for the learning experiences (Vygotsky 1978).

Conceivably, the students observes the lecturers or mentor teacher during their teaching, also the lesson plan proved the students are vast in using questions to find solutions to their problems. One can as well conclude that stimulus and questioning skills are germane to explanation skills in order to enhance effective participation in line with prior studies (e.g Fermandez, 2010; Tofade et al. 2013; Tang 2018; Luísa et al. 2019). The appropriate use of these teaching skills suggests that the participants are aware of the significance of micro-teaching modules in teacher education programmes in line with other prior research carried out on the significance of micro-teaching to teacher education programmes (e.g Aubertine 1967; Copeland 1975; Passi 1976; MacDowell 2010; He & Yan 2011; Molina 2012 Remish 2013; Kim 2014; Wie 2015; Shanu 2016; Ike 2017). This is also in support of other studies which emphasises micro-teaching as a good teaching technique in developing teaching skills by concluding that micro-teaching can help to develop student‟s confidence and improve their performance in teaching (e.g, Scheeler 2008; Shagrir, 2010; Bilen 2014; Mahmud & Shahriar 2016; Igwe, Rufai, & Uzuka, 2013; Reddy 2019).

Conversely, the three other teaching skills that were below expectation with the lowest levels of significance being *closure and transfer, followed by reinforcement and introduction* respectively, see (Table 5.10). These skills were not well-demonstrated by the participants despite several experiences acquired by the students. From the field observations, the students were taught the introduction skill and were also allowed to demonstrate this skill individually during one of the modules. Nevertheless, the inability to apply the particular introduction skill

that was practiced by the student has shown that the students are not reflecting on their prior experience and may as well not be interacting and connecting this knowledge to solve their problems. Piaget (1969) and Vygotsky (1978) believe that connecting and interacting with prior experiences and materials give students the opportunity to transfer the knowledge to solve problems. Perhaps there was not any further complimentary effort from the faculty or department that could reinforce the understanding of the teaching skills.

The interview responses reveals that micro-teaching have been well taught but not well demonstrated to help the student's model teaching behaviours. Social learning theory suggests modeling can build and develop the pedagogical knowledge of students to reproduce an action (Bandura, 1977). The participants claimed they were grouped to present micro-lesson and individual members were only allowed to take an aspect during the presentation without any modelling. In addition, members of the group where lost along the line but presented micro-lessons without performance feedback to track individual mistakes. The social learning theory assumption is that students should model behaviour that will enhance their understanding. According to Yost (2002) role-modelling is significantly associated with skill development. There is a need for the university to develop in the students'" progression of teaching skills by demonstration through expert teachers or teaching videos that will help the students to model the expected teaching behaviours. Badura (1977) opined that behaviour can be learnt through direct experience or observing other people's behaviour.

From the results, findings has proved that the pre-service teachers are lacking practical experience right from the faculty which could inform the proper application of the teaching skills in line with the findings of Onwuagboke, Osuala and Nzeako (2017) on the impact of micro-teaching in developing teaching skills, they concluded that teaching skills can be acquired through an experienced faculty member. Similar findings by Scherff and Singer (2012) on pre-service teachers watching framing and re-framing field experiences; the results show direct bearing on how teachers educators should shape university coursework and provide a safe place for the pre-service teachers to hone their teaching skills. It was also in support of the finding of Schaffer (2012) that the faculty needs to structure and guide the teacher's education programme and expose the pre-service teachers to practice experience. The finding of my results resonate the findings of He &Yan (2011) and Morrison (2010) who concluded that practice has been neglected in teacher education programmes and initial teachers enter into teaching without proper training. Similarly, the finding also supported the

current findings of Bold, Martin, Molina, Rockmore & Stacy (2017) and Barnes, Boyle, Zuilkowski, & Bello (2019) that the training of pre-service teachers is theoretical rather than practical exposure of the classroom reality. In another research study carried out by Luísa el ta (2019) on the first year students and teachers questioning in the classroom, the findings reveals that students ask more questions in practical classes compared to normal classroom lectures.

To end this session, I briefly look at how the participants present their videos with digital technology. The results reveal that the pre-service teachers were able to adequately use Google Drive through their cell phones as a digital technology to record and hand-in the video presentations. The pre-service teachers have good knowledge of technology, plausibly they are regularly exposed to the usage of technology in the lecture halls coupled with regular interaction with their cell phones as a means of communication. This finding is evidence that pre-service teachers are able to manipulate simple technology for achieving their goal. This is in support of the prior findings of Chai, Koh, Tsai, & Tan (2011) modelling primary school pre-service teachers in TPACK for meaningful learning with ICT and it was revealed that the basic knowledge of the pre-service teachers about technological knowledge was positive. The appropriate use of technology by the students in the presentation of micro-teaching videos shows that adolescent and young adults are fast users of simple technological tools (Zhang, Yang and Wang, 2019).

The results suggest that pre-service teachers' knowledge of technology was positive with the use of digital video platforms. Perhaps the cell phones have been their companion and regular means of sharing information that aids easy communication and social interaction. These findings also resonate with the finding of Koh, Chai and Tsai (2010) on technological pedagogical content knowledge in Singapore, the findings reveals that the pre-service teachers had a moderately high confidence about technological knowledge. In a more recent study carried out by Teo, Sang,Mei and Hoi (2019) on pre-service teachers acceptance of Web 2.0 technology it was revealed that with social pressure pre-service teacher are likely to use Web 2.0 technology. Micro-teaching with digital videos can be a good strategy in teacher education; it may aid a good social interaction among students by creating an avenue for students to effectively collaborate and exchange positive ideas useful for their professional career. This result was in tandem with the findings of Chigona (2013), building community practice with multimedia in digital storytelling, it was discovered that there was a mutual engagement among participants and the pre-service teachers knowledge were enhanced through active

collaboration and interaction. Vipin (2018) opined that digital technology breakdown the communication process. The technology knowledge of the participants and development of teaching skills were further discussed in the findings of my SRQs in alignment with the MRQ in light with other literatures, along with my findings.

The SRQ one in alignment with the MRQ- W*hat are the micro-teaching knowledge level of final year pre-service B.Ed. teachers in general, and its relation to technology as a tool in micro-teaching presentation?'* The proper application of teaching skills especially the explanation skill, skill of stimulus variation and skill of questioning by the pre-service teachers reveals their knowledge level on micro-teaching theory and practice. The participant's perception on micro-teaching theory is highly encouraging when compared to the practice as revealed in Chapter 5. The participants are fully aware of the significant role of micro-teaching to their professional development. The knowledge of micro-teaching has helped them to understand the true concept of teaching and what the teaching profession is all about. The participants inability to adequately demonstrate the skill introduction, reinforcement and closure in the video presentation is questionable owing to the fact that the students were all exposed to micro-teaching theory and practices in the university right from the beginning of their training, and there is even an element of micro-teaching in their year one.

From the field observation and the participants interviews, the students were grouped to practice the skill of introduction in year one as earlier mentioned, this should have strengthened the knowledge level in the application of the introduction skill that happens to be the fourth in the hierarchy (Table 5.9 in Chapter 5). Demonstrating limited knowledge of these skills prove that the students were not really committed or perhaps they were not seeing these skills has an important skill to the lesson presentation compared to the skill of explanation, skill of stimulus and skill of questioning. The micro-teaching knowledge level of the participants is not doubted in line with the knowledge acquired in four years from the modules which is sufficient to give the pre-service teachers adequate knowledge of the concept. The pre-service teachers recognise the place of micro-teaching as an important element that bridge the gap between theory and practice of teaching in teacher education programmes as asserted by Adedapo (2013), Benton-Kupper (2001), Bell (2007) Ghanaguru, Nair and Young (2013) that micro-teaching is perceived as a vital tool, an instructional strategy that reconcile the principle and practice of education.

From the participant's interviews, micro-teaching modules in the University of Western Cape are content-rich which informs their knowledge-know of micro-teaching. However, the video analysis proved contrary that attention is needed in the knowledge-how to help develop the students in some practical aspects of teaching skills. If the pre-service teachers are struggling with the application of some teaching skills that is an aspect of micro-teaching, it will be difficult to conclude that the student have an in-depth knowledge of the concept. The lesson plan observation also shows that the students" knowledge about micro-teaching is limited to the theoretical knowledge in line with student's interviews. Some elements of the lesson plan were badly written; perhaps the students are not well-informed from the faculty or not exposed enough to practical demonstration as advocated by social learning theory of Vygotsky (1978) which emphasise the convergence of social and practical elements in learning and that a child can construct meaning through practical activities. Although the student's interviews show that the knowledge level and understanding of micro-teaching are more of theory than the practice which is opposing the supervisor's opinion that the university has improved on micro-teaching by giving more attention to student's professional practice through group presentation of micro-teaching in year two and three. However, the high numbers of students in the class, infrastructural facilities, excess workload load, administrative duties coupled with students" attitudes during the micro-teaching exercises, might be a constraint to implement properly.

The unconscious prejudice of which the pre-service teacher holds on practical training remains evidence in the application of these skills; closure and transfer, reinforcement and introduction. Possibly the students are expecting practical demonstration from the university or from expert teachers not from their colleagues as demonstrated in 2nd and 3rd year of their programmes. Although from the students interviews, micro-teaching is seen as a core module with a lot of theory with little or no guidelines on how practical teaching should be done except teaching practice exercises and school observation which the researcher also believes are a good source of practical training. From the field observation, it is expected from the student to demonstrate an average performance in the usage of these, if they were able to reflect on their group presentations during micro-teaching and teaching practice exercises. Perhaps the student's attitudes towards this vital aspect of training might affect their low performance in those three skills.

The findings suggest that for pre-service teacher's to gain more understanding of micro-teaching theory and practice, particularly the skills that were below average, there should be an

intense training from the university with committed attitudes from staff and students in order to gain better experience needed for their professional competences. The results are in support of previous findings (eg,Foley 1974; Scherff and Singer 2012;Welse and Schaffer 2017) who concluded that faculty should structure and guide the experiences of the pre-service teacher‟s with through teacher preparation programmes. The result is in tandem with UNESCO (2015) that teacher education should move away from their conventional methods to positive outcome practices that inform competence models. This type of model is what Bandura (1977) in social learning termed as observational learning. There should be an opportunity for the student to observe expert teachers or demonstrated videos that will inform their knowledge. Teaching and learning processes must be related to the expectation of the students and the purpose of teaching any particular module of micro-teaching. Micro-teaching must be aligned with the theory and practices of teacher education in order to increase the knowledge level of the students to see the significance of such modules to their lives. Particularly, the development of their career in line with the assertion of Reddy (2019) that the pre-service teachers should be taught with examples in the way they could understand micro-teaching. If teaching and learning is not well structured, it tends to be useless to learners. Learners tend to veer off the programme without any good structure (Eng, 2017).

Conclusions drawn from these findings in light with the MRQ and SRQ are that the knowledge level of pre-service teachers on micro-teaching exceeds expectation. These skills, as perceived from the demonstrations of the selected teaching skills which exceed expectation are in line with their responses that micro-teaching is a vital module in teacher's education programmes. This could help them to build teaching skills and gain more confidence in teaching as it has been reported in other findings (eg., Passi 1976 Remesh 2013; Molina 2012; Arsal 2014; Van Sickle 2013 and Zeki 2015; Onwuagboke, Osuala and Nzeako 2017; Reddy 2019). This result is also in support of Onwuagboke, Osuala and Nzeako (2017), Esiobu and Maduekwe (2008) and Benton-Kupper (2001) that micro-teaching is the major instructional technique designed to link the theory with the practice of teaching and enable the pre-service teachers to master teaching skills needed for effective content delivery in the classroom.

Consequently, the findings are reiterating the claim of Çelik (2019), Ajayi-Dopemu and Talabi (1986) in Aslihan and Ahmet (2013) that micro-teaching is a good strategy in teacher education programmes which allow students to transfer the knowledge of theory to real teaching situations. Therefore, the pre-service teachers knowledge of micro-teaching should be an ideal

of classroom experience which will give them the opportunity to experience real teaching. In addition, the pre-service teacher's knowledge level of micro-teaching should be based on the actual teaching culture and should not be seen from the theoretical understanding of the concept alone. It is therefore essential for the university to improve the understanding of pre-service teachers' and erase their biases, so that the teacher education programmes will adequately develop the prospective teachers to appreciate and perceive micro-teaching as vital modules for professional development in order to appropriately enrich their learning experiences.

In addition, the SRQ two in alignment with the MRQ: *How does cell phone as digital technology develop micro- teaching skills in final year pre-service B.Ed. teacher's programme at UWC*? From the field observation and the interview responses, the opportunity of using technology to develop the teaching skills of students would have been easier if the university demonstrated teaching skills via technology. The skills that fell below expectation would have significantly improved if the students were exposed to video demonstrations or other technological tools that could better inform the appropriate application of these skills. It is expected that the university should model the pattern of behaviour needed for the professional development in light with the social learning theory. Badura (1977) stated that modelling a skill plays an important role in influencing first time teachers. Although the skills that meets expectation are the effort of the university despite being constrained by insufficient facilities. The TPACK perspectives also encourage teacher trainers to integrate technological tools to enhance meaningful learning and as well inculcate in the students the ability to apply technology in their content delivery.

Although most students are of the opinion that their technology knowledge was not from the university alone and that university is not having any learning spaces where they could learn how teaching skills could be applied, this may possibly affect the performance of the pre-service teachers in demonstrating the mastery of the skills that falls below expectation. The supervisors are of the same opinion that university students are taken to the Cape Town Teaching and Leadership Institute (CTLI) for seminars outside the campus but could be better if such opportunities were available on campus. The focus group participants emphatically claimed that the university lacks technological facilities, from the interviews, faculty does not have a Smart Board and they have to book it in advance from another faculty weeks before it could be accessible. The evidence shows that the participants rarely rely on the technological training given by the university alone. Perhaps research and assignments in micro-teaching and

other modules possibly force them to go the extra miles in using technology to find solutions on how they could solve their problem, particularly the application of teaching skills. This result is in collaboration with Chigona (2015) on the pedagogical shift in the 21st century-: preparing the pre-service teachers with new technology, her findings proved that pre-service teachers experience technology during their training because they were not allowed to submit hand written assignments. According to Thomas & Diana (2013), effective integration of technology will enhance professional development and give pre-service teachers opportunity to learn and practice with available technology.

From the results of this study in light with the sub-research question two on *how technology develops micro-teaching skills in final year pre-service B.Ed. teacher's programmes at UWC?* The finding shows overwhelming support for the use of technology in developing teaching skills. The participants recognised the significant roles of technology in the development of micro-teaching skills perhaps it serves as a source of information, engagement and motivation for better understanding of the micro-teaching skills. This was in line with the assertion of Parker and Chao (2007) that students are motivated and learn better if they are actively engaged. In addition, from the research conducted by Ivala, Gachago, Condy and Chigona (2013) on enhancing student engagement with their studies: A digital storytelling approach, it was revealed that technology allows students to take control of their learning with deep understanding of the subject matter. The teaching skills, particularly those that fell below expectation would have been better developed if the experience gathered by the pre-service teachers were motivated with technological tools in the university.

The results suggest that technology would have helped develop a better understanding of micro-teaching skills and also give pre-service teachers the confidence and in-depth knowledge of the teaching skills as seen from previous literatures. The result is also in support of the recent study carried by Ledger, Ersozlu and Fischetti (2019) onPre-service Teachers‟ Confidence and Preferred Teaching Strategies using TeachLivE Virtual Learning, the findings revealed that TeachLivE technologies provides an alternative to real classroom experiences for pre-service teachers to „practice and rehearse‟ the art and science of teaching and in turn improve quality teaching that has only ever been addressed, valued or measured during real classroom experiences. The results also support Shanu (2016) who investigate the impact of videos on student performance. The findings reveals that there was improvement in the performance of students exposed to a video as a form of technology compared to those not exposed to videos.

In conclusion, with particular reference to the MRQ of this study, the result has proved the authentic values of technology in the development of micro-teaching skills as the participants has shown more concern that their teaching skills would have developed better, if modelled with demonstrated videos. The result is in line with the outcome of the recent research carried out by Ledger and Fischetti (2020) on micro-teaching and technology as the classroom shows that if technology are synchronised with real learning environments, then micro-teaching will offer a safe background to good teaching with the ability to record and review for reflective practice processes. In addition, they argue that micro-teaching improved self-efficacy and prepared better graduates for the workforce. The result was also in tandem with the research carried out by Utami, Pahlevi, Santoso, Fajaryati, Destiana and Ismail (2018) on android based applications of teaching skills who proved that mastery of concepts based on the existence of examples on teaching practices using videos, revealed that getting concrete examples of teaching practice is more easier through videos.

The pre-service teacher's application of teaching skills would have been more encouraging if the university exposed the students to samples of teaching videos to compliment the classroom teaching. The results also resonates with Al Darwish and Sadeqi‟s (2016) findings on the impact of micro-teaching on student teachers‟ performance, the students‟ teachers gain a lot of training skills through video observation. The findings also proved that there was an increase in the transfer of innovation from the training sessions into classroom practice and the participants‟ were able to understand the new teaching skill. The pre-service teachers could demonstrate good knowledge of teaching skills if technology is integrated into their micro-teaching modules with an opportunity to access demonstrative videos or record an expert teacher during teaching sessions in order to reflect and model acceptable teaching behaviours.

In the process of answering the MRQ in light with the SRQ three: *How will a digital video platform support micro-teaching presentation?* From the literatures in chapter three, young adults are regarded vast users of social platforms, and in this current dispensation, students are looking for the easiest ways to understand learning activities as stated by Henderson, Selwyn and Aston (2017) that university students anticipate flexibility in learning with the ability to access learning materials wherever they are. In as much as learning can take place anywhere,

universities can encourage whatever means will enhance meaningful learning among the students. This is in tandem with Chigona (2015) that using mobile technology, students and teachers can interact and access quick information from the internet. TPACK and social learning theory emphasises that students can easily learn new concepts through collaboration and interaction with technological tools. Consequently, if the digital video platforms have been encouraged among the pre-service teachers at UWC to practice and reflect on their practice, the teaching skills would have been well understood.

From the supervisors interviews, the university have been able to give comprehensive training which they believe the students could use in their professional career, perhaps the supervisors also expect the students to personally develop themselves from the classroom experience during the modules and methods lecturers. In addition, the students are expecting too much from the supervisors coming up with different excuses for completing an assignments which could inform the development of teaching skills. However, it is obvious from the student's performance that the pre-service teacher's needs more than classroom lectures in order to demonstrate mastery of teaching skills. The three skills that falls below average despite spending four years in a programme is evidence that the students have not been reflecting on corrections given in the class. Although the university is laying emphasis on students‟ reflections in teaching practice as seen in the student portfolios, it seems the students do not know the values or pay less attention to it. The process of reflective practice is to guide and help to develop personal skills and stimulate self-development. According to Brenton (2015) video platforms will help to evaluate, criticise and reflect on our actions.

Although most of the students are aware of different social platforms and its significance to learning and they have been using these platforms to their own advantages but have not used it to record supervisors or personal teaching activities in order to watch and reflect on any teaching performance, perhaps to avoid ethical issues. Nevertheless, there are many teaching videos on the YouTube that can be watched which may enhance the knowledge of micro-teaching skills. The findings emphasises the usefulness of digital video platforms as a means of gaining more experience through personal self-critique for self-improvement which may help in the development of teaching skills and a better understanding of micro-teaching as a vital aspect of pre-service teachers‟ professional development. This is in support of the assertion of Savas (2012) that digital videos is a powerful tool in teacher education programmes which enhance good professional development. This result is also in line with the current findings of

Yip, Wong, Yick, Chan and Wong (2019) on augmented reality videos on student learning which shows that videos can facilitate better understanding of concepts and help students to gain a conceptual understanding of any complex issue. In their findings, students gain and grasp information within a short period when compared to the traditional methods.

The pre-service teachers would have performed better in the three skills that were below expectation if they had taken advantage of the cell phones as a platform to learn and reflect. From the student's interviews, pre-service teachers are not really exposed to adequate feedback that may hone their teaching skills. A supplementary strategy would have been introduced to engage the students like the cell phones. Cell phones as a digital video platform may serve as a feedback mechanism, helping the student to have a re-think on their performance at their leisure time in order not to repeat similar mistakes. Given pre-service teachers‟ immediate performance, feedback can develop teaching proficiency (Auld, Belfiore & Scheeler, 2010). The results reveals that digital video platforms, if encouraged among the students, will effectively contribute to micro-teaching skills in line with findings of Onwuagboke, Osuala and Nzeako (2017) who exposed some set of students to practice micro-teaching skills under CCTV recording with immediate feedback and claimed that digital videos provides good knowledge of immediate feedback to enhance micro-teaching skills. In this digital technology era, students learn better with visual reality, and the digital video platforms can produce audio and visual reality that may help pre-service teachers learn and model teaching behaviours better at their own convenience without stress. In line with the theories and the conceptually developed model in Chapter 2 of this study, pre-service teachers should be allowed to construct learning through experience and reflect to model acceptable teaching behaviours.

In conclusion, the result of this MRQ in light with the SRQ three on the effective contribution of the digital video platforms to micro-teaching, digital videos were found highly useful and encouraging by the pre-service teacher. It gives room for self-reflective practice, and if constantly used it may inspire and support pre-service teachers to do extremely well in micro-teaching presentations compared to their current performance. Ekpo-Eloma, Arikpo and Ebuta (2014) opine that the consensus of video integration in micro-teaching adds glamour to and makes assessment procedure more realistic and practically oriented. Furthermore, video recordings gives room for self-evaluation with immediate feedback and provide pre-service teachers to keep track on their record, given the chance to monitor their own progress in line with the findings of many studies (Onwuagboke, Osuala and Nzeako 2017; Savas 2012;

Collins, Cook-Cottone, Robinson, & Sullivan 2004; Wu and Kao, 2008). The result also supported Umeh, Magbo and Nsofo (2015) that videos are a powerful device in promoting the effective teaching and learning processes in the school. In the research carried out by Savas (2012), video helps the pre-service teachers to effectively improve their teaching skills and found that 80% of the participants were able to overcome teaching problems after watching videos. Therefore, the present pre-service teachers using their cell phones as a digital video platform can interact with peers to observe, learn and possibly imitate good habits of teaching.

Although, it possible to conclude that the pre-service teachers application of teaching skills from the result in the MRQ is an average performance owing to the fact that three of the skills; *explanation, variation and questioning* were adequately applied along the line of the sub-skills. The skills of *introduction, reinforcement* and *closure* that fell below expectation are also vital skills that should not be taken for granted by the participants. These three skills are crucial to the teaching and learning processes and it is essential to deepen the knowledge of prospective teachers on all skills with good practice during the training process. From the participants‟ interviews in line with the lesson plans observations, it reveals that more attention is placed on the content knowledge than the pedagogical aspects of the teaching skills; reasonably this could have influenced the commitment of the students towards micro-teaching and by implication making it difficult to apply some skills as revealed in the findings.

The assumptions of TPACK in Chapter 2 of this study emphasises the pedagogical knowledge and content knowledge should align with technological knowledge and all these knowledges needs to be more structured to reflect the professional act; that is practical learning that can be learnt at school in line with MRTEQ (2015). Teaching competencies advocated by MRTEQ (2015) involves knowledge-mix; that is the combination of theory and practice that can be measured with demonstrative outcomes of the teaching skills. The emphasis of MRTEQ (2011; 2015) is that learning in practice should be fundamental to teacher education programmes which can effectively be carried out through micro-teaching exercises. It should be noted that expertise is not defined by the rules and principles of a programme, but through demonstrative practice with the wisdom of understanding for a reflective learning as asserted by Thompson &Pascal (2012) that competency depends on personal intuition that can be demonstrated through practice.

The low demonstrative outcome in the three skills out of six despite the cumulative experience of the pre-service teachers as seen in the three teaching skills (Table 6.2) revealed that there is a need to deepen the teacher education programmes, particularly micro-teaching with real and authentic situations. This finding resonates with another finding of Chigona (2015) on quality of teacher education for 21st century classrooms, her findings reveals the need to re-design and re-brand teacher education programmes in order for the pre-service teachers to be well equipped to meet the needs of the present digital generation students. When real situations are employed in micro-teaching, it helps to deepen the knowledge of the student in the act of teaching (Remish 2013). Deepening the knowledge of good practice is the responsibility of the university to allow the prospective teachers to experience authentic teaching exercises within the university not only on teaching practice. According to Foley (1974) and Remish (2013), learning the pedagogical skills of teaching is the function of the faculty to structure the training technique used for the pre-service teachers. Although the university is challenged by space, facilities and shortage of teaching staff, they should devise a means of working with the available resources to build and develop teaching competences in the learners as opined by Remish (2013) that competency and teaching efficiency required special training with continuous monitoring of skills. Good practice is considered necessary for teacher training programmes, as it helps the pre-service teachers to gain teaching experiences with the aims of developing more knowledge and skills of learning to teach (Harden and Crosby, 2000).

The conclusion drawn from these findings is highly in support of a well-equipped micro-teaching laboratory as an important and determinant element in teacher education programmes. The results suggest deepening the professional knowledge of the pre-service teachers through a micro-teaching laboratory. The micro-teaching laboratory that will create an opportunity for students to reflect and learn in practice with the knowledge of feedback seeing oneself as they see others, and as a practical way to improve their teaching competencies. This result is in line with current findings of Ledger and Fischettti (2020) that micro-teaching 2.0; technology as a classroom has been unique in the preparation of the pre-service teachers to see the importance of reflective practice in a situated learning situation. They stressed that the students experienced an authentic scenario that has help the pre-service teachers to diagnose their strengths and weaknesses from a demonstrated video. In a well-equipped laboratory, pre- service teachers may have access to rehearse teaching behaviour with the facilities that enhance reflective practice. The result is also in a correlation with the findings of Welsh & Schaffer (2017) on how effective teaching skills can be developed through reflection, it was discovered

that the candidates teaching skills were deepened in a laboratory as they move away from being a student to take the roles of a teacher. Similarly, the findings are also in support of other scholars, for instance, Onwuagboke, Osuala and Nzeako (2017); Utami , Pahlevi , Santoso , Fajaryati , Destiana and Ismail (2018) and Ledger, Ersozlu and Fischetti (2019); that micro-teaching laboratory should be a serene learning atmosphere, a safe place to examine, rehearse and master the art of learning to teach when compared to the complexity of teaching practice schools.

The laboratory should be well-equipped with the facilities that will help the students acquire at least more knowledge of how the teaching experience will be before the teaching practice exercise in accordance with the claim of Ledger, Ersozlu and Fischetti (2019); Otsupius (2014) and İncik and Özkan (2018) that with a micro-teaching laboratory, pre-service teachers are prepared to improve their mastery of teaching skills and develop confidence for the real classroom experience. In view of various studies on micro-teaching and the results from this study, it is obvious that the participants would have demonstrated good mastery in the application of teaching skills particularly the skills that were below average if there were opportunities to experience practical learning in a micro-teaching laboratory that could complement the knowledge acquired within and outside the university.

6.7 SUMMARY OF CHAPTER

In this chapter, the result of the findings discussed along the main research question MRQ in alignment with the sub-research questions SRQs shows that the pre-service teachers are technologically good in the usage of simple technological devices. From the results, the pre-service teachers' knowledge level of micro-teaching shows that they were well-informed in some micro-teaching skills which were adequately applied in the video presentations. However, the participants are weak in some teaching skills, which need improvement. In the next chapter, the researcher discuss the summary conclusion and recommendations of the study. The research reappraisal, the overview of each chapter, implications and limitations of the study were also discussed.

CHAPTER SEVEN

SUMMARY, CONCLUSION AND RECOMMENDATIONS

7.1 INTRODUCTION

The previous chapter discusses the findings of the results from the data collected in line with the aims of this study that is to explore the application of micro-teaching skills with digital technology among 4th year B.Ed. students at the University of the Western Cape. The chapter responded to all research questions through quantitative and qualitative data analysis as seen in Chapter 5. The study came up with several findings that are germane to the development of teacher education programmes at UWC and other universities. The findings of the main research question revealed that the pre-service teachers at UWC are lacking practical experience on the application of key teaching skills that perhaps may have a negative effect on their professional competencies. Another interesting finding from the main research question is that pre-service teachers are able to manipulate simple technology for achieving their goal. The results suggests that if simple technology is integrated into the pedagogical content knowledge as a complimentary strategy at higher education institutions, the students may manipulate this technology to their own advantage. From the findings, if given an enabling environment and adequate support with a good infrastructure, there is the possibility for the pre-service teachers to improve significantly on their teaching skills.

From the qualitative analysis that responds to the sub-research questions, findings were drawn from each research question. The sub-research question on *What are the micro-teaching knowledge level of final year pre-service B.Ed. teachers, in general, and its relation to technology as a tool in micro-teaching presentation?* The findings reveals the perception of the pre-service teachers on micro-teaching theory and practice, it was discovered that more attention should be given to the practical aspects of the programme to hone their teaching skills. The pre-service teachers advocated for more demonstration that is practical, and learning experiences from the university, which must be related to their expectations in teaching practice schools. The findings show that the pre-service teachers have an in-depth understanding of micro-teaching from the theoretical point of view.

The sub-research on *How does cell phone as digital technology develop micro-teaching skills in final year pre- service B.Ed. teacher's programme at UWC?* The findings reveal the effective roles of technology in the teaching and learning process. It shows that technology as a powerful tool enhances effective learning. The pre-service teachers express their view on the significant impact of technology in learning more about the teaching skills. The confidence levels of the participants may increase perhaps if technology has been integrated as a strategy in the training of the pre-service teachers on the application of micro-teaching skills and how it can be effectively applied.

The research question on *How does a digital video platform contribute to the effectiveness of the micro-teaching presentation?* The finding reveals digital video platforms as a form of technology of participation enhance reflective learning. The digital platform creates room for collaboration and interaction among students and it has really reinforced the sense of teamwork among the pre-service teachers. It may help to self-evaluate and self-criticise in as much that the technology is within their reach, they were able to learn and reflect on their mistakes.

Another outstanding revelation from the results is the need to deepen the professional knowledge of prospective teachers with good practice; these involves a kind of re-structuring, re-branding and re-designing of the micro-teaching modules in UWC to reflect professional practice. The pre-service teachers should be exposed to practical demonstrations of teaching culture, which includes: workshops and seminars, observation of expert teachers, teach and re-teach exercises with an element of reflective practices. The findings re-emphasises teaching skills competencies in line with the MRTEQ assumptions on knowledge-mixes, but it was discovered that there is misalignment in the policy document of MRTEQ, micro-teaching assumptions and the implementation of the teacher education curriculum at UWC. The results revealed that there was no framework or specific guidelines from MRTEQ to direct the actual implementation of the policy document along the lines of micro-teaching assumptions.

In addition to this finding, there was also a strong impetus for a well-equipped micro-teaching laboratory, a place where pre-service teachers will be exposed to authentic classroom scenarios. A room to acquire the teaching culture in a realistic approach with an opportunity to practice teaching individually and reflects on the performance feedback. A laboratory that will expose the pre-service teachers to demonstrative teaching activities with the possibility to plan,

teaching, reflect, re-plan and re-teach to gradually develop in-depth understanding on the skills and teaching competencies. In the findings, teacher educators were also mentioned as a challenge to the pre-service teacher's professional development. The faculty members and the method lecturers are not on the same page in the process of training would-be teachers. There is no unity in diversity among the modules and methods teachers, also there is no uniform procedure and as well no constant reflection on their modules, strategies or assessment procedures that could have built a strong bond for professional development. However, the lecturers were constrained with the lack of adequate support from the university coupled with excess workload, inadequate infrastructural facilities and over populated classes as part of the challenges facing effective micro-teaching in the university.

In this chapter, I give an overview of this study in line with the aim and objectives of the study to clarify the purposes and the personal interests for embarking on this study; I give a brief re-appraisal of the study and overall summary based on the seven chapters and what each chapter is all about. In addition, I discuss the outcome of the research questions in relation to the findings, the implications, the recommendations and limitations of the study were also discussed in this chapter.

7.2 **A RE-APPRAISAL AND SUMMARY OF CHAPTERS**

I have briefly discussed the findings of this study in the previous section. I will give a brief summary of the main sections of this study in order to explain what the study is all about and the outcomes. The current study is exploratory and conducted at the Faculty of Education, Department of Educational Studies, University of the Western Cape, South Africa. This study explores the micro-teaching skills among the final year students using digital technology as a recording device. The researcher is passionate about the pre-service teachers teaching competencies. Teaching competency is measured by the pre-service teacher's effective content delivery as characterised by passion and modelling effective teaching behaviours. The teaching behaviours can only be demonstrated with an effective application of teaching skills. Therefore, contributing to the professional development of the pre-service teachers becomes my focus as an educational technologist in using simple and available technologies to hone the micro-teaching skills of the pre-service teachers. In order to achieve the aim, I engaged with the following three objectives: (1*)* to investigate the micro-teaching knowledge level and the application of teaching skills with digital technology among the 4th year B.Ed. students at

UWC,(2) to evaluate the use of cell phone digital technology as a micro-teaching presentation platform among the pre-service teachers and (3) to examine the extent to which cell phones as digital technology can support micro-teaching presentations among the 4th year B.Ed. students. I re-appraise and summarise each of the chapters below.

7.2.1 ***Chapter One***

This chapter begins with the introduction of the research study by giving a brief overview of teacher education programmes, technology and micro-teaching. The chapter highlights the background of the study by looking at South African teacher education programmes with particular reference to UWC. The context of the study was discussed alongside the *minimum requirement for teacher education qualification* MRTEQ (2011; 2015). The background also tries to explain with literatures, the alignment of teacher education and technology as a way of improving the pre-service teachers teaching skills. In this chapter, the rationale of the study was articulated on how active learning can be encouraged through the available and simple technologies. The statement of the study which expressed the misalignment in the policy document and actual implementation brought out the aims and objectives of this study. The research questions were raised in this chapter and the significance of the study explains how the findings may be useful to the stakeholders in the educational industry. The chapter concluded with the scope of this study that provides the limitations of the study and stating the reasons why the B.Ed.4th year students were the focus of the study.

7.2.2 ***Chapter Two***

This chapter specifically deals with the theoretical framework that underpinned this study. Three theories were used in this study to guide effective application of micro-teaching principles towards the preparation of teachers within B.Ed. programmes. Vygotsky's socio-cultural theory, Bandera's social learning theory and the TPACK theory of Mishra and Kohler framed the study. The social constructivism theory opines that learning is a social collaborative activity where people create meaning through interactions. The Bandera's social learning theory focused on observational learning, where people learn from one another through modelling, observation, imitation, and the TPACK framework emphasises the integration of technology as an element to meaningful learning. From the significance of these theories, the study came up with a model called knowledge acquisition, construction, and implementation with technology (KACIT) which explains the procedure that were used to examine the application of teaching skills with a digital technology device.

All these theories were fully explained alongside the importance of micro-teaching as a technique of developing teaching skills.

7.2.3 ***Chapter Three***

This chapter explains the study extensively by consulting past and present related literatures, finding a correlation in support of the MRQ and the three SRQs. The chapter opens with the conceptualisation of micro-teaching; it explains teaching as interactive activities which encourage active participation in the process of establishing new knowledge. Brief historical backgrounds of micro-teaching were discussed; micro-teaching assumptions, teaching skills, objectives, advantages, disadvantages and problems of micro-teaching were explained in this chapter. The concept of technology, its significance to teaching and learning situations, digital technology, cell phones, social media and social platforms were also discussed. In addition, the concept of teacher education programmes with a brief history of teacher education programmes in South Africa, policy framework of teacher development in South Africa, teacher education programmes in UWC with particular attention to the practical modules were fully discussed. This chapter also contain *minimum requirement for teacher education qualification* (MRTEQ), appraisal of MRTEQ and micro-teaching modules in UWC, reflective practice in line with the assumption of micro-teaching were also included.

7.2.4 ***Chapter Four***

This chapter provides a thorough account of the research methodology and concept of the research study. This chapter explains the mixed-methods used in the study, the quantitative and the qualitative approach, triangulating the data for comprehensive results. The chapter discussed the descriptive research design using a case study approach; it explains the population using a purposive sampling of students and lecturers. The multiple data collection methods which provide evidence includes: video presentations, focus group discussion, interviews of students and lecturers and portfolio observation of lesson plans were discussed. Data analysis procedures were explained, validity and reliability of the study using the experts in micro-teaching to validate the self-constructed rubric. Ethical considerations and limitations of the study were discussed.

7.2.5 *Chapter Five*

Chapter five of this research study gives the account of how the data collected were analysed. The analysis followed the two methods used in this study. The quantitative approach was used to analyse the video presentations of the teaching skills, employing the statistical programme SPSS version 25 that is known for its swift execution of statistical analyses, while the interviews and portfolio analysis of lesson plans were analysed with the qualitative approach using the thematic and content analysis procedures. The chapter also provided the findings of the results that reveal the knowledge level of the students about the concept under investigation. The results from the qualitative analysis in line with the research questions were identified and categorised into themes that were briefly discussed in the chapter.

7.2.6*Chapter Six*

This chapter provided a detailed discussion on the findings, supporting all findings with relevant and current literatures that have been carried out. The comprehensive analyses were also based on the two approaches, quantitative and qualitative. All the findings and discussion were based on the aims, objectives and the research questions. The results were able to answer the main research question in alignment with the sub-research questions. The observed teaching skills were fully discussed alongside the sub-skills. The generated themes were discussed in alignment with the sub-research questions with a lot of revelation on how micro- teaching as a strategy may improve teacher competency. This chapter was able to give us a clear picture of the problem affecting pre-service teachers in UWC and proffer possible solutions.

7.2.7 *Chapter Seven*

This chapter starts with the summary of the findings by giving a brief overview of the results in line with the research questions. The chapter outlines the implications of this study to teacher education and relates the result outcomes to SRQ. The chapter discussed the research limitations, followed by re-appraising the summary of each chapter and recommendations were made based on the findings of this study in line with prior theoretical and empirical findings. The findings proposed micro-teaching strategies that will support pre-service teachers at UWC in developing the pre-service teacher's mindset for a reflective practice leading to their

teaching competencies in line with the policy documents. Establishing a well-equipped micro-teaching laboratory with innovative technology that will enhance the development of teaching skills and re-structuring the modules of practical learning in line with the findings were discussed as recommendations in this chapter.

7.3 **RELATING THE STUDY OUTCOMES TO THE RESEARCH QUESTIONS**

This study explores micro-teaching skills among the final year students using digital technology as a recording device. Three objectives were raised: (1) to evaluate the knowledge level of the 4th year B.Ed. students on micro-teaching and the use of digital technology as a platform for micro-teaching presentation; (2) to determine the use of digital technology as a platform among the pre-service teachers in micro-teaching; (3) to examine the application of micro-teaching skills with digital technology among the 4th year students. In addition, three research questions were formulated to find answers to the main research question. : (1) How does technology develop micro-teaching skills in final year pre-service B.Ed. teacher's programmes at UWC? (2) What are the micro-teaching knowledge level of final year pre-service B.Ed. teachers, in general, and its relation to technology as a tool in micro-teaching presentation? (3) How does a digital video platform contribute to the effectiveness of the micro -teaching presentation? The findings of sub-research questions in alignment with MRQ were outlined below:

7.3.1 *SRQ 1: How does cell phone as digital technology develop micro-teaching skills in final year pre-service B.Ed. teacher's programmes at UWC?*

The findings in Chapter 5 (see Table 5.12) as discussed in Chapter 6. Understanding the effective role of technology in the teaching and learning process.

- The participants recognised the significant roles of technology in the development of micro-teaching skills but participants barely rely on the technological training given by the university.
- However, if well integrated the pre-service teachers will definitely improve in teaching skills that fell below expectation. In line with this: - the students should be exposed to video demonstrations or other technological tools that could better inform their knowledge on the application of these skills.

- The university also should expose the students to samples of teaching videos to compliment the classroom teaching serving as a source of motivation in the development of teaching skills. Much attention should not be placed on the content knowledge than the pedagogical aspects of the teaching skills, there should be a balance.

7.3.2 *SRQ 2: What are the micro-teaching knowledge level of final year pre-service B.Ed. teachers, in general, and its relation to technology as a tool in micro-teaching presentation?*

From the findings presented in Chapter 5 (See Table 5.11) as discussed in Chapters 6. I am disposed to state the following:

- The knowledge level of the participant's was revealed through their perception on micro-teaching theory and practice. The pre-service teachers recognise the place of micro-teaching as an important element that bridges the gap between theory and practice of teaching in the teacher education programme.
- The findings suggest that pre-service teachers gain more theoretical understanding of micro-teaching when compared to the practice; this is reflected in the skills that were below average. The teaching and learning process need to be related to the expectation of the students particularly micro-teaching modules must aligned with the theory and practices of teacher‟s education in order to increase the knowledge level of the students to see the significance of such modules to their lives and the development of their career.
- The pre-service teachers knowledge level of micro-teaching should be based on the actual teaching culture and the university needs to improve the pedagogical knowledge of pre-service teachers and erase their biases. Moreover, the teacher education programmes will adequately develop the prospective teachers to appreciate and perceived micro-teaching as a vital module for their professional development in order to appropriately enrich their learning experiences.

7.3.3 *SRQ 3: How will a digital video platform contribute to the effectiveness of the micro-teaching presentation?*

From the finding in Chapter (5) (see table 5.13) as discussed in Chapter 6. I would like to outline these findings together with others findings discussed in the chapter:

- The students are aware of different social platforms as a form of technology of participation but not really using it to learning teaching skills. The findings emphasises the usefulness of digital video platforms as a means of gaining more experience through personal self-critique for self-improvement that may help in the development of teaching skills.

- The digital videos platform were found highly useful and encouraging, it gives room for self-reflective practice. Since the digital video platform can produce audio and visual reality, it will help pre-service teachers to learn and model teaching behaviours better at their own convenience without stress. Digital video platforms may be a good supplementary strategy for the pre-service teachers to have feedback mechanisms, helping the student to have a re-think on their performance at their leisure time in order not to repeat similar mistakes.

- Deepen the knowledge of good practice with a well-equipped micro-teaching laboratory as an important and determinant element in teacher education programmes. The micro-teaching laboratory that will create an opportunity for students to reflect and learn in practice with the knowledge of feedback seeing oneself as they see others, and as a practical way to improve their teaching competencies. The responsibility of the university is to develop the prospective teachers with an authentic teaching experience within the university environment not only teaching practice and school observation, despite being challenged by space, facilities and shortage of teaching staff.

7.4 IMPLICATIONS FOR FURTHER RESEARCH

Teacher education programmes is a continuous exercise with different perspectives from province to province, and country to country. It will be difficult to generalise the findings as being conclusive and by implication, there is a need to propose further research findings in this

area of discipline and the issue under investigation. From the findings of this research, many outcomes need urgent attention within and outside the province.

This study was aimed to explore the application of micro-teaching skills with digital technology cell phones among the 4th year students at the University of the Western Cape. The current technological challenges and the functionality of the teachers within the four walls of the classroom are a concern to all and sundry. With the proliferation of digital technology and its significance to learning, it has becoming an area of interest to researchers all over the world. In line with my findings, I suggest the next directions for additional research:

1. This study was interested in the application of micro-teaching skills with digital technology and it contribution to effective micro-teaching presentations. However, this can be expanded in various ways for proper implementation within the university. Further investigation can be carried out on the way to integrating this simple digital technology as a strategy of developing the pre-service teacher's competency.

2. The teachers education programmes is unique in its nature, the theory and practice need a kind of balance from the supervisors and students perceptions. Studies can be carried out to explore the correlation between the knowledge-know and knowledge-how of the student through classroom observation. This will help the university to understand the student weaknesses and strength and as well adjust or adopt strategies that may improve teaching practice exercises. In line with this proposed study, the findings may as well contribute towards the improvement of the pre-service student's professional performance.

4. From the findings we discovered there was a mismatch between the policy document and the actual implementation of the teacher education curriculum. It will be interesting carrying out an investigation or appraisal on the policy document of MRTEQ, its interpretation and implementation within some selected university. The result of this investigation may be useful to the policy-makers to come up with a concise framework for all the university lecturers.

7.5 LIMITATIONS OF THE STUDY

The study was carried out not without any limitations. This empirical study was limited by some expected and unexpected challenges. The most challenging aspect is finance to develop a video platform for the students. The attitudes of the pre-service teachers used as participants during interviews and the submission of video presentations were not too easy to come by, the researcher has to pacify and encourage the participants. The findings of the study cannot be generalised for all pre-service teaches because the results covers only aspects of teacher education programmes in the university that is the senior phase.

7.6 RECOMMENDATIONS

The main focus of this study was to explore the application of micro-teaching skills with digital technology among 4th year B.Ed. students at the University of the Western Cape. Teachers are a vital element in the development of a nation; adequate attention is highly needed to give the best type of training that can enhance their teaching competency. As earlier mentioned expertise cannot be measured by principles and guidelines alone, but by actual practice and constant reflection on what works well and what needs improvement. The recommendation of this finding is specifically based on the results, if some of the recommendations can be implemented, it is optimistic that pre-service teachers at UWC will improve and compete favourably with their counterparts anywhere in the world. In line with the themes and with best practice, I give the summary of my recommendations in three categories, which includes the WCED, the University and the Faculty as stated below.

7.6.1 *Recommendations to WCED*

Recommendation 1: It is recommended that the WCED should create a holistic approach to pre-service teacher education modules with theories and practice that are necessary to facilitate professional development. The WCED in conjunction with the university needs to recognise the vital place of micro-teaching in teacher education programmes, placing micro-teaching at the centre of pre-service teacher developments. Micro-teaching must be given more attention as a core module in the university. The WCED should encourage the university to develop a methodological concept with good innovation to build and reinforce teaching skills. The WCED needs to beef up the content of the modules and structure the outline in line with the

micro-teaching assumptions, allowing the student to see the importance of micro-teaching in their professional development.

Recommendation 2: In an attempt to strengthen the micro-teaching modules, the KACIT model should be implemented in the universities where teachers are trained. All faculty members should be encouraged to support the implementation of the model. The model should be incorporated into the micro-teaching module particularly in year two and year three modules; this will help the pre-service teachers to reflect on their actions in line with the policy document of MRTEQ assumptions on knowledge-mix; learning *FROM* practice and learning *IN* practice. Implementing the KACIT model will allow the pre-service teachers to interact and share ideas as a team. It will create the opportunity to rehearse, teach, record their teaching using cell phones and evaluate their performance at their convenient time and reflect on how to improve in line with the micro-teaching assumptions.

Recommendation 3: The policy document of MRTEQ assumption on the knowledge-mix for teaching competence in terms of observation outcome should be re-emphasied with a clear guideline for the South African universities to have uniform framework and clear pictures of the implementation. MRTEQ should give direction on the actual implementation of the policy document along the lines of micro-teaching assumptions towards the pre-service teacher education curriculum for professional development. The WCED should develop a uniform curriculum for the teacher education programmes within the province.

Recommendation 4: It is recommended that more opportunity should be created for teaching practice exercises and peer teaching. There should be progression of teaching practice to increase pre-service teacher's opportunity for practice, which may help develop student teachers‟ self-confidence. The WCED should encourage the university to intensify school practice in year three. The timing for the exercise in year three should be increased for at least 6 weeks in order to have an in-depth understanding of the teaching profession. Teaching practice exercises should start from year two for at least four weeks if not more. The year one and two should be given opportunity to observe and pre-teaching in schools for at least four weeks. My concept of pre-teaching practice is a situation where the pre-service teachers will be placed at schools and for peers to observe, work and interact on their expectations. They will observe mentor teachers and then plan their own lesson, teach and record their own teaching

with the help of their colleagues, discuss and reflect together and re-plan lessons to re-teach. At the end of the observation period they should write a report on their teaching experience.

7.6.2 *Recommendation to the university*

Recommendation 5: It is highly recommended that the university should establish a well-equipped micro-teaching laboratory that will be open to all pre-service teachers to observe teaching and practice what have been learnt theoretically for immediate peer evaluation and supervisor constructive criticism, this will help the concern students to reflect on their areas of strength and weaknesses. The laboratory will give the students better opportunity to practice teaching in a non-threatening environment with the chances to mimic authentic classroom scenarios. With the micro-teaching laboratory resources, pre-service teachers may have the opportunity to experience different teaching strategies from demonstrative videos which may improve their teaching skills to develop self-confidence in teaching practice

Recommendation 6: It is recommended that the university encourage close collaboration between academic staff from the departmental subject discipline and the EDC module lecturers. It is highly needed to have consistent skills development strategies, lesson plan development and the techniques of teaching the pre-service teachers. There should be unity in diversity and experts should meet to organise training every session in to order to agree on the best modality and workable strategy that can improve the performance of the students. Re-connect the gap between academic staff to get together with methods lecturers to teach students how to write a good lesson plan using a measurable verb. There should be a strong bond between methods lecturers and module teachers, speaking in one voice as partners in progress.

7.6.3 *Recommendation to the Faculty*

Recommendation 7: It is recommended that there should be a shift from relying on power point presentations to other simple and available technologies as teaching resources. Students should be introduced to posters, charts, and the use of real objects and available materials as alternative creative resources in teaching practice. In this way, pre-service teachers may develop creative ideas on improvisation and production of instructional materials to enhance their teaching in schools where there are no technological resource materials. The faculty as

well can create a mini-room in the faculty where pre-service teachers can learn to produce and improvise instructional materials to improve their creativity.

Recommendation 8: It is recommended that the faculty establish a strong teaching mentoring programme, that will guide pre-service teachers on what teaching is all about. A well-structured mentoring programme will encourage in-house micro-teaching for self-reflection, leading to self-confidence. The mentors may consist of final year students or expert teachers who will be supporting and encouraging the pre-service teachers by giving constructive criticism that will help them grow in their chosen career and develop to function effectively in the teaching profession.

Recommendation 9: The faculty should encourage the pre-service teachers to develop a growth mindset about teaching exercises as a simple and learnable activity. Students should be educated with the type of mindset that will lead to more learning. The strategies that will help challenge the mindset of the prospective teachers for their professional practice should be developed. The university should learn to reinforce student learning, taking the student situation into consideration and their voices should also be significant to their professional development.

Recommendation 10: It is recommended that the faculty place more emphasis on skill development and teaching competency. Pending the time the university will respond to the micro-teaching laboratory, the faculty can improvise by creating a space within the faculty. The pre-service teachers should be exposed teaching skills; there should be progression of teaching skill from one module to the other modules. Practical teaching should be the core of the module. Students should be divided into smaller groups in each level of the modules to practice and rehearse how to teach at least twice every month in every session where all students will be involved in the process. This may assist the students to develop more confidence and competency.

Recommendation 11: It is recommended that the faculty should at least organise seminars and workshops on teaching skills, strategy and techniques that will help to hone their teaching skills. This can be done in each module by bring in an expert from school to talk to the pre-service teachers and give them opportunity to interact and ask questions based on their previous teaching practice experience. In addition, after teaching practice exercises, the faculty

can organise a debriefing for the students to share their experience and clarify students' misconceptions.

Recommendation 12: It is recommended that there should be technology alignment in micro-teaching presentation. The micro-teaching platform can be created for pre-service teachers in the faculty by grouping the students as teams, to interact and practice teaching using their phones as recording devices, share the videos among group members for reflection and group evaluation. The students should be encouraged to constantly use their phones to watch teaching videos from YouTube and also as a recording device which will help them to reflect on their performance in order to improve on their mistakes.

Recommendation 13: Establishing a video platform as an innovative approach to learn micro-teaching skills and reflect on it. This gives the pre-service teachers opportunity to practice teaching own their own and at their convenience, and as well, persists to get it right. Faculty should reinforce and encourage student's performance by praising student effort as they persist.

Recommendation for further study

Teacher education programmes is a continuous process, I have only given my view in line with my findings on how teacher education can be improve in the area of teaching skills. Going by my topic an exploration of micro-teaching skills with digital technology (cell phone) in B.Ed. programmes at the University of the Western Cape, it is obvious I have not covered all aspects of teaching skills; I also discovered in the video presentation that some salient teaching skills are begging for attention. My suggestion for further investigation is that an explorative study can be carried out in other teaching skills like proper use of chalkboards, appropriate use of instructional materials, application of non-verbal cues, planned repetition, skill illustration and examples to mention just few.

7.7 CONCLUSIONS

Teachers are seen and regarded as the nation builders because the development of the nation is inherently tied to the development of the teacher education programmes. Their roles from the classroom significantly affect the national development in one way or the other. The training given to the pre-service teachers in the university may have adverse effects on the learners either positively or negatively because pre-service teachers of today are the future teachers of

tomorrow. Most universities saddle with the responsibility of training teachers are relenting in the bid to give the pre-service teacher a kind of training needed to meet the current schooling system. Perhaps the university may be challenged with innovative technology, over-population of students and space. Now that technology is speedily creeping into education and it has gradually shifted the central roles of teachers from information disseminators to information facilitators. Schooling systems are also becoming more interactive with innovative technology tools as the learners take control of their learning activities. The training of pre-service teaches also need adequate attention that will help the students to perform effectively with current trends in the schooling system as asserted by Welsh and Schaffer (2017) that actually get a good quality teacher; there is a need to increase the coursework of teacher education programmes alongside field experiences.

Research has shown that the training and development of teachers will not be complete without placing micro-teaching theory and practice at the centre role of teacher education programmes. Although most universities are aware of the significant role of micro-teaching in teacher education programmes but attention were not really given to the modules as expected, particularly the practical aspect. From field observation, the university has shifted their attention from teacher training to teacher education, leaving the practical experience of the pre-service teachers to the mentor teachers in teaching practice schools not minding the types of training received by these mentor teachers. Over the years micro-teaching theory and practice has significantly assisted the pre-service teachers‟ performance and has helped them gain more knowledge and attitudes needed for professional development. Lin (2016) opines that micro-teaching assists the potential teachers to acquire initial teaching experience and it also helps them to develop teaching skills. These teaching skills will enhance effective teaching in their area of specialisation which has been my area of focus in this study.

My keen interest focusing on the exploration of micro-teaching skills with digital technology among the 4th year pre-service teachers at the University of the Western Cape is to examine the effective use of these teaching skills in order to ascertain the area of strength and the weakness of the students before their graduation. The pre-service teaching competency can only be measured with good application of the teaching skills and understanding these skills depends on how the student is exposed to both the theory and practice of micro-teaching. Most of the time students are blamed for not teaching effectively either in their place of work or during teaching practice exercises not considering their background knowledge. This has also

challenged me to investigate more into teacher education programmes and to proffer useful recommendations that may help improve the professional development of the pre-service teachers. From the research study coupled with other relevant literatures, it was discovered that the faculty has to re-structure and re-design their curriculum along the current practice. In addition, with the current innovation, technology has to be integrated to the pedagogical knowledge and content knowledge in order to assist the pre-service teachers" understanding of the current changes in their career.

In conclusion, my passion for the teaching profession has made me constantly look for innovative ways to enhance effective application of teaching skills in teacher education programmes. Coming up with the idea of digital video platforms, using cell phones as an alternative strategy to learn more about teaching skills is a means to engage the students actively. If well implemented by encouraging the students to always use their phones meaningfully, it will create an opportunity for pre-service teachers to learn and reflect on their own at their convenient time. From the results, I can boldly say that I have tried to respond to the needs of the pre-service teachers and suggested what could be done to adequately support them in fulfilling their dreams as professional teachers. It is hoped that the impact of this study will surely be useful to the university community particularly the Faculty of Education, where this research was carried out. I hope that as the recommendations are being implemented, the impact may be felt throughout South Africa and beyond as UWC pre-service teachers exhibit good traits of their professional practice.

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APPENDIX 1

The Registrar

University of the Western Cape (UWC)

Dear Ms Lawton-Misra

REQUESTFOR PERMISSION TO CONDUCT RESEARCH AT UWC

I am writing to request your permission to conduct a research study in the University of the Western Cape (UWC).Am a PhD student from the Department of Educational Studies in the Faculty of Education of this notable University. I am in the process of gathering data through survey that will be used in my study titled: *An exploration of micro-teaching skills with digital technology (cell phone) in B.Ed. programmes at a Western Capeuniversity*.Due to the nature of the study, I would like, during a lecture period,to expose the year four Bachelor of Education (B.Ed.) students in the Faculty of Education to a short video on the application of micro-teaching skills.I will also interview some interested students and staff who volunteer to participate in the study and a consent form will be signed at the beginning of the process.The research aims to determine the extent to which digital video will contribute to the effectiveness of micro-teaching and teaching practice among the pre-service teachers at UWC. The project thus contributes towards urgently-needed empirical evidence that may be used to inform the school curriculum and university programmes.

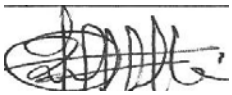
The planned data collection period is during the third and fourth term in second semester. Interviews will be arranged with purposively selected individual students and university-based supervisors at a mutually agreed upon location. With the participants‟ permission, the interview will be audio-recorded to facilitate the collection of information, and later transcribed for analysis. Participation in the study is voluntary, and individual participants are assured anonymity and confidentially.

All information provided is confidential. The names of the students and the university-based supervisors will not appear in any report resulting from this study. There are no known or anticipated risks to a participant in this study. If you have any further questions regarding the study, kindly use the contact details of my university supervisor, Dr Melanie Luckay, provided above, or my details below:

Okuntade.Japhet.O.
Department of Educational Studies
Faculty of Education, University of the Western Cape
Private Bag X17, Bellville, Cape Town
Tel: 0781618145, E-mail 3775781@myuwc.ac.za

I look forward to speaking with you and thank you for possible assistance in this project.

Yours sincerely,



Okuntade, Japhet. O (PhD student, UWC)

Appendix 2

The Dean
Faculty of Education
University of the Western Cape (UWC)

Dear Professor Nomlomo

REQUESFOR PERMISSION T TO CONDUCT RESEARCH AT UWC

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Faculty of Education, University of the Western Cape
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Tel: 0781618145, E-mail 3775781@myuwc.ac.za

I look forward to speaking with you and thank you for possible assistance in this project

APPENDIX 3

The Head of Department (HOD) Educational Studies, Faculty of Education
University of the Western Cape (UWC)

Dear Professor Smith

REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT UWC

I am writing to request your permission to conduct a research study in the University of the Western Cape (UWC).Am a PhD student from the Department of Educational Studies in the Faculty of Education of this notable University. I am in the process of gathering data through survey that will be used in my study titled: *An exploration of micro-teaching skills with digital technology (cell phone) in B.Ed. programmes at a Western Capeuniversity*. Due to the nature of the study,I would like, during a lecture period, to expose the year four Bachelor of Education (B.Ed.) students in the Faculty of Education to a short video on the application of micro-teaching skills.I will also interview some interested students and staff who volunteer to participate in the study and a consent form will be signed at the beginning of the process.The research aims to determine the extent to which digital video will contribute to the effectiveness of micro-teaching and teaching practice among the pre-service teachers at UWC. The project thus contributes towards urgently-needed empirical evidence that may be used to inform the school curriculum and university programmes.

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Faculty of Education, University of the Western Cape
Private Bag X17, Bellville, Cape Town
Tel: 0781618145, E-mail 3775781@myuwc.ac.za

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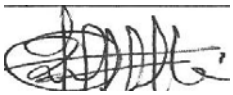

Okuntade, Japhet. O (PhD student, UWC

APPENDIX 4

The Lecturer, Faculty of Education
University of the Western Cape (UWC)

Dear Dr Luckay

REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT UWC

I am writing to request your permission to conduct a research study in the University of the Western Cape (UWC).Am a PhD student from the Department of Educational Studies in the Faculty of Education of this notable University. I am in the process of gathering data through survey that will be used in my study titled: *An exploration of micro-teaching skills with digital technology (cell phone) in B.Ed. programmes at a Western Capeuniversity*.Due to the nature of the study,I would like, during a lecture period, to expose the year four Bachelor of Education (B.Ed.) students in the Faculty of Education to a short video on the application of micro-teaching skills.I will also interview some interested students and staff who volunteer to participate in the study and a consent form will be signed at the beginning of the process.The research aims to determine the extent to which digital video will contribute to the effectiveness of micro-teaching and teaching practice among the pre-service teachers at UWC. The project thus contributes towards urgently-needed empirical evidence that may be used to inform the school curriculum and university programmes.

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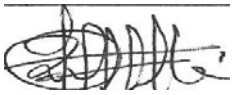

Okuntade, Japhet. O (PhD student, UWC)

APPENDIX 5

Research Title: *An Exploration of Micro-teaching Skills with Digital Technology (cell phone) in B.Ed. Programme at a Western Cape University*

INTERVIEW CONSENT FORM

I……...…….willingly consent to be part of the research.

- I have read the information sheet and I voluntarily agree to participate in this study.
- I have had the opportunity to ask questions related to the research, received satisfactory answers to my questions, and any additional details I needed.
- I agree to take part in the above study by participating in an interview.
- I am aware that the discussion is being digitally recorded.
- I understand that my participation in this research is voluntary and I have the right to withdraw my participation at any time.
- I am aware that the interview will result in research that will be published. I do/do not give consent for my name to be used (please circle appropriate). I understand that if I do not want my name to be used, the researcher will adhere to this.
- I may also refuse to answer any questions that I do not feel comfortable answering.
- I understand that all information shared must be kept confidential.

Participant's name:…….

Participant's signature:……

Date and location:……..……

Researchers Name: ……..……..

Researchers Signature:…….

Researcher's details: Okuntade,Japhet.O (3775781@myuwc.ac.za).

APPENDIX 6

Research Title: *An Exploration of Micro-teaching Skills with Digital Technology (cell phone) in B.Ed. Programme at a Western Cape University*

PARTICIPANT INFORMATION SHEET

Dear Participant

This letter is an invitation to consider participating in the above research project. The research is being conducted by myself, Okuntade, Japhet Omolere. I am a PhD student in the Faculty of Education at the University of the Western Cape (UWC). The research aims to contribute toward urgently-needed empirical evidence that may be used to inform the school curriculum and university teaching in various programmes.

Before you participate, it is important that you understand why the research is being conducted and what it will involve. Please take the time to read the following information carefully and discuss it with others if you wish. If you would like clarity or any further information, please do not hesitate to ask. Please take your time to decide whether you would like to participate in this research. My details are provided at the end of the document.

Purpose of the Research

The purpose of the study is to explore micro-teaching skills with digital technology in B.Ed. programmes in order to determine students‟ micro-teaching knowledge levels and how technology can help develops micro-teaching skills. The project thus contributes toward urgently-needed empirical evidence that may be used to improve pre-service teachers‟ performance in micro-teaching and teaching practice as well in the development of school curriculum and university teaching and learning process.

Description of the Research and your Involvement

The research will include video presentation, interviews and focus groups with selected fourth year university students at UWC. Interviews will be arranged with purposively selected individual students at a mutually agreed upon location. Questions will focus on micro-teaching

and uses of digital technology (see some questions below and rubric for assessing the video). With the students‟ permission, the interview will be audio-recorded to facilitate the collection of information, and later transcribed for analysis.

Confidentiality

Your name will not be recorded (but coded) during the interview so as to maintain confidentiality. I will keep all records of your participation, including a signed consent form that you will need to complete to participate. All these records will be locked away safely and will be destroyed once the research has been completed.

Voluntary Participation and Withdrawal

Participation in the study is voluntary and you are free to refuse to participate. If you decide to participate, you may keep this information sheet and you will be asked to sign a consent form. You are able to withdraw from the research at any time without giving reason, and you may also choose not to answer any questions that will be asked.

Benefits and Costs

There will be no direct benefits from participating in the research. Through the information learnt there may be long-term benefits to inform teaching at schools as well as the school curriculum. There will be no costs for participating in the research other than your time. All interviews will be conducted at your convenience, so there are no additional costs for transport or otherwise. You may be served light refreshment during discussion.

Informed consent

Your informed consent in this research is required to proceed in order to give you the questionnaire and interview you. I have included the consent form with this information sheet so that you can review it and then decide whether or not you would like to participate.

If you have any further questions regarding the study, kindly use the contact details provided below, or those of my PhD supervisor, Dr Melanie B. Luckay in the header of the letter above:

Okuntade.Japhet.O.
Department of Educational Studies
Faculty of Education, University of the Western Cape
Private Bag X17, Bellville, Cape Town
Tel: 0781618145, E-mail 3775781@myuwc.ac.za

I look forward to speaking with you and thank you for possible assistance in this project.

Thanking you for considering to be part of this research.

Okuntade, Japhet.O (principal investigator)

APPENDIX7

INTERVIEW AND FOCUS GROUP SCHEDULE

Leading Questions

(*This interview will be recorded and transcribed*)

LEADING QUESTIONS

1. What do understand about micro-teaching?
2. How best do you think microteaching can be presented to you?
3. Is there any way technology has helped to improve your teaching skills?
4. What advice will you give to the university on how they can help pre-service teachers to grow professionally?

SUBSIDIARY QUESTIONS

1. What experience do you gain from microteaching class
2. Have you apply technology in your microteaching presentation and how
3. How do you feel using technological tool in microteaching
4. How has technology affect your thinking about microteaching
5. How do you understand the word platform
6. How do you perceive the use of phone as a platform in microteaching
7. How is the use of phone affected your participation in microteaching
8. What experience have you gained using platform in microteaching
9. How will digital technology enhance your practical demonstration in microteaching
10. Would you prefer using digital video platform to any device in microteaching?

APPENDIX 8

Rubric for portfolios (lesson plans)

CHECKLIST FOR ANALYZING STUDENT PORTFOLIOS AND REFLECTIONS (DRAFT)			
	Good	Fair	Poor
Statement of objectives in behavioral terms			
Introduction			
Content			
Conclusion			

General comment:

APPENDIX 9

Introduction	Exceed Expectation	Meets Expectation	Need Improvement
1.Teacher did review of previous learning 2.Stating the instructional objectives at the beginning of the class 3.Teacher used common and relevant examples 4. There was a link between the last topic and the new topic.			
Stimulus Variation			
1. Teacher moved around the class while teaching. 2. Teacher used some gestures such as hands, head ,face etc 3. Teacher varied speech while teaching as tone, pitch, pause 4. Teacher allow student to actively participate in class			
Explanation 1.Lesson is well explained with clarity 2.Explanation of content is relevant to stated objectives 3.Class is interesting to students with relevant resource material 4. Teacher used easy flow of ideas from known to unknown.			
Reinforcement			
1.Teacher praised the learners verbally 2. Teacher used non-verbal praise; smiling or nodding of head 3. Teacher praised learners with extra-verbal statement ;Hum 4. Teacher acknowledged learners contribution e.g Yes or I see			
Questioning			
1.Asking clear, short and simple question 2.Teacher ask questions before calling any name 3.Teacher spread questions to every corner in the classroom 4.Teacher asked questions while answers were still on the board			
Closure and transfer			
1.Teacher summarized the lesson verbally 2.Teacher list the important points on the board 3.Teacher appreciate the students for their contributions in the class 4.Teacher gave the learners home work on the topic;			

APPENDIX 10

UNIVERSITY of the WESTERN CAPE

OFFICE OF THE DIRECTOR: RESEARCH
RESEARCH AND INNOVATION DIVISION

Private Bag X17, Bellville 7535
South Africa
T: +27 21 959 4111/2948
F: +27 21 959 3170
E: research-ethics@uwc.ac.za
www.uwc.ac.za

28 August 2018

Mr JM Okuntade
Faculty of Education

Ethics Reference Number: HS18/6/18

Project Title: An exploration of micro-teaching skills with digital technology (cell phone) in B-Ed, programmes at a Western Cape University.

Approval Period: 20 August 2018 – 20 August 2019

I hereby certify that the Humanities and Social Science Research Ethics Committee of the University of the Western Cape approved the methodology and ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report in good time for annual renewal.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

PROVISIONAL REC NUMBER - 130416-049