THE EXPERIENCES OF PRE-SERVICE TEACHERS IN IMPLEMENTING FORMATIVE ASSESSMENT: A CASE STUDY OF A SOUTH AFRICAN UNIVERSITY

By

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DECLARATION

Student number: 30902231

I, Primrose Ntombenhle Khumalo, declare that **The Experiences of Pre-service Teachers in Implementing Formative Assessment: A Case Study of a South African University** is my original work and has never been submitted to any University. All the sources I have used or quoted have been indicated and acknowledged by means of complete references.

2023/09/26

Signature _____Date_____

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ABSTRACT

The purpose of this study was to investigate pre-service teachers' experiences with formative assessment implementation during practice teaching. There are few studies that focused on Post Graduate Certificate in Education (PGCE) preservice teachers. Previous findings revealed a need for enhancements in the programme that is at least two years divided into theory and practice for the preservice teachers to be able to be proficient in using formative assessment strategies. Formative assessment is crucial as it promote learning and closing gap during teaching and learning. There is research evidence which indicates that when preservice teachers experience formative assessment during initial teacher training, they value it and apply it during teaching Cui (2021). Previous research reveals that PGCE graduates are faced with some challenges during practice teaching in terms of implementing formative assessment and teachers who are qualified to be teachers through the traditional Bachelor of Education program seem to discriminate against PGCE holders and assume they are failed in their previous qualifications and opted for teaching as a way to merely get employment and not because they are good at it or have passion for teaching. PGCE teachers' confidence is being undermined. Contrary to this belief by PGCE holders that they are far much better where content is concerned as they come from degrees that are somewhat" difficult" and full of content. In contrast, previous research indicates that graduates from extended programs tend to be satisfied with the way they were trained and that they are viewed as more readily prepared by school principals where they are employed. The study was conducted amongst Post Graduate Certificate in Education (PGCE) pre-service teachers in one South African university in KwaZulu-Natal Province. Research has revealed that formative assessment, as opposed to summative assessment, improves learners' learning. However, the term does not represent a well-defined set of practices, which affects its successful implementation in various contexts. According to Vygotsky (1978), learning is always socially constructed, requiring the active participation of the learner in interaction with others. Formative assessment makes use of this insight, since it involves activities that both assess learner performance and promote learning.

The study employed a sequential explanatory mixed method design to examine the experiences of 99 pre-service teachers with regard to their implementation of formative assessment strategies during practice teaching. Data was collected through Likert scale questionnaires, a focus group discussion, and document analysis. During the first phase of data collection, questionnaires were used, and during the second phase, thirteen pre-service teachers drawn from the original sample participated in a focus group discussion and document analysis. For quantitative data, phase frequencies and percentages were used to report the questionnaire results, with descriptive analysis conducted to interpret and present the findings. In the qualitative follow-up phase, data was collected through the focus group discussion and analysed through thematic analysis.

The findings revealed that PGCE pre-service teachers implemented the following key formative assessment strategies objectives, discussion and questioning as well as feedback however, they did not implement self-assessment or peer assessment. Based on the findings, the study proposes a model for pre-service teachers' formative assessment implementation, to contribute to foundational formative assessment knowledge. The model may be used to underpin formative assessment practices. The study recommends that reflective professional development be maintained through the establishment of effective pre-service teachers' learning communities.

Recommendations for future research: The teacher educators should employ mentoring, modelling and scaffolding to greater assessment comprehension in the enactment of formative assessment strategies like self-assessment and peer-assessment. Time required to practice enacting self-assessment peer assessment for PGCE preservice teachers. This highlights that further opportunities are required for PSTs to experience all formative assessment strategies during Initial Teacher Education (ITE) as well as extended school placements in which to explore the enactment of self-assessment and peer-assessment.

Keywords: pre-service teachers, practice teaching, formative assessment, formative assessment strategies, feedback.

TABLE OF CONTENTS

LIST OF TABLES

LIST FIGURES

CHAPTER ONE: BACKGROUND AND INTRODUCTION

1.1 Context and Background of the study

This chapter serves as an introductory chapter of the study, is mainly examines the experiences of Post Graduate Certificate in Education (PGCE) preservice teachers with implementing formative assessment during practice teaching. Chapter One presents the introduction, background of the study, context, problem statement, research questions, aims of the study, significance of the study and operational definitions. The chapter closes with an overview of the structure of the study.

Post Graduate Certificate in Education and Teacher Training in South Africa. Teacher Training post 1994 in South Africa is through universities (Wolhuter, 2006). The Department for Higher Education and Training (DHET) is responsible for all teacher specialisation and continuing professional development. This is in line with the 2021 to 2025 strategic plan Teacher training in all phases (DHET,2011). Teacher completes a 4 -year BA in Education and a 1 year Post Graduate Certificate in Education (PGCE). However, with the implementation of the 2011 strategic plan, unqualified graduate teachers will complete the PGCE over 2 years, part-time.

For an individual to become a qualified teacher in South Africa there are two routes. The first is Bachelor of Education degree which takes four years. The second route is the Post Graduate Certificate in Education (PGCE). Mahlangu and Pitsoe (2013) report that there is about 5% teacher attrition yearly due to teachers retiring, relocating, leaving the profession and sometimes due to death. This led to the provision of the alternative ways, such as PGCE, to educate and recruit teachers in addition to the traditional four-year undergraduate B.Ed. qualification. The PGCE programme is offered by South African universities for a duration of one year for full time studies and two years for part time studies. The PGCE program is the only program that provides professional registration with the South African Council for Educators (SACE) for individuals who graduated with a qualification that is not Bachelor of Education (B.Ed.) . The National Qualification Framework (NQF) classifies PGCE at level 7 with 120 credits as a minimum requirement (CHE, 2013, DHET, 2015). The PGCE was introduced to recruit individuals who already hold a degree with subject majors which are taught in schools. The PGCE grants students the opportunity of acquiring educational theory and knowledge to qualify as teachers as their previous qualification had already equipped them with the relevant subject content knowledge Betram, Mthiyane and Mukeredzi, 2013). The PGCE program also focuses on practical learning, that is work integrated learning (WIL) which is performed in schools to train the prospective teacher for the field of work when they finally assume their tasks of teaching. The Revised Minimum Requirements for Teacher Education policy (MRTEQ), 2015) stipulates that a PGCE teacher must undergo a school-based

WIL (work Integrated Learning) that comprises of a supervised and assessed teaching practice for a minimum of 8 weeks and a maximum of 12 weeks. Issues regarding the assessment component in teacher education include insufficient or inappropriate assessment component in teacher preparation and is one of the issues that needs to be addressed Oo, Alonzo and Asih (2022). The time allocated to the PGCE preservice teachers is perceived as limited, mainly because of the practice of using content developed in one year. The PGCE curriculum specifics are dependent on teacher educators' discretion, policy guidelines and students' expectations. Teacher educators' discretion potentially dominates decisions making with the PGCE curriculum. Dube (2021) conclude that PGCE preservice teachers faces challenges during practice teaching in terms of assessment because they had inadequate knowledge of assessment due to inadequate training. The findings by Dube (2021) affirm that PGCE preservice teachers are well equipped for classroom management, assessment, and lesson presentation.

The experience of PGCE preservice teachers concurs with the argument by Mkhasibe, Mncube and Ajani (2021) that they are not properly mentored by the mentees during practice teaching. Butler and Cuenca (2012:301) mentioned that the first reception of student teachers by mentor teachers is crucial in guiding student teachers in their professional development. Lampert (2010) reports that teaching practice helps student teachers gain skills and knowledge about schools, learners, teaching, school routine, teaching practice, teaching theory, staff meetings and, most importantly, the nature of the child. Busher, Gunduz, Cakmak and Lawson (2015) state that the opportunity to work with experienced teachers hones student teachers' skills. Therefore, good experience during teaching practice appear to lead to positive judgements.

Lesson planning is a process that is part of the training in the PGCE programme, and that is then implemented in the teaching practice periods. This process involves outlining a lesson plan, with its objectives taking into consideration the teaching strategies, assessment strategies, A lesson plan acts as a map, assisting in guiding a series of activities to ensure students gain the knowledge, skills or attitudes set out within the learning objectives. It also provides a record of what has been taught and assists in planning and alignment of assessment tasks Diggele, Burgess and Mellis (2020). activities, and resources as part of a series of lessons. A lesson plan should identify the key aim and outcomes, content, structure and timing of activities and assessment tasks. Mathabela (2021:67) revealed that PGCE graduates prepared their lessons thoroughly and used different teaching strategies to accommodate different learning abilities. They concur that they were aware that lesson planning is critical to ensure effective learning. According to Diggele, Burgess and Mellis (2020) The planning of learning activities is an important part of course design everyday teaching, curriculum and lesson design must be aligned to achieve the intended learning outcomes. Learning

activities should encourage student participation and guide and engage students towards the achievement of the set, agreed learning objectives.

Learning to assess is one of the most important yet challenging tasks for pre-service teachers (Xu & He, 2019). During their practicum, pre-service teachers are expected to learn assessment, teaching and learning strategies. Teaching practicum prepares prospective teachers for the profession by enhancing opportunities for newly qualified teachers to appreciate the role and process of teaching (Aglazor, 2017). Mjåtveit and Giske (2020) found that pre-service teachers' (PSTs') modest use of formative assessment may be attributed to the fact that teacher training institutions have failed to introduce and teach the topic properly. Moreover, there appears to be a need to strengthen cooperation between teacher training institutions and partner schools to stimulate an understanding of formative assessment.

Popham (2009) argued that assessment literacy is an essential professional capability; therefore, teacher education programmes should pay attention to it as part of assessment education. However, pre-service teachers' levels of assessment literacy prior to graduation were found to be relatively low or inconsistent in DeLuca, Klinger et al (2010), and in Volante and Fazio (2007). The literature suggests that pre-service teachers often graduate and enter classrooms without being adequately prepared to meet the challenges of classroom assessment (Popham, 2009). Formative assessment has been on policy agendas internationally for decades, but implementation has proven to be challenging (Birenbaum, DeLuca, Heritage, Klenowski, Looney, Smith, Timperly, Volante & Wyatt-Smith, 2015:118). Black and Wiliam (1998:61) reviewed more than 250 articles related to formative assessment. They concluded that 'formative assessment does improve learning'.

The formative assessment has become a core component of teaching (Khizar, Daud & Asad, 2021). The teacher's experience with this area of teaching and the strategies he or she employs are crucial for the successful implementation of formative assessment in the learning process. That is why continuous teacher training programmes significantly influence the implementation of formative assessment (Khizar, Daud & Asad, 2021). In addition, practicum experiences in classrooms give pre-service teachers opportunities to practise specific pedagogies with students and refine their abilities in real time. It is critically important for PSTs to experience the full teaching process in order to develop pedagogical and reflective skills, as well as teacher efficacy (Wilcoxen & Lemke, 2021). Formative assessment takes place when teachers and students respond to students' work, make a judgement about what is good learning, and provide informative feedback (Khizar, Daud & Asad, 2021).

There has been concern among researchers that 80% of relevant studies reviewed report inadequate knowledge of formative assessment on the part of teachers at the school level (DoQuyen & Khirani, 2017). Oo, Alonzo and Davidson (2021:3) state: 'Building pre-service teachers' capacity for assessment decision-making before entering the profession is crucial in initial teacher education.' DeLuca and Klinger (2010) maintain that pre-service teacher education is the central method for preparing competent and confident beginning teachers.

Sabel, Forbes and Zangori (2015:436) are of the opinion that research is needed on the ways in which pre-service teachers learn how to employ formative assessment in the classroom. Mitten (2017) points that providing pre-service teachers with learning experiences that develop formative assessment knowledge and practices may be an ideal way to prepare novice teachers to integrate formative assessment into their teaching practices successfully. However, Mitten (2017) states that limited research exists on how this might be accomplished in ways that truly impact teacher practice.

The use of practice-embedded courses that integrate coursework with field experiences could aid pre-service teachers in developing more robust connections between formative assessment theory and practice. During teaching practice, pre-service teachers are provided with mentors to support and guide them as part of the induction process, aimed at acquainting the novice teacher with the work environment (Iwu, 2021). Iwu (2021) stresses that mentors play an important role in helping to mould novice teachers. James and Pedder (2006) found that providing an authentic experience with formative assessment was critical in promoting preservice teachers' learning, enabling them to implement formative assessment in their later careers. McMaugh and Cavanagh (2022) found that pre-service teachers improved significantly during their final placement in terms of their skills in instructional strategies, classroom management and promoting student engagement. This is echoed by Iwu (2021:38), who stated that 'teaching practicum is a vital component of the initial teacher education (ITE) programme because it enriches future teachers' knowledge, skills and abilities toward a lifelong career in the teaching profession'. Maphalala (2013) was of the same view as Iwu (2)21) with regard to mentors, finding that mentors could identify specific areas of development in which student teachers may need to be supported, such as in lesson planning and presentation, curriculum planning and assessment. Iwu (2021) also found that the teaching practicum component of the initial teacher education (ITE) programme is significant to the development of future teachers and a requisite element that must be embarked on in preparation for a career in teaching. The assessment of students' performance in order to gauge and improve their abilities is almost as old as the modern schooling system, which emerged in the aftermath of the industrial revolution. The assessment has been affirmed as a vital component in the professional

careers of teachers. It enables them to improve their instructional practices and the learning progress of students (Gotch & French, 2014; Hussain, Kayani & Akhtar, 2018). Cui (2021:2) states that 'supporting pre-service teachers to experiment with formative assessment during their practicum is arguably timelier than introducing it later in their career when they become accustomed to existing practices in school'.

Given the promising nature of formative assessment practices with regard to student learning and engagement, finding ways of supporting novice teachers as they develop these practices is very important (Gotwals & Cisterna, 2022:1). Formative assessment has been conceptualised differently by different groups, with these differences having implications for how to best support teachers as they enact formative assessment practices in the classroom (Anderson & Palm, 2017). This study aims to investigate how formative assessment implementation by preservice teachers develops during teaching practice. Several teacher education programmes have transformed in recent years to improve teacher education quality, which is often the cause of a gap between theory and practice. According to a comparative study of teacher education in developed countries with well-established systems, teacher education programmes attempt to connect theory and practice through the design of reflective work and the integration of high clinical work (Darling-Hammond, 2017). As Matsumoto-Royo and Ramirez-Montya (2021) point out, practice-based education rests on critical factors for improving teacher preparation and responding to challenges in order to prepare teachers adequately to educate new generations of learners. William (2013:15) stated that formative assessment is 'one of the most powerful ways of improving student achievement'.

Black and Wiliam (1998:61) reviewed more than 250 articles related to formative assessment. They stated that the studies 'show conclusively that formative assessment does improve learning'. However, the study stated that teachers experience difficulties in effectively incorporating formative assessment into their teaching practices. Black and Wiliam (1998) concluded that when feedback was of high quality, it improved students' work. The work of Black and Wiliam (1998b) highlights that preparing teachers to be literate in assessment, particularly in terms of using assessment for learning, has the highest potential to increase students' outcomes.

Assessment courses provided in ITE may be classified into three types: standalone assessment courses that are heavily weighted toward theoretical assessment principles; assessment courses that make use of real students' work; and assessment courses that include real assessment practices (Oo, Alonzo & Davidson, 2021). Building pre-service teachers' capacity for assessment decision-making before entering the profession is crucial in initial teacher education (Oo, Alonzo & Davidson, 2021:3). Pre-service teacher education is the central method for preparing competent and confident

beginning teachers (DeLuca & Klinger, 2010:419). Furthermore, McGlamery and Shillingstad (2017:18) state that 'teachers' understanding of formative assessment and summative measures improve following direct instruction and modelling in the higher education classrooms'.

Pre-service teachers are expected to connect, integrate and reconcile theory acquired in various aspects of their preparation programmes with their field experiences. Sleep and Boerst (2012) studied how a course assignment to conduct a 'student thinking' interview could support preservice teachers in their understanding of the use of formative assessment in Mathematics teaching. Pre-service teachers conducted one audio-recorded interview with a student in which they asked the student to complete a Mathematics task and then used pre-planned questions to probe student thinking. After the interview, the pre-service teachers were asked to review the recording and any collected work to identify at least two assertions about student understanding supported by the collected evidence.

Pre-service teachers are required to write lesson plans that include lesson objectives and assessment activities, to teach lessons, and to keep personal reflective journals during practice teaching (Glamery & Shillingstad, 2017:11). Darling-Hammond and Bransford (2007) attest that field experience should actively engage students in forming their pedagogical schemata through experiential learning in method subjects. In their study, teacher candidates demonstrated their understanding of assessment by including one to three formative assessment measures and at least one summative assessment for each lesson written.

Teacher candidates are expected to focus on student learning and study the effects of their work. They should assess and analyse student learning, make appropriate adjustments to instructions, monitor student learning, and positively affect learning for all students (DeLuca & Bellara (2013:357). DeLuca and Klinger (2010) alluded to the importance of aligning coursework with practice in assessment learning. Alkharusi, Kazem and Al-Musawai (2011:121) are of the view that educational measurement or assessment courses are offered while students are undergoing practicums so that they have opportunities to receive feedback on their practices related to educational measurement tasks. The recommendation was supported by the finding that pre-service teachers who have participated in teaching practicums tend to have higher average levels of educational measurement knowledge and skills, as well as a more positive attitude, than those who have not participated teaching practicums. Martinez (2013:1340) also states that 'the practice of teachers can also be influenced by their training'. A study by Segalo and Dube(2022:4)found in their study that PGCE preservice teachers illustrate in their journal entries that teaching was not an easy thing as the schools expects preservice teachers to teach as it is assumes that the student had

undergone training. Moosa and Rembach(2018) found in their study that mentees' pedagogical decisions were informed by their mentors. The mentors foregrounded administrative tasks, which led to teaching taking a back seat. The findings showed that for some mentees, there was a mismatch between the way they were taught at university and their experience at school. Mentors were also negative towards teaching profession, which resulted in mentees questioning their career choice. Mentees expected their mentors to expose them to system requirements, to serve as role model, to provide feedback on lesson planning and teaching and make them feel welcome in the classroom, however this was not always the case. In another study it is revealed that teaching exposes the pre-service teacher to the realities of effective teaching and helps them to try out methods of teaching and gain practical classroom experience under experts Morris and Werf (2012).

In a study conducted by Hamodi, Lopez-Pastor and Lopez-Pastor (2017:186), the authors found that formative systems experienced in initial teacher education are valued because they enabled pre-service teachers to achieve deeper learning and made them reproduce in practice as teachers what they found useful as ITE students. In their role as teachers, the participants of that study recognised that the formative assessment they had experienced as university students was invaluable in their professional practice in schools. They also referred to some barriers to implementing change, in terms of the workplace environment, pupils' families and members of the educational community.

DeLuca and Volante (2016:22) argued that it has been generally acknowledged that classroom teachers' assessment practices lag behind the current research base, particularly in relation to formative assessment. They contend that the reasons for this disconnect are multifaceted, and typically relate to the conservative culture of schools and the lack of appropriate professional development. Formative assessment occurs when both teachers and fellow learners respond to learners' work, making a judgement about what is good learning and giving helpful feedback (Amua-Skei, 2016). As teachers incorporate more formative assessment techniques into their day-to-day teaching, they will have more information on which to base modifications to their teaching. Ramsey and Duffy's (2016:6) research findings show that although most teachers use some kind of formative assessment in their classrooms every day, there needs to be a much broader understanding of what formative assessment is and what it looks like. The aim of formative assessment is ultimately to improve students' learning (Sach, 2015:323). Ateh (2015:113) affirms that when engaged in formative assessment, teachers pose questions to students, listen to their answers, and decide how to move learning forward based on students' reasoning and participation.

Teachers internationally are expected to be assessment literate, having the requisite knowledge and skills to assess and accurately report learner achievement (Poskitt, 2014:542). Newfields (2006) argues that assessment literacy is important for three reasons. First, assessment is a common feature of most educational systems; second, knowledge of assessment is required to understand much of the educational literature; and finally, it gives the opportunity to teachers to communicate their classroom results with others. Assessment literacy is a crucial skill for pre-service teachers, and needs to be taught and addressed within methods classes so that preservice teachers are better equipped with the skills, beliefs, knowledge and confidence to apply suitable assessment practices and promote learner attainment in the classroom (Siegel & Wissehr (2011).

Assessment occurs in a political, economic, cultural, educational and human context, being subject to multiple dynamic influences. Very few of these influences can be managed by the teacher; however, the teacher is responsible for the assessment of their learners (Poskitt, 2014:542). In South Africa, the Minimum Requirements for Teacher Education Qualifications (MRTEQ) (2015: 53) stipulates that 'newly qualified teachers must be able to use the results of assessment to improve teaching and learning'. Amir et al (2015:142) note that an effective teacher is required to develop assessment literacy in order to transform the learning objectives into assessment activities that display student understanding and achievement. Quyen and Khairani (2017:165) affirm that teacher knowledge is the most significant factor in the implementation of formative assessment.

Many researchers and advocates of formative assessment believe that the primary benefit of formative assessment is to help students improve their learning (Frey & Schmitt, 2007:411). Teaching guided by formative assessment allows students to focus on the learning they need to derive from their subject area (Jacoby, Heugh, Bax & Branford-White, 2014:73). Formative assessment promotes learning and helps teachers to adjust their teaching accordingly. The students and the teachers both benefit from the process. Boston (2002:2) asserts that 'assessment becomes formative when information is used to adapt teaching and learning to meet students' needs'. Students' learning is promoted and remedial learning takes place when students are given feedback about where they need to improve learning. It is envisaged that pre-service teachers are trained in how to use formative assessment practices so that students benefit through engagement with the teacher. 'Postgraduate teachers in training and undergraduate students completing the final year of their academic and professional education have personal and direct experience of assessment in ways that may impact significantly on the approaches they adopt as teachers' (Mitchell, 2006:188). Kiggundu and Nayimuli (2009:347) explain why teaching practice is such a critical part of becoming a competent teacher in a developing and under-resourced country. Teaching practice is a challenging but important part of teachers' training, especially in developing countries such as

South Africa, where the effectiveness of the teaching practice can be diminished or eroded by a range of challenges, such as geographical distance, low and uneven levels of teacher expertise, a wide-ranging lack of resources as well as lack of discipline among a wide cross-section of learners and educators.

The formative assessment experiences of pre-service teachers who have attained a Post Graduate Certificate in Education (PGCE) are the focus of this study. The PGCE is a one-year teaching qualification awarded after an undergraduate degree. In this qualification, it is assumed that the potential teachers already have the subject content knowledge of their discipline from their undergraduate studies. It is a professional qualification that equips student teachers with the knowledge and competencies that they need to teach discipline-specific knowledge to children in schools. Teaching practice is a module taken by pre-service teachers which translates to their professional learning during the practice teaching period. Pre-service teachers are expected to translate theory into practice during this period. Institutions offer PGCE qualifications for primary and high school teachers, with students introduced to the practicum once a week throughout the year. During teaching practice, school-based and home-based mentors play the role of mentoring students and supervising. However, the primary responsibility lies with university-based lecturers to support the pre-service teachers and award the final assessment marks. Currently in South Africa, the teaching practice comprises a full day of teaching once a week during the academic recess when schools are still open, plus six weeks of supervised teaching practice by university-based lecturers.

Teaching guided by formative assessment allows learners to focus on the learning they need to derive from particular subject areas. The approach also enables teachers to focus on the factors that are under their control (Jacoby, Heugh, Bax & Branford-White, 2013:73). Assessment functions formatively when evidence about pupil learning is elicited, interpreted and used by teachers, learners or their peers to make decisions about further steps that are likely to improve performance and the learning process (Williams, 2011; William & Leahy; 2007). Black et al (2003) found that well-developed content knowledge is a necessary precondition for assessment for learning practices if teachers are to interpret the responses of pupils, ask good questions, provide quality feedback that focuses on what pupils can do to improve, and adapt their teaching with the aim of supporting pupils' learning.

PGCE teachers are expected to display a minimum level of assessment literacy and know how formative assessment is implemented during teaching and feedback. When teachers are not adequately trained in ways to accurately assess learners' learning and communicate the results, they assess their learners in a similar manner to the way they were assessed in schools (Siegel & Wissehr,

2011). 'Today's prospective teachers, in order to do their jobs properly, desperately need to become assessment literate' (Popham, 2011:267). It is crucial that teacher educators teach and stress the importance of up to-date formative assessment methods. McGee and Colby (2014:523) attest to the idea that assessment is not optional; it is essential for effective classroom management. Unfortunately, teacher educators seem to neglect the need to train teachers in assessment. Guskey (2003), Popham (2011) and Stiggins (2008) state that 'teacher education programmes and in-service opportunities have often neglected this critical component in the past'. There has been a call for an increased emphasis on a formative assessment designed to assist learning. (Pellegrino et al, 2001; Popham, 2011; William, 2011).

Teacher training is a process, and teachers are not expected to be proficient within a year, although there are pre-service teachers who enrol in the full time programme who have teaching experience without a professional certificate. The primary purpose of formative assessment is to enhance teaching and learning (Crooks, 2004; Ministry of Education, 2007). Bell (2005) states that formative assessment is a crucial part of the learner-centred classroom (Pryor & Crossoud, 2008), and is influenced by classroom factors, including student-teacher relationships, the physical setup of the classroom, and learning opportunities provided by the teacher (Cowie, 2000). Formative assessment usually takes place during learning (Bell, 2005; McManus, 2008). It establishes the extent of pupils' learning, their future goals, and the pathway to achieving them (Black & Wiliam, 2006; McManus, 2008, William & Thompson, 2007).

Several countries promote formative assessment as a fundamental approach to educational reform. The Organisation for Economic Co-operation and Development (OECD: 2005:1) has studied the use of formative assessment in eight educational systems: Australia (Queensland), Canada, Denmark, England, Finland, Italy, New Zealand and Scotland. According to Clark (2010:342), Scotland advocates for formative assessment practices in learning initiatives across the nation. Cowan (2009:73) reports that Scotland had ten projects which promoted formative assessment, one of which was Support for Professional Practice through Formative Assessment, a government-funded programme. Cowen (2009:78) found that Post Graduate Diploma in Education (PGDE) students were not proficient in the implementation of formative assessment. This was possibly because the PGDE is one-year programme, often immediately following the completion of a degree, so that students graduating with the diploma had little first-hand experience of schools. Interestingly, many students from both the PGDE and the Bachelor of Education (BED 4) said that they intended to continue using formative assessments in their induction year, but significantly more BED 4 students stated this as their firm intention.

The aim of formative assessment is to promote teaching and learning and to meet students' needs through social interaction. Clark (2010:343) argued that formative assessment is a process based on high-quality interaction between the teacher and the learners and, crucially, between peers, in the collaborative zone of proximal development (ZPD) – and 'not between the student and a software programme'.

In Queensland middle school classrooms, assessment for learning was seen as a pedagogical practice that teachers could choose to use as part of quality teaching and learning, with the purpose of helping students improve and become self-regulated learners. According to Will (2010:6), one of the findings in the Queensland study was that learners learn through social interaction; the more advanced learners who display expertise in the process of learning support those who are struggling and, in the process, they learn from helping other learners. Clark (2010:344) attests that 'in the formative assessment classroom, students are building their understanding of new concepts and working together to assess the quality of their own peers' work against well-defined criteria'.

It is evident that formative assessment is promoted in the eight countries listed above. The researcher in the current study was interested in how much theoretical knowledge is applied by Post Graduate Certificate in Education (PGCE) teachers in terms of promoting formative assessment. In a study by Bertram, Mthiyane and Mukderezi (2012:9), participants revealed that they changed their practice by learning about learning theories, assessment procedures, methods of teaching and classroom management strategies. Assessment competencies are basic competencies, according to the policy on the Minimum Requirements for Teacher Education Qualifications, (2015:62), which states, 'Newly qualified teachers must be able to assess learners in reliable and varied ways, as well as to be able to use the results of assessment to improve teaching and learning.' This study, therefore, sought to investigate Post Graduate Certificate in Education (PGCE) pre-service teachers' experiences with implementing formative assessment in classrooms during practice teaching.

1.2 Context

This study was located in a comprehensive university in northern KwaZulu-Natal. The university has a Faculty of Education, which trains pre-service teachers, in-service teachers and post-graduate teachers. In all pre-service teacher education programmes in South Africa, assessment content is delivered as part of general pedagogy and is compulsory for all students in teacher education programmes.

Practicum experiences have been found to positively affect pre-service teachers' practices and help identify professional development needs (Heck, Willis, Simon, Grainger & Smith, 2020). In South Africa, the policy on the Minimum Requirements for Teacher Education Qualifications (MRTEQ), 2015:53) stipulates that 'newly qualified teachers must be able to use the results of assessment to improve teaching and learning'. The study therefore focuses on Postgraduate Certificate in Education (PGCE) pre-service teachers and their formative assessment experiences.

To develop a comprehensive understanding of the formative assessment process, the researcher included pre-service teachers' voices. Sach (2013:274) is of the view that to bring about real and lasting improvements to children's learning, teachers' voices are highly relevant and need to be heard. Duckor (2014:28) argued that formative assessment topped the list of the most influential practices that improve student outcomes. Research suggests that using a diverse array of formative assessment methods is critical to promoting student success (Black & Wiliam, 1998). Duckor (2014:28) notes that we do not always know which practices are most effective, when to deploy them, and why a particular combination works for a particular student in a particular classroom.

The PGCE is offered full time over one year or part time over two years after a bachelor's degree or equivalent diploma. Both qualifications are pitched at Level 7 of the National Qualifications Framework of the Higher Education Sub-Framework (DHET, 2015). The PGCE is one-year Postgraduate Certificate in Education certificate comprising 120 credits. It is made up of core modules, subject specialisation modules and practice teaching modules. The participants in this study attended practice teaching on Wednesdays, two weeks' of observation classes, and six weeks of practice teaching. Full-time students have eight weeks of practice teaching, supervised by a university lecturer. Each student teacher in the study was assigned two subject mentors, one per subject, who provided support during practice teaching. Larkin (2013) argued that mentors are expected to assume the roles of guiding, supervising, counselling, overseeing, modelling, supporting, critiquing and instructing.

1.3 The problem statement

Studies in initial teacher education (ITE) show that curriculum design does not always support pre-service teachers (PSTs) in terms of their acquisition of knowledge and practical skills development (Grainger, 2014; Oo, 2020). According to Hoardley(2018) teachers enact pedagogy with evident low levels of specialised knowledge, Thus, teachers may be an obstruction in the process of knowledge becoming pedagogic communication. Sibanda(2016) studied what PGCE preservice teachers expect from and also bring to a formal teaching program to understand the nature and extent of subject content knowledge part time PGCE students bring to classroom, who were referred

to as " unprofessionally qualified". The study stresses concern of the reduced duration of the PGCE program and aim at answering question of the kind of professional knowledge that PGCE part time claim they bring to the program and also what they expect to gain more knowledge on through the university based program. Teacher training institutions are responsible to equip graduates with the relevant curriculum philosophies. However, a PGCE graduate is one that has had the opportunity to study school related theory in the discipline and not focused towards grooming the student to become a teacher but a professional of the registered course thus PGCE now focuses mostly on channeling the previously studied theory into the spectrum of school, classroom, curriculum and education holistically. Mathabela(2021:104) findings revealed that PGCE preservice teachers felt the need for enhancements in the program that is at least a two year program divided into practice and theory in order to be proficient in teaching. Nkambule and Mukeredzi(2017:6) maintain that student teachers can often plan, teach and assess work in honest and professional ways through guidance support and rigorous practices from their universities and placement schools. Pre-service teachers often struggle with formative assessment; they tend to consider students' knowledge in terms of correct or incorrect, with consequences in terms of how they respond to their students' thinking (Sabel, Forbes & Zangori, 2015). Kwatubana and Bosch(2019) findings revealed that PGCE preservice teachers were unanimous about the value of practice teaching in enabling them to test the theory learned at university. Some were positive about the benefits, others indicated that they gained awareness of the difference between theory and practice and that not all theories were applicable to all situations. Mathabela (2021:96) revealed that PGCE preservice teachers are undermined by the B.Ed. preservice teachers and in-service teachers, and they were not afforded the opportunity to teach, and they were discouraged by the teachers to teach. They believe that they won't be able to teach because they did a 1-year course. PGCE preservice teachers asserted that they face discrimination because they were somewhat lacking in terms of pedagogical knowledge as compared to Bachelor of Education. Formative assessment is supposed to go further than this; it is purpose is not just to ascertain whether pupils know subject content, but to assist students to learn the content and apply it (Wu & Jessop, 2018). A study conducted by Mjåtveit and Giska (2020) on the implementation of formative assessment by pre-service teachers in Physical Education classrooms revealed that there is little evidence of feedback given by the PSTs to students that stimulated learning and promoted students' understanding and participation. 'Teachers need to be skilled and knowledgeable in formative assessment practices before they enter their profession so that they can decide which assessment strategies are best used to improve student learning' (Oo, Alonzo & Davison, 2021).

Initial teacher education (ITE) needs to ensure that pre-service teachers have an adequate 'assessment for learning' literacy and that they have provided students with the opportunity to

critique existing assessment knowledge and skills (Oo, Alanzo & Davison 2021:3). 'Building PSTs capacity for assessment decision-making before entering the profession is crucial in ITE' (Alonzo et al, 2021). Teacher education programmes play a vital role in developing the teachers' assessment literacy. During a teacher education programme, pre-service teachers are exposed explicitly and implicitly to different conceptions of assessment, the teacher educator teaching methods, course work, and practical experiences (Kothai & Rajendran, 2020). Knowing how to plan and implement formative assessment is crucial for teachers and preservice teachers. Hbaci (2015) states that 'assessment is one of the pre-service teacher's concerns'.

In teacher education programmes, pre-service teachers' conceptions of how to conduct assessments change after they have completed the assessment component of their studies (Smith, Hill, Cowie & Gilmore, 2014). During the practicum, pre-service teachers are found to benefit from their agentic engagement with others, and opportunities for critical thinking and reflection (Yuan & Lee, 2014). Popham (2011:269) appeals for proper training in assessment strategies in teacher education programmes, resting his argument on the conviction that 'assessment literacy consists of an individual's understanding of the fundamental assessment concepts and procedures deemed likely to influence educational decisions'. Professional training and development are particularly valuable for both in-service and pre-service teachers (DeLuca, Chapman-Chin & Klinger (2019).

Teacher education programmes need to train pre-service teachers to increase their awareness of the significance of formative assessment and the capabilities of planning and implementing formative assessment in their classrooms efficiently. Therefore, how pre-service teacher education programmes train pre-service teachers on formative assessment needs to be investigated (Can & Haser, 2019:3). Building upon previous research on teacher education programmes is required in order to equip pre-service teachers with contemporary knowledge about assessment and to optimise opportunities to promote their assessment literacy (Levy- Vered & Alhija, 2018). Smith, Hill, Cowie and Gilmore (2014) found that during a teacher education programme, the New Zealand pre-service teachers' views shifted from assessment as primarily summative to the view that assessment supports learning and informed teaching.

Teacher education programmes have started to prepare teacher candidates to use assessment for multiple purposes. More teachers are now being trained to engage with the complex nature of classroom assessment and to be capable of analysing such practices in the light of assessment principles, purposes and philosophies (Eyers, 2014; Smith et al., 2014). Assessment plays a vital role in the educational process. It is also helpful for policymakers, stakeholders and educationists for proper implementation of the curriculum in any education system (Jogan, 2019:549).

Taylor (2021:4) captures the nature of the problem by stating that 'the problem regarding assessment for learning remains. Teachers are unable to effectively exercise formative assessment as an integral part of everyday pedagogical practice'. Cumming and Wyatt (2009) concur, stating that research studies indicate that teachers feel inadequately prepared for the task of formative assessment. Some educational researchers have advocated for a greater emphasis on developing not only in-service teachers' assessment literacy but also pre-service teacher's assessment literacy, particularly with formative assessment practices (DeLuca & Johnson, 2017). Research has shown that prior to hands-on experiences with classroom assessment, many pre-service teachers commonly hold the view that summative assessment is equated with administering tests, which in turn are used to assign grades (Graham, 2005).

Formative assessment has been on policy agendas internationally for decades, but implementation has proven to be challenging (Birenbaum, DeLuca, Heritage, Klenowski, Looney, Smith, Timperley, Volante & Wyatt-Smith (2015:118). McGlamery and Shillinstad (2017:11) identified that the assessment of student learning is challenging for all educators. Differing conceptualisations of formative assessment have led to a wide variety of practices, and it is unclear which factors facilitate or hinder its implementation (Heitink, Van der Kleij, Veldkamp & Skhildkamp, 2015:51). Many studies have shown that formative assessment implementation is still practised unevenly and is still a challenge which warrants further research. Izci (2016:2541) found that although teachers may know about the notion of formative assessment and its strategies, they do not practise formative assessment in their own classrooms. There is thus a gap between the theory and the practice of formative assessment, and teachers are the most important stakeholder in closing this gap.

Studies reviewed by Quyen and Khairan (2017:165) on the implementation of formative assessment reveal that teachers did not understand the concept of formative assessment or how to implement it. Siegel and Wissehr (2009) attest that many studies support the finding that while pre-service teachers know about a variety of assessments, they are not incorporating them into practice during practice teaching. According to Miranda and Hermann (2015:80), their 17 years of experience in teaching and providing professional development programmes to both pre-service and in-service teachers revealed that although most teachers are familiar with formative assessment strategies, many have questions about how to use these to modify instruction in real time, and have difficulty envisioning how to integrate formative assessment continuously into their classroom instruction. Dell and Dell (2016: 22) observe, 'Teachers generally use some types of formative assessment strategies, but the implementation of their practice is uneven.' Sabel, Forbes and Zangori

(2015:436) contend that future studies should investigate how pre-service teachers learn how to employ formative assessment practices in the classroom, particularly in terms of instructional 'next steps' in response to their analysis of students' thinking. Limited pre-service assessment education that is theory-laden, disconnected from teachers' daily assessment practices, and potentially misaligned to current educational assessment standards has been identified as contributing to these low literacy levels (De Luca & Klinger, 2010). The study aimed to understand Post Graduate Certificate in Education (PGCE) preservice teachers' experiences with and implementation of formative assessment in classrooms during practice teaching.

1.4 Research questions:

The main research question is: What are the experiences of Post Graduate Certificate in Education (PGCE) preservice teachers in the implementation of formative assessment during practice teaching? The research sub-questions are as follows:

1.4.1 How do Post Graduate Certificate in Education (PGCE) teachers conceptualise formative assessment during teaching practice?

1.4.2 To what extent do PGCE pre-service teachers integrate formative assessment into teaching and learning during teaching practice?

1.4.3 To what extent do PGCE pre-service teachers integrate formative assessment during practice teaching?

1.4.4 How do PGCE pre-service teachers implement different types of formative assessment strategies during teaching practice?

1.5 The objectives of the study

The aim of the study is to investigate the experiences of PGCE preservice teachers' implementation of formative assessment and to design a model of preservice teachers in understanding how formative assessment should be implemented. The study sought to achieve the following objectives:

1.5.1 To determine Post Graduate Certificate in Education (PGCE) pre-service teachers' conceptualisations of formative assessment during teaching practice;

1.5.2 To explore pre-service teachers' experiences with the implementation of formative assessment during practice teaching;

1.5.3 To establish the extent to which PGCE pre-service teachers integrate formative assessment during practice teaching;

1.5.4 To investigate how pre-service teachers, implement different types of formative assessment strategies during practice teaching.

1.6 Significance of the study

Assessment is an integral part of teaching and should therefore be included in teacher education as a central set of skills to be learned (Kyttala, Bjon, Rantamaki, Narhi & Arob, 2021). In South Africa, within initial teacher education programmes, little is known about the experiences of PGCE preservice teachers on the implementation of formative assessment strategies. This study sought to understand pre-service teachers' understanding of formative assessment and to develop an in-depth understanding of how pre-service teachers implement formative assessment strategies during practice teaching. South African curriculum and assessment policies promote both summative and formative assessment (Department of Education (DBE), Republic of South Africa, 2011). There has been an increase in teacher education programmes that train pre-service teachers' on the use of formative assessment during teaching (Macken et al, 2020). Yet research reveals that pre-service teachers still struggle with formative assessment and in some pre-service training, pre-service teachers are not exposed to the different forms of assessment (Siegel et al, 2011). Govender (2019) and Kanjee (2020) both observe that formative assessment is seldom practised in classrooms. The study findings may assist higher education and basic education curriculum developers, policymakers and other stakeholders involved in curriculum planning and development to revise their policies and improve the curriculum so that pre-service teachers and in-service teachers can effectively integrate formative assessment practices into their teaching practices. Brunker, Spangagou and Grice (2019) are of the view that 'pre-service teachers (PSTs) learn through assessment how to utilise assessment processes in their practice'.

Given the problematised perceptions of formative assessment in research, understanding how PGCE pre-service teachers implement formative assessment during practice teaching is crucial to ongoing development. Such research will expand knowledge on the extent to which teachers implement this important component of classroom practice. Chung (2008 found that teacher candidates valued the opportunity to assess well. Research has revealed that when used correctly, formative assessment can positively impact student learning (Black &William, 1998). The study is therefore significant in terms of its aim since there are limited studies on pre-service teachers and formative assessment implementation during practice teaching.

Initial teacher education programmes need to ensure that pre-service teachers have an adequate knowledge of formative assessment in practice and that they have provided student teachers with the opportunities to observe and practise it. Oo, Alonzo and Davidson (2021) state that building PST capacity for assessment decision-making before they enter the profession is crucial in ITE. Practicum experiences have been found to have a positive effect on PST practices and help to identify professional development needs; however, only a handful of studies have investigated the assessment practices of PSTs in their practicum (Heck, Willis, Simon, Grainger & Smith, 2020).

Xu and Brown (2016) point out that pre-service teachers need to have enough practice to apply and evaluate their conceptions of assessment. Investigation is needed into how teacher education programmes can produce high-quality teachers who are capable of connecting theory and practice (Darling-Hammond, 2006). The

Findings from this study may fill a significant gap in the literature on how pre-service teachers' assessment knowledge gained in initial teacher education programmes is sustained when they transition to full-time classroom teaching in South African schools. The findings may inform teacher educators, subject advisors, principals and higher education policymakers on how to strengthen the assessment practices of pre-service teachers through policy improvement. For teachers, an awareness of the value of formative assessment may entail a major shift in their perception of their role – from that of teacher who assesses mainly for summative purposes, to that of teacher who assesses for formative purposes. There is a critical difference between the two approaches. Developing pre-service teachers' formative assessment implementation is crucial. The research may also inform future assessment policies which still need to be developed to guide pre-service teachers as they enter new territory.

The Department of Basic Education has promoted a formative assessment policy for several years (Republic of South Africa (RSA), 2011). In the wake of Covid-19, the Department of Basic Education reinforced the shift from summative assessment to formative assessment practices. The South African Assessment Policy stipulates that formative assessment is crucial to improve learning BDE, (RSA, 2011). In South Africa, little research has been conducted on pre-service teachers' formative assessment implementation during practice teaching. Mitten (2020) believes that to better understand how to prepare teachers to use formative assessment, a trajectory describing how teachers develop formative assessment knowledge and practice is needed.

1.7 Definition of terms

1.7.1. Formative assessment

Formative Assessment is a planned, ongoing process used by all student teachers and teachers during learning and teaching to elicit and use evidence of learners' learning to improve student understanding of intended disciplinary learning outcomes, and support students to become more self-directed learners (Formative Assessment for Students and Teachers (FAST), 2017:1). In this study, the term is used interchangeably with 'assessment for learning'.

1.7.2. Assessment for learning

Assessment for learning is part of everyday practice by students, teachers and peers who seek, reflects upon and respond to information from dialogue, demonstrations and observations in ways that enhance on-going learning (Klenowiski, 2009:264).

1.7.3. Post Graduate Certificate in Education (PGCE)

Post Graduate Certificate in Education (PGCE) is a one-year qualification to train graduates who wish to become school teachers (Policy on the Minimum Requirements for Teacher Education Qualification, 2015:3).

1.7.4. Teaching Practice

Teaching practice is described as a period when student teachers spend teaching at placement schools as part of their training. Onovo and Aniako (2022) described teaching practice as a form of work-integrated learning (WIL) that is defined as a period when students are working in the relevant industry to receive specific in-service training in order to apply theory to practice. In the context of this study, teaching practice refere to a period in which B.Ed. and PGCE preservice teachers are placed in schools to conduct their teaching practice.

1.7.5. Experiences

Experiences refers to experiences as things that presents themselves to people directly with ideas, opinions, feelings, and meanings. The study's experiences refer to the PGCE preservice teachers experiences in the implementation of formative assessment strategies.

1.7.6. Pre-service

Pre-service teachers are the people for whom practicum is constructed, through which they gain experience in the practicalities of teaching in schools (Lawson, Cakmak, Gunduz & Busher, 2015:393).

1.7.7. Practice teachers

Practice teachers is a collective term for the pre-service teachers who are undergoing on the-job-training and are expected to cooperate and learn about classroom teaching and learning process from cooperating teachers or supervising instructors (Lindstrom, Losstrom & Londen, 2022).

1.7.8. Mentor Teachers

Mentor Teachers are experienced teachers who assist, offer guidance, advise and provide counselling services to student teachers during their teaching practice. Jafar, Yaakob, Mutsapa, Yusof and Awang, 2021).

1.7.9. Supervisor

Supervisor refer to a supervisor as an experienced teacher who is responsible for assessing and evaluating student teachers during teaching practice Ode, IIoakasia and Maduka (2020:6).

1.8 Overview of the Research Design and Methodology

This section provides a preliminary overview of the research design. A more detailed discussion of the research design and the choice of methodology is presented in chapter 3.

1.8.1 Research Approach

In this research study, a mixed method approach was followed to collect needed data in order to answer the research questions of the study to fulfil the aim of the study. Johnson and Christensen (2014:488) defined this approach as "research that involves the nixing of quantitative and qualitative methods or other paradigm characteristics". The study conducted the mixed method approach to overcome the weakness of using a single approach as well as to strengthen the advantages by constructing on the outcomes from the first approach. This means that the collected results from the PGCE preservice teachers experiences from the questionnaire furthermore, the results were used to develop the questions of the interview guide with the focus group which may helped in achieving the accurate results of the study. Fraenkel, Wallen and Hynu(2015) confirmed that the explanatory sequential design utilizes the qualitative results to improve and enlarge the data gained from the qualitative method.

1.8.2 Research Paradigm

Paradigms are general viewpoints or ideologies Perera (2018). Research paradigms are a set of common beliefs and agreements shared by scientists on how problems can be understood and address Perera (2018). Pragmatism embraces both quantitative and qualitative designs, hence it underpins the mixed method philosophical paradigm Creswell and Creswell (2018). The rationale of using pragmatism was to have a thorough understanding of the phenomena under study due to the flexibility inherent in the paradigm to choose the methods, techniques, and procedure appropriate to the needs and purpose of the research Creswell and Creswell (2018).

1.8.3 Research Design

In the current study, the explanatory sequential mixed methods design was used. A sequential explanatory mixed methods design was adopted to undertake as it was the best fit to answer the proposed research questions and draw a broader conclusion of findings. This PGCE preservice teachers study commenced with a quantitative phase and was followed by a qualitative phase. This design starts with quantitative research and continues with qualitative research and the main goal is to conduct an in-depth analysis and elaboration of the data collected with quantitative research Creswell and Plano Clark (2014).

1.8.4 Population

The population was drawn from PGCE preservice teachers' cohort who were willing to participate in this study after acquiring approval from the university research office to conduct this study. A total of 452 PGCE preservice teachers consented to be part of the sampling procedure. This study was open to all PGCE preservice teachers to ensure everyone had a chance to participate in the research.

1.8.5 Sampling Method

The participants in this study were drawn from one of the campuses of one South African university after acquiring approval from the university research office to study the Experiences of PGCE preservice teachers in the implementation of formative assessment during practice teaching. During the quantitative phase of the study the researcher employ systematic random sampling. During the second phase of the study purposive sampling was employed using the following selection criteria: Registered PGCE full-time, registered for two methodology subject and a teaching practice module, had completed home-based and university organised practice teaching as well as weekly Wednesday practice teaching in neighbouring schools as arranged by the university except when schools are closed and there is academic recess and examinations. The invitation letter informing the potential participants of the particulars of the study, its duration, activities, location, and the amount of time that would be required was distributed to the PGCE preservice teacher by the researcher and the assistant researcher who was not part of the study. For the qualitative part of the study, a purposive sampling strategy was used to recruit the participants. Participants for this study signed the consent from to participate in the study.

1.8.6 Research Site

The study was conducted in the Faculty of Education at one South African University in the province of KwaZulu-Natal.

1.8.7 Data collection methods

According to Flick (2018:2018:18(, data collection refers to the selection and production of linguistic or visual material used to study and comprehend phenomena, social contexts and individual and group experiences. The quantitative data were collected by the researcher after the practice teaching through the questionnaire for the first phase. The researcher conducted focus group discussion and reviewed documents to gather qualitative data for the second phase. Hence, the qualitative method is subordinate to the quantitative approach in this design. The 99 respondents' answers to a questionnaire on a five-point Likert scale which were used to collect data because Likert -scale questionnaires are useful in generating response frequencies suitable to statistical treatment analysis. The collection of the data collection tool lasted for 60 minutes. The five- point Likert scale consists of 15 items and five open ended questions on formative assessment experiences was administered.

To collect qualitative data in the second phase interview guide and documents analysis methods were used. Flick (2018) argues that data collection is used to discover and describe issues in the field and procedures. A semi -structured interview guide and rubric for lesson plan evaluation was used to collect qualitative data. The interview was collected through focus group discussions of 13 PGCE preservice teachers who attended practice teaching and completed eight weeks of practice teaching. Billups (2021:3) describes document analysis as a systematic procedure for assessing and evaluating documents to elicit meaning and gain knowledge. Furthermore, Billups (2021) states that document analysis contains data that the researcher must interpret within the context of the study's focus. The researcher analysed PGCE preservice teachers' lesson planning and Annual Teaching Planning (ATP) to ensure that their planning was aligning with the prescribed curriculum. The focus group discussion elicited PGCE preservice teachers experience regarding how they experience formative assessment implementation during teaching practice. A document analysis of 12 PGCE teachers was also analysed after the focus group discussion. A lesson plan was analysed using a rubric to assess the objectives, content formative assessment activities which are key aspects to consider when writing a lesson plan. What was analysed is whether lesson objectives aligned with content prescribed in the curriculum, the activities asking questions to ensure learners understanding since through formative assessment tasks with feedback, learners can check their understanding, address gaps in their knowledge.

1.8.8 Data analysis

According to Ghosh (2017:2) data analysis is a process of applying analytical practices to arrange, evaluate, assess, present and interpret data.

The data analysis method, proposed by Braun and Clarke (2019) was employed to analyse data. The researcher followed the six steps of analysing data, namely: familiarisation with data, generating codes, constructing themes, defining themes and writing a report. Recordings of the focus group discussion were transcribed verbatim and coded before analysis. The two sets of data to analyse in qualitative phase was from focus group discussion and document analysis of lesson plans. Initially the researcher became familiar with the data through reading and re-reading transcripts and identifying meanings and patterns. This process led to the generation of initial codes. Constant re-reading, comparing codes and analysis enabled the researcher to collate codes into broad set of themes. The themes were subsequently reviewed alongside the collated extracts from interviews to ensure they were accurate representation of the data set as a whole. Once this process had concluded, themes were defined and given a descriptor.

1.8.9 Maintaining validity and reliability in quantitative data collection

Reliability and validity refer to the research quality and it must be clear to the reader what has been done throughout the process, and that nothing is kept hidden Kvale and Brinkman (2018:272). In quantitative research, it is important to consider the quality of collected data and instrument which is through validity and reliability. The questionnaire was in English since it is the medium of instruction in this one South African university. The validity and reliability of the questionnaire were assessed through inviting two panel of curriculum and instructional studies department lecturers with at least Doctorate and a minimum of 8 to 10 years of teaching experience in teaching and student assessment to comment on the questionnaire and give feedback. The feedback was valuable, and after minor amendments, the questionnaire was clear and easy to read and understand.

1.8.10 Maintaining credibility and trustworthiness in qualitative research

Trustworthiness is the term used for measuring the quality of research in qualitative research Mishra and Alok (2017). The researcher used four criteria proposed by Lincoln and Guba (1985), namely credibility, transferability, dependability, and confirmability to validate the study.

1.8.11 Maintaining validity and reliability in quantitative research

In quantitative research, it is important to consider the quality of the data collected and instrument or tools which is through validity and reliability Othman, Steen and Fleet (2021). In this study validity and reliability of the questionnaire were assessed using content and face validity it was established by inviting some members of the department of curriculum and instructional studies to comment and give feedback. The feedback was valuable, and after minor amendments, the questionnaire was clear, easy to read and understand.

1.8.12 Ethical considerations

The researcher maintained ethical procedures throughout the study and ensure that participants are afforded the opportunity for confidentiality, anonymity, and choice of terminating participation. Prior to beginning of this study, ethical clearance was issued by UNISA. The researcher sought permission from one South African university from the research office to conduct the study. Consent forms of the participants were secured. The aim of the study was clearly explained to the participants. Confidentiality was assured to participants. All PGCE preservice teachers who participated in qualitative phase agreed to be audio recorded. To protect participants' identities, the researcher used pseudonyms, PSTs A, B, C, D, E, F, G, H, I, J, K, L, M was used to refer to participants when reporting findings. To maintain confidentiality and protect the participants identity, the researcher made sure that no other individuals had access to data and use several safeguards to protect the identity and maintain confidentiality. All hard copy documents provided by a participant were code with a unique number. No individually identifiable information was associated with any of the documents or files. Pseudonyms were used on documents and hard copies of transcripts. Participants were given the freedom to choose to participate or not, without having to fear that non-participation would have negative consequences. Anonymity was guaranteed.

1.9 The division of chapters

This thesis is divided into six chapters, as follows:

Chapter One**:** Background of the study

In this chapter, the background of the study provided an overview of the study. The chapter presented research areas such as the introduction, the background of the research, theoretical framework, significance of the study clarification of the concepts, statement of the problem, objectives of the study, research questions, research methodology, measures of trustworthiness, ethical considerations, division of chapters and definitions of terms.

Chapter Two: Theoretical framework and literature review

The chapter presents the theoretical framework that informed the study. Vygotsky's (1978) theory of social constructivism is the main theoretical framework underpinning the study, while formative assessment theory also makes an important contribution. Chapter Two discusses these two theories in some detail. The second section will explore existing literature on what is already known on how PGCE and preservice teachers implement and experience formative assessment during practice teaching. It also presents and discusses concepts that relate to formative assessment implementation according to a wide range of researchers. PGCE Pre-service and in-service teachers' experiences of

formative assessment are covered, taking into consideration the views of researchers from South Africa, Africa, and the global community.

Chapter Three: Research design methodology

This chapter covers the research methodology in detail. This chapter contains the rationale for empirical research, explaining the explanatory sequential mixed methods approach, the paradigm, sampling procedure, data collection procedure and data analysis. Measures of trustworthiness and ethical consideration that were employed.

Chapter Four: Data Analysis Interpretation

This chapter presents the results of the quantitative and qualitative portions of the study, drawn from responses to questionnaires, a focus group discussion and document analysis. The chapter covers participants' biographical information, focus group discussion and document analysis and interpretation. It begins with descriptive statistical analysis results based on the questionnaire. It also presents the qualitative data obtained from focus group discussions and document analysis. Pre-service teachers' views are quoted verbatim in support of the findings.

Chapter Five: Discussions of findings

This chapter concludes by discussing the findings regarding the pre-service teachers' experience with formative assessment, referring to the findings of the previous chapter and those revealed in the literature reviewed.

Chapter Six: Recommendations, implications, conclusion, and model of teacher knowledge

In this chapter, the researcher proposed a theoretical model for PGCE preservice teachers' practice of formative assessment, considering all that has been investigated and synthesised. The chapter also makes recommendations and draws final conclusions.

1.10 Conclusion

This chapter has provided an overview of the study by outlining the background of the study, the objective of the study, the problem statement, the significance of the study, the research methodology, ethical consideration, definitions of key concepts, and an overview of the rest of the study.

1.11 Chapter Summary

This chapter provided an orientation to the study. It provided the background of why the study was conducted, exploring the PGCE and preservice teachers experiences in the implementation of formative assessment during teaching practice in one South African university. The next chapter presents in detail the contextual and theoretical framework of PGCE preservice teachers formative assessment experiences during teaching practice.

CHAPTER TWO: LITERATURE REVIEW ON PRESERVICE TEACHERS AND THEORETICAL FRAMEWORKS

2.1 Introduction

The previous chapter provided the background to the topic, in which a gap in the literature was revealed which the current study aimed to close. It described the study background, rationale, problem statement, objectives, research questions, location and gave a brief overview of the PGCE preservice teachers teaching experiences. Chapter Two is a broad review of the literature on PGCE pre-service teachers' formative assessment implementation during practice teaching. The chapter discusses the history of formative assessment, formative assessment implementation by PGCE pre-service teachers, formative assessment by South African teachers, and the current practices of formative assessment by pre-service teachers.

Teacher education programmes have transformed in recent years to improve teacher education quality, which often experiences a gap between theory and practice (Matsumoto-Royo & Ramirez-Montoya, 2021). Some programmes have increased opportunities for pre-service teachers to gain practical experience and learn essential pedagogical skills through school fieldwork, besides on-campus learning (Darling, Stansberry & Xiu, 2020). Matsumoto-Royo and Ramirez-Montya (2021) are of the view that 'it is necessary to have more detailed, updated research on core practices of teaching and assessment of pre-service teachers. Research posits that developing classroom practices such as formative assessment takes time and professional support (Heredia, 2002; Dunn & Mulvenon, 2009). Many teachers struggle to enact effective classroom formative assessment precisely and in a coherent manner (Ateh, 2015). DeLuca and Chapman-Chin (2019) concur that learning to both teach and implement formative assessment takes time and requires a great deal of support. Abell and Siegel (2011) believe that formative assessment, as part of the teaching process, must be changed to offer more support to learning, a point with which Shepard (2000) concurs.

Studies have shown that changing teachers' traditional conceptions of assessment is hard. Even if teachers understand the benefits of contemporary assessment practices, they generally choose to use traditional assessment practices during their instruction (Heritage, 2007). Research has shown that pre-service teacher education, in particular, is the cornerstone of changing teachers' traditional conceptions of classroom assessment (Siegel & Wissehr, 2011). Without practice in a real classroom with real students, pre-service teachers are likely to repeat more traditional, unexamined assessment practices (Graham, 2005:619). Practicum experiences are central to pre-service teachers' teacher programmes worldwide and ideally represent the component that unites university learning with practical learning in the field (Dann & Dann, 2018). The study was conducted in the period

immediately after the pre-service teachers had completed practice teaching so that they could share their experiences on how they had implemented formative assessment during this time.

Musa and Islam (2020) state that many countries now practise formative assessment for learners, with some having achieved extraordinary results. They further state that in Bangladesh, formative assessment is a new concept; summative assessment is the dominant method of assessment. Pre-service teachers who understood the principles of assessment for learning and wanted to implement ongoing formative assessment experienced tensions with supervising teachers who wanted to retain high control of the practicum. As a result, most preservice teachers could not use assessment strategies effectively to inform their decisions about learning and teaching activities. In their study, Oo, Alonzo and Davidson (2021) found that those pre-service teachers who were allowed greater autonomy during their practicum and understood assessment for learning strategies had greater freedom to experiment, which allowed them multiple opportunities to apply the results of assessment activities to improve both their own teaching and students' learning. A study carried out by Lee (2013) reported that after receiving one year of training in writing assessments, pre-service teachers' conceptions of assessment changed, reflecting their assessment practice rather than theory only.

An experimental study was conducted in Indonesia by Prasetya (2018), who investigated preservice teachers' assessment literacy by interviewing student teachers conducting teaching practice in school. The finding shows that participants received more administrative test tasks than guidance on designing assessments. Nkambule (2017) states that teaching practice is the most challenging experience for preservice teachers in teacher education. PGCE preservice teachers enter the programme with limited teaching experience and theoretical education grounding. Concerns have been raised regarding PGCE preservice teacher quality and low quality of teaching and learning in schools associated with poor teacher education Sosibo and Nomlomo (2014). Given the short duration and lower credit value of PGCE programme compared to its B.Ed. counterpart the researcher is of the view that PGCE might not provide students with rigour to prepare them adequately to acquire, integrate and confidently apply formative assessment strategies in classrooms during practice teaching. Dias-Lacy and Guirguis (2017) reports that some of the challenges that graduate teachers are face with in the workplace that they feel unprepared for include work overload, lack of support from teachers, lack of support from administration, discipline challenges, curriculum challenges, work and family demands, time management and lack of set routines.

Practicum experiences have been found to have a positive effect on pre-service teachers' practices and help to identify professional development needs (Heck, Wills, Simon, Grainger & Smith, 2020). However, only a handful of studies have investigated the assessment practices of pre-service teachers in their practicum. Xu and Brown (2016) highlight that pre-service teachers need to have enough practice to be able to apply and evaluate their conceptions of assessment, but in their review of studies on teacher assessment literacy from 1985 to 2015, they found fewer than 20 studies addressing the understanding and development of teacher assessment literacy in practice. The work of Black and Wiliam (1998b) and Hattie (2008) highlights that preparing teachers to be literate in assessment, particularly formative assessment, has the highest potential to increase students' outcomes.

2.2 Theoretical framework: Social constructivism

This study is underpinned by the theory of social constructivism posited by Lev Vygotsky (1978). Palit (2020:9) states, 'It is called social constructivism because he emphasised the critical importance of culture as well as language development and the importance of the social context for socio-cultural development.' Stobart (2008:151) is of the view that 'the learning theory approach which underpins assessment for learning is probably best described as social constructivism. It seems that formative assessment practices have a good fit with constructivist learning theories.
Social Constructivism and Formative Assessment

The following five paragraphs highlight the conceptual link between formative passement & Social constructivism is a theoretical approach to teaching and learning which understands social constructivism. Knowledge in social constructivism is culturally situated, and learning takes place through social construction (Ginga & Zakariya, 2020). Silalahi, Zainal and Sagala (2021) expand on this observation by stating that a person builds his own knowledge by connecting his past knowledge with new knowledge. Knowledge connection occurs when a person interacts with other people to exchange and confirm understanding, so that new knowledge is a combination of social, cultural-historical and individual aspects. The influence of all of these forces is key to developing proficiency in society. In the school setting, the exchange of knowledge between students allows them to evaluate and improve their own understanding so that new and holistic knowledge is gradually constructed. According to Sardareh and Saad (2012) formative assessment practices have a relationship with constructivist learning theories particularly with the role of social interaction in knowledge construction. Social constructivists acknowledge the importance of social interaction and more knowledgeable peers in shaping learners' experiences. According to social constructivists, teachers mediate students' learning through assessment. Teachers have a chance to use classroom

activities as an assessment tool that enabled learners to achieve outcomes. The findings in a study by Sardareh and Saad (2012) reveals that teachers believed that learning is active and not passive. The basic tenets of the socio-cultural approach are Learners construct their own knowledge, participate in authentic activities and internalise the tools of practices; learners are reflective beings; they can think and reflect on their lived experiences; and social interaction or dialogue plays a crucial role in learning (Shah, 2019). Silalahi, Zainal and Sagala (2021:241) state that in the social constructivist paradigm, students are central in the learning process and that for any real learning to take place, students must be actively engaged. Social constructivism acknowledges that learners possess a rich source of prior knowledge that they bring to the learning situation through collaboratively interacting with fellow learners in a dialogic learning environment. Learners learn from one another through interaction, in which they actively construct and assimilate new knowledge and skills that are meaningful and useful in their own lives (Warnich & Lubbe, 2019). Social constructivism views students as active learners, not as mere listeners and absorbers of information in the classroom; therefore, the process of adding, mastering and developing knowledge is based on students' learning activities.

Social constructivism considers assessment as an ongoing and continual process that is necessarily formative in nature. It stresses the role of social interaction and collaboration in the classroom, in which learners receive feedback from their teachers and peers that facilitates, monitors and powerfully drives the learning process, thus raising learner achievement. Formative feedback processes that are supportive and motivating will help learners to progress to the next step in their learning (Saedareh & Saad, 2012). Students reflect on their activities through formative assessment, creating their own new understandings, with the teacher mediating by providing students with an opportunity to ask questions and experience new things (Sardareh & Saad, 2012). Any attempt to understand formative assessment must, therefore, be based on a constructivist perspective of learning (Staunto & Dann, 2016). Social constructivists acknowledge the importance of social interaction and more knowledgeable peers in shaping learners' experiences. According to social constructivists, teachers mediate students' learning through assessment (Sardareh & Saad, 2012:344). Constructivist assessment instruments include activities such as problem-solving, portfolios of work, projects, compositions, performances, drama, interviews, group discussions and investigations (Malaysia, 2018). In a constructivist classroom, teachers use authentic assessment practices such as role play and drama, concept maps, reflective journals, portfolios and debates. These assessment strategies help and support the teachers in monitoring students' knowledge construction, assisting them to apply their new understanding in real-life situations (Sardareh et al, 2012).

2.2.1 Social constructivism principles

Palit (2020) noted the following principles of social constructivism:

a) Social interaction

Social interaction is one of the major aspects of Vygotsky's theoretical framework, playing a fundamental developmental role in cognition. According to Vygotsky (1978), mention that the thinking in terms of how he is socialised through culture and function in two levels namely on social and individual and how he interacts with significant others and how he interacts within his inner being. This is in line with internal and external aspects in the learning and social environment.

b) The Zone of Proximal Development (ZPD)

Vygotsky (1978:86) defines the zone of proximal development (ZPD) as 'the distance between the actual developmental level and the potential developmental level, as determined through problem-solving under adult guidance or in collaboration with more capable peers.'

The concept of the ZPD rests on two principles:

- Meaningful learning takes place only when teaching offers ideas and information that are beyond what is currently known and understood, but are within reach of existing knowledge and understanding. In other words, new work needs to challenge the learner, but only within their zone of proximal development – if new knowledge is too advanced, it will be beyond the abilities of the learner and learning will not take place.
- Although they may have the same starting points, learners differ in how far they can reach beyond their existing knowledge and understanding to learn new material.

  Teaching targeted at a learner's ZPD can bring further learning, so it is useful for a teacher to know about each learner's ZPD in a social context (Palit, 2020).

c) Assisted learning and scaffolding

'Scaffolding means support for learning and problem-solving. This is the principle of setting a learner a task that is currently beyond their experience, but within their ZPD, and then providing support, modelling, guidance and hints so that the learner can achieve' (Palit, 2020). Vygotsky (1978) was of the view that what is achieved first on the interpersonal level will become assimilated into the zone of actual development (ZAD), becoming internalised so that it may then be achieved unaided. The teacher's role is to offer support and then gradually withdraw this support as the learner masters the task until the ZDA has shifted, and so has the ZPD around it. According to Wood, Bruner and Ross (1976:98), scaffolding is characterised by the following characteristics:

- recruitment of interest in the task;
- simplifying the task and reducing the degree of freedom;

- maintaining the pursuit of the goal;
- marking critical features and discrepancies between the correct production and what has been produced by the learner;
- frustration control; and
- demonstrating and modelling the ideal solution.

d) Language development

Vygotsky (1978) maintained that language is the primary form of interaction through which adults transmit to the child the rich body of knowledge that can exists in the culture. Social constructivists view knowledge as a social process that is mediated through cultural tools and language. Learning thus involves collaborative problem-solving and participating in communities of practice (Westbook, 2013).

2.2.2 The constructivist approach to teaching

The constructivist approach to teaching involves recognition of learners' experiences and knowledge; teaching is a process in which learners relate their existing understanding, ideas and knowledge to what they come into contact with (Richard, 2003:1624). Vygotsky's social constructivism emphasises social interaction as a tenet of classroom teaching (Amineh & Asl, 2015).

2.2.3 The Vygoskian concept of the constructivist classroom

The following are the essential characteristics of the Vygotskian classroom:

- Learning and development is a social and collaborative activity;
- The zone of proximal development can serve as a guide for lesson planning;
- Learning in school should occur in a meaningful context;
- Out of school experience should occur in a meaningful context.

2.4.4 Social constructivist teaching strategies

Social constructivist teaching strategies involve collaboration between teacher, learner and community. Active, challenging, authentic and multidisciplinary tasks create opportunities to learn, and in the learning process, emphasis is on knowledge construction, not production. The teacher uses scaffolding as an effective form of teaching, and targets both the level of actual and potential development – the zone of actual development (ZAD) and the zone of proximal (ZPD). Tasks set for learners should be authentic and meaningful, requiring problem-based thinking and various modes of communication. Simulation may be used to make learning more meaningful (Palit, 2020). A social constructivist teacher ensures that all students collaborate to construct new understandings. During collaboration, students learn both from themselves and their peers, with the ZPD playing

an important role in peer collaboration. When learners are actively engaged in tasks that fall within their ZPD, scaffolding helps them extend their understanding beyond the zone of actual development to the new developmental level, and thus achieve their learning objectives (Sardareh et al 2012).

Thus, zone of proximal development, context, scaffolding, social interaction and collaborative learning are all essential principles of the social constructivist classroom. Vygotsky's (1978) theory of social constructivism, along with his ZPD model, highlights the significance of the social context in promoting cognitive development, as well as the role of different types of challenging tasks, in which students are able to build their understanding by applying their knowledge (Slavin, 2014). The teacher's role in applying and facilitating formative assessment is to select appropriate tasks that provide effective opportunities for collaborative work between students, to facilitate continuous development (Moos & Brookhart, 2019).

Johar (2005) proposed a model of teaching which has been found to be effective in improving students' learning outcomes. It is based three stages of learning:

- Observation is the stage where initiative and modelling should take place. Learners should strive to imitate the teacher or more capable others by observing and practising the same learning activity.
- In the scaffolding stage, learners strive to learn from more knowledgeable others, who should assist struggling learners.
- In the collaborative learning stage, a group of peers makes every effort to understand each other, so that learning occurs in the process of socially constructing new knowledge through peer-to-peer discussion.

Social constructivist instructional strategies are known for encouraging critical thinking, innovation, knowledge construction and retention, and greater performance (Ginga & Zakariya, 2020:6). Guey, Cheng and Shibata (2010) are of the view that in a constructivist classroom, teachers emphasise active and collaborative learning, rather than isolated learning. These authors show that in the teaching of algebra, the use of a social constructivist teaching strategy is effective and leads to improved performance.

According to Vygotsky (1978), cooperative learning is a pillar for enhancing students' understanding. Learners play an active role in monitoring their progress. They constantly collaborate with their teachers to monitor their current level of achievement about their learning intentions. During the learning process, students actively communicate their learning evidence to their teachers, other students and parents (Sardereh & Saad, 2012:344).

Social constructivist theory emphasises social interaction as an essential aspect of teaching and learning (Vygotsky, 1978:57). Social assessment takes place as a socio-cultural activity that involves social interaction among stakeholders and influences the nature of learning itself. Learning

always occurs in a social context, and is influenced by national and state policies, curriculum teaching strategies, assessment strategies and community expectations.

Teacher assessment knowledge is a complex structure rather than a simple set of sequential skills that may be implemented in any context (Looney, Cumming, Van Der Kleij & Harris, 2017). Knowledge construction is really the central concept in the theory. Vygotsky stresses that knowledge construction has always rested on the social interactions of people, and may be seen when people share, compare and debate ideas – especially when some have more knowledge than others, and may take the role of mentors. Shepard, Penuel and Pellegrino (2018:22) emphasise that all learning is fundamentally social, involving the individual's use of shared language, tools and practices in interaction with their social context. In the classroom, the social environment of learning is accorded centre stage, and learners both refine their own meanings and help others to find meaning. In this way, knowledge is mutually built (Dagar & Yadav, 2016:2)

Formative assessment considers the role of interaction and joint collective action in the learning process. Assessment is not unidirectional, but rather involves both teachers and students in a reciprocal activity to move learning forward within a community of practice (Heritage, 2010). Vygotsky (1978) asserted that knowledge should not be isolated from social and cultural contexts, arguing that all higher mental functions are social in origin and are embedded in the context of a socio-cultural setting. In the social constructivist model, knowledge is constructed through an interaction approach, and the teacher shifts from being the sole dispenser of knowledge to being a motivator, guide and resource person. Constructivism emphasises a learner-centred, learner-directed and collaborative style in the teaching-learning process, in which learning is supported by the teacher, who provides scaffolding and authentic experiences for learning (Dagar & Yadav, 2016:2). Social constructivist teachers should ensure that all students collaborate to construct new understandings. During collaboration, students learn about learning from themselves and their peers (Sardareh & Saad, 2012). Sardareh and Saad (2012:346) revealed that students learn better when teachers ask them to work in groups. They state that teachers should allow students to interact with other students and give feedback on their work so that they know what to do at each stage of an activity.

It is clear, therefore, that Vygotsky viewed learning as a social process in which learners collaborate with others – teachers or peers – who have more knowledge than they do, in order to develop their cognitive structures, which are still in the course of maturing and which are unlikely to fully mature without interaction with others. In this regard, he distinguished between two levels of development: i) the level of actual development that the learner has already reached – the level at which the learner

is capable of solving problems independently and ii) the level of potential achievement or understanding that the learner is capable of reaching under the guidance of teachers or in collaboration with peers.

The zone of proximal development (ZPD) is the area in which learning takes place through the process of scaffolding. Assessment, according to this understanding, is an interactive process in which teachers and peers help learners use their zone of proximal development (ZPD) to progress to the next step in their learning (Sardareh & Saad, 2012). The constructivist view of assessment is that formative assessment of students' learning is of great worth to learners, and that for assessment to support learning, students should be actively engaged in the assessment process (Vygotsky, 1978). Sardareh and Saad (2012) point put that assessment is an integral part of teaching and learning. As stated in the first paragraph of Point 2.2, Stobart (2008:151) was of the view that 'the learning theory approach which underpins assessment for learning is probably best described as social constructivism'. It seems that formative assessment practices have a good fit with constructivist learning theories (Sardareh & Saad, 2012). A certain degree of understanding of these aspects of formative assessment need to be demonstrated by pre-service teachers. A study of their understanding is therefore valuable, as it may inform further research and teacher educators, who will be better equipped to support teachers in demonstrating an adequate understanding of formative assessment.

2.3 Theoretical framework: Formative assessment

William and Thompson (2007) proposed the use of specific formative assessment strategies and techniques for learning and teaching in the classroom. The authors based their work on Ramrasad's (1983) three key processes in learning and teaching: establishing where learners are in their learning and teaching; establishing where they are going; and establishing what needs to be done to get there. William and Thompson (2007) conceptualised effective formative assessment practices as comprising five key strategies for improving learning and teaching.

These are:

- clarifying and sharing learning intentions and success criteria;
- engineering effective classroom discussions, activities and tasks that elicit evidence of learning;
- providing feedback that moves learners forward;
- supporting learners to serve as learning resources for each other; and supporting learners to take greater ownership of learning.

William and Thompson (2007) further clarified that these key aspects of formative assessment are in line with the following formative assessment principles: curriculum philosophy, classroom

discourse, interactive whole-class teaching, feedback, collaborative learning, reciprocal teaching, peer assessment, metacognition, motivation, interest, attribution and self-assessment.

Table 2.1 below summarises the key aspects of formative assessment.

Table 2.1 Aspects of formative assessment

Table 1
Aspects of Formative Assessment

	Where the learner is going	Where the learner is right now	How to get there
Teacher	**1.** clarifying, understanding, and sharing learning intentions and criteria for success	**2.** engineering effective classroom discussions, tasks and activities that elicit evidence of learning	**3.** providing feedback that moves learners forward
Peer	Understanding and sharing learning intentions and criteria for success	**4.** activating students as learning resources for one another	
Student	Understanding learning intentions and criteria for success	**5.** activating students as owners of their own learning	

Note. Adopted from "Developing the Theory of Formative Assessment" by P. Black and D. Wiliam, 2012, in Assessment and Learning p. 209. Copyright 2012 by Sage Publications.

Source: Black & Wiliam (2012)

2.3.1 The history of formative assessment

The term formative assessment has its origins in the field of curriculum evaluation. Michael Scriven (1967) coined the terms 'formative assessment' and 'summative evaluation' in 1967, emphasising their differences both in terms of the information they seek and how that information is used. For Scriven (1971), formative evaluation gathers information to assess the effectiveness of a curriculum and guide school system choices as to which curriculum to adopt and how to improve it. Benjamin Bloom contributed greatly to the theory of assessment, linking the mastery of learning concepts to the term formative and summative evaluation. Bloom, Madaus and Hastings (1971) suggested that to improve school achievements and close the achievement gap, differentiated instruction was needed. Differentiation may be accomplished by conducting ongoing formative assessments to determine learners' levels of understanding and then using that knowledge to guide instruction and target learning gaps, thus enabling learners to learn more effectively. Bloom et al. (1978) further asserted that explicit feedback, with teachers correcting misconceptions and misunderstandings, is important and occurs as a result of ongoing formative assessment.

Black and Wiliam (1998) stated that 'over 30 years of research suggest formative assessment is a vital component, proven to be highly effective in increasing student learning'. Substantial studies have been conducted on formative assessment from different perspectives internationally. In their meta-analysis Black and William(1998b) examined over 250 studies during a nine-year period,

which led them to conclude that formative assessment improves students' learning and achievement.

2.3.2 Definitions of formative assessment

Research has acknowledged the complexity of defining formative assessment, presenting varied definitions and viewpoints for it (Bennet, 2011; Dunn & Mulvenon, 2011). Although definitions vary, there is general consensus among assessment scholars that it is a classroom embedded process that provides teachers and learners with information to support decisions about instructional planning and the regulation of learning behaviours (Cisek, Andrae & Bennet, 2019). Zhao, Heuvel-Panhuisen and Veldhuis (2016:2) define formative assessment as the assessment that teachers continuously do during teaching, figuring out what their learners know and what difficulties they have, and using this knowledge to adapt their instruction to cater for the learners' needs. Bennet (2011:7) suggests that formative assessment should be seen as an amalgamation of both process and instrumentation, describing formative assessment as 'neither a test nor a process, but some thoughtful integration of process and purposefully designed methodology or instrumentation'.

Formative assessment implementation in the classroom can be challenging if teachers are unsure about the nature, purpose and practices associated with it (Kaur, 2021). Researchers such as Black and Wiliam (1998a) and William and Leahy (2007) argued that the term 'formative assessment' should describe practitioners' use of assessment rather than the assessments themselves. Research suggests that formative assessment can improve students' learning (Black & Wiliam, 1998). The concept of formative assessment still does not represent a well-defined set of practices, an issue which might affect its successful implementation in different contexts (Saad, 2013). In some contexts, formative assessment is applied as a label for an assessment instrument or tool (Bennet, 2011). Black and Wiliam (1998) described formative assessment as a process. Kauri (2021) is of the view that defining 'formative' is problematic in the sense that there is no guarantee that the assessment will achieve its intended purpose. A test or resource designed to give formative feedback is only formative if the teacher uses it to provide support and feedback to students (Dunn & Mulvenon, 2009).

In earlier research, a lack of clarity prevailed about what formative assessment is and how it is used (Harlen, 2007). Harlen (2007) explains that when teachers use formative assessment mechanically without a deep understanding of its meaning or purpose, it can have a negative effect. Taras (2007:365) stated that there was a problem with the definition of formative assessment, pointing out that the definitions were multiple and uncoordinated. Wylie and Lyon (2015) acknowledged some confusion around what formative assessment is. In their view, this made it difficult for teachers to embrace formative assessment, and it created barriers for school leaders seeking to

support effective implementation in their school contexts. It is, therefore, crucial to support pre-service teachers to develop a clear conceptual understanding of formative assessment, both in theory and in practice, in order to develop the effective implementation of formative assessments. Formative assessment provides feedback and information during the teaching process, while learning is taking place (Liu, 2015). The definition of formative assessment adopted in this study is based on Black and Wiliam's (2009:7) definition, which states

> "Formative assessment as a practice in a classroom is formative to the extent that evidence about student achievement is elicited, interpreted and used by teachers, learners or their peers to make decisions about the next steps in instruction that are likely to be better, or better founded, than the decisions they would have taken in the absence of the evidence that was elicited".

Remesal (2011:473) attaches the conception to 'instructional practice'. Griffiths, Gore and Ladwig (2006) point out that in many cases, teachers' beliefs affect teaching practices to a greater degree than either their experiences or the socio-economic school context in which they teach. Formative assessment, in its simplest form, is a formative assessment to enhance learning (Wei, 2010:838). According to the National Policy Protocol for Assessment (BDE) (2011:3), formative assessment in South Africa is defined as informal assessment for learning, or daily assessment, for the monitoring and enhancing of learners' progress. This is done through teacher observations and teacher-learner interactions, which either the teacher or learners may initiate. Formative assessment occurs during instruction. It is also called assessment for learning. It is diagnostic as it is used to monitor students' learning as well as identify students' learning difficulties to offer remedial measures where applicable (Amua-Skeyi, 2018).

Formative assessment processes enable students to learn from their mistakes, be more experimental, and develop more desirable higher-order cognitive skills (Okyere, Kuranchie, Larbi & Twene, 2018). Examples of formative assessment procedures are class tests, project work, assignments, presentations and quizzes. Feedback is a vital feature in formative assessment. Providing timely feedback to students enables them to recognise their strengths and weaknesses in learning, and improve on them. Feedback goes beyond providing scores on performance to students, and encompasses striving to understand the thought process underlying their performance (Amua-Skeyi, 2016). After 30 years of assessment for learning, and despite worldwide research on classroom practice, it seems surprising that some researchers believe the general understanding of other researchers is at too early a stage to be theorised.

2.3.3 Features of formative assessment practices

Moss and Brookhart (2009) presented a summary of the features of assessment practices, according to their purpose, recommending that teachers observe all aspects of formative assessment, and, at the same time, highlight the best features in response to the need for change in assessment practices.

Table 2. 2 Features of assessment practices

Table 1. Features of assessment practices.

Formative Assessment (Assessment *for* Learning)	Summative Assessment (Assessment *of* Learning)
Purpose: To improve learning and achievement	**Purpose:** Attainment should be measured or audited.
It is done while you are learning day by day, minute by minute.	Conducted on a regular basis to create snapshots of what has occurred.
Emphasis on the learning process and growth.	Emphasis on the outcomes of learning.
Assumed to be an essential component of the teaching-learning process.	Assumed as a distinct activity, following the teaching-learning cycle.
Collaborative— Teachers and students know where they are going, they are aware of the learning requirements, and they use assessment data as feedback to guide and change their actions to fulfil those requirements.	*Teacher directed*— Teachers give students tasks to do and then assess how well they complete them.
Fluid— A continuous process impacted by student needs and feedback from teachers.	*Rigid*— A constant indicator of the student's accomplishments.
Intentional learners' role is adopted by both teachers and students.	Teachers play the part of auditors, while students play the part of the audited.
Teachers and students utilize the data they collect to make modifications to improve over time.	Teachers use the data to determine if a series of instructional activities is a "success" or a "failure."

Source: Moss and Brookhart (2009).

Source: Moss & Brookhart (2009)

2.3.4 Practices and principles of formative assessment

In examining formative assessment, there is a need to explore related practices and principles. Shavelson, Young, Ayala, Brandon, Furtak and Ruiz-Primo (2008:300) describe three types of formative assessment practices: The first is 'on-the-fly' formative assessment, which is informal and unplanned, occurring spontaneously when there is a teachable moment in the classroom. It involves a variety of formative assessment practices, strategies and approaches infused into a lesson, based on needs identified by the teacher. The second is planned interaction, and comprises a set of deliberate practices, strategies and approaches planned ahead and infused into a lesson. The teacher, therefore, 'plans for and crafts ways to find the gap between what students know and what they need to know'. It is designed to discern and improve students' knowledge acquisition. The third type is formative assessment practices embedded in the curriculum. These are usually ready-to-use planned-out tests and assessments embedded at junctures within a unit where an important sub-goal needs to be reached before students go on to the next lesson or level. The embedded

assessment tells the teacher what students currently know and what they still need to learn; that is, the gap, so that teachers may provide timely feedback (Shavelson et al, 2008:301).

Formative assessment needs to provide teachers with information and feedback, either to be given to the students or to plan for interventions to help them move forward. Embedded assessments also tell the teacher 'what students currently know and what they still need to learn so that teachers can provide timely feedback' (Shalvelson et al, 2008:301). There are thus diverse practices related to formative assessment, depending on the approaches a teacher takes in the classroom (Kaur, 2021). Despite the diversity of formative assessment-related teacher practices, one key principle or strategy reflected both in the definition of formative assessment and in the phases of instruction mentioned above is the notion of feedback, or 'feedback that moves learning forward', according to Black and Wiliam (2018:10). Formative assessment, therefore, needs to provide teachers with information and feedback, which the teacher may either give to the students and then make use of, or simply make use of in planning for intervention to help them move forward.

2.3.5 Types of formative assessment

In the educational setting, assessment may be carried out using different tools, strategies and methods. 'Various formative assessment methods have been suggested in the relevant literature' (Zeng & Huang, 2021:2). In South Africa, formative assessments takes the form of projects, class tests, homework, classwork, and assignments, and is used to give feedback, diagnose learning problems and design groupwork (Kanjee, 2009). However, teachers have generally not adopted the broader meaning of assessment, and in Kanjee's (2009) study there was limited evidence of relevant comments in learners' workbooks that would help them improve their understanding. In an educational context in China, methods such as providing feedback, questioning, portfolio assessment, self-assessment, peer assessment and formative use of summative assessments are commonly used by Chinese English First Additional Language teachers (Wang, 2019). Assessment tools may include observation, anecdotal records, checklist, rating scales and rubrics, conferences and portfolios (Frimpong & Osei, 2021). Informal methods of formative assessment include oral questioning and observing students as they work, including their facial expressions, with oral questioning the most dominant method (Akom, 2010). Formal methods include the use of tests, homework, quizzes and diagnostic tests (Ugoduluwanwa, Ogba & Igu (2021:33). Sezen-Barrie and Kelly (2017) stated that formal formative assessments that are pre-planned, scored or recorded are helpful for understanding students' progress in learning; however, they are of limited use for gathering information about the dynamic social construction of knowledge and students' reasoning and argumentation skills. Classroom activities naturally involve interactions between teachers and students, and between students and fellow students, and a great deal of information about student learning is collected through classroom conversations (Ruiz-Primo, 2007). Teachers' questioning

is also an important attribute of an effective informal formative assessment tool. Sahin and Kulm (2008) investigated types of teacher questions in two sixth-grade teachers' videotaped maths lessons, and found that the majority of questions were factual in nature. They also found that the teachers used similar types of questions over different lessons, meaning that there was no evidence of different questioning patterns used for different subjects. Franke, Webb, Chan, Freund and Battery (2009) found that while pre-service teachers (PSTs) asked initial questions to elicit students' understanding and ideas, they struggled to follow up on answers given.

Observation is an informal assessment technique of watching students in order to identify strengths and weaknesses, patterns of behaviour, and cognitive strategies. Choosing assessment strategies requires that teachers consider the range of classroom situations that students will experience. Liu (2015) mentioned the following types of formative assessments:

- observations during in-class activities of students' non-verbal feedback;
- homework exercises as review for exams and class discussions;
- reflection journals that are reviewed periodically during the semester;
- question and answer sessions, both formal and planned and informal and spontaneous;
- conferences between the teacher and students at various points in the semester;
- in-class activities where students informally present their results; having learners periodically answer questions about the instruction; learners' self-evaluation of performance and progress.

Sezen-Barrie and Kelly (2017) emphasised the importance of informal formative assessment as a form of classroom conversation. Informal formative assessments integrated into ordinary instructional activities can be used by teachers to assess students' understanding each time students participate in classroom conversations (Sezen-Barren & Kelly, 2017). Many studies support the value of conversational interaction-based informal formative assessments in supporting students' learning and suggest that questioning is the most common strategy for engaging students in the process (Chin, 2006; Cobb, Boufi, McClain & Whitenack, 1997). During an informal formative assessment such as an interactive classroom conversation, teachers explore students' ideas and use questions to scaffold their ideas to help them construct normative knowledge (Chin, 2006). In teacher education, formative assessment is emphasised as an important strategy to teach pre-service teachers; however, informal formative evaluations may not always be well illuminated in teacher education programmes. This study therefore explores to what extent informal formative assessment as a form of classroom conversation occurs in pre-service teachers' (PSTs) classrooms in order to provide insight to teacher educators regarding PSTs' informal formative assessment practices.

When teachers' informal formative assessment practices are well developed, their instruction methods and content will continuously adapt to meet student learning goals during their lessons (Furtak & Ruiz, 2007).

2.3.6 Factors influencing formative assessment implementation

Although the benefits of formative assessment for teaching and learning are well documented, it is not an easy task for teachers to implement (Black and Wiliam, 1998). Research has found that the actual adoption of formative assessment in classrooms is less than satisfactory (Berry, 2010; Yan & Brown, 2021). Outside the school context, external policies, that is, government educational policies, influence teachers' intentions to implement formative assessment. Policy level initiatives such as assessment or curriculum reforms promoted by the government are a powerful factor in the lives of teachers (Lorente-Catalan & Kirk, 2016; MacPhail, 2018). Should governments officials promote formative assessment, teachers may well find a sense of legitimacy in learning about it and then become more willing to implement it. Furthermore, educational policies supporting formative assessment would encourage schools to provide relevant professional development, which, in turn, would enhance teachers' intentions to implement formative assessments. In a study by Tang, Cheng and So (2006) teachers reported that they became motivated to implement formative assessment when they were supported by the government and their schools. DeLucaChapman-Chin and Klinger (2019) stated that purposeful training assisted teachers to become comfortable with implementing formative assessment in the classroom. When teachers had sufficient training and/or supportive measures, they were more confident to take action. DeLuca et al (2019) also point out that teachers became more comfortable with formative assessment when they participate in a continuous professional learning community and have guidance from knowledgeable experts. Hamodi Lopez-Pastors and Lopez-Pastors (2017) reported that pre-service teachers' early exposure to formative assessment practices may lead to a positive attitude towards it. They stated that there was a need to provide teachers with appropriate education or professional training pertinent to formative assessment. Dixon and Haig's (2009) study found that professional development programmes improved teachers' knowledge about formative assessment and influenced their perceptions regarding the difficulty and effectiveness of formative assessment by expert supported inquiry learning. Their findings suggest that a narrow understanding of the use of formative assessment prevailed among teachers. So, and Lee (2011) concurred that it is possible to optimise teachers' perceptions and understanding of formative assessment by expert supported inquiry learning and that a lack of understanding of formative assessment limited teachers' creativity when applying this tool in their classrooms. In Crichton and McDaid's (2016) study, teachers' lack of confidence and support in performing formative assessments had a negative impact on their inclination to implement it. School leadership plays a vital role in enhancing teachers'

intentions to implement. When school leaders are aware of the importance of formative assessment and know how to support teachers, a positive community of formative assessment uses may be built (Yan, Panadero, Yang & Lao, 2021; Moss, Brookhart & Long, 2013). Brink and Bartz's (2017) study reveals that some school administrators have made formative assessment a priority, and have provided effective technical support, continuous professional development, and other necessary resources for curriculum change. This support resulted in teachers' attitude changes and an inclination to implement formative assessment. The success of formative assessment in classrooms also depends on personal and contextual factors related to teachers' beliefs, attitudes, knowledge and skills (Yan, 2014). Teachers with higher self-efficacy are likelier to carry out formative assessments than those who lack self-efficacy (Yan & Cheng, 2015). A lack of confidence will invariable result in a lower level of implementation of formative assessment (Crichton & McDaid, 2016). Kiggundu and Nayimuli (2009) conducted a study teaching practice: a make or break phase for student teachers focused particularly in teachers who obtained their teaching qualification through the PGCE program. The findings of the study reported that most graduates felt that the PGCE program was very beneficial. However, students still felt like most important aspect of this program was the teaching practice, which provides them the opportunity to be exposed to the experience of real teaching, where they were able to apply contextual knowledge and theory that was provided to them by university lecturers. Du Plessis (2010) conducted a study which focused on the views of University of South Africa (UNISA) distance learning education who enrolled for the PGCE and have completed the teaching their practice. The study focused on exploring the views of student teachers on how UNISA prepared them for teaching practice, the context of teaching practice and mentoring they will be receiving and how they were assessed. The study concluded that student teachers felt like they needed more clarity on the expectations of the qualification from them because they battled with lesson planning, assessment criteria, lesson conten and integrating this with practical examples.

2.4 PGCE and Pre-service teachers' policies and assessment training in initial teacher education

Teacher training institutions are responsible to equip graduates with relevant curriculum and assessment philosophies however, a PGCE graduate is one that has had the opportunity to study school related theory in the discipline of the previous qualification which was unrelated and not focused towards grooming the student to become a teacher but a professional of the registered course thus PGCE now focuses mostly on channelling the previously studied theory into the spectrum of school, classroom, curriculum and education holistically. Assessment is an additional demand upon the initial teacher education (ITE) curriculum. Preservice teachers (PSTs) learn through assessment how to use assessment processes in their own practice (Brunker, Pandagou & Grice, 2019). Ngibe,

Plyman and Adu (2019) found that PGCE preservice teachers struggled to teach in overcrowded classrooms consisting of 40+ learners, something which in the South African context, which leds to some mentees even lost their self-control. A theory-practice gap was evident, while mentees were exposed to constructivist learner centred-approaches, some teachers still taught in the traditional way. Atienza, Valentia-Peris and Lopez-Pastor (2022) examine the 42 pre-service teachers' diaries during their primary and secondary education training and their experiences and perception on didactics the findings revealed that preservice teachers did not experience formative assessment and shared assessment during their compulsory education. However, after experiencing the methods in the subject, students perceive formative assessment and shared assessment very positively and they expressed the intention to apply formative assessment in their future professional practice. Historically, assessment has been an isolated and relatively neglected discipline within teacher education programmes (Xu & Brown, 2016). However, there have been calls for reform in this regard in international contexts. MRTEQ (2015) framework was instituted in order to standardised national curriculum in South Africa. MRTEQ framework is research driven, seeks to improve graduate attributes of student teachers so that they are thoroughly prepared by the time they credentialed teachers. Regarding the PGCE programme, the MRTEQ policy requires students to have an in-depth and focused or specialised knowledge and practical skills that should enable them to apply it in schools in varying context (DHET, 2015).

According to the revised policy on the Minimum Requirements for Teacher Education Qualifications (MRTEQ) (Department of Higher Education and Training, 2015) all newly qualified teachers should know who their learners are and how they learn, understand their individual needs and tailor their teaching accordingly, be able to assess learners in reliable and varied ways; as well as be able to use the results of assessment to improve teaching and learning, and be able to reflect critically on their practice, in theoretically informed ways and in conjunction with their professional community of colleagues, in order to constantly improve and adapt to evolving circumstances. Despite the central role of formative assessment advocated in policy documents, Govender (2019) and Kanjee (2020) both found that teachers have limited knowledge and experience in the effective use of assessments for improving learning and teaching. Schnackenberg (2014) are of the view that pre-service teacher preparation programmes have long struggled with the best way to prepare future teachers with the skills, information and professionalism they need to become effective teachers. Over the years, a variety of approaches and programme designs have been created and implemented as 'the one'. However, no specific curriculum design has emerged as the single best way to prepare future teachers. In the study by Izci and Caliskan (2017), the concept of assessment for learning was integrated into their teacher education program as mandated by Turkey's Ministry of National Education.

In South Africa, the Minimum Requirements for Teacher Education Qualifications (MRTEQ) policy (Department of Higher Education and Training (DHET), 2015:11) governs teacher education. The policy states that 'teaching is a complex activity that is premised upon acquisition, integration and application of different types of knowledge practices. MRTEQ presents three benefits of work-integrated learning: First, it enables pre-service teachers to accumulate concrete classroom experiences. The policy declares that time spent in the workplace is very important and specifies how much time prospective teachers need to spend in school-based placement during initial teacher education programmes. Second, work-integrated learning (WIL) provides pre-service teachers with opportunities to engage in practical learning, regarded by the policy as an important condition for the development of tacit knowledge, which itself is an important component of learning in order to teach in the DHET (2015:10). Pre-service teachers are required to accumulate experiences of preparing, teaching and reflecting on their own lessons. Third, WIL is valued because it contributes to pre-service teachers' situational learning. The policy stresses the importance of exposing pre-service teachers to 'varied and contrasting contexts of schooling in South Africa' (DHET, 2015:18). MRTEQ sets up policy conditions that will provide preservice teachers with the knowledge base they require, and suggests that the 'fusing together of different kinds of knowledge' should happen during teaching practice (DHET, 2015:9).

2.5 Empirical studies on formative assessment by pre-service and PGCE preservice teachers

Concerns have been raised regarding low poor quality of teaching and learning in schools usually associated with poor teacher education (Sosibo and Nomlomo, 2014). The national policy framework and development in South Africa provides a clearer context on what is required for one to obtain the teaching qualification through the Post Graduate Certificate in Education (PGCE)route. It outlines the requirements, the aims and purpose of the PGCE qualification. The Minimum Requirements for Teacher Education Qualification policy (Gazette 34467) stipulates that the minimum admission requirement into PGCE is an appropriate diploma or bachelor's degree. An appropriate diploma or degree should include sufficient disciplinary learning in appropriate academic fields to enable the development of teaching specialization or subject as specified for each school phase. Given the short duration and lower credit value of Post Graduate Certificate in Education (PGCE) programme compared to its Bachelor of Education, the researcher from the findings also wanted to do research on PGCE experiences on how they implement formative assessment during teaching practice. Bachelor of Education is a four -year degree, the Post Graduate Certificate in Education (PGCE) is offered full-time and part-time. One year full-time and two years part-time. On the other hand, PGCE students are expected to spend an average of 10 weeks in schools during their time in training. Typically, B.Ed. students spend an average of 21 weeks in

schools across the four- year period of study Minimum Requirements for Teacher Education Qualifications (Department of Higher Education and Training, 2015). Very few studies have been undertaken to investigate the PGCE preservice teachers' formative assessment strategies during teaching practice. The policy describes competent teachers based on the following: teachers should be individuals who are specialist in a particular learning area, subject phase, a specialist in teaching and learning who is able to assess and be a curriculum developer. The teacher should be able to act as a leader, an administrator, a manager, a scholar, lifelong learner and a professional who is able to play role of a community member, a citizen and also take up a pastoral role. This policy framework acknowledges that the initial professional education is mainly the responsibility of higher education institutions however it notes that the programs that are constructed to train teachers by higher education institutions should be developed around seven roles that are documented in the norms and standards for educators (2002).

Coombs, DeLuca and MacGregor (2020) studied pre-service teachers' approaches to assessment in Canada and grouped participants using latent class analysis. They found that the largest class of teachers endorsed contemporary assessment approaches, such as assessment as learning and tailoring assessment to meet the individual needs of learners; however, the extent to which findings from this study may be generalised to teachers throughout Canada is limited because pre-service teachers are likely to hold idealist conceptions of assessment (Daniels & Poth, 2017). Bokoe, Eshun and Bordoh (2013) used interviews and classroom observation to investigate the formative assessment techniques that College of Education Social Studies tutors employed to assess teacher-trainees in the central region of Ghana. The findings revealed that the major assessment methods used were portfolio assessments and self-assessment. Furthermore, the study indicated that because of the rushed way in which teachers devised formative assessment and scoring, there was an over-concentration on the cognitive domain of learning, and far too little emphasis on the psychomotor and affective domains. Mathabela (2021:102) found that PGCE affirmed that practical learning played a significant role in preparing them to become good teachers. The study further revealed that PGCE preservice teachers value reflection the most and it helps in creation of lesson objectives and ensuring that they are all met. Karp and Wood (2008) found that pre-service physical education teachers indicated a willingness to conduct alternative assessments, but the researchers found that a discrepancy existed between assessment beliefs and practices, since teachers lacked experience with alternative assessments. In practice, they implemented alternative assessments far less than they planned to.

Izci and Caliskan (2017), employing an action research method, explored the influence of participating in an assessment course. The results revealed that teachers' participation in the course

secured an in-depth knowledge of assessment and improved both student and school accountability. DeLuca, Chavez and Cao (2013) and Smith, Hill, Cowie and Gilmore (2014) revealed that pre-service teachers' assessment improved after they had received regular professional assessment training. Al-Noah, Taqi and Abdul-Kareem (2014) found that professional teacher development programmes played a crucial role in enhancing practising teachers' knowledge and skills of assessing. Matovu and Zubairi (2014) found that assessment related training influences teachers' assessment practices. On the other hand, studies by Brown and Hirschfield (2008), Levy-Vered and Alhija (2015) and Vadar (2010) showed that attendance of assessment training courses did not necessarily enhance teachers' conceptions.

DeLuca and Klinger (2010) found that primary pre-service teachers who engaged in a module on assessment were significantly more confident in their assessment knowledge than those who elected not to complete the module. Pre-service teachers who were engaged in an assessment module for each year of their four-year programme consistently recorded how the level of confidence in relation to assessment increased each year (Volante & Fazio, 2007). Cowan (2009) found that formal assessment courses coupled with classroom practicum placements supported pre-service teachers' development of formative approaches to assessment. In a related study, Smith, Hill, Cowie and Gilmore (2014) compared the assessment beliefs of first- and third-year pre-service teachers across four teacher education programmes. Their findings showed that pre-service teachers' beliefs shifted from primarily supporting summative to primarily supporting formative assessment conceptualisations by the end of the programme. Beziat and Coleman (2015) found no significant change in the assessment literacy of primary pre-service teachers who had engaged in a classroom assessment module. These results are in marked contrast to those of DeLuca and Klinger (2010) referred to above. Research also highlights how the provision of courses directly relating to assessment in initial teacher education (ITE) programmes resulted in greater assessment literacy among pre-service teachers than among in-service teachers (Alkharusi, Kazeem & Al-Musawai (2011). The authors stated that the teaching of formative assessment approach must be coupled with experiences in authentic classroom settings for optimum gains to be achieved.

Hamodi, Lopez-Pastor and Lopez-Pastor (2017) argued that pre-service teachers' early experiences with formative assessment are likely to result in their use of it in their future teaching careers. In general, relevant education and training is an important facilitator of teachers' implementation of formative assessment (Yan, Panadero, Yang & Lao, 2021). Osman (2021) revealed that learners taught by teachers who had undergone training in assessment only during their pre-service training had the highest mean values for class tests, essay-type questions, oral questions, homework, class exercises, and performance assessments; those whose teachers had undergone assessment training

both pre-service and in-service had the highest mean scores in objective assessment, oral presentations, individual project work, group project work and portfolio assessment. Standard deviations for each subgroup indicated that the high variability in responses was associated with portfolio assessment among learners whose teachers had undergone both pre-service and in-service training. The least variation in responses was associated with class exercises in the group whose teachers had undergone only the pre-service training. Thus, results of the study showed a significant difference between teachers who had undergone assessment training both pre- and in service and teachers who had undergone assessment training only pre-service. The difference was especially apparent in the results of learners' homework, group project work and portfolios. Ciu (2021) found that pre-service teachers could implement formative assessment strategies appropriately. Hung (2008) found that teacher candidates valued the opportunity to practise assessment of K-12 learners' learning through the completion of a performance assessment. Some researchers in education have advocated for a greater emphasis on developing not only in-service teachers' but also pre-service teachers' assessment literacy, particularly with formative assessment practices (DeLuca & Johnson, 2017). Research has shown that prior to hands-on experiences with classroom assessment, PSTs commonly hold views of assessment that are largely skewed in favour of summative assessment, equated with the administering of tests, which in turn are used to assign grades (Graham, 2005). Alkharusi et al (2011) conducted research that suggests that there is value in connecting course content with field-based experience to maximise pre-service teachers' understanding of the assessment of student learning. Pre-service teachers at the University of South Africa (UNISA) have one to two courses in which the primary focus is on teaching assessment literacy.

Alkharusi, Aldhafri, Alnabhani and Alkalbani (2012) also found that teachers were lacking in assessment literacy knowledge despite having positive attitudes about assessment and showing relatively high levels of competence in assessment. DeLuca and Bellara (2013) examined a possible misalignment of pre-service teachers' programmes to standards as a contributing factor to low assessment competency among teachers. Gedye (2015:44) stated that formative assessment is one of the 'most important mechanisms for improving student learning'. Formative assessment is for learning promotion, and is centred around students and academic improvement.

William (2006:284) affirms that an assessment of a student is formative only if it shapes that student's learning. Assessments are formative, therefore, if and only if something is contingent upon their outcome and the information is actually used to alter what would have happened in the absence of this information. Wiliam (2006:285) stated that formative assessment has a crucial role to play if data drawn from it is interpreted in terms of learning needs and used to adjust meet the needs of students. Students must benefit through the process for it to be formative. This may involve

questioning students so that struggling students benefit through listening to feedback. Ruiz-Primo and Furtak (2006) attest that 'the use of formative assessment practices within classrooms has been shown to lead to significant student learning gains in science'. Research indicates that the process of monitoring student learning and modifying instruction are difficult for many novice teachers.

Otero (2006:249) argued that a beginning teacher needs to know not just a set of theories about student learning and various useful teaching practices, but also how to integrate a specific learning theory into a specific teaching practice to facilitate conceptual development among students. She further attests that 'a theory of learning must be embedded in a teacher's understanding of formative assessment'. The findings in a study by Volante and Fazio (2007:759) suggest that teacher programmes did not provide a deep understanding of various approaches to classroom assessment and evaluation. These authors concluded by stating:

> There is a need for mentoring of pre-service teachers during practice teaching, where mentors model appropriate classroom assessment and evaluation skills. A number of teacher candidates noted this lack of appropriate mentorship within field settings. Being in a classroom where the teacher includes you when she/he assesses the students is important. It should be imperative that the student teacher is part of the assessment process of the children in the classroom.

This poses a challenge for in-service teachers, since some may not have been exposed to the theories and philosophies of assessment. In a study by Kuze and Shamba (2011), it was evident that in-service teachers were found wanting about formative assessment. It appears that where they did implement it, they were not aware that they were doing so.

There is a need to increase knowledge and understanding of formative assessment techniques in teacher preparation programmes (Bennett & Cunningham, 2014: 990). It becomes evident from the literature that teacher educators need to teach students formative assessment, as 'improving classroom assessment practices has proven to be challenging' (Bennett & Cunningham, 2014:99). Bennett and Cunningham (2014) attest that formative assessment is given little attention in classrooms. They further state that formative assessment in and of itself is a form of action research, noting that the practice of formative assessment is generally done in the learning environment by student teachers, since it is a natural component of action research (Bennet & Cunningham, 2014:100).

Formative classroom assessment is conducted during teaching so that teachers understand how far learners meet the lesson objectives. It also informs and guides teachers on how they can assist learners to reach the desired learning objectives (Brookhart, Moss & Long, 2014:41). Klenowski (2009:2014) defined assessment for learning (i.e. formative assessment) as 'part of everyday practice by students, teachers and peers that seeks, reflects upon and responds to information from

dialogue, demonstration and observation in ways that enhance ongoing learning'. The current research is informed by the social constructivist theory of teaching and learning. Moeed (2015:184) confirms that assessment for teaching and learning is underpinned by a social constructivist theory of learning.

Heritage (2007:141) defined formative assessment as 'a systematic process to continuously gather evidence about learning'. In formative assessment, the gathered information is used to identify a learner's current level of learning and to adapt lessons to help the learner reach the desired learning goals. For the purpose of this study, the formative assessment definition and the theoretical framework used align with the social constructivist theory. It is envisaged that learners will construct understanding during formative assessment practices with the help, support and mentorship of experienced teachers. Heritage (2007:141) further supports this idea in stating that in formative assessment, 'students are active participants with their teachers, sharing learning goals and understanding how their learning is progressing, what next steps they need to take, and how to take them'. It would appear than in practice, formative assessment has different meanings for different teachers. A study by Frohbieter, Greenwald and Schwartz (2011:2) states 'despite the widespread enthusiasm for expanding formative assessment, there is still much uncertainty about this strategy'. It appears that formative assessment practices differ from school to school. This study responds to the call for increased research in the area of formative assessment practices by PGCE pre-service teachers and their experiences with the implementation of formative assessment during practice teaching. Chappuis and Chappius (2008:1) attest that definitions of formative assessment abound, resulting in multiple and sometimes conflicting understandings. Chappius and Chappuis (2008:2) defined formative assessment as an ongoing dynamic process that involves far more than frequent testing and measurement of student learning. They confirm, as others authors have done, that it occurs during the instructional process.

The multiple understandings of formative assessment and the varied applications of its principles are problematic, giving rise to tension between effective pedagogical approaches and testing for accountability (Black, Harison, Hodgen, Marshall & Serret, 2010; McAdie & Dwason, 2006). Clark (2011:166) makes the point that the essence of formative assessment does not reside in an agreed-upon definition but in the principled application of formative practice to the specific learning interactions taking place in the classroom. The current study attempts to investigates how PGCE student teachers have applied these principles and how they conceptualise formative assessment. The pre-service teachers relate their own stories about their experiences, and elucidate on their ideas about what formative assessment is and ought to be. 'Many teachers feel inadequately prepared in regards to assessment and feel that they need assistance in implementing various classroom

assessments and in making assessment-related decisions' (Bennett & Cunningham, 2014:99). Bennett and Cunningham (2014:99) go on to maintain that 'a need exists to increase knowledge and understanding of formative assessment techniques in teacher preparation programmes. In practice, much may depend on the context of the classroom, and the unique set of learners and various other contextual factors. Mitchell (2006:190) attests that formative assessment presents a challenge to educators in all sectors of initial teacher education (ITE) courses, stating, 'In Scotland there is a formal introduction of formative assessment which needs to be implemented.' Mitchel (2006:188) supported the call for further research into formative assessment practices. The current study is cognisant of the fact that the postgraduate teachers investigated may well have copied practices from teacher educators whose examples of formative assessment may not align with the principles as revealed by the literature.

The rationale for this investigation is further supported by Chun (2006:3), who stated that 'teachers generally accept the concept of formative assessment, but they have difficulties putting it into regular practice'. Teachers' challenges are large classes and curriculum changes. 'When formative assessment is used within the classrooms, teachers may vary in their application of the same performance criteria, either among themselves or with different students or classes' (Chun, 2006:4). Brookhart, Moss and Long (2010:42) attest that 'creating a good formative learning environment is not a simple matter'. Formative assessment, if used effectively, can provide teachers and their students with the information they need to move learning forward (Heritage, 2007:140). Pre-service teachers need to learn much about how to implement formative assessment during teaching and how to adapt teaching for the benefit of students. Data gathered from formative assessment practice needs to be used effectively, with teachers needing to make a concerted effort to identify a learners' current level of learning and thereafter to adapt lessons to help the learners reach the desired learning goal. Brookhart, Moss and Long (2010:41) further attest that 'formative classroom assessment is an assessment conducted during instruction to give teachers and students a clear idea of how students' performance levels compare with the learning target (learning goals or objectives), and how they might close the gap between their current level of understanding and the target'. During their studies, PGCE pre-service teachers are expected to engage in practice teaching and reflect on their practices. Popham (2011:270) stated that teacher educators are expected to identify and recognise assessment literacy as second in importance to teaching proficiency. The PGCE pre-service teachers in this study were expected to connect theory and practice, with the investigation seeking to understand the extent to which they did so. Popham (2011:270) attests that nowadays, teacher educators need to be aware of the need to prioritise assessment literacy. This affirms the importance of formative assessment, and the problem that Bennet and Cunningham (2014) and Popham (2011) raise – which is that it is not sufficiently prioritised. Popham (2011:270) goes so

far as to state that teacher educators are ‘guilty’ of sending pre-teachers out to practise teaching without the expected level of assessment proficiency. During professional preparation, PGCE student teachers are supposed to have learnt about assessment practices and their implementation. Thus, their experiences are an area of interest for the researcher, in terms of how much they understand about formative assessment, and whether they do in fact integrate it into their lessons.

Chun (2006:3) raised the issue that implementing formative assessment is particularly difficult with learners who are considered more challenging. The problem may be one of lack of experience, and of teacher educators’ over reliance on theory. In this regard, Allen and Wright (2013:137) state that teacher educators are in danger of preparing teachers who know much about theory and little about practice. Linking carefully constructed practicum experiences with on-campus courses has been highlighted as one of the most powerful and effective ways of supporting student-teacher learning (Darling Hammond, 2006). Regarding the PGCE programme, the MRTEQ policy requires students to have an in-depth and focused or specialised knowledge and practical skills that should enable them to apply it in schools in varying contexts(DHET, 2015).

Teacher educators play a crucial role in training pre-service teachers. They prepare pre-service teachers to teach by developing their knowledge of teaching (Trumbull & Fluet, 2008), as well as shaping their beliefs and practices. Young and Jackman (2014: 409) attest that trained teachers fail to practice formative assessment more frequently than untrained teachers do, suggesting that there may be a need more effective education or development programmes to meet the needs of teachers in lower secondary schools. Pre-service teachers' experiences with the implementation of formative assessment, as investigated in the current study, have implications for classroom practices in South Africa, and improvements in learners’ learning. Kanjee (2013:466), attested that teachers in South Africa struggled to meet the demands of the assessment policy and to effectively use assessment for improving learning in the classroom. They further indicated that this challenge has to be effectively addressed if South Africa is to maintain quality education for all learners. Popham (2011:268) stated that although assessment literacy is a critical component of training, teachers are not expected to know every assessment-related aspect; however, they should understand the concepts and procedures that have an influence on education decision In Canadian teacher preparation, findings by Volante, Drake and Beckett (2010), as cited in Clark (2015:920), attest that ‘faculties do not teach courses on assessment and evaluation, rather assessment is embedded into teachable subject areas; therefore, the assessment content is not properly infused and is often neglected in teachable subject courses. Pre-service teachers in the Postgraduate Certificate in Education are trained to be able to implement formative assessment. However, they still need practice in implementing it, and what remains unknown is how long they take to master it, to what

extent that practise it, and how they do so. The need to understand this aspect forms part of the rationale for the current study.

Professional development in any career usually takes place when the learner is placed in a work-based environment. Teaching is complex, and teacher trainees need several years to be professionally developed after university. As stated under paragraph 1.1 student teachers are expected to be proficient assessors, according to the Minimum Requirements for Teacher Education Qualifications (MRTEQ) (2015:53), which states, 'Newly qualified teachers must be able to assess learners in reliable and varied ways, as well as to use the results of assessment to improve teaching and learning.' PGCE student teachers are not expected to know everything about assessment-related concepts, but they are expected to display a level of proficiency in formative assessment. In South Africa study of PGCE preservice teachers and the implementation of formative assessment during practice teaching was conducted by Khumalo and Maphalala (2018) found that preservice teachers can provide feedback to learners during practice teaching. Similar findings of Atenza, Valencia and Pastor (2022) also indicate that university students value formative and shared assessment because it permits continual feedback. They further found that university students said formative feedback favours reflective and meaningful learning.

2.6 International perspective on formative assessment practices

Many countries practise formative assessment in schools, with some reporting extraordinary results (Musa & Islam, 2020). Educators uses this form of assessment to measure the effectiveness of learning in the classroom, and to gain information on the competencies of the learners, in order to adjust teaching and enhance learners' learning outcomes (Khizar, Daud & Asad, 2021). Teachers' experiences and strategies are crucial for the implementation of formative assessment in the learning process, and continuous teacher training programmes have a significant influence on its implementation (Widiastuti, 2020). However, teachers have different perception of formative assessment (Khizar, Daud & Asad, 2021:709).

Johnson, Sondergeld and Walton (2019), whose study was located in the United States found that teachers' theoretical perceptions of formative assessment do not have much effect on their use of it in the English classroom. They also found that new teachers do not view formative assessment more favourably than experienced teachers so. In Turkey, teachers have a positive perception of formative assessment, but there is a similar lack of impact in terms of their assessment preferences (Onalan, 2018). In the Netherlands, Heitink, Van der Kleij, Veldkamp, Schidkamp and Kippers (2016) conducted a systematic review of the prerequisites for the successful implementation of assessment for learning (formative assessment) in classrooms. They particularly emphasised that students play a pivotal role in assessment for learning. Heitink et al. (2016) identified four critical

aspects for successful implementation: the teacher, the learner, the assessment and the context. With regard to the teacher, the two prerequisites were teacher knowledge and skills, and teacher beliefs and attitudes. Knowledge and skills refer to those necessary for the teacher to effectively collect, analyse and interpret assessment data and adjust subsequent instruction. Beliefs and attitudes refer to the philosophy underlying their teaching practice and the degree of constructivism in their understanding of learning and pedagogy.

A United States study by Liu, Johnson and Fan (2016) examined teachers' formative assessment practices across three educational districts, revealing that teachers tended to implement questioning and learning tasks effectively but needed support in sharing learning criteria, providing individual feedback during lessons, and fostering collaboration. Teachers' reliance on questioning and implementing learning tasks, coupled with the lack of peer and self-assessment, supported previous findings that teachers in the US tend to employ formative assessment as a teacher centred strategy. In Canada, research done by Volante and Beckett (2011) revealed that teachers recognised the importance of making students active participants in assessment processes. Daniels, Poth and Hutchison (2014), examining how pre-service teachers conceptualise the purpose of classroom assessment, supported the observation that teachers in Canada are increasingly adopting the stance that assessment improves learning. Research investigating pre-service teachers' conceptions of assessment found that pre-service teachers in the province of Alberta have more positive conceptions of assessment (such as assessment improves learning and assessment improves teaching) than negative conceptions (such as assessment is ignored and assessment is bad). Black and Wiliam (1998:141) were early researchers in the field, and posited that improved formative assessment helps low achievers more than other students, and so reduces the range of achievement while raising achievement overall.

The benefits of formative assessment as evidenced in research studies have made it an important agenda in educational reform across the globe (Birenbaum et al, 2015). Professional training and development are, therefore, particularly important for both in-service and preservice teachers (DeLuca et al, 2019). Hamodi et al. (2017) reported that pre-service teachers' early exposure to formative assessment practices led to a positive attitude towards it and facilitated participants' implementation of it later as teachers. These results imply the need to provide teachers with appropriate education or professional training pertinent to formative assessment. DeLuca et al. (2019) advocated purposeful training in the practice of it, stating that teachers need to be comfortable with implementing formative assessment in classrooms. These authors found that when teachers had sufficient training or supportive measures, they were more confident to take

action. In contrast, as reported in Crichton and McDaid's (2016) study, teachers' lack of confidence and support in performing formative assessments had a negative impact on their inclination to implement it. In China, various methods of formative assessment have been suggested, including the provision of feedback, questioning, portfolio assessment, self-assessment, peer assessment and formative use of summative tests that are commonly used by Chinese English teachers (Wang, 2017). However, Brown and Gao (2015) found that Chinese teachers were strongly influenced by their belief in the important role of summative assessments, which limited their willingness to implement formative assessments. Similarly, teachers in Wong's (2014) study favoured achievement-oriented assessments more than other forms of assessment and, therefore, were reluctant to conduct formative assessments. So and Lee (2011) reported on the possibilities of optimising teachers' perceptions and understanding of formative assessment through expert supported inquiry learning.

Dixon and Haig's (2009) study found that professional development programmes improved teachers' knowledge about formative assessment and influenced their perceptions regarding the difficulty and effectiveness of implementing it. Dixon and Haig (2009) also found that teachers' involvement in projects enhanced their understanding of formative assessment and their confidence in practising it, which, in turn, increased their willingness to implement formative assessments.
Iczi (2016) identified four categories of factors that influenced teacher's willingness to use it: personal, contextual, resource-related and external factors. In Greece, Nikou and Economies (2019) also found that, within the context of technology-enhanced teaching, teachers' perceived ease of using technology influenced their intention to adopt mobile-based formative assessment.
Clark (2015:93) was of the view that there are certain conditions that need to be met in order for formative assessment to be successful. These are:

- dedicated political support at all levels of the government;
- a clear and compelling expression of the conceptual framework which underpins the formative curriculum;
- close collaboration between teachers, administrators, parents/caregivers, learners and the wider community, who understand their roles in working together to engage students in the process of their own learning;
- practitioners' approach to and management of curricular transformation, which should ensure that obstacles are perceived as constructive and necessary challenges;
- the integration of summative and formative assessment activities into functional systems so that they work in concert to support and evaluate learning.

Clark (2015:93) further proposed, 'When such conditions exist, a "formative curriculum" ensures that all young people meet the high standards of achievement, including attainment, needed, for life

and work.' Clarke' (2015) preconditions for success contribute to a framework for understanding how different countries use formative assessment and promote its use. Mitchell (2007:187) explains that in Scotland, policymakers introduced an initiative called 'Assessment is for Learning' in order to promote formative assessment practices. This initiative extended its influence across Scotland, where teachers were encouraged to adopt and adapt formative assessment practices to enhance the learning of pupils aged three to eighteen. The promotion of formative assessment in Scotland from an early age indicates that current preservice teachers in that country are likely to be familiar with the concept and support it during teaching practice.

According to Crossouard (2011:63), Scotland advocates strongly for formative assessment by engaging teachers in the implementation of formative assessment practices. Crossouard (2011:63) attests that Scotland has built upon the King's-Medway-Oxfordshire Formative Assessment Project, and has given strong policy endorsement to formative assessment in all grades. The vision of Scotland's government makes assessment continuous and integral to pedagogic discourse and classroom interactions. Self-assessment and peer assessment are encouraged. In Scotland, teachers have an influence on nation-wide practices in the classroom by being centrally involved in advisory subject reference groups, through which they have opportunities to work in their implementation as field officers and moderators.

Lampert (2009:27) defined practice as 'the doing of something repeatedly or continuously by way of study, exercise in my any art, handcraft, and so forth, for the purpose, or with the result, of attaining proficiency'. Pre-service teachers learn the art of teaching through repeated practice, but need the theoretical component as well; just as theory without practice is of little value, so too, practice without theory will tend to be weak. In the current study, pre-service teachers were informed by the content of their PGCE course and by what they learnt and observed while they were teaching in person once a week and during home-based practice teaching. According to Kane, Rockoff and Staigner (2008), cited in Lampert (2009:27), 'There is evidence that teachers do become more effective with two (2) years of experience, perhaps from practising in the sense of repeated efforts to do the same thing.'

What in-service teachers practise in classes in terms of formative assessment is the focus of this investigation. It was expected that there would be changes in attitudes and a desire to learn about 'assessment for learning' as well as changes in beliefs about assessment, all of which influence formative assessment practices. Pre-service teachers may not be as proficient as expected if teacher educators fail to invest time in teaching them assessment for learning practices and modeling daily practices in subject didactics modules and practice teaching modules. Heritage (2007:145) attests

that there must be investment in formative assessment practices if it is going to be successful, and that changes in practice must begin with pre-service training. Pre-service teachers should not exit the teacher training programme without the knowledge and understanding of formative assessment practices. Mitchell (2007:1880) concludes that postgraduate teachers in training and undergraduate student teachers completing the final year of their academic year and professional education have personal and direct experience of assessment in ways that may impact significantly on the approaches they adopt as teachers.

Young and Jackman (2014:398) explain that in 2006, the Caribbean government initiated the 'Strategic Plan for Educational Enhancement and Development (2006-2015)', which focused on the promotion of quality practices in the classroom and on strategies that support and inform instructional practices. Pre-service teacher development for this programme took the form of a two-week course called 'Teacher Induction' while in-service teachers were exposed to a two-year programme where they learnt about theories, principles of assessment and practice of implementing various strategies. Young and Jackman's (2014:407) findings were that trained teachers held significantly more positive perceptions about the use of formative assessment for helping to improve planning and teaching, and for helping students to monitor their own learning. This suggests that untrained teachers may not as readily consider formative assessment as a practice that can help them improve the planning and teaching of content to the extent that trained teachers do.
Darling-Hammond and McCloskey (2008:265) note that countries such as Australia, Hong Kong and the United Kingdom are English-speaking countries which advocate the use of assessment for learning. Assessments in these countries is integrated into curriculum teaching, learning and assessment with the aim of shaping teachers' teaching strategies and improving learners' learning. These authors studied formative assessment in Finland and Sweden, the highest-achieving countries in assessments for learning and affirm that Finland's education system is rated first among member countries of the Organisation for Economic Co-Operation and Development (OECD). Finland's leaders point to their use of school-based, student centred, open-ended tasks embedded in the curriculum as an important reason for the nation's extraordinary success in international exams. The success of Finland in the implementation of assessment for learning is attributed to its excellent teacher professional development, in which teachers receive intensive teacher training for three years in curriculum and assessment systems. Most of Finland's teachers hold Master's degrees in content and education. 'Preparation includes a strong focus on how to use formative assessments in the service of student learning' (Darling-Hammond & McCloskey, 2008:266). Sweden also invests heavily in state-funded graduate teacher education for all teachers and relies on a highly trained teaching force to implement its curriculum and assessment system. 'Swedish assessments

use open-ended, authentic tasks asking students to demonstrate content knowledge and analytic skills in grappling with real-world problems (Darling-Hammond & McCloskey, 2008:266).

2.7 South African experiences with the implementation of formative assessment

Formative assessment has been regarded as having immense pedagogical potential in reinforcing student learning (Black & Wiliam, 2018). The South African National Assessment policy (Department of Basic Education (DBE), Republic of South Africa, 2011) articulates that assessment is the process of gathering, recording, interpreting, using and reporting information about a child's progress and achievement in developing knowledge, skills and attitudes. 'Assessment, therefore, goes far beyond testing; it involves daily interactions between the teacher and each learner, such as moment-by-moment interactions, observations and engagements' (Govender, 2020:1). The South African policy is consistent with global trends that advance the pedagogical value of assessment, particularly formative assessment, as opposed to summative assessment only.

South African curriculum policy affords opportunities for formative assessment, but the actual implementation of formative assessment practices remains a concern (Mahlambi, 2021). Kanjee (2009), Kanjee and Sayed (2013), Berry (2011), Govender (2020) and Kanjee (2020), among others, have reported that formative assessment is used somewhat sporadically in South African classrooms. The South African curriculum and assessment policies legitimise both summative and formative assessment (DBE, Republic of South Africa, 2011) and continuous formative assessment is seldom practised in classrooms (Kanjee & Sayed, 2013). Kanjee and Sayed's (2013) study found that Foundation Phase teachers demonstrated 'below basic level understanding' of formative assessment as a result of ineffective teacher training and professional development on formative assessment. Gotwals and Cisterna (2022) note that given the promising nature of formative assessment practices on student learning and engagement, finding ways of supporting beginning teachers as they develop these practices is important.

Given its importance, it is not surprising that the Department of Basic Education (DBE) (2019) launched an initiative to enhance the capacity of teachers to implement formative assessment strategies through professional development programmes delivered by assessment experts, subject advisors and school-based programmes linked to professional learning communities. Kanjee (2020) found that teachers practise a wide range of formative assessment strategies in classrooms, with a relatively small percentage able to effectively name the learning outcomes and assessment criteria during teaching. In the majority of lessons presented, learners were unaware of what they were going to learn and the evidence that they would be required to demonstrate to show understanding of concepts. In 2020 and 2021, during the pandemic-related lockdowns, the DBE issued circulars

instructing all government schools to assess learners through formative assessment for progression purposes. It is important that preservice teachers are supported in developing and reflecting on practices that support student engagement and learning at the beginning of their professional careers Gotwals and Cisterna (2022).

In the South African education system, assessment is informed by the National Protocol on Assessment (NPA), launched in 2011 by the DBE to introduce changes in the way assessment is administered in South Africa. According to the NPA (2011), both summative and formative assessment have to take place formally. Formative assessment is the collection of evidence of learning that can be used to improve learning and inform instruction. According to the Department of Basic Education (2011), all formal assessment tasks undertaken by learners need to be moderated to ensure the quality of the tasks and fairness in marking. In South Africa, the national curriculum, CAPS, endorses the importance of learners' active involvement in assessment as part of a continuous collection of information by learners and teachers. This can be used to improve learning DBE (2011). There is evidence that there is now a shift in how formative assessment is implemented to improve learning in South African schools. Reyneke (2016) posits that for the operating of formative assessment in the country's examination-driven education system, school-based assessment has to be infused into the formal assessment programme, which the South African Curriculum and Policy Statement (CAPS) affirms. Reyneke (2016) acknowledges that South Africa faces more challenges concerning the implementation of school-based assessment on a large scale than do countries such as Finland and Sweden. In the South African educational landscape, various researchers have attempted to research teachers' formative assessment practices. These studies revealed inconsistencies in how teachers implement formative assessment in classrooms. Kanjee and Mthembu (2015) asserted that teachers' assessment literacy is low, and a large number of them face difficulties in assessing their students appropriately. Mahlambi's (2021:479) findings reveal that 'teachers have limited pedagogical knowledge in using assessment for learning to improve active learning in their classrooms'. Kanjee (2020) and Govender (2019) concur that teachers are struggling to implement formative assessment. Kanjee and Mthembu (2015) investigated 21 Foundation Phase teachers' understanding and use of formative assessment and summative assessment in three schools across three quintile categories (Q2, Q3, Q5). They found that most teachers demonstrated only a partial understanding of formative assessment. In classroom practices, they found that none of the teachers were observed engaging learners to help them understand lesson objectives, with three teachers using only traditional questioning approaches, focusing on learners who raised their hands. There was no descriptive written feedback; the feedback comprised only ticks and comments such as 'good work', 'well done', 'work not done', or 'incomplete'. This kind of feedback shows an inadequate grasp of formative assessment. Similarly, Mkhwanazi,

Joubert, Phafude and Fraser (2013:471) found that teachers were unable to use formative assessment approaches during their lessons. In their study, none of the teachers shared assessment criteria with learners, frequently asked only lower-order questions, and were unable to support learners to develop and practise self-assessment and peer assessment skills. The researchers found that the predominantly written feedback was limited to ticks, marks and evaluative comments such as 'good' and 'well done'. Kuze and Shumba (2011:165) found that three teachers lacked the required knowledge to implement formative assessment during their lessons. These researchers reported that while two teachers implemented some aspects of the formative assessment approach, such as introducing learning outcomes and reminding learners of learning objectives before assigning an activity, they were not aware of using any specific formative assessment strategy. Kuze and Shumba (2011) ascribed the teachers' poor knowledge and skills in formative assessment to the lack of teacher development and teachers' limited understanding of the policy requirements, noting that schools in rural areas were severely disadvantaged. Kanjee and Sayed (2013) noted several additional factors hindering South African teachers' effective use of formative assessment.

2.7.1 Formative assessment as a practice

Despite widespread acknowledgement in the literature of the importance of non-summative assessment in education, there are several still-evolving definitions and conceptualisations of formative assessment (Black & Wiliam, 2015:6). The definition used in this study is that 'assessment is formative to the extent that evidence about student achievement is elicited, interpreted, and used by teachers, learners or their peers, to make decisions about next steps in instruction that are likely to be better, or better founded, than the decisions they would have taken in the absence of the evidence that was elicited' (Black & Wiliam, 2009:7).

2.7.2 Formative assessment strategies framework

William and Thompson (2008:57) suggested a framework to conceptualise formative assessment. They acknowledged the roles of the teacher, the learners and their peers. The framework consisted of five key strategies:

- Clarifying and sharing learning intentions and criteria for success;
- Engineering effective classroom discussions and other learning tasks that elicit evidence of student learning;
- Providing feedback that moves learners forward;
- Activating students as instructional resources for one another; Activating students as owners of their own learning.

This framework is significant because it offers a comprehensive model that reflects the dynamic relationship between teachers and students. It highlights the important role of teachers in engineering effective practices and emphasises how students are responsible for their own learning. It assists teachers and learners to put feedback into action. The framework also identifies the pedagogical practices that allow this benefit to be felt. Heritage, Kim, Vendlinski and Herman (2009:2) define the four pillars of formative assessment as:

- identifying gaps in students' learning;
- deciding where students are in their learning and what they need to learn;
- adjusting instructions to address individual students' learning needs; and supporting them towards achieving their learning goals.

Alvarez, Ananda, Walqui, Sato and Rabinowitz (2014) proposed six guiding principles for effective formative assessment, explaining that effective formative assessment:

- promotes students' learning through the continual monitoring of students' progress;
- elicits evidence of learning through a variety of tasks, depending on the instructional purpose;
- changes the roles of teachers and learners, with the teacher seeking to create a supportive learning environment in which the learners are at the centre of teaching and learning;
- uses learning progression to anchor learning goals and monitor learning;
- results in meaningful feedback and adjustments to improve instruction for students;
- enables young people to become self-regulated and autonomous learners

2.7.3 Formative assessment key strategies in classrooms

The major principles of formative assessment are to identify students' weaknesses and strengths, enhance students' motivation and metacognition, and provide feedback to inform teaching and learning (Yan & Cheng, 2014:129). These principles are well recognised for their capacity to improving students' learning. Black and Wiliam (2018:10) contended that the analysis of William and Thompson (2007) shows how the various activities through which formative assessment is implemented may be conceptualised as five key strategies. These are listed below. In the current study, the use of these strategies is influenced by the research objectives and questions, along with the observation that researchers who base their studies on the theory of formative assessment make use of these strategies (Andersson & Palm, 2017:107; Black & Wiliam, 2018:10; Saito & Inoi, 2017:216; Black & Wiliam, 2009:8). According to Hill, Ell, Grudnoff, Haig, Cochran-Smith, Chang and Ludlow (2017:187), these five strategies should guide formative assessment practices. Saito and Inoi (2017:216), who formulated the strategies, stated that they tested

William's model which is designed specifically for implementing formative assessment strategies. Leahy, Lyon, Thompson and William (2005:20) claimed that 'we know from the research and from our work with teachers that these strategies are desirable things to do in any class'.

The five strategies for implementing formative assessment in the classroom, as proposed by Saito and Inoi (2017:216), are as follows:

- **Clarifying, sharing and understanding learning intentions and criteria for success**. Learning intentions and success criteria need to be communicated to students.
- **Engineering effective classroom discussions, questions and tasks that elicit evidence of learning**. This strategy refers to the use of various methods to gather evidence of students' learning process and products.
- **Providing feedback that moves learners forward**. Performance feedback can be given in various ways. The teacher should provide feedback that directs future action for improvement and enhances students' beliefs that their ability is gradually improving.
- **Activating students as instructional resources for one another**. The students help one another in the process of assessment.
- **Activating students as the owners of their own learning**. This strategy promotes students' self-regulated learning.

According to Gordon, McGill, Sands, Kalinich, Pellegrino and Chatterji (2014:345), formative assessment is the foundation of high-quality teaching. It should be ongoing and fluid, building from data sets to guide a teacher's instruction for groups of students and individuals. Gordon et al. (2014:346) stated that 'formative assessment should connect to the work our teachers do in the classroom every day to result in quality learning for our students'.

2.7.4 Classroom assessment practices

Assessment is an informal gathering of information about students' state-of-the-art knowledge through various ways of collecting information at various times and in different contexts (Nasab, 2015:166). Remesel (2010:473) defines classroom assessment as a complex process of collection, analysis and evaluation of evidence about teaching and learning, and learning outcomes. In classrooms, formative assessment refers to frequent, interactive assessments of student progress and understanding to identify learning needs and adjust teaching appropriately (the Centre for Educational Research and Innovation (CERI), 2008:1). Classroom teaching is relational work, in that working on learning in the classroom involves concerted action by at least two people, the teacher and a student. Teaching in school necessarily involves intellectual and social collaboration. To do their job, classroom teachers need to act deliberately to maintain productive relationships with individual students in ways that result in those students learning Lampert (2010:22). In South

Africa, the National Protocol on Assessment (NPFA) (2011:3) defines assessment as collecting, analysing and interpreting information to assist teachers, parents and other stakeholders in making decisions about the progress of learners. Black and Wiliam (1998(b):2) define assessment as all those activities undertaken by teachers and by the students in assessing themselves, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged. Such assessment becomes formative assessment when evidence is actually used to adapt the teaching to meet learners' needs.

Assessment in the classroom plays a vital role in ensuring that students are meeting instructional objectives (Beziat & Coleman, 2015). Heitink, Van der Kleij, Veldkamp, Schildkamp and Kippers (2015:51) concur that assessment plays a crucial role. Nasab (2015:168) argued that 'one of the most important tasks facing teachers is assessment'. Students' conceptualisation of what is important and worth learning is reflected in how teachers handle assessment and their chosen methods of assessment. Duncan and Noonan (2007) studied classroom assessment and found that Mathematics teachers relied more on objective multiplechoice tests and recall activities than did teachers of other subjects, such as English or Arts. Nasab (2015:168) furthermore argued that 'students take cues on what is important and what is not important based on what is assessed'. Students will always spend more time on what seems to be important during teaching and learning. Relevant classroom assessments that serve as meaningful sources of information are those that do not contain surprises. This suggests that assessments should reflect the concepts and skills that the teacher has emphasised in class, along with the teacher's clear criteria for judging students' performance (Guskey, 2005:2). The best classroom assessments also serve as meaningful sources of information for teachers, helping them identify what they have taught well and what they need to work on. Assessment must be part of an ongoing effort to help students to learn. Teachers should follow assessment with helpful corrective instruction, and then give students a second chance to demonstrate their new level of competence and understanding. The second chance helps determine the effectiveness of the corrective instruction and offers students another opportunity to experience success in learning (Guskey, 2005:4).

Alkharusi and Al-Musawi (2011:121) found that pre-service teachers need to operationalise their educational measurement knowledge into actual classroom settings. This would enable pre-service teachers to see the usefulness of the educational measurement component of their studies and its relevance to their prospective teaching careers and is more likely to foster skilfulness in performing educational measurement tasks. Alkharusi and Al-Musawi

(2011:121) recommend that the educational measurement course be offered while students are conducting their teaching practicum, so that they have opportunities to receive feedback on their practices. This recommendation was supported by the finding in their study that preservice teachers with teaching practicum tended to have higher average levels of educational measurement knowledge and perceived skills, as well as more positive attitudes, than those without the teaching practicum. Nasab (2015:166) listed three kinds of assessment: assessment for learning, assessment as learning and assessment of learning. These are discussed below.

a) Assessment for learning

Assessment for learning, in its simplest form, is formative, in that it promotes learning (Wei, 2010:838). Formative assessment is a range of formal and informal assessment procedures; for example, monitoring children's writing development, anecdotal records, and observations undertaken by teachers in the classroom as an integral part of the normal teaching and learning process, to modify and enhance learning and understanding (Wei, 2010:838). Formative assessment has attracted a good deal of research interest in all subject areas, including second language education (Black, 2009:519). Assessment for learning provides feedback to students and offers assistance to teachers in using the information to adjust instruction. Hattie and Temperly (2007) noted that as part of the formative assessment process, feedback needs to have a clear goal ('Where am I going?'), qualitative information about current performance ('How am I doing?) and information about how to improve subsequent performance ('Where to next?'). Teachers should create opportunities for this thinking process by engaging learners in assessment of one another (Nasab, 2015:166). Assessment for learning influences the motivation and self-esteem of students, since it provides them with constructive feedback. Assessment for learning encourages the active involvement of students in their learning, and depends on teachers' diagnostic skills to make it work (Pattalitan Jr, 2016:69). William (2011) emphasised the embedded nature of assessment for learning within a deliberate learning culture.

According to William (2011), all assessments for learning involve the active participation of both teachers and students in contributing to an integrated process of teaching and learning. One of the findings of the study by DeLuca, Klinger, Pyper and Woods (2015:129) was that 'the majority of principals also reported the increased presence of assessment for learning (AfL) in classrooms, identifying that success criteria are posted in classrooms, walls and social media'. DeLuca et al. (2015:124) argue that educators should implement assessment for learning on a daily basis to support and promote their own learning.

b) Assessment as learning

This type of assessment is a way of engaging students in their own learning and intensifying the practice and skill of metacognition. Learning to assess oneself and others is a skill that can be learned with practice, particularly in terms of how one frames the verbal feedback one gives. Each student plays an active role in assessment as learning, so that there is a clear connection between assessment and learning. Students assess themselves as they are learning, which promotes adaptation from the feedback, with the student reflecting on the assessment in a critical manner (Nasab, 2015:166).

c) Assessment of learning (see Chapter 1)

Assessment of learning is summative assessment, for which there is a place in classrooms. Summative assessment aligns with curriculum outcomes, and is prescribed by policymakers. 'A key component of summative assessment is to gauge students' learning with regard to content standards' (Nasab, 2016:167). This happens when teachers use evidence of student learning in making a judgement on their achievement of educational goals and standards (Pattalitan Jr, 2016:698).

2.7.5 Formative feedback

Shute (2007:154) defines formative feedback as 'information communicated to the learner that is intended to modify his or her thinking or behaviour for the purpose of improving learning'. Hattie and Temperly (2007) emphasise that the main goal of feedback is to highlight the discrepancy between current understanding and performance, on the one hand, and the learning goal, on the other, and to encourage and enables learners to reduce the gap.

Shute (2007:156) stated that the main goal of formative assessment is to strengthen students' knowledge, specific skills, understanding of certain content and general skills such as problem solving. Rust, O' Donovan and Price (2005:234) argued that a social constructivist approach to feedback requires that students actively engage with feedback. Sadler (1989:78) identified three conditions for effective feedback. These are:

- knowledge of the standards; o having to compare those standards to one's own work; and
- taking action to close the gap between the two.

'The second and third conditions both require students to actively engage with the feedback. Students should be trained in how to interpret feedback, how to make connections between the feedback and the characteristics of the work they produce, and how they can improve their work in the future. It cannot simply be assumed that when students are given feedback, they will know what

to do with it' (Sadler, 1989:78). It is widely recognised that feedback is an important part of the learning cycle and lies at the core of formative assessment (Atjonen, 2014:243). Bartz (2017:8) and Koray (2016:3) concur, stating that results of formative assessments should result in the teacher adjusting instructional strategies, and giving feedback to students in order for students to gain a sense of ownership of the learning achievement. Feedback informs students about the strengths and weaknesses of their performances. Demiraslan and Civek (2014) found that students who received and provided feedback tended to have positive perceptions of it. The students said that the process of receiving and providing feedback was beneficial, effective and productive. They also said that they had the opportunity to recognise and eliminate their mistakes and deficiencies and acquire new perspectives. Feedback should follow a three-way path from pupils to the teacher (so that the teacher can understand the pupils' levels of understanding); from teacher to pupils, (whereby the teacher responds to a challenge or extends pupils' ideas); and from pupil to pupil, in as much as pupils can help and be helped by mutual dialogue (Atjonen, 2014:243). Feedback can be elicited through both oral and written exchanges and over various time scales (Black, Wilson & Yao, 2011b:74). Shute (2007:1) stated, 'Formative feedback represents information communicated to the learner that is intended to modify the learner's thinking or behaviour for the purpose of improving learning'. Effective formative feedback must be specific, simple, descriptive and focused on the task. This allows learners to set clear expectations of themselves and to make decisions that influence their own successes.

Feedback is key in formative assessment (Thomas & Sondergeld, 2015:85). van Diggie, Burgess and Mellis (2020) stated that feedback helps close the gap between current and desired performance and has the greatest impact on learning when it is immediate. Preservice teachers must ensure that teaching plan includes time for individual feedback to learners and the facilitator. Feedback promotes learning by informing the student of their progress and the specific areas needing improvement, motivating the student to engage in relevant activities to further their learning, reinforcing good practice, and promoting self-reflection. In addition, formative feedback contributes to students' learning and teacher planning adjustments (Thomas & Sondergeld, 2015:86). Based on qualitative results on pre-service teachers' feedback ability, Thomas and Sondergeld (2015:94) found that most pre-service teachers developed in their ability to provide quality feedback. Pre-service teachers appeared to experience growth in three areas: authenticity, appropriateness, and critical refining skills. Good feedback practice is broadly defined as anything that might strengthen the students' capacity to self-regulate their own performance. Nicol and MacFarlane-Dick (2006:205) provided the following benefits of good feedback in practice:

- It helps describe successful performance with the assistance of goals, criteria and standards;
- It facilitates the development of self-assessment for learning;

- It gives high-quality information to students about their own learning;
- It improves communication between peers and between teachers and students;
- It enhances positive motivational beliefs and self-esteem;
- It gives opportunities to fill in the gap between current and desired performance;
- It provides teachers with information that will help them plan and design their instruction.

2.7.6 Definitional challenges of formative assessment and attributes of formative assessment

According to Gedye (2015:40), definitions of formative assessment vary. He summarised formative assessment as 'an assessment which provides the learner with information but allows them to improve their learning and performance'. This definition is learner centred; the learner receives feedback and uses the feedback for further learning. Heritage (2007:140) stated that formative assessment, if implemented effectively, provides learners and teachers with the information they need to move learning forward. Heritage (2007:141) defined formative assessment 'as a systematic process to continuously gather evidence about learning'. Data is used to identify a student's current level of learning and to adapt lessons to help the student reach the desired learning goal. In formative assessment, students are active participants with their teachers, sharing learning goals and having a clear understanding of how their own learning is progressing, what steps they need to take, and how to take them. Heritage (2007:145) concluded, 'Teachers must view formative assessment as a worthwhile process that yields valuable and actionable information about students' learning. If they do not, formative assessment will be seen as "yet another thing" that is being externally imposed on them.'

Squire (2010:1) stated, 'Research shows that formative assessment can be a powerful means of improving student achievement; it is assessment *for* learning, not assessment *of* learning'. In Squire's article, teachers and policymakers alike cited formative assessment's potential to help teachers respond effectively to students' learning needs. Squire (2010:1) listed the attributes of formative assessment as follows:

- Formative assessment emphasises the quality rather than the quantity of student work;
- It prioritises advice and guidance over grades;
- It avoids comparing students in favour of enabling individual students to assess their own learning;
- It fosters dialogues that explore understandings rather than lecturers that presents information;
- It encourages multiple iterations of an assessment cycle, each focused on a few issues;
- It provides feedback that engenders motivation and leads to improvement.

Black and Wiliam (1998) have referred to formative assessment as 'assessment for learning'. This point of view affirms that it is a teaching technique, as noted by Umer, Javid and Farooq, 2013:113). Black and Wiliam (1998) acknowledged that there is no internationally agreed-upon term for formative assessment. They go on to state, 'Classroom assessment, classroom evaluation, internal assessment, instructional assessment, and students' assessment have been used by different authors, and some of these terms have different meanings in different contexts. Dunn and Mulvenon (2009:1) affirm that 'there is no agreed-upon lexicon with regard to formative assessment'. Tekyiwa and Amua-Sekyi (2016:10) define formative assessment as embedded in a teaching and learning process that provides feedback to the teacher in the course of teaching to enable him or her to judge how well students are learning. It also provides information on the effectiveness of teaching, which will help to determine appropriate remedial action where necessary. For this reason, it is referred to as 'assessment for learning'.

Summative assessment is used at the end of a course or programme to determine the level of students' achievements or how well a programme has performed. It often takes the form of external examinations or tests and is referred to as 'assessment of learning'. Filseck and Kerres (2012:5) disputed Dunn and Mulvenon's (2009) perception that there is confusion with regard to the definition of formative assessment. Confusion may arise from the commercial vendors who sell so-called formative assessment tests. Filseck and Kerres (2012:5) state that they hold the work of researchers in higher regard than the claims of companies who commercialise what they call formative assessment tests.

Klenowski (2009) encapsulates most researchers' conceptions of assessment for learning in countries such as New Zealand, Australia, Canada, Europe, the United Kingdom and the United States, which have all generated broadly similar definitions of assessment for learning. The central idea is that of learning by students. With the permission of the Third International Conference on Assessment for Learning held in Dunedin in New Zealand, Klenowski (2009) defined assessment for learning as 'part of everyday practice by students, teachers and peers that seeks, reflects upon and responds to information from dialogue, demonstration and observation in ways that enhance ongoing learning'. The researcher makes use of this definition by Klenowiski, along with the definition of Black and Wiliam (2009:7), stated under Point 2.7 in this study.

Sadler (2006:79) indicated that the theory and practice of formative assessment should be informed by an adequate conceptualisation of what ought to be in practice. Writing in 2009, Pinchok and Brandt (2009:1) explained that there were varying and often conflicting viewpoints and definitions of what formative assessment was; whether it was a product or a process, and whether it was

something that one could buy. Ramsey and Duffy's (2016:6) findings are that 'most teachers have a limited repertoire when it comes to formative assessment strategies, and the current tools and training that districts provide are not sufficient'. These findings show that formative assessment practices vary. Ramsey and Duffy (2016:16) defined formative assessment as a collection of formal and informal processes used to gather evidence for the purpose of improving student learning and providing teachers and students with continuous, real-time information that informs and supports instruction. This formative assessment definition seems to be unattainable. However, even though researchers define formative assessment differently, the definitional issue should not interfere with the understanding that formative assessment practices are an essential aspect of learning and can be implemented more consciously and deliberately by teachers wishing to improve learner performance and enjoyment of learning. Western countries such as Canada and Scotland have long practised formative assessment successfully without there necessarily being absolute consensus about its definition.

According to Warwick, Shaw and Johnson (2014:41), the working definition for some authors is the term 'assessment for learning' (AfL). These authors indicated that the term is interchangeable with the term 'formative assessment'. The term 'assessment for learning' can be defined and conceptualised as incorporating all teacher and pupil assessment-related practices that might be employed in day-to-day teaching and learning. Assessment for learning may be understood in a more specific manner as only those components of formative assessment that focus on strategies which help learners to take ownership of their learning. Warwick, Shaw and Johnson (2014:41) use the term 'assessment for learning' as a synonym for 'formative assessment'. Popham (2006:6), cited by Warwick, Shaw and Johnson (2014:41) stated that assessment for learning had been characterised as not a test but a process, focusing on providing qualitative insights on student understanding, for both the teacher and the learner to act upon. In a study of three districts on formative assessment in classrooms, Ramesy and Duffy (2016:7), define formative assessment as 'part of everyday teaching practice, not an occasional classroom event'. It includes any teaching practice that elicits, interpreters and uses evidence of students' performance to improve instruction and learning. This is how Ramesy and Duffy (2016:7) explain and operationalise formative assessment in practice. Formative assessment:

- is a systematic, continuous process used during instruction;
- evaluates learning while it is developing;
- is integrated with teaching and learning;
- actively involves both teacher and students;
- provides feedback loops to assist teachers to adjust ongoing instruction and close gaps in learning;

- includes students' self- and peer assessment;
- is actionable and supports instruction while learning is taking place.

The definition by Ramsey and Duffy (2016) is an operational definition which explains explicitly what formative assessment looks like in practice. The definition covers what ought to take place in classrooms when formative assessment is used as a teaching tool. The researcher concurs with Heritage (2007:140), who affirms that if formative assessment is used effectively, it can provide teachers and their students with the information they need to move learning forward.

Formative assessment practices are not yet evident in many classrooms, despite several years of researchers' findings that formative assessment improves learning. As early as 2007, Heritage (2007:140) stated, 'After more than a hundred years of exhortations and a significant body of research on the topic, the idea that assessment and teaching are reciprocal activities is still not firmly situated in the practice of educators.' Heritage (2007:140) further argued: Educators recognise that annual state tests provide too little information that arrives too late for planning instruction, and this has prompted districts and schools to supplement state assessments with interim or benchmark assessments.

In the above discussion, many definitions of formative assessment are presented. Table 2.3 lists authors and their various definitions.

Table 2. 3 Definitions of formative assessment according to various authors

Authors	Definitions
Sadler (1989)	'Formative assessment is concerned with how judgements about the quality of student responses (performance, pieces, or works) can be used to shape and improve the student's competence by short-circuiting the randomness and inefficiency of trial-and-error learning' (p. 120).
Gipps (1994)	'… takes place during the course of teaching, and it is used essentially to feed back into the teaching/learning process.' (p. vii)
Black and Wiliam (1998)	'… all those activities undertaken by teachers, and /or by their students, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged' (p. 7)
Turnstall and Gipps (1996)	'… is the process of appraising, judging or evaluating students' work or performance and using this to shape and improve their competence' (p. 389)
Cowie and Bell (1999)	'… the process used by teachers and students to recognise and respond to student learning to enhance that learning, during teaching' (p. 101)
Shepard et al. (2005)	'… assessment carried out during the instructional process for the purpose of improving teaching or learning' (p. 275)
OECD (2005)	'… frequent, interactive assessment of student progress and understanding to identify learning needs and adjust teaching appropriately' (p. 21)
Popham (2006)	'An assessment is formative to the extent that information from the assessment is used during the instructional segment in which the assessment occurred, to adjust instruction with the intent of better meeting needs of the students assessed' (p. 3)
Popham (2008)	'… a planned process in which assessment-elicited evidence of student status is used by teachers to adjust their ongoing instructional procedures or by students to adjust their current learning tactics'. (p. 7)
McManus (2008)	'Formative assessment is a process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve students' achievement of intended instructional outcomes' (p. 3)
Heritage (2008)	'The purpose of formative assessment is to provide feedback to teachers and students during the course of learning about the gap between students' current and desired performance so that action can be taken to close the gap' (p. 2)

These varying definitions were cited by Dunn and Mulvenon (2009) as examples of a lack of consensus. In their work, they quoted only Black and Wiliam's definition, paraphrasing the rest. However, despite the slight differences in wording, the central thrust of these definitions is that formative assessment is a form of assessment used by teachers to assist learners to learn better, and teachers to adjust their teaching to ensure that this happens.

Bennet (2011:5) indicated that 'formative assessment' does not yet represent well-defined artefacts or practices. Research suggests that the general practices associated with formative assessment can facilitate learning, even though existing definitions allow such a wide variety of implementations. Bennet (2011) adds a critical voice by stating that 'if we cannot clearly define an innovation, we can't meaningfully summarise results across studies because we won't know which instances to include in our summaries'. Bennet (2011:7) summarises by stating that well-designed and implemented formative assessment should be able to suggest how instruction should be modified, as well as suggest impressionistically to the teacher what the teacher can do.

2.8 Pre-service and teachers' conceptualisations of formative assessment

Different researchers defined the term 'conception' differently; this study has looked at different definitions but has not exhausted them. The purpose is to identify how other authors have defined the term, and then use these definitions to understand how the pre-service teachers in this study formed their own conceptions and operationalised these conceptions during teaching. Thompson (1992:259), cited by Dayal (2015:43) defined a 'conception' as a 'general, mental structure, encompassing beliefs, meanings, concepts, propositions, rules, mental images, preferences, and the like'. Thompson (1992), cited in Brown, Lake and Matters (2010:210), used the term 'conception' to capture all that a teacher thinks about in relation to the nature and purpose of an educational process and practice. Pajares (1992), cited by Remesel (2010:473), indicated that the relationship between beliefs, or conceptions, and school practices is well known, and pointed out that conceptions are closely linked to practice. Young and Kim (2010:13) affirm that 'teachers' beliefs about and conceptions of teaching influence all aspects of their teaching, assessment included'. Brown and Gao (2015:4), defined the term 'conception' as referring to 'the general, usually implicit, knowledge a person has about the nature of a phenomenon'. Brown and Gao (2015:4) went on to say that conceptions refer to 'the ideas, values and attitudes people have toward what something is (what they think it is and how it is structured) and what it is for (its purpose)'.

Conceptions are formed gradually through experiences with a phenomenon, which means that conceptions of assessment arise from students' experiences of being assessed in relation to their knowledge and abilities. Previous experiences with assessment play a major role in how preservice teachers conceptualise assessment. The teaching of formative assessment in pre-service training should reflect changes that have taken place in formative assessment, and teacher educators should familiarise pre-service teachers with these by giving them a thorough grounding in theory, as well as exposing them to formative assessment in practice. In China, the pre-service conception of assessment is associated with success in examinations (Hen & Brown, 2013). In general, the thinking of pre-service teachers in China about formative assessment is that it is *not* diagnostic or

formative, has no bearing on the development of character and may well be irrelevant. Assessment is generally conceptualised as summative, which does not promote learning, being an assessment of learning where students learn for progression and promotion. Brown and Gao (2015:5) state, 'Research into teacher conceptions of the assessment conducted in non-Chinese contexts has focused largely on the competing tensions between formative assessment and summative functions of assessment'. According to Brown and Gao (2015:6), China has an assessment context that presses teachers towards two different ends; that is, high performance in summative assessment examinations and formative improvement. The education system of China places great emphasis and value on success in the many high-stakes examinations used for selection and placement purposes. Assessment in China is examination orientated and promotes summative learning. Summative assessment approaches hinder the pre-service teachers' implementation of formative assessment practices.

Teachers' conceptions of formative assessment will play a role in how pre-service teachers practice formative assessment. Teacher educators must understand that the point of departure in teacher education is to understand the pre-service teachers' conceptions of assessment. Preservice teachers' conceptions are informed by their experiences as students and the ways in which they conceptualise assessment and beliefs about learning. Thus, attempts to change classroom practice should be informed by how pre-service teachers believe and think about assessment. Simon (2010:10) reveals that to some extent, pre-service teachers enter their programme with distinct views about assessment based on intuition and past experience. In the study by Simon (2010:10), pre-service teachers understood assessment as meaning more classroom management, higher student motivation, and greater social justice, rather than a means of supporting learning. Formative assessment is conceptualised as assessment for learning by researchers such as Klenowiski (2009) and Griffiths, Gore and Ladwig (2006). As stated in Section 2.3.2, Griffiths, Gore and Ladwig (2006) held that beliefs affect teaching practices to a greater degree than teaching experience and socio-economic school contexts do.

Remesel's (2010:472) study results indicated that teachers' conceptions were one of the key factors that influence classroom decisions. Kim and Corcoran (2017:12) stated that research suggests that the quality of training provided through teacher education programmes affects teachers' practice, effectiveness and learning outcomes. In a review of 57 published articles on teacher education and learning outcomes, Wilson, Floden and Ferrin-Mundy (2001) found that teachers with a strong subject matter knowledge and a high level of pedagogic preparation were linked to higher student achievement and higher teacher performance in evaluations. DeAngelis, Wall and Che (2013) and Ingerisoll, Merill and May (2014) affirm that quality preservice teacher education programmes and

graduates who have extensive pedagogic and methodological preparation are linked to teachers who are more likely to remain in teaching. Pre-service teachers' training should take into consideration the process of training pre-service teachers rather than focusing on teacher qualifications only. Training pre-service teachers is a process which warrants modelling and giving feedback to pre-service teachers about their classroom practices so that they develop confidence in learning from practice. This might involve assigning them projects and activities which promote learning. Winterbottom,

Brindley, Taber, Fisher, Finney and Riga (2008:194) attest that 'trainees' conceptions of assessment may be influenced by prior experiences and understandings on entering the PGCE course'. Prior experience will affect what they learn from both faculty seminars and in communities of practice during school placements. Taber, Riga, Brindley, Winterbottom, Finney and Fisher (2011:177) revealed that in their study, most trainees thought of assessment as summative in nature. Very few thoughts that one of the primary purposes of assessment was to support learning. In discussions, however, trainees agreed that giving feedback to students in addition to a grade on their performance in a test or other piece of work could be useful in terms of helping students improve their understanding, which could result in improving their performance. The findings reveal that trainees' conceptions are still dominated by summative assessment, although they saw the value of formative assessment.

MacClellan (2004:528) found that a few participants made connections between the formative mode of assessment and constructivist perspectives on learning and could offer a persuasive case for the process of assessment having an impact on pupils. However, these participants were outnumbered by the many who uncritically suggested that formative feedback can and will enable the teacher to promote learning. They stated that working within a formative framework allows teachers to identify achievements. This leads to teachers increasing their capacity to identify individual students' differences in learning and to appreciate differentiation, which can lead to the promotion of learning. These participants considered the quality of feedback as a yardstick for promoting further learning.

Vandeyer and Killen (2007) affirm that pre-service teachers need to be trained to conceptualise assessment as a learning function rather than a summative function. Taber et al (2011:171) affirmed that 'new entrants bring with them their own experiences and understandings of school assessment procedures, and enter a profession where in recent years a new orthodoxy has developed for discussing assessment. The new orthodoxy focuses on formative modes of assessment that inform further learning'. Taber et al's (2011:177) findings suggest that a number of trainees believe that

formative assessment practices provide feedback to help students see how they could improve. Some trainees felt that learners focused on the summative grade awarded and disregarded feedback or comments. Taber et al (2011:178) concluded by stating that some PGCE trainees' conceptions of formative assessment contained elements of Black and Wiliam's (1998a) definition of formative assessment (see Point 2.3.2.).

2.9 Formative assessment and practice teaching

Quiren and Khairani (2017:162) citing Bloom, Hastings and Madaus (2013:2187), attested that the term 'formative assessment' was first introduced by Scriven in 1967. Black and Wiliam (1998) drew attention to the topic, stating that it was one of the most powerful ways of improving students' learning. Torrance and Pryor (2001) began the journey of refining the theory, looking at teachers' action research, and documenting how assessment criteria and processes are communicated to students. According to Magna and Lizada (2015:24), 'The concept of formative assessment has been clarified from the 1990s until the early part of the 21st century'. A growing body of research suggests that a critical aspect of effective classroom-based formative assessment is the alignment of assessment activities with goals focused on student learning (Nest, Long & Engelbrecht, 2018:3). Formative assessment is also called classroom evaluation, classroom-based evaluation, or classroom assessment. Assessment *for* learning is distinguishable from assessment *of* learning. Formative assessment may include a range of formal and informal assessment procedures; for example, the monitoring of children's writing development, anecdotal records, and observations undertaken by teachers in the classroom. All of these are an integral part of the normal teaching and learning process and help to teacher to modify and enhance learning and understanding (Wei, 2010:838). The term includes feedback and correctives provided to both students and teachers in the teaching and learning process.

Lopez-Pastor and Silica-Camacho (2015:89) assert that there is a practice amongst teacher educators to train pre-service teachers in traditional modes of assessment. They further stated that 'one of the main difficulties in developing formative assessment is the prominence of a professional culture that identifies the concept of assessment with grading and final examinations. Teachers' assessment practices are influenced mostly by how assessment was taught during pre-service teacher training. In the current study, pre-service teachers narrate how their experiences in the classroom were influenced by their teacher educators' teachings. Hamodi and Lopez (2012), cited in Lopez-Pastor and Silica-Camacho (2015:89), found that students and pre-service teacher education (PTE) graduates consider the development of formative assessment to have helped them develop their professional skills. According to Wren (2017:1)

> [a] prerequisite for educators to implement formative assessment effectively is the belief that all students are capable of achieving. Equally important is the classroom atmosphere that breeds success instead of competition. In such a class, information gleaned from a discussion, homework, a quiz or any type of assignment or activity used for formative purposes can make a difference to students if it is conveyed appropriately to them.

It is clear that students are at the centre of formative assessment implementation and that formative assessment should be viewed from the perspective of learning and a supportive classroom environment. Hamodi, Lopez-Pastor and Lopez-Pastor (2017:172) expressed the same sentiment, stating that formative assessment implies a system of assessment that evaluates students' work and arrives at decisions in a way that maximises the effectiveness of teaching and learning by providing constant and timely feedback. Earl (2012) and Stiggins and Chappius (2012), cited by Deneen and Brown (2016:3), concur that assessment for learning remains a profound imperative. However, assessment for learning requires that teachers and students perform as active assessors, using interpretations of achievement to build learning and learner capacities.

Hassan (2011:334) argued that formative assessment, in his experience, requires a lot of time and effort by the teacher in order to keep track of each student's learning development, but the results can be very satisfactory when the teacher tests students' specific knowledge at the end of the course. The idea is supported by Grob, Holmeier and Labudde (2017), who state that formative assessment is for the promotion of learning which is why it is called 'assessment for learning'. Cisek (2010), cited in Grob et al (2017), explained that formative assessment is a process of teacher and learner engagement which informs the teacher about the level at which learners are, their areas of strength and their areas requiring improvement, all of which help the teacher with planning for the next lesson and help the student to adjust appropriately during teaching and learning. Formative assessment takes place during teaching and learning, in which there are opportunities for eliciting evidence of learning through various methods such as observations. William (2007) stated that the crucial feature of formative assessment is that evidence is evoked, interpreted in terms of learning needs, and used to make adjustments to better meet the learning needs of students.

William (2007:285) lists three types of formative assessment, shown in Table 2.4 below.

Table 2. 4 Types of formative assessment

Type	Focus	Length
Long cycle	Across marking periods, semesters, years	4 weeks to 1 year or more
Medium-cycle	Within and between teaching units	1 to 4 weeks
Short-cycle	Within and between lesson	5 seconds to 2 days

Source: William (2007)

As may be seen in Table 2.4, William (2007) differentiates between three types of formative assessment: long cycle, which focuses on marking periods, semesters and years, and lasts four weeks to a year or more; medium cycle, which occurs within and between teaching units and may last for one to four weeks; and short cycle, which focuses on periods within and between lessons, and lasts between five seconds and two days. There is considerable research evidence to show that effective formative assessment promotes student learning gains. As far back as 1998, Black and Wiliam (1998) reviewed 250 empirical studies on assessment and classroom learning to uncover whether and how formative assessment in schools and college classrooms benefited learning. Brophy (2008), cited in Nolen (2011:319), states that formative assessment has been widely promoted as a means to support student learning and motivation. The practice has the potential to communicate to students the value of what they are learning, both in the classroom and beyond. Poskitt (2014:542) states, 'Teachers internationally are expected to be assessment literate, which requires knowledge and skills to assess and accurately report student achievement.' In South Africa, the Minimum Requirements for Teacher Education Qualification (MRTEQ) (2015:53) stipulates, 'Newly qualified teachers must be able to use the results of assessment to improve teaching and learning'. The findings of a study by Siegel and Wisssehr (2009) attest that while pre-service teachers know about a variety of assessments, they do not incorporate.

Volante (2012:67) explained that formative assessment practices might include a student's completing a journal reflection, a self-assessment of performance, a submission of a performance or a submission of a draft of a final assignment. Interestingly, Stiggins (2005) did not equate formative assessment with assessment for learning, stating, 'It is tempting to equate the idea of assessment for learning with the more common term formative assessment'. To Stiggins (2005), assessment for learning is about far more than testing more frequently or providing teachers with evidence so that they can revise instruction, although these steps are part of it. Assessment for

learning involves students in the process. There is student-teacher interaction which improves learning because students are actively engaged in the process. Stiggins (2005) proposed that when teachers assess for learning, they 'use the classroom assessment process and the continuous flow of information about student achievement that it provides in order to advance, not merely check on, student learning'.

2.10 Conclusion

The aim of the study was to investigate pre-service teachers' experiences of formative assessment practices. The researcher has given an extensive review of the literature of African, Asian and Western researchers' findings in the topic, showing how formative assessment is understood and practised around the world. The review has shown that the concept has been in use since the late 1960s and that despite a plethora of differing definitions of the term, most researcher concur that formative assessment is essentially 'assessment for learning' rather than
'assessment of learning'. Reviewed studies have been located in countries as diverse as South Africa, Ghana, China, Cameroon, Lesotho, Finland, the Netherlands, Scotland and New Zealand.
The literature has revealed that pre-service teachers' experiences during teaching practice have a significant impact on their understanding of formative assessment practice. Several researchers concur that formative assessment strategies should be implemented in schools at an early stage with pre-service teachers. Through the practicum, pre-service teachers make critical connections between theory and practice, experiment with innovative ideas, and reflect on their own beliefs in teaching and learning, a stated by Xie and Cui (2021).

2.11 Chapter Summary

In this chapter, the review of the literature was based on the international and national literature on PGCE preservice teachers and their experiences on formative assessment implementation. The South African policies that govern the teaching practice and theoretical framework that underpinned the study. The review revealed that PGCE preservice teachers still experience challenges during practice teaching. Issues relating to how they implement formative assessment strategies, mentoring, access of teaching resources, supervisory support and assessment were found to be the problem facing PGCE preservice teachers. They maintained that they need more time in schools and although there is guidance and support from mentor teachers, studies show that they are still struggling with proficient implementation of formative assessment strategies.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

The previous chapter presented the theoretical framework and literature review pertinent to this study, the experiences of PGCE preservice teachers and the implementation of formative assessment strategies. Considering the literature review it has been shown that there is a need for examining PGCE preservice teachers experiences in the implementation of formative assessment strategies on enhancing learners learning during practice teaching. The researcher reviewed the literature on formative assessments and PGCE preservice teachers, feedback strategies, definition of formative assessment. Black and William's (2009) Theory of formative assessment was used as a fitting conceptual framework and Social Constructivism as a theoretical framework of the study. There are limited studies that connect the PGCE preservice teachers experiences with the implementation of formative assessment strategies. This chapter outlines the methods of the study which were followed to answer the research questions. This chapter starts with an identification of the research paradigm within which the researcher positioned this study. Descriptions are also given of the research design, target population and sampling procedures, data collection process, instrument validation and reliability, data analysis techniques and ethical considerations. The researcher used pseudonyms for the name of the university and participants.

3.1 Introduction

This study set out to answer the following main and subsidiary research questions:

The main research question is: What are the experiences of Post Graduate Certificate in Education (PGCE) preservice teachers in the implementation of formative assessment during practice teaching? The research sub-questions are as follows:

- How do Post Graduate Certificate in Education (PGCE) teachers conceptualise formative assessment during teaching practice?
- To what extent do PGCE pre-service teachers integrate formative assessment into teaching and learning during teaching practice?
- To what extent do PGCE pre-service teachers integrate formative assessment during practice teaching?
- How do PGCE pre-service teachers implement different types of formative assessment strategies during teaching practice?

3.2 Research paradigm

All researchers approach problems with some form of personal philosophical positioning which affects the way they see the world and the way they choose to conduct the research (Parvaiz, Mufti & Wahab, 2016:67). This research adopted a pragmatic research paradigm. Pragmatism, as a research philosophy, provides a degree of adaptability in the production of knowledge Morgan (2014). The researcher used pragmatism because it embraces both interpretivist and positivist views, and integrating these two viewpoints, and allows more complete understanding of research objectives Toyon (2021). Pragmatism was chosen for this study as the preferred philosophical framework to underpin this study. This study investigate PGCE preservice teachers experiences in implementation of formative assessment strategies during practice teaching in one South African university. The pragmatism was chosen for this study because it embraces both quantitative and qualitative designs, hence it underpins the mixed method paradigm Creswell and Cresswell, 2018). The use of mixed designs by pragmatics enables researchers to have a thorough understanding of the phenomena under study Muzata(2021).The word 'pragma' is derived from the Greek word *payua*, which means 'action', and from which the words 'practice' and 'practical' are in turn derived.

The word paradigm is defined severally. To Mertens (2005: 7), a paradigm is 'a way of looking at the world … [undergirded] by certain philosophical assumptions that guide and direct thinking and action.' To Neuman (2006: 81), it is 'a general organising framework for theory and research that includes all basic assumptions, key issues, models of quality research, and methods for seeking answers. According to Kaushik and Walsh, 2019) pragmatists acknowledge the existence of several realities, but recognise that they are always changing and dependent on our actions and experiences. To Morgan (2007:49) a paradigm represents 'systems of beliefs and practices that influence how researchers select both the questions they study and methods that they use to study them'. The two main research paradigms which have dominated research in both the natural and social sciences are the quantitative and qualitative research paradigms (Johnson, Onwuegbuzie & Turner, 2007). The former paradigm relates to a view of reality associated with positivism and post-positivism: that the world of reality lies outside of a person and can be observed, measured, and understood to some extent. According to Du Plooy-Cilliers, Davis and Bezuidenhout (2014:25), positivism is defined broadly as an approach employed in the natural sciences, expressing a view that there is a single, objective and stable social and physical external reality governed by laws. Positivists view reality as having order and regularity; they subscribe to objectivism. Positivism favours recording data in terms of numbers that can be processed using statistical techniques and believe that knowledge is universal and absolute. From the research point of view, positivism is commonly referred to as quantitative research.

The second perspective of reality is that there is no one truth and that a multiplicity of several explanations of reality are possible (Graaf, 2014: 47). Some authors refer to this second tradition as 'interpretivism'. According to Du Plooy-Celliers et al (2014: 28), interpretivism aims to gain in-depth understanding, which often requires the researcher to spend many hours in direct contact with those being studied in order to be able to appreciate how they experience daily life and to get an understanding of what is meaningful and relevant to them. Interpretivism holds that the truth is dependent on peoples' interpretation of facts; interpretivists are not interested in generalising the results, as positivists are. Insofar as this second perspective is concerned, most authors refer to it as qualitative research. Typically, this manifests in the production of thick descriptions of subjective experiences and meanings based on qualitative data (Newman, 2011: 424). Based on their knowledge claim, positivists adopt quantitative methods to describe reality in the world, whereas constructivists (interpretivists) espouse qualitative methods to construct the meaning of the phenomena under investigation.

According to Denzin and Lincoln (2005), Geven (2008), Tashakkori and Teddlie (2003; 2009), Bryman (2012), Ritchie and Lewis (2013) and Klenke (2016), researchers may be categorised in the educational field into three communities. A third research paradigm exists, referred to as 'mixed methods' or 'pragmatism' (Johnson et al., 2007; Creswell, 2009). Pragmatism recognises 'that there are many different ways of interpreting the world and undertaking research, that no single point of view can ever give the entire picture and that there may be multiple realities' (Lewis & Thornhill, 2012). Cameron (2011:101) stated, 'Pragmatism in its simplest sense is a practical approach to a problem and has a strong association with mixed methods research.'

Philosophically, pragmatism believes in using procedures that work for a particular research problem under study. Typically, this involves employing different methods to understand a research problem (Creswell, 2014: 567). The concern for pragmatists is to find out what works and what enables solutions to the problems under investigation. According to Halcomb and Hickman (2015:6), pragmatism sees the research problem as being most important, valuing both the *subjective* and *objective* to reveal answers.

(Creswell, 2014: 565). According to Teddlie and Tashakkori (2009: 4) the mixed methods research paradigm emerged in the social and behavioural sciences in the 1990s, joining qualitative and quantitative methods of scholarly enquiry as the 'third research community'. As Williams (2007: 65) avers, 'researchers typically select the quantitative approach to respond to research questions requiring numerical data, the qualitative approach for research questions requiring textual data, and the mixed methods approach for the research questions requiring both numerical and textual data'. To this end, Johnson et al. (2007) emphasise the point that in the social and behavioural or human sciences, mixed methods research started with researchers and methodologists believing that both

qualitative and quantitative viewpoints and methods were useful, as the combination addressed their research questions more fully than a single method alone might have done. Morgan (2007:53) affirms the view that more recently, work combining qualitative and quantitative methods has emphasised a largely pragmatist stance. Thus, mixed methods researchers focus on numeric and narrative data analyses (Graff, 2014:45). According to Denscombe (2008) and Plano-Clark (2010), cited by McGruder, Schraw and Buckendahl (2013:146), 'researchers across the world and in diverse disciplines have increasingly using mixed methods research, which involves the systematic and rigorous collection and analysis of both quantitative and qualitative data within a single study'. Creswell and Plano-Clark (2007: 5) define mixed methods research comprehensively as a research design with philosophical assumptions as well as methods of enquiry, with the philosophical assumptions guiding the direction of the collection and analysis of data and the integration of qualitative and quantitative data in a single study or series of studies. Mixed methods research has four characteristics; namely (a) the collection and analysis of qualitative and quantitative data, (b) the use of rigorous qualitative and quantitative methods, (c) the use of a mixed methods research design to integrate data, and (d) the occasional incorporation of a philosophy or theory to frame the design (McCrudden, Schraw & Buckendahl, 2013:151). Integration is the characteristic that truly defines then mixed methods approach and separates it from other methodologies.

To Denscombe (2008:272) the mixed methods approach involved the use of

- quantitative and qualitative methods within the same research project;
- a research design that clearly specifies the sequencing and priority that is given to the quantitative and qualitative elements of data collection and analysis;
- an explicit account of the manner in which the quantitative and qualitative aspects of the research relate to each other, with a heightened emphasis on the manner in which triangulation is used; and
- pragmatism as the philosophical underpinning of research.

According to Jonson, Onwuegbuzie and Turner (2007: 115), there are various justifications for employing mixed methods in a study. These are (a) seeking convergence and corroboration of results from different methods of studying the same phenomenon (triangulation), (b) seeking elaboration, enhancement, illustration and clarification of the results from one method with results from the other method (complementarity), (c) using the results from one method to help inform the other method (developmental), (d) rediscovering paradoxes and contradictions that lead to a reframing of the research question (initiation), and (e) expanding the breadth and range of enquiry by using different enquiry components (expansion). There are some parallels between these reasons and those advanced by Venkatesh, Brown and Bala (2013: 6), who list seven purposes of mixed methods research. These are (a) to achieve complementarity by obtaining mutual viewpoints about similar experiences or associations; (b) to achieve completeness by ensuring that a total

representation of experiences or associations is attained; (c) to develop further an idea which has emerged from a previous study or phase of the same study (sequential mixed methods); (d) to explain or expand upon the understanding obtained in a previous strand of a study; (e) for corroboration or confirmation purposes, that is, to assess the credibility of inferences obtained from one approach; f) to compensate for the weaknesses of one approach by using another; and g) to obtain divergent views on the same phenomenon.

According to Ponce and Pagan-Maldonado (2015:114), mixed methods research seeks to achieve the following four objectives:

a) Combine or integrate quantitative and qualitative methods toward the best possible approach to the research problem;
b) Generate quantitative data toward a clear and deep understanding of the research problem being addressed;
c) Generate quantitative and qualitative data from the same research problem that allows the researcher greater certainty in inferences, conclusions or statements which formulate its findings;
d) Make more robust research by using the strengths of one research model to offset methodological shortcomings from the other. This produces more reliable research.

In this regard, the central premise of mixed methods research is that the use of quantitative and qualitative approaches, in combination, provides a better understanding of research problems than either approach alone. Ivankova, Creswell and Stick (2006) contend that the rationale for mixing both kinds of data within one study is grounded in the fact that neither quantitative nor qualitative methods are sufficient, by themselves, to capture trends and details of situations. When qualitative and quantitative methods are mixed in a single study, one method is usually given priority over the other. However, in studies involving sequential mixed methods, one method clearly informs the other (Ostlund, Kidd, Wengstron & Rowa-Dewar, 2010: 370). In such cases, the aim of the study, the rationale for employing mixed methods and the weighting of each method determine whether and how the empirical findings will be integrated.

Accordingly, Mills and Gay (2016: 444) aver that mixed methods research uses ‘the advantages of both quantitative and qualitative research designs and data collection strategies to understand a phenomenon more fully than is possible using either a quantitative or qualitative design alone’. However, mixed methods research requires knowledge of both quantitative and qualitative methodology. This mixture or integration of the two approaches can take place in the philosophical or theoretical frameworks, methods of data collection and analysis, overall research design and conclusions. As Johnson and Onwuegbuzie (2004: 18) point out, ‘Many research questions and combinations of questions are best and most fully answered through mixed research solutions.

Johnson and Onwuegbuzie (2004) aver that 'both quantitative and qualitative research is important and useful'. As such, the goal of mixed methods research is not to replace either of these approaches but rather to draw from the strengths and minimise the weaknesses of both in single research studies and across studies. To McGruder, Schraws and Backpedal (2013:146), this 'mixing' of research approaches leads to more than merely the sum of its parts; it yields a more complete understanding of a research problem. Mixed methods research achieves this through leveraging the strengths of qualitative and quantitative approaches and by systematically integrating the databases. Thus, in mixed methods research, the researcher:

- collects and analyses persuasively and rigorously both qualitative and quantitative data based on research questions;
- mixes, integrates or links the two forms of data concurrently by combining them or merging them, by having one build on the other sequentially, or by embedding one within the other;
- gives priority to one or both forms of data in terms of what the researcher emphasises; uses these procedures in a single study or in multiple phases of a programme of study; frames these procedures within philosophical worldviews and theoretical lenses;
- combines the procedures into specific research designs that direct the plan for conducting the study (Creswell & Plano-Clark, 2011:5).

From the literature, a number of reasons have been presented to justify the use of the mixed methods research paradigm. Wisdom, Cavaleri, Onwuegbuzie and Green (2012) present these as follows:

- Corroboration – using the results of one method to corroborate the findings of the other about a single phenomenon;
- Complementarity – using one method to elaborate, illustrate, enhance or clarify the results from another;
- Developmental – using the results of one method to inform another method.
- Instrument development – qualitative methods are employed to design a quantitative instrument, then the instrument is tested in the study. Both complementarity and developmental were reasons for the use of mixed methods in the current study.
- Sampling – one approach facilitates sampling for the other approach.
- Initiation – one method is used to uncover the paradoxes and contradictions in findings from the other method;
- Expansion – the depth and breadth of the study are expanded through the use of different methods for various components of the research.

Morgan (2014:1051) points out that pragmatism embraces 'the importance of joining beliefs and actions in the process of inquiry that underlies any search for knowledge, including the specialised activity that we refer to as research'. Subedi (2016: 571) gives a more philosophical explanation

for the value of using mixed methods in research by stating that although pragmatists believe that there is an external world which is independent of our minds, there is no 'absolute truth lying out there'. Thus, pragmatists embrace both constructivism and positivism. Thus, for pragmatists, the research question or problem is the central focus – and not the research paradigm in which one is steeped (Pavaiz, Mufti & Wahab, 2016: 68).

Accordingly, pragmatism allows researchers to study what interests and is of value to them 'in the different ways that they deem appropriate, and use the results in ways that that can bring about positive consequences within their value system' (Tashakkori & Teddlie, 1998: 30). Thus, pragmatism is driven by anticipated consequences (Regmi, 2010: 11) and is 'a practical approach to a problem and has a strong association with mixed methods research' (Cameron, 2011: 101). McMillan and Schumacher (2006:401) critique mixed methods by drawing attention to a disadvantage of using mixed methods, namely the need for the researcher to be proficient and competent in both qualitative and quantitative methods, the extensive data collection and resources needed to undertake a mixed method study, and the tendency to use the mixed methods label liberally to studies which only superficially mix the two dominant research paradigms. There are several aspects pertaining to the research paradigm chosen for this study which the researcher wishes to present to assist the reader to follow the researcher's framing of the issues. These are outlined under several sub-headings below. Pragmatism is suitable for this study because it supports both objectivism and subjectivism. It uses research procedures that are practical, merges data methods and is unbiased. Thus, this study chose pragmatism as the epistemological lens to frame this study based on the research objectives, questions, and context. Muzata (2021) notes that the use of mixed designs by pragmatics enables researchers to have a thorough understanding of the phenomenon under study

3.3 Research design

Guetterman (2017: 5) explains that a research design is like a roadmap guiding the entire research process in terms of methodological procedures, decisions, the flow of research, and how one thinks about integrating data. To Kumar (2014: 123) a research design is a plan through which one decides for oneself and communicates to others one's decisions regarding what study design one proposes to use, how one will collect information from the respondents, how one will select participants, how the information one collects is to be analysed and how one intends to communicate one's findings. Mixed methods research designs involve the collection, analysis, and 'mixing' of quantitative and qualitative designs to understand a research problem (Mills & Gay, 2016:444). They include both quantitative and qualitative data collection strategies within the same study. This study used a sequential explanatory research design in which the collection and analysis of

quantitative data was followed by the collection and analysis of qualitative data. The mixed methods sequential explanatory research design consists of two distinct phases: quantitative and qualitative. In this design, a researcher first collects and analyses the quantitative (numeric) data. This is followed by the collection and analysis of qualitative (textual) data during the second phase. The qualitative data helps to explain, or elaborate on, the quantitative results obtained in the first phase. Thus, the second qualitative phase builds on the first quantitative phase, and the two phases are subsequently connected in the interpretation stage (Ivankova, Creswell & Stick, 2006: 5; Warfa, 2016:4). In this research design, priority is given to the quantitative data, and the two methods are integrated during the interpretation phase, with the purpose of giving a full description and/or explanation of the phenomenon being studied (Creswell, 2014:57). In the explanatory sequential design, quantitative data is collected first and is more heavily weighted than is the qualitative data. The findings of the quantitative study then determine the type of qualitative data to be collected in the second phase, which includes data collection, analysis and interpretation to help explain or elaborate on the quantitative results (Gay & Mills, 2016:445).

Figure 3.1 illustrates the major steps of the sequential explanatory research design.

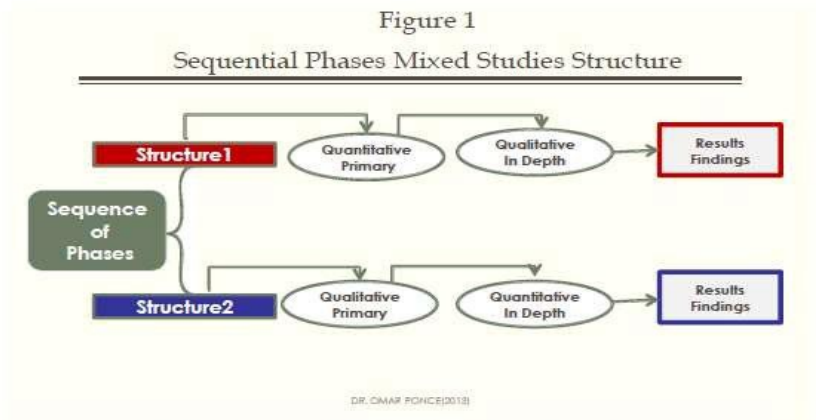


Figure 1. Sequential Phases Mixed Studies Structure

Figure 3. 1 The phases of sequential explanatory research design

Figure 3.2 gives another perspective concerning this research design.

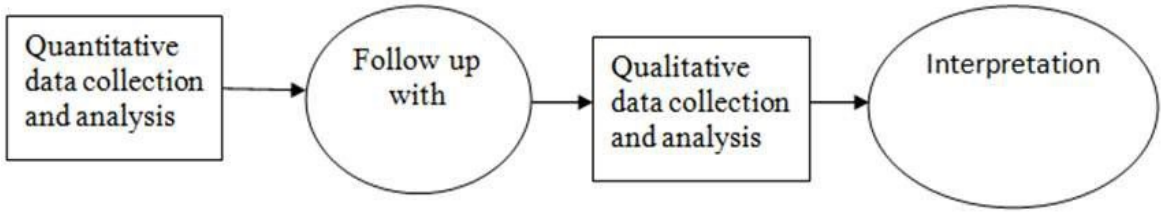


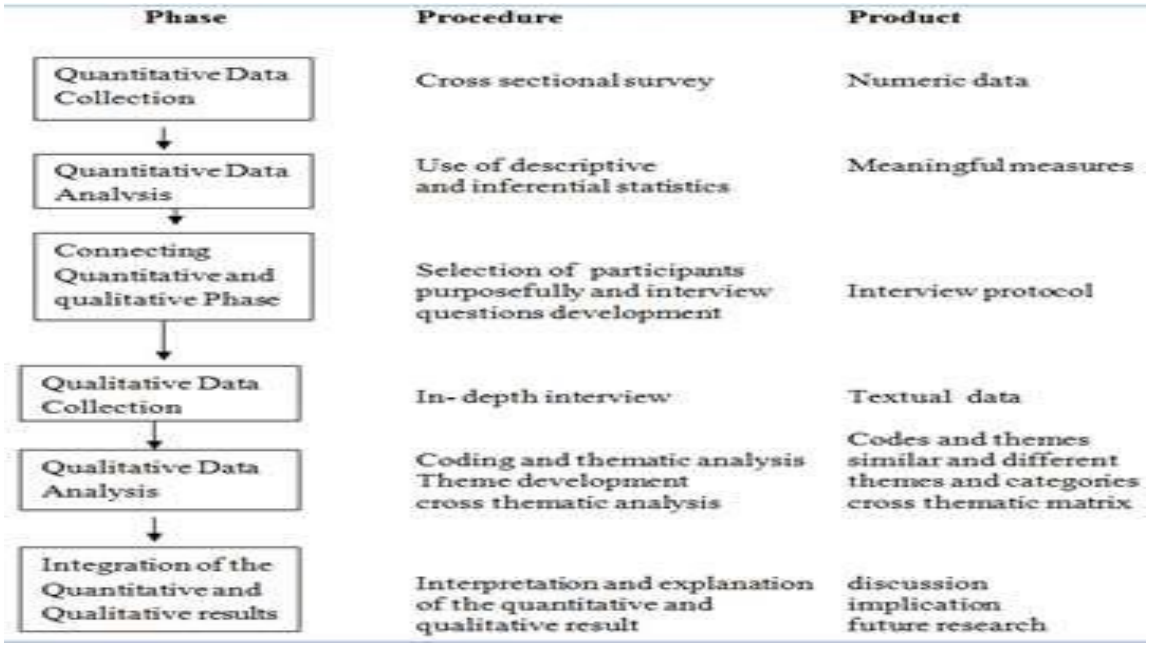
Figure 3. 2 A simplified sequential explanatory research design

The explanatory design is a two-phase mixed methods design having two variants, with the follow-up explanations of qualitative data used to explain or expand on the quantitative results. Specific

quantitative findings that need additional explanation are identified, and participants who can best help explain these findings are identified for the qualitative phase of the study. Thus, these participants are purposefully selected for a follow-up, in-depth, qualitative study. The two sets of data are connected in two places. The first connection point relates to the use of the quantitative results to select participants for the second phase, and the second connection point involves the mixing that happens after the qualitative data has been collected and analysed. In this regard, the results are connected to gain a better understanding of the findings from both phases. Accordingly, in this study, the researcher collected quantitative and qualitative data sequentially in two phases, with one form of data collection following and informing the other (Creswell, 2014: 572).

According to Warfa (2016: 5), there are two strengths of the sequential explanatory research design; namely that a) it enables a researcher to gain a deeper understanding of findings revealed by quantitative studies, complemented by qualitative data, and b) the two-phase approach makes sequential designs easy to implement, describe and report. On the other hand, Warfa (2016) notes that this research design has the weakness of demanding a great deal of time, which may make it difficult for a researcher to complete both data collection phases, especially given that the second phase is often in response to the results of the first phase.

Figure 3.3 presents the steps that constitute the sequential explanatory research design.



The rationale for using the sequential explanatory research design in the current study was that the quantitative data and its subsequent analysis provided a general understanding of the research problem, and the qualitative data and its analysis refined and explained these statistical results by exploring participants' views in more depth (Ivankova, Creswell & Stick, 2006: 5).

The advantage of using the sequential explanatory design lies in its straightforwardness and the opportunities it yields for the exploration of the quantitative results in more detail. The design can be useful, especially when unexpected results arise from a quantitative study. On the other hand, the limitations of explanatory sequential design lie in the lengthy time required and the feasibility of having the resources to collect and analyse both types of data (Ivankova et al. 2006).

3.4 Mixed- Method Approach Research approach

Mixed methods research draws on the strengths of both quantitative research and qualitative research design Berman (2017). Mixed methods simply employ a combination of both qualitative and quantitative approaches based on the purpose of the study and nature of the research questions aiming to provide a better understanding of the subject. In utilising the integration of both methods, it helps the researcher to use the advantage of both qualitative and quantitative methods Taherdoost (2022). This study was framed within the mixed methods research approach to build on the strengths of both the quantitative and qualitative data as the researcher attempted to address the research questions of the study. A primary justification for a mixed methods approach was its potential to generate an enriched and enhanced understanding of the implementation of formative assessment by PGCE pre-service teachers during practice teaching. The formative assessment experiences of pre-service teachers as they implemented formative assessment during practice teaching were explored through mixed methods. Humerinta-Peltomaki and Nummela (2006) found that 'mixed methods added value by increasing validity to the findings, informing the collection of the second data source, and assisting knowledge creation'. Studies that use a mixed methods approach gain a deeper understanding of the phenomenon than studies that do not use both quantitative and qualitative approaches. Therefore, the reasons for adopting the mixed methods research paradigm in the current study were that this paradigm (a) seeks to build on the strengths of both quantitative and qualitative, and (b) is used when quantitative or qualitative research alone is not enough to address the research problem or answer the research questions. In this study, it was felt that more data would be needed to extend, elaborate on, or explain the first database (quantitative). Accordingly, quantitative data was followed up with a qualitative study to obtain more detailed, specific information than could be gained from the results of quantitative results alone. (Creswell, 2014: 565). In concurrence, Guetterman (2017: 3) envisions that using mixed methods 'provides more complete understanding of a phenomenon than either qualitative or quantitative research alone'. In this study, the qualitative research dealt with pre-service teachers' subjective experiences and the meanings they associated with formative assessment implementation during teaching practice (Du Plooy-Cilliers, Davis & Bezuidenhout, 2014: 173).

3.5 Explanatory Sequential Design

Sequential explanatory design involves the collection of quantitative data in the initial phase Muzata (2021). The mixed method research used in this study is explanatory sequential mixed method research. This study involved a two-phase process in which the researcher collected quantitative data using a 5-point Likert-scale through questionnaire for the first phase. The results from the quantitative data were analysed and statistically represented. The quantitative results were analysed using descriptive and inferential statistics. The empirical data gathered through the questionnaire, literature and theoretical frameworks guided the researcher in the type of questions to ask the PGCE preservice teachers for the focus group discussion and document analysis during the second qualitative phase of this research. In the second phase (qualitative)the researcher wanted to directly engage with PGCE preservice teachers to deeply understand their lived experiences and shared meanings as PGCE preservice teachers who implemented formative assessment strategies during practice teaching.

3.6 Population and sampling techniques

Creswell (2014: 160) defines a population as 'a group of individuals who have the same characteristics. In this study, the target population was all PGCE pre-service teachers in the province of KwaZulu-Natal. The accessible population comprised 452 PGCE student teachers who were registered full-time in 2017 at one of the universities in the province. For the quantitative phase of the study, systematic random sampling was used to select the participants.

The PGCE student teachers were selected on the basis of the following attributes:

- Registered PGCE full-time student teachers at National Qualification Framework (NQF) 7 in 2017;
- Registered for two methodology subjects and practice teaching modules;
- Had completed home-based and university-organised practice teaching;
- Had attended university-organised weekly classroom observations at schools except during school holidays and academic recess at the university.

Typically, because of the size of the target population, a researcher needs to draw on a smaller group of participants to save time and other resources. This calls for sampling techniques to be used, as may be required in the study. Sampling procedures in the social and behavioural sciences are often divided into two groups: probability and non-probability sampling. In probability sampling, every member of the population has a known (non-zero) probability of being included in the sample; some form of random selection is used, and the probabilities can be assigned to each unit of the population objectively (Alvi, 2016: 12). On the other hand, in non-probability sampling, 'randomisation is not important in selecting a sample from the population of interest' (Etikan, Musa

& Alkassim, 2016: 1). Thus, by way of definition, 'non-probability sampling is a sampling technique where the samples are gathered in a process that does not give all the participants or units in the population equal chances of being included' (Etikan et al, 2016: 1).

Probability sampling techniques are primarily used in quantitative-orientated studies and involve selecting a relatively large number of units from a population in a random manner where the probability of inclusion of every member of the population is determinable (Tashakkori & Teddlie, 2003a: 713). Probability sampling aims to achieve representativeness, which is the degree to which the sample accurately represents the entire population (Creswell, 2014: 161). For the first phase of the study, participants were selected through systematic random sampling (Imenda & Muyangwa, 2006: 95) from a list of PGCE pre-service teachers, resulting in a research sample of 130 pre-service teachers. The researcher accessed a complete list of all the 452 registered PGCE students in 2017, with permission from the Registrar's office (see Appendix B). Each student was assigned a number from a table of randomly generated numbers, and the first 130 numbers drawn comprised the research sample. This was deemed to be a sufficient representation of the accessible population. Of the 130 student teachers, 99 returned duly completed questionnaires, giving a return rate of 99%.

The motivation for the use of a qualitative research sample was to place emphasis on the uniqueness of the phenomenon, group or individuals in question. As Manion et al. (2016: 161) argue, 'It is unwise to talk about "sample" and more fitting to talk about a group of individuals.' According to Manion et al. (2016: 161), this is so because in most qualitative research, the extent to which such a group of individuals is 'representative of a wider population or group is irrelevant, as much qualitative research seeks to explore the particular group under study, not to generalize'. Rosenhalt (2016:511) affirms the point by stating that 'generalizability is not the primary objective for in-depth interviews or focus groups, but rather the objective is to develop an understanding of the meaning behind behaviours. Similarly, the intention of this study was not to generalise the findings. Non-probability sampling techniques are frequently used in qualitative studies and may be defined as selecting units – for example, individuals, groups of individuals or institutions based on specific purposes associated with answering a research study's questions. Consequently, a non-probability sample does not purport to be representative of the population from which it has been drawn; therefore, it makes no claim to the generalisability of the findings. One such sampling technique is purposive sampling, whereby 'a researcher has something in mind and participants that suit the purpose of the study are included' (Etikan et al., 2016: 1).

In this study, thirteen (13) PGCE preservice teachers were purposively selected to participate in the second phase of data collection from the group that had participated in the quantitative phase. A

focus group interview was conducted with the thirteen interviewees in order to build on the quantitative data and extend the researcher's understanding of the formative assessment practices of the student teachers who had completed their teaching practicum. Through focus group interviews, the researcher had an opportunity to probe deeper into the participants' experiences about how they integrated and implemented formative assessment. Documentary analysis was also conducted to obtain maximum insight into the student teachers' experiences in formative assessment implementation (Hammarberg, Kirkman & Lacey, 2016: 500). The researcher identified possible focus group members from the results of the quantitative phase using homogeneous purposive sampling. Palinkas et al. (2015:3) justify the selection of homogeneous sampling for the purpose of reducing variations, simplifying analysis, and facilitating group interviewing. The researcher personally made appointments with PGCE student teachers at a convenient time for them. Multiple forms of data collection took place in the qualitative phase, a focus group discussion, phone conversations and document analysis.

3.7 Data collection

The main data sources for this study were questionnaires (for quantitative data), an interview schedule and selected documents (for qualitative data). The respective instruments used to collect data are described below.

3.7.1 Likert Scale Questionnaire

In this study, the Likert-scales questionnaire is the first instrument the researcher administered a questionnaire (for the quantitative phase) to a randomly selected research sample of PGCE pre-service teachers. Likert-scales use a series of questions and provide participants with nominal, ordinal or numerical response options Story and Tait (2019:196). In this study, the researchers aimed to investigate about the PGCE preservice teachers experiences and the implementation of formative assessment during practice teaching. Therefore, the researcher used an explanatory sequential design mixed method design. The first phase was facilitated using the Likert- scales questionnaire. The researcher informed participants of the purpose of the study and that participation was voluntary. The researcher informed them that their participation was valuable as the success of the study depended on it.

The student teachers gave written consent a~~bo~~ut their participation in the study (see Appendix D). As explained above, the first step involved quantitative data collection.

The five-point Likert-scale questionnaire was a self-designed questionnaire was guided by the research questions and was used to investigate the PGCE preservice teachers experiences on the implementation of formative assessment during practice teaching. With a critical analysis of the literature review on the formative assessment strategies and PGCE preservice teachers during

practice teaching, the researcher constructed the questionnaire with the response characteristics having the Likert scale questionnaire and open-ended questions for the PGCE preservice teachers to respond to their experiences and the types of formative assessment strategies which they implemented during practice teaching.

Creswell (2014: 202) explains that in quantitative research, data is analysed to address research questions, with the researcher required to describe trends in the data through the use of variables or questions in an instrument. Quantitative data collection and analysis was conducted on formative assessment experiences during practice teaching during the first phase, using a questionnaire. A cover letter accompanied the questionnaire, explaining the purpose of the study and acting as proof that the researcher was indeed a registered student engaged in research in formative assessment experiences of PGCE pre-service teachers. The questionnaire took between 30 and 40 minutes to complete.

A questionnaire is a written collection of self-report questions to be answered by a selected group of research participants. Questionnaires allow the researcher to collect large amounts of data in a relatively short amount of time (Mills & Gay, 2016: 570). In this study, the questionnaire was the main research instrument, designed to elicit as much relevant information as possible from the respondents. It consisted of three sections: A pre-coded Section A, focusing on biographical information, such as gender, age and highest qualification attained; Section B, having 15 Likert-type scale items (ranging from 'strongly agree' to 'strongly disagree'); and section C, which contained four open-ended questions, giving the respondents an opportunity to express their views concerning the implementation of formative assessment during the time they were in schools for teaching practice – including the impact thereof on classroom practices. Section C was designed to draw out in-depth information and insights from the participants. In this regard, Section C yielded qualitative data from the respondents, which was later supplemented with data from the focus group discussion. Creswell (2014:242) explains that in questionnaires one may ask some questions that are closed-ended and some that are open-ended. The advantage of the combination of kinds of questioning is that predetermined closed-ended responses can get useful information to support theories and concepts in the literature, while open-ended questions permit the researcher to explore reasons for the close-ended responses and identify any comments participants might have that are beyond the responses to the close-ended questions. The disadvantage of this, however, is that the researcher inevitably ends up with a lot of qualitative data to analyse (Creswell, 2014: 242). Nonetheless, Welman, Kruger and Mitchell (2005:175) justify the inclusion of open-ended questions in questionnaires, stating that it has the advantage that respondents' answers are not influenced unduly by the interviewer or the questionnaire; the verbatim replies from respondents

can provide a rich source of varied material which might have been untapped by categories on a pre-coded list.

The questionnaire was design and guided by the model of formative assessment suggested by Black William (2009:4). This model has five formative assessment strategies:

(a) Clarifying and sharing learning intentions and criteria for success
(b) Engineering effective classroom discussions, questions, and learning tasks that elicit evidence of learning
(c) Providing feedback that moves learning forward
(d) Activating students as instructional resources for one another
(e) Activating students as the owners of their own learning.

This formative assessment model was useful for this study because the aim was to investigate the PGCE preservice teachers experiences and how they implement formative assessment strategies. PGCE preservice teachers have a variety of experiences in teaching their subjects and how they implemented formative assessment strategies in every topic and in their daily lesson plans as a main way to assess their learners understanding. The formative assessment strategies theoretical framework and social constructivism as a theory of learning was used to design a Likert-scale questionnaire and the open-ended questions to elicit PGCE preservice teacher's experiences. The researcher used the theory of learning called social constructivism as it is aligned with formative assessment of students learning Sardareh and Saad (2012). Moreover, this theory is also related to the teacher's role in applying and facilitating the formative assessment strategies through preparing the appropriate tasks that provide effective collaboration work between students with continuous development Moss and Brookhart (2019). The results of this study indicated that learners receive feedback on their work from the PGCE preservice teachers using feedback information to improve learning. In finalising the formatting of the questionnaire, the researcher held discussions with the supervisor and a statistician on the appropriate use of coding to ensure that there would be no missing values, which would have adversely affected data processing and, consequently, the findings. The statistician also advised on some of the terms which could have been difficult for the participants to interpret.

3.7.2 The focus group discussion

The qualitative phase of the study served as a follow-up to the dominant quantitative phase, and sought to address questions not addressed in the quantitative phase. Overall, the intention of the qualitative phase was to obtain focused explanations and check for common patterns in the data (Gays & Mills, 2016: 446). Qualitative research seeks to probe deeply into the research setting to obtain in-depth understandings about the way things are, why they are that way, and how the

participants in the context perceive them (Mills & Gay, 2016:32). As a research methodology, qualitative research is concerned with understanding the process and the social and cultural contexts which underlie various behavioural patterns and is mainly concerned with exploring the 'why' questions of research (Creswell, Eberhson, Eloff, Ferreira, Ivankova, Jansen, Nieuwenhuis, Pietersen, Plano-Clark, Van der Westhuisen & Maree (eds) (2014:50). In this regard, the aim of qualitative researchers is to refer to a whole-world experience, because the interest is in the depth of human experience, including all personal and subjective peculiarities that are characteristic of individual experiences and meanings associated with a particular phenomenon (Du Plooy-Cilliers, Davis & Buzuidenhout, 2014:173).

Typically, qualitative researchers work from the constructivist or interpretivist paradigm, which supports the notion that reality, as experienced by individuals, is 'constructed' by them, and seeks to understand the ways in which they do so. Multiple realities in this study about formative assessment implementation during practice teaching informed and strengthened the study. Qualitative researchers engage in deductive reasoning as they work from collected data toward a theory (Grafft, 2014:46). In this study, the PGCE teachers' experiences revealed their multiple realities in relation to the implementation of formative assessment. Sutton and Austin (2015:226) state that qualitative research can help researchers to access the thoughts and feelings of research participants, which can enable understanding of the meaning that people ascribe to their experiences. In this respect, the current study was phenomenological in nature, in that it sought to understand how the participants experienced a certain phenomenon – the implementation of formative assessment during teaching practice (Sutton & Austin, 2016:227).

Accordingly, data from the focus group discussion and documentary analysis helped to explain the quantitative results, thereby achieving complementarity. In the interpretation phase, the quantitative and qualitative data was integrated to give full effect to the responses to the research questions of the study (McKim, 2017: 204). The researcher did a thematic analysis of each lesson plan while analysing document. Documents analysis was done to determine the experiences of PGCE preservice teachers and what formative assessment strategies were given to learners. Data from documents were transformed into word documents and analysed. The researcher read transcripts several times to make sense of them. The researcher did coding manually while attempting to identify phrases or keywords in PGCE preservice teachers practices of formative assessment strategies. The conceptual framework of Black and William (2009) discussed in chapter two was also used to get an idea of twelve PGCE preservice teachers formative assessment strategies used during teaching practice strategies that were determined to be related to themes were put under the themes. The conceptual framework of Black and Williams'(2009) model of formative assessment

were used in identifying and naming the themes. The qualitative phase included focus group discussions and document analysis, allowing the researcher to further understand how PGCE student teachers experienced formative assessment implementation during teaching practice. The researcher sought to collect rich descriptive data in respect of students' experiences in the implementation of formative assessment during practice teaching. Accordingly, the PGCE student teachers were asked to relate their subjective teaching experiences and how they implemented formative assessment during teaching practice. Thus, the researcher collected thick descriptions of these experiences through the participants' personal accounts of their experiences. Bryman (2008: 503) reports that the original idea for the focus group was to conduct interviews with a group of people who were known to have certain experiences and could yield useful information about those experiences. According to Du Plooy-Cilliers (2014: 186), a researcher should choose participants based on their experiences. The PGCE student teachers were interviewed at a school after their period of practice teaching because of the insights and experiences they would have gained during this period. In this regard, Bryman (2008: 503) affirms the point that a focus group may be very helpful in the elicitation of a wide variety of different views in relation to a particular issue. In qualitative research, the viewpoints of the people being studied constitute an important point of departure (Bryman, 2008: 503).

The whole data collection procedure should be explained in detail. Type text here Maree, Creswell, Eberhson, Ferreira, Ivankova, Jansen, Nieuwenhuis, Pietersen, Plano-Clark and Westhuisen (2014: 90) point out that one advantage of the focus group interview strategy is that group interactions will result in widening the range of responses, activating forgotten details of the participants' experiences and releasing inhibitions that may otherwise have discouraged some participants from disclosing information. In a focus group discussion, the researcher explores the perceptions, experiences and understandings of a group of people who have some experiences and understanding of a situation or event (Kumar, 2014: 193). According to Creswell (2014:240), a focus group discussion is a process 'of collecting data through interviews with a group of people, typically four to six'. However, Onwuegbuzie, Dickson, Leech and Zoran (2009:3) argue that focus groups should have between six and twelve members. To Gill, Stewart, Treasure and Chadwick (2008: 293), 'The optimum size for a focus group is six to eight participants excluding researchers, but a focus group can work successfully with as few as three and as many as 14 participants.' Gill, et al. (2008) further argue that small groups risk limited discussions occurring, while large groups can be chaotic, hard to manage for the moderator and frustrating for the participants who may feel they get insufficient opportunities to speak. The focus group for this study comprised 13 PGCE student teachers.

According to Luenga and Savithiri (2009: 218) 'a focus group is a form of qualitative research'. The questions for the interview guide were formulated based on the findings from the quantitative

phase of the study (see Appendix I). The interview guide (see Appendix J) consisted of semi-structured items, inviting the respondents to share their experiences on formative assessment implementation practices and strategies during practice teaching. The researcher facilitated the focus group interview, bearing in mind the conditions of group dynamics as stated by Maree et al. (2014: 91). During the discussion, the researcher outlined the ground rules and guided the group to ensure a non-threatening environment and appropriate group dynamics (Krueger & Casey, 2000). She ensured that all participants had their say; they took turns so that each participant's experiences were heard and were captured and digitally recorded on a voice recorder. The researcher ensured that participants understood that the focus group was a platform for each member to share their experiences and views on the topic at hand. The researcher also discharged the role of moderator to safeguard participants and their data. The participants were allocated letters from A to M. According to Cohen and Morrison (2018), confidentiality is how participants' right to privacy must be protected. The researcher used pseudonyms to conceal the participants' identities. There was only one focus group comprising 13 participants. The interview/discussion lasted three hours and 35 minutes. Following the discussion, the researcher transcribed the recorded data verbatim, after which the transcriptions were taken back to the focus group members for correction, verification and confirmation (Kumar, 2016: 194).

3.7.3 Document analysis

Document analysis is a form of qualitative research in which documents are interpreted by the researcher to give voice and meaning to an assessment topic (Bowen, 2009). The following documents were evaluated: Student evaluation forms, Curriculum and Assessment Policy Statements (CAPS), and lesson plans. Analysing documents incorporates coding content into themes like how focus group transcripts are analysed. Document analysis was employed in order to provide data and response to the research sub-question number 3: To what extent do preservice teachers implement formative assessment strategies during teaching practice?

The teaching practice evaluation forms were analysed about how student teachers assessed learners formatively during practice teaching, the type of formative assessment administered during teaching, and the topics covered during evaluation (whether they were what is prescribed in the policy document). The researcher collected the participating PGCE preservice teachers' files with the following documents lesson plans, Annual Teaching Plan (ATP). The purpose of collecting the documents was to look for whether PGCE preservice teachers utilize formative assessments strategies during teaching practice. The lecturer's comments were evaluated against lesson plan criteria. In the lesson plan, the focus was on the type of formative assessment planned and carried out. According to Creswell (2014: 245), 'a document represents a good source of text (word) data

for a qualitative study'. The focus group members submitted documents at times convenient to them. The researcher sought permission and consent from PGCE students to use their files for data analysis (see Appendix G).

The document analysis is the third instrument in this study. The researcher collected the PGCE preservice teachers lesson plans and Annual Teaching Plans (ATP) 12 participants provided the researcher with their files the provided documents the purpose was to look for whether PGCE preservice teachers utilized formative assessment strategies except self-assessment and peer-assessment. The findings revealed that they did not use self-assessment and peer- assessment. They were 12 PGCE preservice teachers' files and they were coded with a participant code to maintain confidentiality and to protect the participant's identity, the researcher made sure that no other individual had access to files to protect identity and maintain confidentiality. To identify each participant's file pseudonym's (PSTs A, B, C, D, E, F, G, H, I, J, K and L) were used during transcribing. Document analysis was done to determine what formative assessment strategies, were given to students.

3.8 Data analysis procedures

Ponce and Pagan-Maldonaldo (2015:126) argue that 'in mixed methods studies, three types of data analysis are used: analysis of quantitative data, qualitative data and analysis of mixed data'. The analysis of mixed methods data consists of organising and combining quantitative and qualitative data to achieve certain objectives. This section presents the methods used for analysis of quantitative and qualitative data collected in this study. Quantitative and qualitative data from each phase was analysed separately, and then findings were integrated using a quantitative-dominant, sequential explanatory mixed analysis strategy.

3.8.1 Quantitative data analysis

In this study, the SPSS 24 statistical package was used for the quantitative data analysis. After data collection, the data was prepared for data entry. The coding of all information on the questionnaire was done by assigning numbers to the data based on the numbers used in the various sections of the questionnaire. After the responses on the questionnaire were coded, the statistician captured them for analysis using the Statistical Package for Social Sciences (SPSS) Version 24. Before the analysis of data started, the dataset was checked for mistakes and errors to avoid any distortion of the results. Following data analysis, the data was cross-checked for any errors by inspecting the frequencies for each of the variables. This was done by going back to the questionnaires and checking the accuracy of data capturing. A thorough attempt was made to start the analysis process with a clean, error-free dataset. The data was then analysed to show the percentages of students

who agreed, strongly agreed, disagreed or strongly disagreed with the statements on the implementation of formative assessment during practice teaching. The quantitative method placed primary emphasis on generalisability by ensuring that the knowledge gained was representative of the population from which the sample was drawn (Palinkas, Horwitz, Green, Wisdom, Duan & Hoagwood, 2013: 2). Descriptive statistics were performed to explore variations and the overall distribution of study variables in terms of the general tendencies in the data; namely, mean, mode, median, the spread of scores variance, standard deviation, the range, and a comparison of how one score related to all others.

From the quantitative analysis, the researcher identified emerging themes the following emerging themes questioning, feedback, group work, homework, and class activities. for open-ended questions in the second phase of the study. The collected data was tabulated and entered a spreadsheet by the statistician and research assistant.

3.8.2 Qualitative Data Analysis

Qualitative research involves putting oneself in another person's shoes and seeing the world from that person's perspective. Thematic analysis was adopted for the qualitative approach in this study. According to Braun and Clarke (2006: 16), 'thematic analysis refers to the method of identifying, analysing and reporting patterns or themes within data'. Braun and Clarke (2006:15) posit that 'the process starts when the analyst begins to notice, and look for, patterns of meaning and issues of potential interest in the data … during data collection'. The analysis involves a constant moving back and forward between the entire dataset, examining the coded extracts of data that one is analysing, and analysing the data that one has produced.

The focus group participants were interviewed, with data analysis yielding certain themes supported by direct quotations from the participants. The researcher in this study mitigated the possibility of bias by seeking the assistance of a statistician and research assistant to ensure that the voices of the participants were represented accurately. As Sutton and Austin (2015: 227) aver, 'It is their voices that the researcher is trying to hear so that they can be interpreted for others to read and learn.' Thus, data analysis in qualitative research involves summarising data in a dependable and accurate manner, leading to the presentation of study findings in a manner that has 'an air of undeniability' (Mills & Gay, 2016: 581). In this study, qualitative data analysis followed an inductive, thematic approach, with initial codes identified by the researcher and verified by the researcher's supervisor/promoter and the statistician. More specifically, in this study, the data was analysed and categorised in the following six phases of thematic analysis proposed by Braun and Clarke (2006: 16).

a) Becoming familiar with the data

The researcher immersed and familiarised herself with the collected data by listening to the audio-recorded focus group interviews and reading and re-reading the data collected from them. The interviews were transcribed verbatim, and lines of text were numbered. The first step was therefore reading and re-reading the transcript and making notes from the extract that covered the experiences of the student teachers' implementation of formative assessment during practice teaching. The transcript was organised according to the order of interview schedule questions (Bree & Gallagher, 2016: 2815).

b) Generating initial codes

In this phase, the data was organised in a meaningful and systematic way across the entire dataset, with codes collated into potential themes that brought together all the data relevant to a particular idea. According to Sutton and Austin (2015: 228), coding refers to the identification of topics, issues, similarities, and differences that are revealed through the participants' narratives and interpreted by the researcher.

c) Searching for themes

A theme is a pattern that captures something significant or interesting about the data and/or research question (Maguire & Delahunt, 2017: 3356). In this study, the researcher collated codes and their associated units of data into potential themes, with all data in a theme describing an aspect of the students' experiences of formative assessment during practice teaching.

d) Reviewing themes

During this step, the researcher reviewed, modified, and developed the preliminary themes that were identified in the previous step. The researcher read data associated with each theme and considered whether the themes cohered with the context of the entire dataset (Marigue & Delahunt, 2017: 3358).

e) Defining themes

In this phase, there was ongoing analysis to refine the specifics of each theme, and the overall story the analysis told. Clear definitions and names for each theme were given, based on the essential idea in each theme. The names given to the themes were concise and informative.

f) Writing up

The researcher then translated the data into a piece of writing by using compelling extract examples that related to the themes, research questions and literature, supported with empirical evidence that addressed the research questions. English language transcription of data was made because data transcription was a necessary step on the way to interpretation (Flick, 2006: 219).

3.8.3 Integration of quantitative and qualitative results

The integration of the results from the quantitative and qualitative phases of the study was considered an essential aspect of this study, enhancing the reliability and validity of the findings within the aegis of triangulation. According to Morran-Ellis, Alexander, Cronin, Dickson, Fielding, Sleney and Thomas (2006: 51), integration is the 'generation of a tangible relationship among methods, data and perspectives, retaining the integrity of each through a set of actions clearly specified by the research team'. According to Mills and Gay (2016: 502), after data is collected, the first step in analysis involves converting behavioural responses into some numeric system (quantitative), or categorical organisation (qualitative).

3.9 Measures to assure reliability and validity

The principles of reliability and validity are essential to sound research, and steps need to be taken to ensure that these principles are upheld. Reliability and validity determine the integrity of the research instruments and ensures the credibility of findings (Noble & Smith, 2015: 1). Research integrity and robustness are as important in qualitative studies as they are in other forms of research (Hammarberg, Kirkman & Lacey, 2016: 499). The questionnaire was tested for its validity and reliability. Reliability was assured by pretesting the questionnaire on a small number of people before it was used in the main study (William, 2006). The questionnaires for the purpose of the pilot study were administered to 20 PGCE student teachers who had not been selected for the main study. For validity, copies of the questionnaire were given to the researcher's supervisor, and a subject specialist in didactics and curriculum studies. They were requested to offer a critique, criticisms and comments concerning the sentence structure, confusing questions, length of the questionnaire and ambiguous statements, and to give suggestions regarding possible clarifications. Having reviewers examine the completeness of the questionnaire is one way to determine its content validity (Mills & Gay, 2016:215). All feedback was carefully studied and considered, and the results were used to finetune the questionnaire. This resulted in a revised instrument ready to be administered to the selected research participants (Mills & Gay, 2016: 215).

In research, the terms internal and external validity are commonly used to describe the investigative rigour of a study. Internal validity refers to how much correspondence exists between the data collected and the research problem. External validity refers to whether the study data can be used beyond the context of the study or applied to other samples that were not studied (Ponce & Pagan-Maldonado, 2015: 127).

3.9.1 Validity and Reliability in Qualitative Research

Validity in qualitative data was ensured by adopting a triangulation procedure. In this study, triangulation involved three sets of data methods: focus group interview using interview guide and document analysis which were employed to identify the formative assessment strategies used by PGCE preservice teachers during practice teaching. A voice recorder was used to record all the procedure of the data collection methods. Since the validity of the findings had to be guaranteed, transcripts were administered and sent back to participants who had to verify the accuracy of the findings.

3.9.2 Reliability

The researcher guaranteed reliability by ensuring that the findings of both qualitative instruments' rubric and interview guide. PGCE preservice teachers, and focus group interview guide was utilised to guide reliability, consequently, participants were asked similar questions. The rubric was used in document analysis to analyse the document using similar criterion.

In qualitative research, validity is the degree to which qualitative data accurately gauges what one is trying to measure (Mills & Gay, 2016: 572). According to Mills and Gay (2016: 572) there are two terms which describe validity in qualitative research: trustworthiness and understanding. According to Noble and Smith (2015:2), validity refers to the integrity and application of the methods undertaken and the precision with which the findings reflect the data, while reliability describes the degree of consistency within the employed analytical procedures. To ensure trustworthiness in this study, the researcher collected data through questionnaires, focus group discussions and document analysis of the PGCE student teachers of the class of 2017.

3.9.3 Trustworthiness

In the study, the researcher used the following strategies as proposed by Guba (1981), cited in Mills and Gay (2016:574), to ensure trustworthiness during focus group interviews and documentary analysis.

3.9.4 Prolonging participation

The researcher-built trust with participants by engaging with them for a prolonged period of time during the focus group discussion, with the discussion lasting three hours and 35 minutes. After the discussion, the researcher remained engaged with the data by immersing herself in it through transcribing and conducting the analysis process, as described under Point 3.7.2. above.

3.9.5 Triangulation

Cohen, Manion and Morrison (2011:141) define triangulation as 'the usage of two or more approaches of data collection in the study of some characteristics of human conduct'. Mills and Gay (2016:397) support the idea of triangulation as a means of strengthening qualitative research by stating that 'triangulation is a primary way that qualitative researchers ensure the trustworthiness, that is the validity, of the data'.

Accordingly, qualitative researchers strive to ensure trustworthiness in their data by not relying on any single source of data, whether it be an interview, observation, or survey instrument. The strength of qualitative research lies in its multi-instrument approach or triangulation. In this study, triangulation was achieved through focus group interviews and documentary analysis. In addition, the researcher has given substantial descriptions of the interpretation process. Verbatim quotations from the data are presented to illustrate and support the themes constructed and the conclusions drawn about PGCE students' interpretations of formative assessment in their classrooms (Hammarberg, Kirkman and Lacey, 2016: 500).

3.9.6 Member checking

The researcher tested the overall report with the participants to ensure that there was no missing and uncaptured data before sharing the data in the final form. This was done through member checking during the discussion and seeking clarification and examples to confirm meaning.

The researcher also conducted data analysis and revised and discussed interpretations to ensure that there no sensitive information was included in the final report.

3.9.7 Transferability

A number of measures ensure reliability in qualitative research. These include the following:

(a) Collect detailed descriptive data: The researcher collected detailed descriptive data,which permits comparison of the study's context and other contexts so that future researchers may consider whether the results are applicable to their context.

(b) Dependability: This refers to the stability of the data (Mills & Gay, 2016: 574). Applicability or transferability of the research findings is the criterion for evaluating external validity (Hammarberg et al., 2016: 500). In this study, there is a possibility that the same result would necessarily be found in another context examining teachers' experiences of formative assessment. This study would therefore inform further research on the extent of formative practices in the classrooms of pre-service teachers.

(c) Overlap methods: This step is similar to triangulation (Mills & Gay, 2016:574). The researcher administered questionnaires, conducted a focus group discussion and engaged in document analyses to triangulate the data and ensure validity. The use of two or more methods helps to ensure that the weakness of one method is compensated for by the strength of another. Focus group interviews and document analysis were used to contribute to an understanding of the PGCE preservice teachers' experiences in implementing formative assessment.

3.9.8 Confirmability

Confirmability has to do with the neutrality and reflectivity of the researcher in terms of acknowledging his or her biases and possible conflicts of interest. The researcher mitigates conflict of interest by employing research assistance to improve the research instrument and to double-check the transcripts.

3.10 Ethical considerations

During this study, the researcher maintained ethical accountability towards all participants through explicitly explaining the nature of the research in detail to the participating participants allowing them the choice of participation. Participants were also granted confidentiality and anonymity during the data collection process. The researcher was entirely honest towards all participants without discrimination, additions nor commissions of any response to ensure fairness towards any party involved. The ethical issues pertaining to this study are presented below under appropriate sub-headings.

3.10.1 Access

O'Leary (2004:150) observes that the first step in collecting data is access: 'Whether it be a written record, workplaces, survey respondents, or interviewees, without access, obtaining credible data becomes impossible.' The researcher needs to gain access by legitimate means to ensure that data collected is credible and that participants are protected from social, psychological and other forms of harm. Researchers all need to ensure that they respect and adhere to prescribed ethics with regard to data collection processes. In this study, the researcher occupied a position of power and authority in the institution in which the research was conducted. This could have led to the abuse of the participants in one way or another at any stage of the research process. In order to ensure the protection of participants, access to participants must be gained appropriately.

Accordingly, the researcher underwent the following steps in seeking permission to gain access.

a) The researcher gained access to the university through the office of the Deputy Vice-Chancellor: Research and Innovation (see Appendix B) and the office of the Registrar (see Appendix C). The Vice-Chancellor's office gave permission to the researcher to conduct this research at the institution.
b) The study made use of a questionnaire, focus group guide and document analysis. Permission to use these tools for data collection was given by the Deputy Vice-Chancellor (see Appendix D).

c) The Registrar's office gave permission to the researcher to access the PGCE-registered students' class list and to access students in order to conduct research (see Appendix E).
d) The researcher went through the appropriate channels to secure ethical clearance (see Appendix A).

3.10.2 Informed consent and protection from harm

According to Mills and Gay (2016:38), 'the most basic and important ethical issues in research are concerned with the protection of participants, broadly defined'. This requires that research participants not be harmed in any way, that is, physically, mentally or socially, and that they participate only if they freely agree to do so by giving informed consent. Informed consent implies that the participants are made adequately aware of the type of information the researcher wants from them, why the information is being sought, what purpose it will be put to, how they are expected to participate in the study, and how the study will directly or indirectly affect them (Kumar, 2014: 285).

In this study, the researcher informed the participants of the objectives of the study and what she hoped to achieve from it. The researcher obtained informed consent by making sure that the participants participated in the study only out of their free will, fully understanding the nature of the study and any possible discomfort that could have arisen as a result of participation (Mills & Gay, 2016: 38). To achieve this, the participants were provided with an information sheet; they were asked to sign a consent form; their opinions were treated with respect by the researcher; ground rules were set emphasising the need for participants to respect and maintain the confidentiality of the views and opinions expressed by other members; participants were assured that participation would result in no detrimental repercussions to themselves and nor would they benefit directly or indirectly as a result of their participation in the study. Thus, the participants who chose to participate in the study did so voluntarily; those who did not want to participate in the study did not return the questionnaires given to them.

Focus group interviews were recorded digitally with the students' consent. Participants stated their names, the time and the date, and signed their consent forms. All study participants agreed to anonymised quotes being used in the final report. The transcripts of the focus group interviews/discussions were entered into a separate dataset using Atlas *ti* to allow thematic analysis to be undertaken.

3.10.3 Confidentiality and anonymity

Wiles, Crow, Heath and Charles (2008: 418) argue that confidentiality in a research context means (a) not discussing information provided by an individual with others, and (b) presenting findings in ways that ensure that individuals cannot be identified through anonymisation. In this study, the researcher assured the anonymity of participants by asking them not to record their names on the questionnaires, and she was not able to match their identity to their responses in any way (Du Plooy, Davis & Bezuidenhout, 2014: 267). During the qualitative phase of data collection, the researcher employed the purposive sampling method to select the 13 pre-service teachers. The coding system was used to identify participants in the data analyses. The following criteria was used to identify the purposively selected pre-service teachers:

- Registered PGCE full-time student teachers at National Qualification Framework (NQF) level 7;
- Registered for two methodology subjects and practice teaching modules;
- Completed home-based and university organised practice teaching;
- Attended university-organised weekly meeting on Wednesdays.

As Creswell and Clark (2014) point out, the purpose of the qualitative phase of mixed methods research is to explain the quantitative findings; therefore, the participants of the qualitative phase should be drawn from the participants of the quantitative phase. Accordingly, in this study, all the participants interviewed in the qualitative phase of the study had participated in the quantitative phase of the study, according to pre-determined criteria.

Regarding focus group interviews/discussions, confidentiality was assured by ensuring that although the researcher was able to match the participants' identities to their responses, the information was known only to her, and no one else. The researcher kept all documents in a locked cabinet, with only the researcher having access to the cabinet The data will be protected and kept in the cabinet for five years, after which it will be destroyed.

3.10.4 Credibility of the researcher

The researcher mitigated conflict of interest and bias by observing and paying special attention to research ethics throughout the research process and by forming partnerships with the statistician and research assistants who assisted with data collection, transcription and analysis (see Appendix Z). These relationships were not in conflict with respect to the outcomes of the study. The focus group participants were invited to review the transcriptions in order to ensure trustworthiness by confirming or refuting what the researcher and assistant researchers had recorded during the interviews/discussions. Overall, the researcher took all the necessary measures and precautions to conduct the study in accordance with high ethical standards.

3.10.5 Ethical issues in mixed methods research

Mixed methods research combines quantitative and qualitative research; therefore, ethical considerations that surface in both forms of enquiry need to be attended to (Creswell, 2014: 583). Ethical issues that might arise in quantitative studies relate to obtaining permission, ensuring anonymity and reporting the data accurately. Ethical issues that might arise in qualitative studies relate to conveying the purpose of the study, avoiding deceptive practices, respecting vulnerable populations, being aware of potential power issues in data collection, respecting indigenous cultures, not disclosing sensitive information, not disrupting research sites, masking the identities of participants, and reporting data accurately. As discussed above, every effort was made to record data accurately, and all other ethical issues were observed.

3.11 Research limitations

Creswell et al. (2014:42) noted that it is important for the researcher to indicate which challenges or limitations might have affected their research. Limitations can be described as constraints or limits in a research study that are out of one's control, such as time, financial resources and access to information. This study had the following limitations:

- First, data was collected at only one South African university. It is possible that the involvement of other universities in South Africa would have revealed different results to those reported in this study.
- Time constraints applied: The researcher had three months to collect data after the practice teaching, during which the questionnaires were distributed and collected, and the focus group discussion was held. In total, 99 participants filled in questionnaires, one focus group was held with 13 participants and 12 documents were analysed.

The transcript of the focus group discussion was done with the help of a research assistant and was not done personally to ensure credibility.

3.12 Conclusion

This chapter has presented the research methods followed in this study, describing the mixed methods research paradigm, the sequential explanatory research design and rationale for its use, the methods of data collection and analysis, the many steps followed to ensure the validity of the study, and the ethical aspects of the study. Details were given on how the data collection instruments were designed and tested, the use of SPSS 24 for analysis of the quantitative data, and Braun and Clarke's (2006) six-phase framework for thematic data analysis of the qualitative data. The chapter ended with a brief explanation of the limitations of the study. The mixed methods research paradigm comes with unique challenges. However, its appropriateness to most social problems made it the ideal choice for use in the current study. In the opinion of the researcher, this chapter has succeeded in outlining and justifying the research methods adopted in this study. The following chapter presents

the results and major findings arising from the application of the research methods outlined in this chapter.

3.13 Chapter Summary

The research methodology was introduced in this chapter, followed by the research approach, methods, paradigm the selection of participants, data collection methods, data analysis that employed thematic analysis was also discussed. Measures of trustworthiness such as credibility, transferability, dependability, and confirmability were also described. Lastly, the study discussed the ethical considerations of this study by focusing on permission, informed consent, confidentiality, and anonymity.

CHAPTER 4 DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents the data revealed through the application of the explanatory sequential method design, followed by a discussion of the research findings. The findings relate to the research questions, which guided the study. The sequential explanatory design used in the study meant that the quantitative phase (Phase One) was followed by a qualitative phase (Phase Two) (Subedi, 2016). In the quantitative phase, the researcher employed a quantitative research methodology, creating descriptive statistics for each item on the questionnaire. The results were calculated using SPSS Version 24 and are presented below. The data from the questionnaires was statistically analysed by a statistician. The researcher implemented integration of the quantitative and qualitative aspects of the study both through reporting and through interpretation. The researcher described the quantitative and qualitative findings in a single report (Fetters, Curry & Creswell (2013). The purpose of Phase Two was to understand the experiences of formative assessment in classrooms during practice teaching by pre-service teachers. This information was gained through a focus group discussion and questionnaires completed pre-service teachers after eight weeks of practice teaching. The questionnaire comprised three sections: Section A covered biographical and demographic data, Section B elicited responses to questions according to a Likert scale, and Section C required participants to answer four open-ended question and one closed-ended question with five options given for the response.

4.2 Methods of data analysis and presentation of data

Descriptive statistical analysis showed vital information about the sample composition in terms of their demographic data and formative assessment experiences. Descriptive analysis was used to identify frequencies and percentages of answers in the questionnaire. Not all respondents answered all of the questions in the questionnaire; therefore, percentages reported correspond with the total number of pre-service teachers who answered the individual question. This section presents the first part of the explanatory sequential mixed method design, the quantitative part. It covers the results of the Post Graduate Certificate in Education pre-service teachers' questionnaire. The data from the questionnaires was statistically analysed using SPSS Version 24. The findings are presented in accordance with the sections on the questionnaire, and with reference to four components of pre-service teachers' experiences of formative assessment. The aim of this section was to elicit factual data with regard to the pre-service teachers' experiences in the implementation of formative assessment during practice teaching. The way the results are presented are in accordance with the order give in the questionnaire – ensures consistency and easy understanding of results. Consistency

in presentation allows the reader to refer easily to the instrument for comparison and understanding of the results. The assistant researcher, a statistician, assisted with the analysis of data obtained from the questionnaire and quality control of the interpretation of the results.

4.3 Biographical data and qualifications of participants

Table 4.1 shows the demographic information of pre-service teachers who participated in Phase One of the study in terms of age, gender and qualifications at the time of the study. A total of 100 pre-service teachers participated in this part of the study.

Table 4. 1 Gender distribution of participants

Gender	Frequency	Percentage (%)
Female	64	66
Male	36	34

Table 4. 2 Age of pre-service teachers

Age	Frequency	Percentage (%)
25 years and below	56	56
26-35 years	34	34
36-45 years	6	6

Table 4. 3 Preservice teachers' academic qualifications

Qualification	Frequency	Percentage (%)
Bachelor	92	92
Diploma	2	2.
Other	6	6

a) Gender distribution

The gender variable was included in this research in order to find out whether there were differences in how males and females implement formative assessment in the teaching of their subjects. Table 4.1 indicates that 34 (34 %) were males, and (66%) were females. Therefore, most participants in this study were female pre-service teachers.

b) Age distribution

Participants were asked to indicate their age by placing a tick next to the relevant age category. Table 4.2 indicates the age distribution of the PGCE pre-service teachers was divided into five categories. The first category was that of pre-service teachers who were 25 years and below,

followed by the category of 26 – 35 years, followed 36 – 45 years, followed by 46 – 55 years, and lastly the 56 and above age group. Table 4.1 shows that the majority of the participants were in the category of 25 years (56%). The category of 26–35 years had 34% respondents while that of 36-45 years had 6 respondents (6%). There were no participants in the categories 45-55 years and 55 and above. The majority of participants were 25 years (56%) or below, which reflects that most of the participants were young, as may be expected of pre-service teachers still undergoing their education.

c) Qualification distribution

Participants were asked to indicate their highest qualification level by placing a tick next to the relevant category. For this research, the highest qualification was divided into three parts: degree, diploma and other qualification. Those in the last other category represented pre-service teachers who hold any qualification that allows them to train as teachers outside of degrees and diplomas. Table 4.1 shows that 92 (92%) were degree holders, 2 (2%) were diploma holders, and 6 (6%) held other qualifications. Therefore, the majority of PGCE pre-service teachers who participated in this study were degree holders.

4.4 Section B: Formative assessment experiences

Section B of the questionnaire comprised 15 statements about pre-service teachers' experiences and understanding of formative assessment. The data captured the participants and the questionnaire was subjected to computer analysis, with the assistance of a professional statistician, converted into percentages and collated in the form of tables and figures to make the data presentation meaningful. The 15 statements, question (Q1) to question (Q15), all concern the pre-service teachers' formative assessment experiences. Pre-service teachers were required to answer based on a 4-point Likert scale from 'strongly agree' (4) to 'strongly disagree' (1). For purposes of this study, 'strongly agree' and 'agree' were both taken to mean that the respondents agreed, while 'strongly disagree' and disagree meant that respondents disagreed.

Table 4. 4 Formative assessment experiences (N=99)

Formative assessment experiences: 99 participants	Strongly agree	Agree	Disagree	Strongly disagree	Missing
1. I learnt how to define formative assessment.	55 **56.1%**	40 **40.8%**	1 **1.0%**	2 **2.0%**	1 **1.0%**
2. I learnt the difference between formative and summative assessment.	57 **58.2%**	39 **39.8%**	1 **1.0%**	1 **1.0%**	1

3. I learnt how to instil in students the ability to find out what is missing in their work.	30 **30.6%**	63 **64.3%**	5 **5.1%**	0 **0.0%**	1
4. I learnt how to use formative assessment to adapt teaching and improve learning.	45 **45.5%**	51 **51.5%**	2 **2.0%**	1 **1.0%**	0
5. Assessment for learning provides the opportunity to students to be actively involved in assessment through self-assessment.	38 **38.8%**	58 **59.2%**	2 **2.0%**	0 **0.0%**	1
6. I learnt how to provide to feedback to the learners to inform my teaching	55 **56.7%**	36 **36.4%**	5 **5.1%**	1 **1.0%**	2
7. Feedback to learners is frequent, descriptive, constructive and immediate, helping students to know how to plan and improve learning	43 **43.9%**	50 **51.0%**	5 **5.1%**	0 **0.0%**	1
8. I am capable of using formative assessment to influence students' confidence.	42 **42.4%**	53 **53.5%**	2 **2.0%**	2 **2.0%**	0
9. I have substantial knowledge of classroom assessment.	27 **27.6%**	62 **62.6%**	5 **5.1%**	4 **4.1%**	1
10. I need additional support in learning how to implement formative assessment strategies.	29 **29.3%**	41 **41.4%**	21 **21.2%**	8 **8.1%**	0
11. I have demonstrated enough understanding of formative assessment practices.	25 25.5%	64 65.3%	6 6.1%	3 3.1%	1
12. My lecturers integrated formative assessment strategies during teaching and learning for my professional development.	41 42.3%	45 46.4%	8 8.2%	3 3.1%	2
13. Formative assessment strategies helps learners to improve learning	61 62.9%	33 34.0%	2 2.1%	1 1.0%	2
14. Collaboration during learning and teaching enhances students' understanding	64 **64.6%**	33 **33.3%**	1 **1.0%**	1 **1.0%**	0
15. I have interacted with learners through discussion to improve learning.	59 **59.6%**	38 **38.4%**	1 **1.0%**	1 **1.0%**	0

Item 1 in Table 4.4 required respondents to indicate whether they had learnt how to define formative assessment. Of the 99 respondents, 1% (1) chose not to respond, while 90.9% (95) of them agreed that they had learnt how to define formative assessment. The remaining 3% (3) disagreed with the statement. The majority of respondents, therefore, felt that they had learnt how to define formative assessment. A small number of respondents indicated that they had not learnt how to define formative assessment. This finding shows the majority of Post Graduate Certificate in Education (PGCE) are capable of defining formative assessment, and that they had been taught what formative assessment is.

Item 2: 'I learnt the difference between formative and summative assessment.' 98% (96) agreed with the statement 2% (2) could not differentiate between formative and summative assessment, and 1% (1) chose not to respond. The majority of pre-service teachers claimed that they had learnt about the

difference between formative and summative assessment. A small number of respondents indicated that they had not learnt to differentiate between formative and summative assessment.

Item 3: 'I learnt how to instil in the students the ability to find out what is missing in their work.' In total, 94% (93) agreed with the statement, indicating that they had learnt about the ability to find out what is missing, while 5.1% (5) disagreed with the statement.

Item 4: 'I learnt how to use formative assessment to adapt teaching and improve learning.' The majority of pre-service teachers, 97% (96) of participants, agreed that they had learnt how to adapt teaching, and 3% (3) disagreed that they learnt how to adapt teaching. This means that the majority of the pre-service teachers agreed that they had learnt how to adapt their teaching in response to formative assessment; however, there is 1 missing value. A small number, 3%, disagreed with the statement.

Item 5: 'Assessment for learning provides the opportunity for students to be actively involved in assessment through self-assessment.' The majority of respondents (98%) agreed with this statement, while 2% disagreed with the statement. The findings show that the majority of preservice teachers felt that learners were provided with the opportunity to be actively engaged through self-assessment.

Item 6: 'I learnt how to provide feedback to the learners to inform my teaching.' In response to this item, the majority of respondents highly rated their competence in providing feedback to the learners to inform their teaching. Only a small number of respondents indicated that they had not learnt how to provide feedback to learners during teaching.

Item 7: 'Feedback to learners is frequent, descriptive, constructive and immediate, helping students to know how to plan and improve learning.' The majority, 94.9%, of respondents revealed that they gave feedback to students frequently in order to help students plan and improve learning; however, 5.1% disagreed with the statement, indicating that they did not give feedback frequently with the intention of helping students to improve learning.

Item 8: 'I am capable of using formative assessment to influence students' confidence.' The majority (95.9%) of pre-service teachers agreed that they were capable of using formative assessment to influence students' confidence, while 4% of pre-service teachers felt unprepared to use formative assessment to influence students' confidence during practice teaching.

Item 9: 'I have substantial knowledge of classroom assessment.' The findings revealed that the majority (89.12%) of pre-service teachers, have substantial knowledge about classroom assessment, while 9.2% of pre-service teachers disagreed that they had substantial knowledge about classroom assessment. This suggests that some pre-service teachers still need training in administering classroom assessment.

Item 10: 'I need additional support in learning how to implement formative assessment strategies.' The majority (70.8%) of pre-service teachers agreed that they needed additional help in applying formative assessment, while 29.3% of pre-service teachers disagreed with the statement. The finding highlights the relatively high need for the pre-service teachers to be trained in the implementation of formative assessment strategies during teaching.

Item 11: 'I have demonstrated enough understanding of formative assessment practices. The majority (90.8%) revealed that they had enough understanding of formative assessment; however, 9.2% of pre-service teachers disagreed with the statement. The findings revealed that quite a high number still need attention with regard to their understanding of how to use formative assessment practices.

Item 12: 'My lecturers integrated formative assessment strategies during teaching and learning for my professional development.' The majority, 88.7%, of pre-service teachers revealed that their lecturers had integrated formative assessment strategies during teaching and learning; however, a minority, 11.3%, indicated that their lecturers had not integrated formative assessment strategies.

Item 13: 'Formative assessment strategies help learners to improve learning.' The majority, (96.9%) of pre-service teachers agreed that formative assessment helps learners to improve learning.

Item 14: 'Collaboration during learning and teaching enhances students' understanding.' The majority, 97.9%, of pre-service teachers who responded to this item revealed that collaboration during teaching and learning enhances students understanding. A minority of 2% of participants indicated that collaboration during teaching and learning did not enhancing students' understanding. This may indicate that they had no experience of collaboration in the classroom.

Item 15: 'I have interacted with learners through discussion to improve learning.' The majority (98%) of pre-service teachers revealed that they interacted with learners through discussion to

improve learning; however, a minority of 2% of pre-service teachers indicated that they had never used discussion to improve learning.

4.5 Qualitative results: Results of pre-service teachers' questionnaire and focus group

The study followed a mixed method approach in which the quantitative phase was followed by the qualitative phase. The qualitative phase comprised data from Section C of the questionnaire, and from the focus group discussion. This section of the chapter presents data from Section C of the questionnaire (the qualitative section), and from the focus group discussion.

Section C of the questionnaire used qualitative questions to gain insight into pre-service teachers' experiences with the implementation of formative assessment during practice teaching. This section examined the pre-service teachers' formative assessment experiences using the following research questions. Note that the letters used below correspond with the letters that appear on the questionnaire.

a) What are your experiences with the implementation of formative assessment?
b) How important is it for pre-service teachers to understand formative assessment? (c) To what extent do you integrate formative assessment practices in your subjects?
c) Indicate the formative assessment strategies you used in the classroom.
d) Please indicate how much you have been exposed to formative assessment by putting an X next to the response that represents your answer.

Thirteen pre-service teachers participated in the focus group discussion. All participants are identified through pseudonyms comprising the letters PSTs and a number. The focus group discussion began with two straightforward questions: What grade and subject were you teaching, and what topic of the CAPS curriculum did you cover during this period? The subsequent eight questions had to do with their experiences of formative assessment, the extent to which they used it, what they felt the most beneficial formative assessment strategies were, what their recommendations were for improving formative assessment practice in the classroom, and related matters. Participants presented data that led to the emergence of several themes. Below, the questions are presented with their responses.

Participants were coded, as shown in Table 4.3 below.

Table 4. 5 Participants in the focus group discussion and the codes assigned to each

Participant	Gender	Subjects
PST A	Male	Isizulu & Tourism
PST B	Female	Economics & Business Studies
PST C	Female	Tourism & English
PST D	Female	Social Sciences & Economics
PST E	Female	History & IsiZulu
PST F	Female	Tourism & IsiZulu
PST G	Male	Business studies & Economics
PST H	Female	Business Studies & Economics
PST I	Female	Geography & Tourism
PST J	Female	Mathematics & Computer Application Technology
PST K	Female	Tourism & English
PST L	Female	Social Sciences& Economics
PST M	Male	Economics & Business Studies

In response to both Section C of the questionnaire and the focus group questions, a range of useful data on pre-service teachers' experiences of formative assessment was elicited. These are presented below, with the themes that emerged from each.

Question 1: What are your experiences in the implementation of formative assessment?

This question was drawn from Section C of the questionnaire. Six sub-themes emerged, as follows.

Theme 1: Pre-service teachers' experiences with implementing formative assessment.

a) Sub-theme 1.1: Checking learners' understanding

The theme of checking learners' understanding emerged in response to the open-ended question in Section C of the questionnaire, about the pre-service teachers' experiences during practice teaching. The findings revealed that pre-service teachers experienced formative assessment as a strategy for eliciting learners' understanding. The pre-service teachers believed that formative assessment meant checking for learners' understanding during the process of teaching and learning in order to know what they understood and did not understand.

This is expressed by PST 1, who had this to say:

'Formative assessment is informal because the teacher checks the understanding of learners by writing classwork.'

In unpacking the above statement, PST 1 continued:

'I sometimes think that I must always check learners understanding through classwork, asking questions and give learners homework until my mentor taught me that I can also use classroom discussion, so that I can do corrections in class and give immediate feedback to learners.'

PST 3 concurred, saying:

'I had a good experience because I knew very well formative assessment is a good assessment to check learners' understanding.'

PST 33 had this to say:

'Formative assessment puts learners on their toes; it makes it easier for a teacher to see whether learners are following or need to emphasise certain aspects.'

PST 31 had this to say*:*

'My experience is that it is very much important to assess learners in order to see what they understand better, and for the teacher to be able to help learners to do better in their summative assessment.'

PST 36 confirmed the assertion, saying

'I have experienced that formative assessment is useful in planning the recorded task and is helpful in checking the learners' understanding on what you have. I experienced that learners do not take seriously the work that is not recorded.'

PST 71 highlighted the importance of checking learners' understanding by saying:

'My experience was that when using formative assessment, it enabled me to know the development on learners understanding so that if they are not following, I can easily clarify.'

PST 75 had this to say:

'Formative assessment was very easy to implement at school because in order for the teacher to measure if learners understood what was delivered, formative assessment has to be used.'

PST 96 confirmed the assertion, saying

'Formative assessment is very important in teaching and learning. During my practice teaching, I used this type of assessment to enhance student understanding. This involved asking questions during the presentation of a lesson and giving small activities for learners to discuss in class.'

b) Sub-theme 1.2: Checking learners' prior knowledge

The findings reveal that pre-service teachers understood that formative assessment entails checking what learners already know and understand before they start teaching a new topic.

The use of prior knowledge for pre-service teachers refers to eliciting learners' understanding by asking them questions based on the previous lesson and what they know about the topic.

PST 74 said:

'Formative assessment enables teachers to check learners' prior knowledge during teaching and learning.'

PST 42:

'My idea of formative assessment was informed by what I learnt in our module of teaching, learning and assessment, where I learnt that before I start teaching, I must ask learners questions to elicit their previous knowledge. I also observed my mentors during PGCE Wednesday observation classes, that it is important to ask learners what they already know.'

PST 93 highlighted the importance of eliciting learners' prior knowledge by saying:

'Learners sometimes become passive if you do not ask them about what they already know. I observed that learners sometimes would respond to what they already know than what you are asking them during teaching, and I learnt that from also observing our evaluation sheet, that prior knowledge when you started teaching is important and I did that through recapping from the previous lesson.'

To pre-service teachers, checking prior knowledge means affording learners the opportunity to engage with the learning process and show what they recall, so that the teacher knows what they understand about any given concept.

PST 96 said:

'*Learners are curious, particularly if you are teaching a familiar concept. I was teaching the concept of the scarcity problem. They raised their hands to share with me how the shortage of money deprived them of the branded clothing they liked.'*

PST 23 added to what PST 96 had said by highlighting the importance of starting lessons with questions:

'The teaching approach I used has assisted me to elicit learners' understanding and curiosity. I started my classes by asking what learners know about the topic, even if they do not respond to

my questions, I probed them until one or two learners responded to my question. It is then that I understood what they know and do not know'.

c) Sub-theme 1.3: Improving learning

The findings revealed that pre-service teachers experienced formative assessment as a means to improving student learning. The pre-service teachers gave learners various activities with the aim of engaging them in learning, such as questioning during teaching, and setting class activities, homework, orals, debates, and class discussions, all of which were forms of formative assessment as well as integral parts of their learning.

PST 4 had this to say:

'*Formative assessment helps learners to improve learning. I have experienced that when learners are given classwork and asked questions during the lesson and assist learners to participate in class, to be critical thinkers and also be able to overcome any learning difficulties.'*

PST 6 concurred with PST 4, saying:

'When I give learners classwork, I give them with the intention of supporting learning as we do corrections in class, so that those who had misunderstanding will improve, although I was not sure whether they all get it right at that same time, because there were those who were passive. However, using formative assessment through class activities was helping to support learning.'

PST 19 had this to say:

'I have experienced that formative assessment gives learners a room of improvement. It helps them to be more knowledgeable.'

PST 25 said:

'*Using the formative assessment is helping to support learning.'*

PST 31 gave the following assertion:

'My experience in the implementation of formative assessment is that the learners have improved more in formative assessment through interaction which arises out of homework or class activity. We discuss the responses and do corrections on the board with learners and discuss why the answer is wrong. I was teaching Mathematics, so it was practical.'

PST 73 had this to say:

'Formative assessment improves learning and the school experience of learners and improves understanding of the subject matter by means of drilling knowledge and understanding.'

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PST 96:

'It is important for pre-service teachers to understand formative assessment because it is the one which is mostly in the classroom to help learners improve learning.

The findings revealed that the pre-service teachers found formative assessment effective during teaching and learning. The pre-service teachers' experiences show that formative assessment is beneficial to learners, and that pre-service teachers believed in implementing it during teaching. The findings agree with the theory of social constructivism, in that responses show an awareness of the need to actively engage learners in the learning process.

Evidently, pre-service teachers found that a great variety of activities support learning during . the process of teaching, as they assist pre-service teachers to identify misunderstandings and to ensure that corrections are done during teaching time. Some of the activities the pre-service teachers used were homework, classwork and questioning during teaching and learning.

d) Sub-theme 1.4: Learners' active engagement

This theme relates to how formative assessment promotes learners' active engagement in learning. The findings revealed that pre-service teachers experienced formative assessment as a means to get learners engaged, sometimes through activities and sometimes simply through questioning. Pre-service teachers revealed that effective formative assessment involves using tasks to elicit learners' understanding. Many used activities prescribed by the Department of Basic Education as stipulated in the Annual Teaching Plan.

PST 72 had this to say:

'To promote active learning I used questioning, class work and homework. Learners are always engaged in the process of learning. We do homework corrections in class so that learners will correct their mistakes during the lesson.'

PST 16 confirmed the assertion:

'*Activities keep learners' participative. Learners become actively involved in the learning. The formative assessment provides a room of improvement to the learners. Formative assessment*

also gives an insight to learners in terms of how questions on the particular area are frequently set'

PST 27 had this to say:

'The learners seem to get involved when there are small tests and quizzes.'

PST 29 said:

'During practice teaching I implemented the formative assessment very good, because this assessment makes learners to be actively involved in the lesson.'

PST 44 had this to say:

'My experience to implement formative assessment in the classroom is when learners become more engaged in the classroom participation through the use of formative assessment. I did activities which were also prescribed in the Annual Teaching Plan, as we joined the schools during third term, when learners were preparing for the exam. Then I realised that formative assessment is more important during the teaching and learning activities.'

PST 70 affirmed this, saying:

'My experience is that formative assessment allows learners to be involved in the lesson as a teacher frequently asks questions and gives out classwork. Learners explore, more learners enjoy, and are not scared to be assessed informally.'

PST 72 had this to say:

'To promote active learning. To develop learners, challenge them for further interactions.' PST 91 said:

'It helps to engage learners. It also helps to make learners feels comfortable by communicating with the teacher.'

As may be seen in the above responses, pre-service teachers experienced formative assessment activities as a way to engage learners through class activities, homework and questioning. It is evident that formative assessment is effective when learners are actively engaged during the lesson. The teachers revealed that they assess learners as per the schedule of assessments and also by using the Annual Teaching Plan, which give guidance on continuous assessment as part of the prescribed curriculum.

e) Sub-theme 1.5: Preparing learners for summative assessment

This theme relates to how pre-service teachers use formative assessment to prepare learners for summative assessment through tests, projects, and any other continuous assessment activities prescribed by the Department. These activity-based forms of formative assessment count towards their summative assessment marks at the end of the term.

PST 45 had this to say:

'I think they work as a building block for the summative assessment. They are really good for the mindset of the learners, and they quickly show how much your learners know and how much they still need to learn; you are able to see this while there is still time not at the end of the year.'

PST 87 confirmed the assertion, saying:

'Formative assessments are used to help students master the subject before they take summative assessment.'

PST 82 had this to say:

'It helps learners to get used to assessments and prepares them for summative assessment. It enables pupils to do exceptionally well during their trials and examinations.'

PST 34 confirmed the assertion, saying:

'My experiences are that it is very much important to assess learners in order to see what they understand better, and for the teacher to be able to help learners to do better in their summative assessment.'

PST 22 said:

'I was assigned by my mentor to assist and support learners who were doing a Tourism project, as they were struggling to do the project in preparation for the exam. The project marks were counting towards the summative assessment marks.'

The pre-service teachers revealed that formative assessment activities were done in preparation for the summative assessment, helping learners to master content so that their performance at the end of the term was far better than might otherwise have been the case. Formative assessment helped them improve their understanding and performance in projects, class activities and tests.

f) Sub-theme 1.6: Shortage of resources

This theme relates to the shortage of resources in schools during practice teaching and how it impacts negatively on the implementation of formative assessment. The findings revealed that pre-service teachers experienced shortages of essential resources such as desktops, apparatus, textbooks, maps and photocopying paper.

This was supported by PST 34 who had this to say:

'There were times when I felt I cannot give homework to learners to do at home because of the shortage of textbooks. I learnt that the previous learners did not bring back the books so that the next class will use those books. Even when I want to make copies, I was told about the shortage of photocopying paper, or I must bring my own photocopying papers.'

PST 72 went on to illustrate the seriousness of the shortage of resources, saying:

'During practice teaching, it was difficult to support learners as there were not enough textbooks. I was teaching Computer Application and Technology, and learners had to share the books. When I was explaining, they had to fight for the book, which disrupted my

teaching and I had no photocopying papers. Even if they made copies for me they would not make copies every day.'

PST 40 confirmed this by saying:

'The shortage of resources was rife where I was teaching, such that learners left their books at home as they were afraid that they would be stolen by other learners during breaks. I used to teach without any book, except if I pleaded with the clerk to make copies for me which was not allowed because the papers were for the preparation of trial examinations. I used to spend some time writing notes on the board instead of teaching most of the time.'

PST 11 had this to say:

'Learners did not bring their textbooks to school where I was placed for practice teaching, because they were afraid that it will be stolen by other learners. When I asked them, they told me that they do not want to bring textbooks to schools, because they were sharing them with other learners – if they lost them they will have a problem during examination.'

PST 23 confirmed the assertion, saying:

'Teachers guide for me would have also supported teaching and learning. However, there were no teachers guides in my school, and there was only one textbook. I was using my mentor's Economics textbook in order to prepare for my daily lessons.'

Clearly, the shortage of basic school resources such as paper and books are a serious problem in schools, and in this case seriously affected the implementation of formative assessment. The shortage is so dire that learners are deliberately leaving the textbooks that they have at home so as to ensure they have something to study from at exam time, thus exacerbating the shortage in class. Pre-service teachers also lack teachers' guides and paper for photocopying.

Question 2: How important is it for preservice teachers to understand formative assessment?
This was the second open-ended question in Section C of the questionnaire.

Theme 2: Preservice teachers' understanding of formative assessment.
This theme includes all those comments that concern the pre-service teachers' understanding of the role of formative assessment. Five sub-themes emerged.

a) **Sub-theme 2.1: To see whether learners understand**

Pre-service teachers revealed that formative assessment informs the teacher about what learners understand during teaching and learning. They indicated that learners understanding could be assessed through classwork, questioning and assignments. Formative assessment could also be implemented to check whether learners would be able to achieve during the summative assessment at the end of the year.

PST 3 had this to say:

'The teacher must know the understanding of learners in the classroom. The teacher must give learners assignments to check the learners' knowledge or capabilities.'

PST 21 confirmed, saying:

'It is important because formative assessment is a good assessment to check learners understanding.'

PST 29 said:

'It is important because after or during the lesson the teacher should assess learners through questions or classwork in order to check their understanding. Therefore, every teacher should use formative assessment during the lesson.'

PST 31 had this to say:

'It is important for pre-service teachers to understand formative assessment to weigh his or her learners' understanding, to see whether they will be able to pass their summative assessments.'

PST 47 had this to say:

'It is important to check the learners' understanding for the current lesson or topic.'

PST 50 confirmed the assertion by saying:

'The teacher should know that implementing formative assessment will also enable them to reflect on their teaching and to see if learners were able to understand what has been taught.'

PST 56 had this to say:

'It is important because the pre-service teachers have to check learners' understanding.'

PST 55 confirmed, saying:

'It is important because it will help the teacher to know and check the level of understanding of learners.'

PST 57 said:

'It is important because teachers have to check the understanding of the learners.'

The findings indicate that pre-service teachers have a clear conception of the importance of formative assessment, and its role in informing them of what learners know and what they still need to learn.

b) Sub-theme 2.2: To help learners improve

Comments under this theme show how the pre-service teachers also saw formative assessment as performing another important function; not only did it inform them of what learners knew, it helped learners understand the work better. Pre-service teachers revealed that formative assessment is important because it involves feedback from learners to themselves, and from

themselves to the learners, which helped the teachers to clarify points and enhance learners' understanding.

PST13 had this to say:

'It is very important so that they can know what tasks to be given to learners so that they can improve learning'.

PST 7 added by saying:

'It is vital because the formative assessment has to start during teaching and learning in order to be able to evaluate how learners attain the subject content.'

PST 8 had this to say:

'To improve student attainment, it involves qualitative feedback for both student and teacher.'

c) Sub-theme 2.3: To establish the extent of learners' prior knowledge

Pre-service teachers understood formative assessment as a means of finding out what learners already knew about previously taught content. During teaching and learning, they elicited learners' prior knowledge in order to address any misconceptions.

PST 16 had this to say:

'Pre-service teachers should understand why formative assessment is important to be used in classroom. They are used to measure the performance of learners and also to check prior knowledge and that are there any misconceptions.'

PST 63 added by saying:

'To check prior knowledge.'

PST 53 confirmed the assertion by saying:

'It is very important, because before you start a lesson you need to ask a question to check learners' development or prior knowledge. You are able to know what they know and what they don't know.'

Pre-service teachers experienced formative assessments during teaching as a strategy which elicited learners' prior knowledge.

d) Sub-theme 2.4: To enhance learners' participation

The pre-service teachers showed that they understood formative assessment as a strategy to improve the quality of their teaching, in that it increased the level of classroom engagement by learners. They understood that real learning requires full learner participation and is not a passive exercise on the part of the learners. Through formative assessment, learners became actively engaged in diverse activities such as classwork, homework and assignments.

PST 20 had this to say:

'Pre-service teachers should understand formative assessment in order to improve their teaching ability and also to be able to engage learners in the lesson content.'

PST 35 said:

'It is very important to understand formative assessment because it helps me as a teacher to communicate with my learners, and the learners to co-operate and participate.'

PST 45 confirmed the assertion by saying:

'Learners were doing class activities, homework and assignments. Learning for me was viewed as participation rather than me doing activity only, as I used various activities to elicit learners' understanding.'

PST 33 confirmed the assertion:

'I used formative assessment to collect the evidence of learning through class activities, worksheets, debates and homework as per the school programme of assessment.'

Evidently, pre-service teachers engaged learners through different formative assessment activities to promote learner participation.

e) Sub-theme 2.5: To get feedback from learners, and to give feedback

Pre-service teachers found formative assessment a useful strategy during teaching, since it gave them feedback from learners, enabling them to assess the quality of the learners' understanding. In addition, it gave teachers the opportunity to give learners feedback about their performance.

PST 6 had this to say:

'It is very important, because you get feedback of whether learners understood the lesson or not and also to determine if lesson objectives were achieved'.

PST 98 confirmed by saying:

'It makes learners be willing to learn and to get feedback.'

PST 36 said:

'It is very imperative for teachers to understand the formative assessment as it is the foundation of teaching and learning and curriculum coverage and helps learners in giving feedback what they already learned.'

PST 70 had this to say:

'It is important for it equips on gaining more knowledge on how to assess learners formatively. Formative assessment is important for teachers and learners in order to give feedback to learners.'

All participants shared that they gave oral feedback in order to facilitate learning.

Question 3: To what extent do you integrate formative assessment practices in your subjects during practice teaching?

This was the third open-ended question in Section C of the questionnaire.

Theme 3: Formative assessment strategies

The question about the extent to which teachers integrated formative assessment into their subjects or classroom practices elicited responses that indicated the many ways in which they did so.

a) Sub-theme 3.1: Homework

Pre-service teachers administered homework as a form of extended learning, done outside of school without the assistance of the teacher. Pre-service teachers used homework assignments to collect evidence of learning and learners' understanding, and for planning purposes. Homework was also given in order for learners to be assisted by others at home, whether siblings or parents, which in itself enhanced understanding.

PST 57 had this to say:

'Giving them homework mainly was to collect learners' understanding outside the school environment.'

PST 71 confirmed by saying:

'I gave learners activities to work on and homework after the lesson in order to plan for subsequent lessons.'

PST 80 confirmed the assertion by saying:

'Giving homework to learners means they will be assisted by their siblings and parents to understand what they learnt at school.'

PST 89 had this to say:

'*After my lesson introduction I checked on what they have achieved. Group discussion and homework were given to them to demonstrate understanding.*

PST K had this to say:

'Homework helped me concerning students who are struggling, and it helps the learners to ask from their peers, parents and knowledgeable members of the community, and it is for supporting learners to prepare for the tests and exams.'

PST E concurred by saying:

'The most beneficial formative assessment to the learners was when I gave them homework and explained to them was expected, the desired outcomes and the effort they needed to put towards the completion of the task. The period was not enough for them to complete the task. Those who did not complete the task would finish it at home. However, I had some reservations that they maybe copy in the morning or give it to someone to do the task for them. In most cases, I would give them classwork, unless it is a research project where they need to research about the topic.'

PST M added by saying:

'I used to give them handouts and they had to attach them at the back of their exercise books. I preferred homework, because they seek the assistance of the parents, peers and any member of the community if they seem to struggle. I used to give them more homework on Fridays because they can go to the library to look for the information and have enough time to read and understand the task.'

Based on the views shared by participants, it is clear that pre-service teachers assigned learners' homework in order to enhance their understanding, involve the family in their learning, and inform the teachers about how much they had understood.

b) Sub-theme 3.2: Questioning

Pre-service teachers implemented formative assessment through questioning in order to check learners' understanding. Pre-service teachers revealed that questioning was the most efficient

teaching strategy for eliciting learners' understanding and addressing misconceptions. Preservice teachers noted that they also asked clarity-seeking questions during learners' presentations in order to assess learners' understanding.

PST 83 had this to say:

'I used question and answer during lessons in order to elicit learners' understanding and identify the gaps during teaching.'

PST 88 confirmed this view:

'I was asking oral questions and giving classroom activities after questioning learners during lessons.'

PST 96 had this say:

'During practice I used to ask questions during the presentation, giving the activities to discuss in class and some classroom tests to improve the learners' understanding.'

PST 91 confirmed the assertion, saying:

'I used to start a lesson by asking questions from the previous lesson and questioning was the most efficient teaching strategy. I also give learners the opportunity to ask questions so that they ask what they do not understand. I was also using oral questions, giving them articles to read and answer questions.'

PST 23 had this to say:

'I observed that learners like to engage with the teacher if they do not understand. As a result, questioning was my strength, and I liked it, since you are able to identify learners' misunderstandings and misconceptions of concepts. I asked questions during the lesson, discussions during teaching and learning.'

PST 40 had this to say:

'I believe in asking learners questions during the lesson and to discuss the content with learners. It helps me to understand whether they are studying at home or they are lazy.'

PST 3 confirmed, saying:

'Questioning is the most important strategy to engage learners and support learners who are struggling, although it was not all learners who were keen to talk. However, they were very relaxed and responded to questions most of the time.'

Pre-service teachers indicated that questioning was an effective teaching strategy, enabling them to identify learners' gaps in terms of understanding. One pre-service teacher indicated that it assisted her to identify whether or not learners were applying themselves to their work.
It is clear that questioning was a much-used strategy in formative assessment.

c) Sub-theme 3.3: Class tests

Pre-service teachers used class tests as a tool for learning. They gave class tests to learners in order to support learning. Many indicated that tests were not only for grading purposes, but to help learners become motivated to learn and improve results. Class tests also prepared learners for the trial examination.

PST 90 had this to say:

'Every week I give or do a spelling test and at the end of the second week I give learners a test which will cover what has been taught in class, and also to prepare learners for the examinations and monthly tests.'

PST 3 had this to say:

'I used class tests in order to prepare learners for the examination and to modify my teaching methods. The corrections and feedback were given during the lesson.'

PST 50 confirmed the assertion by saying:

'Every time whenever I am teaching, I used to give learners a class test so that they study at home, and to see where they are confused. That is what we were taught, to ascertain learners' understanding and to re-teach when we identify gaps.'

PST 1 added to this by saying:

'We were not allowed to give graded tests. Our mentors in the school where we were placed told us to set the test and seek guidance from the mentor. They wanted us to prepare learners for the trial examination.'

Clearly, class tests were used to motivate learners and to prepare them for the trial examinations so that they performed better during examinations.

d) Sub-theme 3.4: Classwork

Pre-service teachers used classwork as a formative assessment strategy, in order to assess whether lesson objectives had been achieved. Classwork was administered in order both to elicit learners'

understanding and to assist the teacher to identify gaps in their knowledge. Classwork was, in effect, an extended learning opportunity, giving feedback to learners about their own understanding and helping them to understand better. Classwork gave the teachers an opportunity to correct mistakes and misunderstandings before moving onto a new section of work.

PST 94 had this to say:

'During my lesson, I gave learners the classwork to see how far do they understand the lesson, and at the end of the lesson, I have given them as a homework if they could not finish the classwork. I have also assessed by giving them remedial classwork to check for understanding.'

PST 92 concurred by saying:

'The main aim of giving learners classwork was to give feedback and do corrections during teaching and learning. The teacher may give the learners classwork with the aim of achieving lesson objectives.'

PST 1 added by saying:

'I assess learners during teaching and learning in order to improve learning. I observed that learners were more enthusiastic to write classwork during teaching and learning because they were corrected and corrections were done in class.'

The findings reveal that pre-service teachers used classwork in order to give feedback during teaching and engage learners through having them correct their mistakes. Classwork was not for grading purposes but intended to improve learning. The literature revealed that many PSTs experience difficulties in using classwork constructively to enhance learners' understanding.

e) Sub-theme 3.5: Classwork as a strategy for improving and supporting learning

The pre-service teachers revealed that they used classwork to improve and support learners' learning. One noted that learners avoided higher-order questions when they were doing classwork, which gave the teacher insight into how much the learners really understood.

PST A had this to say:

'Okay, with me I can strongly agree that we need formative assessment activities. I think it is a pivotal pillar of teaching, but I recommend a change in any form of formative assessment whether it is classwork, homework. The questions should be designed in such a way that it promotes learning, not memorisation. In classwork, I highly recommend it because it is where you seem to identify learners' misunderstanding during interaction. I think learners are too lazy,

sometimes, to do the work at home. It is better when you observe them in class and help them when it is necessary. In learners' laziness I have observed that they started with answering lower-order questions and avoided higher-order questions where they had to criticise, evaluate and analyse. I think doing classwork focusing on higher-order questions only, with the intention to train them, will help them to have courage to answer and be familiar with how higher-order questions are answered, rather than giving them homework to do at home and submit it while their sibling did the homework for them at home.'

PST H had this to say:

'In terms of the recommended formative assessment tasks, or any changes, I can say I think it is good as it is, but depending on the subject that is taught. For example, I teach History. In History the subject is talking about past things and events. Sometimes the class activity is limiting them in terms of seeking the information. There must be some tasks which need to be done in class and those which are research projects. Classwork was working for me if I was teaching facts and asking lower-order questions like name, mention and match; however, if they need to analyse and synthesise, they had to do a research project where they need some time to look for the information and go to the library and look for the people in the community who know history. I recommend a blended approach in terms of activities, depending on the skills that the teacher wants to assess, and the subject matter he is teaching at that particular point in time.'

PST H had this to say:

'Firstly, I think classwork is the most suitable strategy which can promote learning in that teachers must have enough information about the topic when they are teaching. In my teaching I happened to teach well-resourced schools during my observation and practice teaching, as well as under-resourced schools. It is an advantage to be resourceful in teaching Business Studies. There was a project which was assigned to learners as per the curriculum-embedded assessment. I had to assist them with the project and propose that they submit drafts to me before they write the final project. The project was about entrepreneurship. They had to interview the shop owners. I had to bring to class the exemplar of how to do a project. However, if they were not assisted during their period, they would have submitted a project which did not meet the objectives of the project. I had to help them to understand the rubric and the questions. My experience was that classwork is beneficial to learners, since the teacher is able to help the learner where there are difficulties in understanding what the task entails.

PST M concurred with pre-service teacher H, saying:

'I prefer classwork because most of the work must be done under the supervision of the teacher, so that the teacher can support learners who are struggling and to understand the strength and weaknesses of the learners.'

f) Sub-theme 3.6: Classwork as a form of achieving learning objectives

Using classwork, pre-service teachers were able to assess learners' understanding, which helped them to achieve lesson objectives. Pre-service teachers used different types of activities to facilitate learning and understanding.

PST E had this to say:

'When I was planning for formative assessment activities, at the back of my mind I was thinking about the classwork which I will assign to learners. I knew very well what I wanted to achieve. I intentionally and purposefully shared my lesson objective during my lesson introduction. I explicitly shared the learning target for the day, so that learners will not get lost when I give them classwork.'

PST G confirmed the assertion, saying:

'I wish to indicate that my mentor was an experienced teacher who supported me during practice teaching. He told me to model and demonstrate what I want my learners to achieve

at the end of the lesson, and to share my lesson objectives throughout the lesson. I was mostly planning for classwork, homework and orals for formative assessment activities.'

PST M confirmed the assertion:

'I used to plan for the lesson in order to give learners classwork, homework and orals for learners to participate in their own learning through activities. Lesson planning also helped me to observe whether learners have achieved the intended outcomes. Planning for lessons provides me with important data for instructional planning.'

g) Sub-theme 3.7: Activities to support teaching and learning

Pre-service teachers used a variety of activities to support teaching and learning and to help assess learners' understanding. Activities included homework, classwork, practical work in Computer Applications and Technology (CAT), discussions, tests, projects and observation.

PST A had this to say:

'*Okay, what I have experienced in the subject Tourism; what I normally used to do is that when I give the activity and I see they are answering the lower order, then in the next period we do the activity or discussion only. So, I sometimes try to take the case studies in the book, or try to bring the case studies that are very familiar to them, so they will get more interested in reading them. So, before they can answer, we read the case study and we go through the questions. Then I make an example. I try to formulate questions myself, trying to channel them how they must tackle the questions and the case study they have. Then from there I can discover whether they are doing it correctly or badly. Then when they keep on doing it badly then I still keep on doing the same thing in different ways until they make it.'*

PST D had this to say:

'I did Social Sciences in Grade 8. When looking at the classwork, what I saw … those activities are well planned, but the activities which challenge learners are limited, and the school is short of resources. Some activities will need charts. The information in the prescribed book is limited.'

PST F had this to say:

'*I was teaching Tourism and Isizulu. When we were doing* indaba eningayo so ngathi uma ngibabuza ukuthi bayayazi yini indaba eningayo kwakunzima ukwazi ukuthi bayayazi yini indaba bengenazo izincwadi babeyi *group of four. I give them i-activity* abanye babebuye bacela ukuyenza emakhaya. So engingakusho ukuthi amaresources awanele for abafundi nathi *as student teachers* asinawo amaresources. *If we want to go in class* siyeboleka*, so formative assessment is not promoted because learners did not submit some work or submit some late.'*

The finding is that not all activities designed to support teaching and learning were successful. Some learners did not submit work or submitted it late. The shortage of resources such as books was an ever-present problem, with learners forced to share books. This suggests that teachers were prevented from implementing formative assessment to their full ability, as expected. Formative assessment is intended to benefit and support the provision of feedback, but without the necessary resources, the learners would be unlikely to achieve to the desired level.

h) Sub-theme 3.8: Class activities

Class activities comprise work assigned by the teacher to learners during teaching and learning in order for them to demonstrate understanding. The aim is to promote learning. The pre-service teachers assigned class activities in order to identify knowledge gaps and misconceptions and adjust

teaching to meet learners' needs. In class activities, learners engaged with one another through discussions and informal writing activities, often seeking assistance from both the teacher and peers.

Comments to do with class activities revealed that the pre-service teachers were still learning how to use activities as a tool for formative assessment. Pre-service teacher A spoke excitedly about what it was like to range questions from lower order to higher order, and how he supported learners in answering higher-order questions about case studies.

PST A had this to say:

'*Still on Tourism of Grade 11, on the topic of main attractions in Africa. It is very important to say that learners were too lazy to do the work. It is just a few who commit themselves in doing the work, and they like doing simple things, like answering the questions 'name', 'give', and 'mention'. They don't want to expose themselves in discussion, analysing and brainstorming, saying something that is new. So what I will do is, when I give them an activity, I give them an instruction. When I mark the activity I see that, okay, maybe they have answered a question of 'name', then they leave the question of 'discuss'.*

Another thing that is confusing: They were having so many books, like Spot on Tourism, Successful Tourism*. I will make sure whenever I give them an activity, learners start from the lower-order and move to the higher-order questions. In the next class we stick in the question of discussion. I will focus on discussion. When I gave the activity, when they are answering lower-order, we read a case study and then I try to answer that question myself. What I normally used to do in the next lesson is to bring case studies and help them to answer the questions based on the case study that I did correctly, until they make it. I will make an example which is very similar to the case study question we are doing.'*

PST K emphasised small groupwork and the importance of showing learners what is expected of them:

'Well, during my English class I gave learners the class activity where they had to conduct an interview. So, before I gave them that activity, I took them to the library where I projected the interview. I paired them into threes, so that they see how an interview is conducted. From then I paired them into the interviewer and interviewee. So I think in terms of showing them, in that the case I was exposing them what they had to do.'

PST J had this to say:

'Most of the time when I was giving classwork, they had a challenge. Some learners did not want to write classwork. To motivate the passive learners, I would switch the exercise books after learners have completed the classwork, and giving the memo where learners have to mark. I did that so that learners will learn from one another. We did corrections in class and that is how I was teaching, sometimes. In order to support learners who are lazy and passive, I would group them into a group of two, so that they become active, although it was having some challenges when other learners did not want to participate.'

Pre-service teachers showed an awareness of the value of class activities as a form of formative assessment, describing how they strove to ensure that learners benefited from classwork. Although their efforts were not always successful, they used a variety of techniques, such as grouping learners and giving model answers, which helped.

Question 4. Indicate the formative assessment strategies you use in class.

This was the fourth and last open-ended question in Section C of the questionnaire.

Theme 4: Integration of formative assessment into the teaching and learning process.

Responses to Question 4 elicited a range of responses showing the ways in which the preservice teachers integrated formative assessment into classwork.

a) Sub-theme 4.1: Questioning to check learner understanding

Questioning is part of formative assessment, occurring during teaching and learning when teachers interact with learners in order to ensure learners' understanding. Questioning informs teachers about learners' insights and misconceptions. Two pre-service teachers' responses are given to illustrate this sub-theme, since they capture the essence of employing questioning as a formative assessment practice.

PST H spoke enthusiastically about using questions:

'The strategy I used mostly during my teaching was questioning. The art of questioning is central to the practice of teaching. I ask questions to ascertain learners' understanding and to interact with learners and to support learners who had misunderstandings, with the aim of improving learning. I asked questions to learners who were not raising their hands, and they will say something … I will interact with them and get them to debate the answers, and I will ask each learner what she understands. There will be learners who will dominate the debate, and the lesson will be interesting, because most learners will participate to counteract the ideas of the opposite side. Learners will compete for responses. I teach Economics and Business

Studies … just to make mention of the topic Business Information. The question was why do we present business information? Some learners said to attract investors and also customers, the stakeholders and the information of the business should be available. Learners debated amongst themselves and as teacher at the end of the debate I have to conclude and I gave a conclusion.'

PST J shared the multi-faceted ways in which he integrated formative assessment into teaching practice using questioning:

'*I think questioning supports learning, in that learners responds better to questions than when they are not asked any questions. I had a challenge of questions which were in the prescribed book. Some of the questions were of a low order, which does not help learners to think out of the box. Learners needed questions which were of a higher order. I remember when we had to do environmental issues which affected global warming. When we looked at the topic, Sustainable Tourism, we had to come up with strategies, ways to minimise those effects which impact negatively on sustainable tourism. I made them design a poster of what they could say about sustainable tourism. What are the major impacts on sustainable tourism? I wanted to bring creativity or talents out, in order to promote learning and to make sure that they understand what is being taught, because they had to integrate Tourism and Geography in order to come up with something solid.'*

These pre-service teachers grasped the value of questioning and had evidently used it to good effect, stimulating a high level of learner engagement through their questions. Questioning is one of the most valuable and easy-to-implement forms of formative assessment, enabling the teacher to both check learners' understanding and promote active learner involvement. Together these results indicate that learning requires interaction and active learner engagement, since very little learning can place when learners are passive. The teachers used higher-order, open-ended questions which demanded thoughtful responses rather than one-word answers. These results indicate that teaching and learning is promoted when there is interaction through questioning.

b) Sub-theme 4.2: Feedback

The pre-service teachers were deliberate in giving feedback to learners and employed different forms of feedback to promote learning.

PST K had this to say:

'Feedback was usually oral in my class, since I was teaching English. Due to the number of learners and time constraints, I tried to give oral feedback to learners so that they treat mistakes

as opportunities to learn. We do the class activities and they correct mistakes during teaching and learning.'

PST E had this to say:

'I monitor learners' work and give feedback while roaming the room, to look for evidence that learners are following the instruction when they are doing class activities. This is not for grading purposes.'

PST A concurred, saying:

'Feedback is a continuous process. I provided oral feedback based on their daily class activities and homework. In research projects, the feedback is continuous, depending on what they submitted. We started practice teaching during the third term. The teaching annual plan prescribed the research projects as part of continuous assessment to be done by learners.'

The pre-service teachers clearly understood that feedback is part of formative assessment. They used oral feedback to correct learners' mistakes and provided ongoing feedback on classwork and homework.

Question 5: What are the most **beneficial forms of** formative assessment strategies **you employ during practice teaching?**

This question was drawn from the interview schedule – see Question 5 in Appendix J.

Theme 5: Most beneficial forms of formative assessment strategies

The pre-service teachers indicated that questioning, giving tests and giving feedback were the strategies they found most beneficial.

a) Sub-theme 5.1: Questioning as a form of eliciting learners' understanding

The pre-service teachers used questioning as a teaching strategy, enabling them to identify gaps in learning. Questioning often gave rise to discussion, which is a valuable teaching strategy for facilitating learning and getting learners to engage with one another.

PST D had this say:

'Formative assessment that worked for me was questioning, in the form of discussion. It is where I used to ask learners questions during teaching and learning, to establish learners' understanding. I used to observe that learners were more comfortable with questioning because they will have engaged with one another and critical thinking was promoted in the process.

Discussion during questioning sessions was able to help me to see where my learners understand, and be able to identify the gaps in terms of understanding. I will use practical examples and demonstration to explain more further so that every learner understands.'

PST I confirmed this view, saying:

'The strategy I used was questioning. I asked questions to evaluate learners' understanding. What I did the first time is observation, observing learners' engagement and how they respond to questions. I used to give them some thinking time to respond to the questions. I do the activities with them, creating my own questions which are subject based. Questioning helped me to analyse learners' thinking about the topic. We are discussing and it also helped me with the identification of learners' misconceptions. When I give them homework it serves as the extension of learning, which has started during questioning and discussion.'

b) Sub-theme 5.2: Questioning strategies to enhance learners' understanding

Questioning is a teaching strategy that requires some practice. Questions may be formulated in a variety of ways, some of them more helpful that others in promoting higher-order thinking. The pre-service teachers understood questioning as an effective formative assessment strategy which may be used to check learners' understanding and close the knowledge gap during teaching and learning.

PST B had this to say:

'In order to ensure that the objectives of learning have been achieved, I integrate questioning during my teaching, to check learners' understanding and to facilitate learning. I encourage learners to interact with me so that I identify the learning gaps and close them during teaching. I can identify whether they understand or are confused.'

PST E said:

'I select topics according to Curriculum and Policy Statement (CAPS) and the annual teaching plan (ATP), as prescribed. My mentors told me to stick with the subject policy documents. Asking questions from learners uncovered and expanded learning and it engaged learners in a better classroom dialogue. They used to enjoy discussing topics and I will synthesise at the end of the lesson.'

PST F added by saying:

'When I was planning for teaching, I observed that learners like to interact and ask clarity-seeking questions at the end of the lesson. I used questioning as a formative strategy because

other learners like to interact and asking questions orally is a crucial process of eliciting information from learners. I am able to close the gap when learners are confused.'

c) Sub-theme 5.3: Class tests as strategy to assess understanding

Pre-service teachers assigned learners weekly test as a form of promoting learning. The findings revealed that learners were given class test so that the teachers could assess understanding and prepare them for the examination.

PST A had this to say:

'I give them class tests and weekly tests in order to assess their understanding. This provides the students with insights. Usually it is a short test, while they still remember what I taught them. I do class tests with objectives and what was stipulated in the annual teaching plan.' PST K concurred, saying:

'I incorporate a weekly formative test in my lessons. During class I provide them class activities and my comments are based on learners' responses. This is what I observed from my mentor. During the first week of observation she used to give them class tests at the end of the unit, and assess them when they are done with that unit.'

PST E had this to say:

'Class tests are for informative. I was told by my mentor and encouraged to use class tests to assist learners to understand the questions, in order to prepare for the trial examination. I found that students were responding to lower-order questions very well and struggled with higher-order questions. As a result, we do all the questions in class which they struggled to answer.'

From these responses, it is clear that the pre-service teachers derived valuable support and guidance from good mentors when it came to modelling classroom practices, such as questioning.

d) Sub-theme 5.4: Feedback and Interaction

The pre-service teachers supported learning through giving feedback, which was especially helpful when learners were engaged with projects. Oral feedback allowed them to correct misconceptions and mistakes.

PST C had this to say:

I preferred oral feedback and interaction, so that I understand what students are thinking. I start with positive sides in my feedback. As a result, I learnt that feedback is not for judging the student; it is for guiding the student into being an efficient learner.'

PST J confirmed the assertion, saying:

'If the feedback is vague, it does not correct the misconceptions as expected, which led to frustration. One day the mentor had to intervene and adjust instruction so that the learners want to do corrections, as they were confused about what they needed to do from my feedback. The mentor guided them how they must attempt to do corrections.'

PST D had this to say:

'Most of the time I used oral feedback during teaching and learning, when we were doing corrections in class. We usually do homework and class activities in class so that those who misunderstood will get a chance to correct their mistakes'.

From what participants said, feedback was used to assist learners with their corrections. It appeared that the pre-service teachers were still learning about the value of precision in instructions. Feedback was helpful when it was verbal and immediate, which gave learners the opportunity to correct misconceptions straight away.

Question 6: **If you were to recommend any changes in the implementation of formative assessment, what would they be?**

This question was drawn from the interview schedule – see Question 6 in Appendix J.

Theme 6: recommendations by pre-service teachers

The question of recommendations elicited a number of interesting responses with regard to changes in classroom practice that the pre-service teachers believed would be helpful.

a) Sub-theme 6.1: Research projects

The pre-service teachers thought that research projects were a particularly helpful way of stimulating learning and implementing formative assessment and supported the use of cell phones as a valuable research tool. They also saw the value of research to themselves as teachers, since research enabled them to stay abreast of developments in their subjects.

PST B had this to say,

'I used the Curriculum Assessment Policy Statement (CAPS). As a teacher trainee I used to give them class activities which are prescribed for the third term. I observed that learners like cell phones, and they used to Google when I asked them questions. I just encouraged them to use them, because they were doing Tourism. I used to explain the task by giving them practical

examples and telling them to Google tourism destinations. They were interested in learning. I found research very interesting and learners were motivated to learn.'

PST J had this to say:

'Formative assessment that has worked for me is research projects. This was according CAPS and the ATP. Learners were given time to conduct research, almost four weeks, depending on the time frame stipulated in the CAPS document. The research project has afforded me the opportunity to give feedback to learners on a continuous basis and to seek advice from my mentor with the activity. Learners seem to enjoy doing research, because they get assistance from their siblings and members of the community who are familiar with the topic and more knowledgeable. There should be more research activities, since learners are familiar with cell phones and they like cell phones. They can research on cell phones. CAPS prescribes what needs to be taught in Maths. They were doing Trigonometry functions. So I also suggested that they used cell phones to view YouTube when they were doing homework. During the period I was teaching them, however, I observed that most of the learners did not have Maths books.'

PST B had this to say:

'My recommended formative assessment strategies which has worked for me, since there is research, classwork and homework, is research. I think I like research. A teacher has to conduct research before he goes to class on the lesson presented. I like research since there are lots of development in terms of the subject I am teaching, Tourism. When learners are engaged in research, that also promotes learning and they learn at a faster rate, since it is self-taught and a discovery of the subject matter which they won't be able to forget Research promotes self-initiated learning, although they still need guidance from the teacher and other learners.'

PST J concurred, saying:

'There should be more research activities that need to be done. Research promotes learner-centredness. In the teaching of Maths, learners learn better when they initiate learning for themselves. The reason why I think research is the core of teaching: When I was teaching Maths and Computer Applications Technology, learners did not want to participate. As a result, they were lacking motivation and did not do homework. They used to copy homework from other learners in the morning. Research is accessible to them because they have cellular phones and they like cellular phones. They can download videos with the sum which they learnt in class. I sometimes encouraged learners to Google and view videos and research and download Mathematics applications.'

PST F had this to say:

'I agree with the previous speaker that formative assessment depends on the subject that you are teaching. In Tourism you have to do research if you want to be relevant and understand the changes, as well as viewing Weather Focus. If you are going to teach certain topics, you must research about what is happening in neighbouring countries in terms of touring and understanding how tourism improves the economy of a country. That will not be possible if learners and teachers are not familiar with research.'

PST H concurred, saying:

'Research as teachers ... you have to know that our learners are very curious. Research does help learners and they are very curious on the things that happen in everyday life. They go as far as Googling what they are learning about in their cell phones. Whatever you teach, when learners are able to view it and Google it from their cell phone during teaching and learning. It helps them with understanding, because they like cell phones and they are using cell phones every day. The learners' activities should be coupled with higher- and lowerorder questions so that learners may improve thinking skills.'

PST F said:

'I also think that research should be conducted before formulating activities. Teachers must do research about the topic so that they guide learners how to research about the topic. I found out most of the activities in terms of Curriculum and Assessment Policy Statement (CAPS) were limiting learners in terms of the ability to express themselves. The activities are not encouraging learners' creativity.'

PST C had this to say:

'I used research projects and cell phone to Google the information and this was done to improve learning and understanding as a formative strategy. It was part of continuous assessment for the term. My mentor assigned me to assist learners with research projects which was part of Term 3 tasks. I was teaching Business Studies. They were assigned to do a research project as part of continuous assessment.'

PST M confirmed the value of research projects, saying:

'The learners were interested in research projects because they were using cell phones during teaching and learning. The lesson was interesting. I was teaching Tourism and we were looking for tourism destinations during holidays. We started to do research during the class period so as to guide them what they need to research.'

PST K had this to say:

'Learners were very interested in doing research projects because they were not allowed to use cell phones during school hours. However, when we were doing research projects, I had to ask permission from my mentor to use cell phones in order to do research'.

The findings revealed that the pre-service teachers have a strong preference for research projects as a way of stimulating learner engagement and promoting learning. Research projects were particularly popular because they allowed learners to use a tool they were familiar with and enjoyed – cell phones. When they were encouraged to use their cell phones, their levels of engagement rose. It has already been established that higher levels of engagement promote higher levels of learning. The use of cell phones for research also meant that learners could continue to research topics outside of school premises, without text books. Pre-service teachers displayed a positive attitude towards cell phones as a teaching and learning tool which improved learning, finding that cell phones promoted cooperation among learners.

b) Sub-theme 6.2: Questioning and discussion

Pre-service teachers recommended effective questioning and discussion as a means to promote learning. Questioning gave them insight into what learners knew and did not know. The preservice teachers used multiple-choice questions, case studies and presentations as a basis for well-worded questions.

PST J had this to say:

'I posed questions during teaching so that I assessed learners' understanding and it helped me to elicit learners' misunderstandings, so that I will be able to correct them in Mathematics. The formative assessment activities like worksheets were useful in engaging learners and they were able to ask questions when they had a challenge.'

PST E confirmed by saying:

'In teaching History, I used to bring in class case studies, depending on the topic. Learners were actively engaged in discussions. As they were viewing and discussing the apartheid era, they were discussing about what they were viewing in the case study.'

PST B added by saying:

'Formative assessment allowed me to question learners throughout the lesson which improved learners' understanding.'

PST G had this to say:

'The most common form of formative assessment I used is questioning and presentation, as it was a useful strategy and enhanced learning outcomes.'

The pre-service teachers revealed that questioning and discussion were used in order to engage learners and facilitate learning.

c) Sub-theme 6.3: Groupwork

Groupwork was a popular formative assessment strategy and recommended by the pre-service teachers as something that could be more relied on by teachers.

PST F had this to say:

'In our course work, the lecturers assigned us with group assignments and activities. They assigned group leaders. We learnt that learners must do cooperative work so that they learn from one another. Usually, because of the shortage of learning material, learners were paired to do class activities and they interact with one another and discuss different ideas.'

PST G said:

'Group activities in the school where I was teaching was the norm. I learnt from what I observed that sometimes subject teachers also give learners groupwork. There was a challenge when they were debating about the answers, you had to monitor noise.'

PST K concurred, saying:

'I found that learners enjoyed doing group activities, even those who seemed to be passive cooperated because they did not have to struggle on their own.'

d) Sub-theme 6.4: Promoting learning through Classwork

The pre-service teachers found classwork a helpful strategy and recommended it. Learners were assigned everyday classwork during teaching and learning, in which they put into practice new ideas that had been explained. The teachers would observe what the learners were doing and offer helpful feedback based on observations, so that they were guided in the way they carried out the classwork.

PST F had this to say:

'I think giving classwork was the most effective type of formative assessment and learners were able to respond to questions when they were doing corrections.'

PST C confirmed the assertion:

'The reason why I used classwork is because I was able to assess learners' understanding and to close the gap.'

PST K added by saying:

'Yes, I think classwork assisted learners to learn. After every lesson I used to give learners class activities and it was working for me and the learners, because I was able to identify learners who are not doing the work when I walking about.'

PST E had this to say:

'In the teaching of History, I used to give them case studies so that they will be able to interpret what is in the case study. We used to do corrections at the end of the case study so that learners get used to data response questions.'

Most participants mentioned that they combined classwork with helpful feedback during the process, so that they could guide their thinking and help them learn from their classwork, rather than waiting until the end of the exercises to correct errors. This was a recommended practice for implementing effective formative feedback.

e) Sub-theme 6.5: Learners non-submission of homework owing to lack of resources

It became apparent that the pre-service teachers constantly battled the issue of poorly resourced classrooms and the non-submission of homework, and that the two issues were closely related. The pre-service teachers experienced homework as an effective formative assessment strategy, yet the strategy was hampered by non-submission in the case of some learners.

PST G had this to say:

'Unfortunately, there were learners who did not do homework, although they were few, because of the lack of resources and laziness. The majority of learners did homework and we used to do corrections in class and they were participating in this type of activity.'

PST I added by saying:

'*You know when a learner did not do the homework he won't participate and won't show you the exercise. However most of learners were active during the class when they were responding to questions which were given as a homework.'*

PST C had this to say:

'*I was teaching English and Tourism. I once gave them the topic to prepare a presentation on gender roles. They were all prepared and wanted to present, however, due to time constraints they were not all able to present. It was interesting as they were sharing different views about the topic. Learners' involvement and engagement was crucial in terms of doing homework. Homework was critical for learners to be supported at home and strengthens learning'.*

f) Sub-theme 6.6: Classroom discussions

Classroom discussions were recommended as a means of enhancing learning.

PST K had this to say:

'Classroom discussion was important during teaching. This usually occurred during teaching and learning. Learners were actively engaged and enthusiastic.'

PST C confirmed the assertion:

'I was teaching English and I used to encourage learners to submit a draft before the final draft. They used to do corrections and get feedback when they were submitting work.'

PST B said:

'I was teaching Economics. Certain topics were supposed to be discussed in class so that learners have a better understanding of what they had to write in the project. Learners enjoyed engaging in discussions, depending on the topic. We once discussed the topic on pregnancy and poverty, where they interacted and contributed to discussions about the factors which impact on teenage pregnancy.'

From the responses of the pre-service teachers, it is clear that pre-service teachers favour classroom activities that are active and get learners engaged – such as research projects, questioning and class discussion. In this respect, they showed evidence of a firm grasp of the principles of teaching and learning, and a willingness to make use of what worked, including cell phones and peer-to-peer teaching.

Question 7: To what extent do you plan for your formative assessment in your lesson plan?

This question was drawn from the interview schedule – see Question 1 under Portfolio file, Appendix J.

Theme 7: The integration of formative assessment into lesson planning

a) Sub-theme 7.1: Establishing lesson objectives

The pre-service teachers showed a high awareness of the need to establish clear lesson objectives, and were in the habit of informing the learners what each lesson's objective were, as they had been taught to do. This helped the learners understand what they were supposed to gain from the lesson, which enhanced their learning. Establishing lesson objectives also helped the pre-service teachers to track learners' progress.

PST A had this to say:

'Whenever you are preparing for a lesson, we were taught during our training that you must prepare a lesson and plan for the kind of activities that you were going to assign to your learners, so that you understand what you are going to teach. Lesson plan is crucial. It serves as a compass of your teaching. The lesson plan helped me to be organised and understand how am I going to interact and engage with learners. I started by writing the lesson objectives using action verbs, as we were taught and observed during school visits when we were still attending. I planned classwork and homework as an extended learning opportunity in the teaching of Tourism and English. Whenever you are planning for a lesson, I started by stating the lesson objectives, so that when I get to class I know what are the objectives I wanted to achieve. I normally used the classwork that is in line with my lesson objectives. On the other hand, I also assess the gaps. I made compliance with school assessment policy and what is prescribed in Curriculum and Assessment Policy Statement

PST B confirmed, saying:

'I learnt during our module in teaching learning and assessment that teaching is integrated with assessment. We were taught that you cannot separate teaching and assessment. In order to ensure the objectives of the lesson have been achieved, I liked to share the lesson objectives with learners. We were taught when we were attending lectures that we must share the lesson objectives with our learners, so that they will know what you are intending to achieve. After sharing with learners, I asked questions, engaged learners in discussions, and shared with them what I understand about the content we were engaged in.'

PST C added by saying:

'I found it difficult to identify the kind of activities I would give to learners before I start teaching because learners are diverse and my starting point was lesson planning with lesson objectives, which informs my lesson activities. We were taught to start by crafting these. I was also thinking

how am I going to present the objectives to learners? I crafted the objectives using Blooms Taxonomy and cognitive progression. It was not that difficult, since our mentors were also assisting us to craft the objectives, as I was assigned two mentors for English and Tourism. With regard to planning, I drafted the lesson plan and showed it to my mentor for advice. As a pre-service teacher, I used to pose questions which are in line with the lesson objectives.'

PST I confirmed, saying:

'I used to plan for formative assessment activities with lesson objectives I intend to achieve. I would consult different sources like the teachers' guide and CAPS, and research about the topic I was planning for my lesson. The tasks connected to the objectives and led learners to the intended outcomes. As we were mentored, it was not difficult to align the task with the objectives.'

PST L had this to say:

'In planning for the class, I used the objectives, because I designed my objectives to achieve the targeted outcomes. I shared the objectives at the beginning of the lesson so that my learners will be motivated to complete the tasks. I did not want learners to be confused. Sometimes they disrupt my lesson due to misunderstanding. However, I helped them to learn.'

b) Sub-theme 7.2: Homework as a vehicle for extended learning opportunities

Homework comprises tasks assigned to learners by subject teachers that are meant to be done at home after learning has taken place. Pre-service teachers revealed that they used homework as an extended learning opportunity for learners, so that they could improve understanding.

PST G had this to say:

'As a commercial teacher, I used homework so that learners had the opportunity to view television on subject-related topics. For example, I remember they had a project on entrepreneurial skills; they had to interview shop owners about the qualities of an entrepreneur. I gave them homework to view programmes which dealt with successful businessmen. I also gave them homework on how to interpret graphs because I observed that they were struggling when it comes to graph interpretation.'

PST H had this to say:

'I observed that homework enhances learners' independence and improves learning achievements. I always plan for homework so that I promote learner autonomy and to check understanding and their learning progress.'

PST E confirmed the assertion:

'I give no grades to homework; it is work in progress because homework is for monitoring learning. I give a range of homework, like essays in History and assignments, with the intention of involving all learners in the assigned tasks. I used to assist them with assignments and also ask them to be assisted by their peers and members of the community, especially elderly people who know about South African history.'

PST I had this to say:

'There must be classwork and there must be some assessment for learners. They take classwork as a homework but sometimes the time will not be on our side. That is why they wrote the classwork as homework.'

PST G had this to say:

'What I observed about my learners is that they were good in doing homework and classwork, and they were also participating in class in the process of teaching and learning. But the problem starts when they were asked to answer a long question or rather essay question. What I did is to just make sure that each and every unit that I have done I just formulate a question which is an essay question, so that I see whether they understood the unit as a whole or they are lacking somewhere. My goal was to assess the learners' understanding, whether they understood the unit, and to answer long questions.'

PST L had this to say:

'Learners did not know how to write an essay and that was a challenge. I will show them how to write an essay by writing on the board and I will give them homework to draft an essay for corrections and submit during the lesson. I will do corrections on the board and learners will write corrections and improve on their draft. They will resubmit for the second time.'

c) Sub-theme 7.3: Questioning as a formative strategy

The pre-service teachers included questions in their planning, using well-planned questions to achieve learning objectives and to elicit learners' understanding. Pre-service teachers revealed that they planned homework and classwork in order to improve learning.

PST E had this to say:

'My lesson planning is informed by the Annual Teaching Plan. When I plan my lesson, I start by identifying the objectives. I plan to use questioning throughout my lesson as a teaching strategy so

that I elicit learners' understanding. That also benefits me as a teacher, so that I support learners who are struggling. However, I used to ask questions during the lesson.'

PSTC concurred by saying:

'In order to ensure that the objectives are achieved, I integrate questioning during the development of a lesson. I like it when learners communicate their ideas and thinking about the topic. I was teaching Tourism, and learners were interested in tourism destinations and they responded in all questions because they could relate to the tourist attraction.'

PST G added by saying:

'When I was planning for formative assessment, I was planning for questioning, classwork and homework. As I indicated, those three types of assessment are not always graded. They are for the improvement of learning. I regard these types of formative assessment helpful to me as a pre-service teacher, to identify learners' gaps and help me to support them. I regarded mistakes as a learning process.'

d) Sub-theme 7.4: Class activities as a strategy for enhancing learner engagement

The pre-service teachers planned for a variety of class activities to keep learners engaged. Sometimes learners copied from their friends during classwork. The pre-service teachers also observed that learners struggled with some classwork, particularly Mathematics.

PST J had this to say:

'After each unit in Maths and Computer Application Technology, I give them classwork so that they write in class and correct their mistakes. However, some learners did not write the classwork. They just sit and did not write at all, and others wait to copy from their friends. The reason I gave them classwork is to assist them. I achieved my lesson objectives through giving learners class activities so that I correct learners' misconceptions on the board. Most of my activities were done in class. I would walk about so that I observed learners who were struggling to write the classwork. At the beginning of my lesson, I used to inform learners about what they needed to know at the end of the lesson, although they did not seem to understand every time.'

PST H had this to say:

'I was teaching Grade 10. When they were given homework, they did not write it. Sometimes I think they were undermining the teacher trainee. When it comes to my mentor, they were writing all the work. They enjoyed the research project because we were assisting them to write the project and the parents and the community were assisting them.'

Question 8: What skills do learners need to improve learning through formative assessment?
This question was drawn from the interview schedule – see Question 2 under Portfolio File in Appendix J.

Theme 8: learners' most needed skills for reading, writing and comprehension formative assessment activities

The pre-service teachers highlighted a number of skills with which learners needed help in order to improve the value of formative assessment.

a) **Sub-theme 8.1: Reading, writing and speaking**

The pre-service teachers identified reading, writing and speaking as the most important skills in facilitating learning and teaching. Language proficiency is critical in the implementation of formative assessment strategies, because if learners struggle with language proficiency, they cannot complete assigned tasks to the required standard, even if they have some understanding of the topic. The language barrier impacted negatively on how learners responded to questions.

PST C had this to say:

'Being a teacher, you must be creative and try to give learners activities where they will read. Learners were having a challenge with reading, and this makes it difficult for them to understand the questions. It is the responsibility of the teacher to try to explain to learners what they need to learn.'

PST E concurred, saying:

'When learners did not understand questions, it is because of their literacy level was not at the expected level. I used to ask questions which were from the book and based on a case study or data response questions, as I was teaching History. Learners did not understand the questions until I read the questions and explained what it means to them. I think there must be reading periods in schools in order to support and improve learners' literacy skills, particularly reading and speaking.'

PST J had this to say:

'Teaching and learning is about speaking, reading and writing. If learners are failing to read, write and speak, they are not able to finish assignments, orals and any class activities. I encountered a challenge when learners did not submit homework, because they did not understand the questions – not because they were lazy. When I explain to them what the question means, they start writing in class. So, for me, reading and writing are crucial for the learners.'

PST A:

'Learners were struggling to respond to higher-order questions, and I had to adapt questions so that learners would be able to respond to activities like case studies and data response questions. They seemed to be having a language barrier. When they were supported, they were able to understand and respond to questions.'

4.6 Conclusion

The results revealed that most PSTs support the use of class activities that involve active participation, and made creative use of the tools and resources that they had to hand – such as cell phones, peer-to-peer learning and community members. They also used a variety of class-based activities, such as questioning, discussion, feedback and research projects, and constantly encouraged learner participation. Their experiences reveal that the teacher mentors they were assigned were especially helpful to them. It is clear that the interviewed pre-service teachers understood the role of formative assessment in promoting learning and implemented it in practice teaching.

4.7 Chapter Summary

This chapter has presented the findings that emerged from the questionnaire, focus group discussion and document analysis. This chapter outlined the themes that were identified during data analysis. It reveals how PGCE preservice teachers implemented formative assessment strategies during practice teaching. The following chapter which is chapter five discusses the discussion and interpretation of the results. Literature review is also used to illustrate how this study extends our understanding of what is currently known about PGCE preservice teachers experiences of formative assessment implementation during practice teaching.

CHAPTER 5 DISCUSSION AND INTERPRETATION OF THE FINDINGS

5.1 Introduction

In the previous chapter, the study findings were presented, based on both the questionnaire and the focus group discussions and in alignment with the research questions. This chapter focuses on an interpretation and discussion of the findings. The researcher considers the findings considering the theories that guided this research, i.e., social constructivism and the theory of formative assessment. The findings are also considered considering the findings of other researchers. This study sought to answer the following research questions:

The main research question is: What are the experiences of Post Graduate Certificate in Education (PGCE) preservice teachers in the implementation of formative assessment during practice teaching? The research sub-questions are as follows:

- How do Post Graduate Certificate in Education (PGCE) teachers conceptualise formative assessment during teaching practice?
- To what extent do PGCE pre-service teachers integrate formative assessment into teaching and learning during teaching practice?
- To what extent do PGCE pre-service teachers integrate formative assessment during practice teaching?
- How do PGCE pre-service teachers implement different types of formative assessment strategies during teaching practice?

5.2 Discussion of themes

The following section discusses each theme in turn as revealed by the questionnaire and interview data presented in Chapter Four.

5.2.1 Theme 1: Improvement of learning

This theme was informed by Research Question 1: How do Post Graduate Certificate in Education (PGCE) teachers conceptualise formative assessment during practice teaching?

The pre-service teachers clearly conceptualised formative assessment as a strategy for improving learning. They had a firm grasp of the fact that formative assessment is an integral part of teaching, and that it needs to be planned for and prepared on a daily, weekly and monthly basis. They were provided with observation opportunities on Wednesdays before they engaged in teaching practice, and had studied a module on teaching, learning and assessment. They revealed that they learnt a great deal during the teaching, learning and assessment module and during observations on Wednesdays, which helped them practise formative assessment more confidently when it came to their period of practice teaching. In this regard, their mentors were also of great assistance. They

understood that formative assessment is conducted in order to improve learning, helping them to identify gaps in learning. Research shows that the effective use of formative assessment assists in improving students' learning (Bell & Cowie, 2005; Stiggins, 2005; Black & Wiliam, 1998). The finding is consistent with Nayagi and Rajendran (2020:5), who found that most pre-service teachers prioritised assessment for learning. Monteiro, Mata and Santos (2021) also found that the majority of preservice teachers understood the conception of assessment as a means to improve learning and teaching. Aziz (2015) investigated the conceptions of assessment of 107 English junior high school teachers in the Indonesian context. In his mixed methods study, participants were given a questionnaire and semi-structured interviews. The results reveal that participants believed the main aim of assessment was to improve teachers' teaching and students' learning. Aziz (2015) also found that they were willing to use practices of assessment to help and improve their own classroom teaching.

a) Sub-theme 1.1: Checking learners' understanding

Checking learners' understanding is an important step in the teaching and learning process (Fisher & Frey, 2014:2). The findings revealed that the pre-service teachers understood formative assessment as a means to check learners' understanding during teaching and learning, as they frequently asked questions to check understanding and identify misconceptions. The findings also reveal that they used class activities and written class tests to elicit learners' understanding. Adesoji (2018:3) states that 'assessment is an activity to demonstrate understanding of facts and ideas. By organising and comparing, learners demonstrate an understanding of the questions by providing a relevant answer to the statement'. The background knowledge that learners bring to the classroom influences how they understand the material that teachers share. Unless the teacher checks for understanding, it is difficult to know precisely what students are getting out of the lesson. The majority of the PGCE pre-service teachers who responded to this question stated that when they implemented formative assessment, they checked learners' understanding. It appeared, too, that the majority of preservice teachers had positive experiences with the implementation of formative assessment in terms of checking learners' understanding during teaching and learning. This finding is consistent with the findings of Patthof (2022), who found that checking learners' understanding is the legitimate way to start the formative assessment process. Sun and Van Es (2015) mention that intentional noticing is an instigator in the exploration and uncovering of student understanding. The findings are also consistent with Benzehaf (2017:11), who found that teachers used different assessment strategies, such as written tests and homework assignments, to check learners' understanding. Different types of formative assessment may be used to assess learners' understanding. Kunci (2022:46) also found that 31 pre-service teachers observed hand signals and used learners' written answers on the board to check understanding.

b) Sub-theme 1.2: To support learning

The findings revealed that pre-service teachers conceptualise formative assessment as a means to improve learners' learning. They supported learning through the use of questioning, class activities, homework and discussions. The aim of formative assessment is to improve and support learning, and it has been proven through research that one of the benefits of formative assessment is that, when used correctly, it does improve learning (Black & Wiliam, 1998). This finding is consistent with Van der Merwe (2022:6), who found that pre-service teachers learnt strategies in their teacher training that supported learning, and that formative assessment was one of them. The strategies which they valued and used included peer learning, eliciting prior learning, questioning, assessment, a variety of 'playful' learning activities and engaging learners in practice. Kunci (2022:46) echoes the findings of Van der Merwe (2022), stating that 71% of the pre-service teachers observed the practice of questioning during teaching; they were aware of questions, student responses to questions, and the quality of questions given by the teachers. Furthermore, Kyttal (2022) found that pre-service teachers were slightly more focused on formative assessment's role in promoting learning than on simply revealing learners' knowledge.

c) Sub-theme 1.3: Learners' active engagement through classroom activities and homework

The pre-service teachers strove to promote the learners' active engagement during formative assessment, using a variety of strategies such as classroom activities and homework. They assigned homework and classwork to learners to engage them in the process of learning. Active learning is defined as any activity that encourages learners to participate in learning, engages them with content, and enhances critical thinking, especially when they apply new ideas beyond the classroom (Lumpkin et al, 2015). Teaching requires a learner-centred orientation, with teachers actively seeking information about student skills and understanding, especially in the classroom when learners are doing activities (Shaughnessy & Boers, 2017). Engagement is the quality of effort students themselves cognitively pursue in their educational activities, which contributes directly to desired learning outcomes (Grocia, 2018).

This finding is in line with Tempelaar, Rienties and Giesbers (2015), and Carolis, D'Errico, Paciello and Palestra (2019), who found that engagement is positively linked with academic achievement and student satisfaction. Engagement is encouraged in classrooms and takes many forms, including collaborative learning (Hyun, Ediger & Lee, 2019). Most studies report that active learning positively influences student learning as students comprehend and remember new content better when they are involved in constructing it (Hyun et al, 2017). This finding is in line with Lumpkin

et al. (2015), who used exploratory writing assignments, small group and paired discussions, 'minute' papers and oral reports in an effort to incorporate active learning in five different courses. Learners reported that the activities helped to clarify the material and increase their understanding and recall. Activities were described as an invigorating break, interesting, interactive and enjoyable (Lumpkin et al, 2015).

d) Sub-theme 1.4: The use of formative assessment to prepare learners for summative assessment

The pre-service teachers understood formative assessment as a building block for summative assessments, and revealed that by using formative assessment, they we are able to identify struggling learners and prepare them for the summative assessment. They furthermore stated that since they started practice teaching during the third term, their mentors wanted them to prepare learners for the final examination. Formative assessment assisted them to do so. They found it helpful as a preparation for summative assessments, enabling them to identify gaps in learning and close the gaps before the exam.

These findings are consistent with those of Burket (2016), who argued that reports on learners' summative assessment presented evidence of their achievements in formative assessment. The findings also echo those of Ngiba (2020:64) who stated that formative assessment was generally used by learners in class for summative gains. Learners in the current study used formative assessment marks to improve their opportunities of getting good grades at the end of the year in Tourism. The combination of summative and formative assessment is supported by Finamor et al. (2016), who concluded that the combination of summative and formative assessment helps to improve students' performance. The essence of the connection between summative and formative assessment is that it maintains a standard of assessment, with students able to identify their shortcomings and correct them before the final exam (Skutil & Kabadayi, 2022). Broadband, Panadero and Boud (2017) state that a combination of formative and summative assessment allows students to develop skills over time, and gives them the opportunity to use the feedback provided to improve performance. Conderman and Hedin (2012:68) also found that student achievement in high-stakes tests is directly related to highquality classroom instruction, which requires teachers to continuously gather formative assessment data and adjust instructions accordingly. Learners' engagement in formative assessment assists them in improving on summative assessment. Pre-service teachers revealed that their mentors encouraged them to assist learners by giving formative assessment activities, which would assist them to perform better in their examinations.

e) Sub-theme 1.5: To diagnose learners' problems and see where more support is needed

The findings revealed that pre-service teachers understood formative assessment as an indication of where modifications were needed to their lessons plans and their teaching. It enabled them to give more targeted support to learners and assist them to understand the work. The pre-service teachers revealed that sometimes learners struggled to understand questions and were supported to understand the questions during teaching. The findings are in line with those of Kabadayi (2022), who found that 17% of pre-service teachers perceived formative assessment as a diagnostic tool to help find and solve learning problems. Moyose (2015) found that formative assessment gives a diagnosis of learners' learning difficulties so that the teacher may help to improve their performance. Formative assessment helps the teachers identify individual learning needs and adjust instruction to better meet the needs of learners (William, 2011).

5.2.2 Theme 2: Pre-service teachers' experiences of formative assessment

This theme was informed by the research question: What are the experiences of pre-service teachers in the implementation of formative assessment during practice teaching?

a) Sub-theme 2.1: Active participation and learner non-participation

The findings revealed that learners were actively engaged in different activities during the process of teaching and learning. Pre-service teachers assigned different activities to learners such as classwork, homework, worksheets, orals and research projects as types of formative assessment. Active learning is defined as any activity that encourages students to participate in learning, engaging them with course material and enhancing critical thinking as they apply new knowledge beyond the classroom (Lumpkin et al, 2013). Active learning is based on the social constructivist theory, which proposes that knowledge is built by the individual in social interactions with others. This finding is in line with Lumpkin et al (2015:129), who reported that teachers set writing assignments, small group and paired discussions, 'minute' papers and oral reports in an effort to incorporate active learning in five different courses. Students reported that activities helped to clarify the material and increase their understanding and recall. Activities were described as an 'invigorating break, interesting, interactive and enjoyable'. The findings are also in line with those of Asare (2021), who found that the dominant formative assessment strategy employed in Ghana was engaging students in effective class participation. This aligns with the social constructivist (1978) view that learners must be actively engaged in the process of learning; learners construct knowledge through interacting with members of the community. In this study, some learners did not participate in class activities and homework owing to a shortage of textbooks and other resources such as photocopying paper. Pre-service teachers lamented the lack of resources in schools, which constrains the effective implementation of formative assessment and consequently,

learning. Most studies report that active learning positively influences learners' learning as it enables them to comprehend and remember new content better (Hylin et al, 2017).

b) Sub-theme 2.2: Shortage of resources

The findings revealed that pre-service teachers sometimes did not implement formative assessment as expected because of the shortage of learning resources. Pre-service teachers relied on photocopied learning materials since there was a shortage of books in some schools. They also lacked textbooks, calculators, photocopying paper, calculators, ink, and the teacher's guide, which affected them negatively and hindered effective teaching and assessing. Missing textbooks meant that some learners did not do homework, and when learners did not do homework, the teacher was unable to identify gaps in their knowledge. According to Azara (2018), books are relevant in the teaching and learning process, and without them, teaching and learning cannot be effective. In addition, instructional resources are crucial in promoting learning and motivating students. This finding is consistent with Khumalo and Maphalala's (2018) finding that pre-service teachers experience a lack of resources which impacts negatively on achieving learning outcomes and results in non-submission of homework. It is also consistent with Molopo and Pillay (2018:5), who found that the lack of resources in a developing country like South Africa is not surprising or unusual. Nakidien, Singh and Sayed (2021:9) also found that the lack of resources, funds and support from school management resulted in teachers' loss of enthusiasm in implementing formative assessment in South African schools. The study's findings are in line with Dube-Xaba and Xulu's (2020:10) findings that inadequate resources such as textbooks, maps and photocopying paper are a challenge to learner achievement. The lack of resources hinders the implementation of curriculum and learner attainment in terms of skills, knowledge and values. The lack of resources in classrooms can also cause extreme distress to learners and teachers.

c) Sub-theme 2.3: Activity adaptation and learner support

The findings reveal that pre-service teachers supported learners in terms of setting activities that enhanced learning and were able to adjust tasks as they uncovered more about learners' abilities. This resulted in learners being to do activities that were within their zone of proximal development. The PGCE preservice teachers revealed that many learners were unable to respond well to higher-order questions. This finding is in line with that of Hai (2022:374), who found that teachers facilitated student improvement, and strove to shorten the gap between actual outcomes and expected outcomes. The results of this research support the idea that teachers find formative assessment beneficial for identifying the gaps in learning, since it offers them the opportunity to increase student learning and supports their teaching practices (Martin, Mraza & Polyy, 2022).

Formative assessment promotes lesson adaptation. When a learner seems to be struggling, the teacher put 'scaffolds' in place as a form of support, as it is the responsibility of the teacher to promote and support learning. Liu (2013:2187) is of the view that in addition to revealing learner ability, formative assessment evaluates the efficacy of the teaching activity itself. Teachers should reflect critically on learners' performance and ask themselves whether poor performance might also be a result of a badly explained task, or a task that is outside of the learners' zone of proximal development. This will enable them to adjust the activity and ensure that the goals of instruction are being achieved. Activities for assessment can take the form of class observation, weekly notes, interviews, questionnaires, portfolios of student scores, homework, tests and so on.

Yan and Cheng (2014:128) reiterate that the foremost purpose of assessment in education is to support learning. Formative assessment can optimise teaching practice in ways that support learners' learning. Plenty of evidence may be found in the literature to show that formative assessment practices can result in improved learner achievement and reduce the achievement gap among learners. The results of a study by Hattie (2009, 2012) found that formative assessment was rated one of the most effective methods for teaching, having a visible effect on student learning. The pre-service teachers in this study provided feedback where they felt that students were struggling. Liu (2013:2187) was of the view that the most important characteristic of formative assessment is the purpose for which it is done. The two main purposes of formative assessment are to inform students' learning and teachers' teaching.

d) Sub-theme 2.3: Reading, writing and speaking

The re-service teachers' experience was that most learners struggled because of a lack of language proficiency, which formed an effective barrier to learning and the completion of formative assessment tasks. Reading, writing and speaking were all considered inadequate and hindered learners' proper self-expression. Pre-service teachers revealed that the main problem was the language of teaching and learning in some schools, since learners were taught in English, which is not their mother tongue. Learners struggled to understand questions, had to have them explained in many cases, and struggled to express their own ideas. In this way, the use of English as a medium of instruction may well have hampered the development of creative and original thinking. This was evident in case studies, data response questions, research projects and assignments. The sentences were poorly constructed, and their reading sometimes was not proficient.

Pre-service teachers revealed that reading, writing and speaking are crucial for learners to understand instructions and questions, along with any other type of formative assessment. Preservice teachers identified that these three skills were critical skills for the effective

implementation of formative assessment in schools. They reported that learners struggled to complete tasks because they did not understand the questions asked.

This finding is in line with findings by Du Plessis (2021), who reported that Post Graduate Certificate in Education graduates' experiences language barriers when implementing formative assessment. The Progress in International Reading Strategy (PIRLS) revealed that in 2016 in South Africa, 61% of learners could not read or write at the appropriate age levels, and 78% of Grade 4 learners were unable to read for meaning in any language, including their home language. This finding concurs with the findings of Volke et al. (2016), who stated, 'Despite a plethora of initiatives to introduce constructivist pedagogies, and to provide all schools with a variety of resources in different languages to encourage questioning, critical thinking and mutual discovery of knowledge, the South African education system continues to experience many literacy challenges.'

5.2.3 Theme 3: Pre-service teachers' understanding of formative assessment

This theme was informed by the question: Why is it important for pre-service teachers to understand formative assessment?

a) Sub-theme 3.1: To see whether learners understand

The findings revealed that checking for learners' understanding is the reason most pre-service teachers gave in answer to the question of why it was important to understand formative assessment. Pre-service teachers indicated that they used formative assessment in order to elicit learners' understanding during the process of teaching and learning. The findings furthermore revealed that formative assessment should benefit learners by assisting the teacher to reduce the learning gap. The findings revealed that the pre-service teachers used questioning to check learners' understanding; this was the main way in which they conceptualised formative assessment.

This finding is in line with that of Khizar, Daud and Asad (2012:714), who found that teachers implement formative assessment in every lesson to identify learners' improvements and understanding of the topic. Adesoji (2018) stated that learners have to demonstrate understanding of facts and ideas. In some activities, by organising and comparing, learners demonstrated an understanding of the topic, giving relevant answers to certain statements. Preservice teachers viewed checking learners' understanding as the most important part of formative assessment. Checking learners' understanding is a component of formative assessment, although not the only one. When teachers routinely check the understanding of the whole class through the use of formative assessment, misunderstandings can surface (Fisher & Frey, 2014a). Pre-service teachers

revealed that they used activities and questioning to elicit learners' understanding in order to assess learners' understanding.

b) Sub-theme 3.2: To improve learning through feedback

The findings reveal that formative assessment improved learning through the feedback that teachers gave to learners after the completion of certain activities. Formative assessment is strengthened by giving feedback, which improves learning. Pre-service teachers revealed that they assisted learners with projects and homework by giving feedback during teaching and by assisting them with corrections in order to improve learning. Feedback was also used to assist learners with drafts of research projects before they submitted final projects.

This finding is in line with Hai (2022), who found that 71.55% of teachers supported students by adjusting their learning activities and providing accurate, detailed and useful feedback. Research has also posited that although formative assessment has the potential to improve student achievement, it is imperative that teachers continuously guide students as they progress through the very crucial learning phases – 'feedback, feed-up and feed-forward' (Anderson & Palm (2017). Studies grounded in Black and Wiliam's (2010) research also posit that improvements in students' performance is reliant on the quality and timing of feedback from the teacher (Gan, Liu & Yang, 2017). Pre-service teachers are of the view that formative assessment supports learning. The finding is in line with Asare (2021), who found that an effective formative assessment strategy is discussing content with students promptly after they finish the class activity and giving feedback immediately. The findings are in line with LevyVered and Alhija (2018:90), who stated that assessment is mainly used as a tool for improving learning. The current study is also in line with Smith, Hill, Cowie and Gilmore (2014:91), who indicated that 'upon entering a teacher education program, pre-service teachers seem to view assessment as a broad concept, mainly formal and summative in nature, but at the end of their study program, they showed a strong understanding of how assessment information can be used to support and inform learning'. Muztagh (2014:121) found that learners perceive descriptive feedback to be the most beneficial for their motivation, and that learners can improve through assessment that gives them 'cues on how to proceed, leads them to feel excited, stimulated, and interested in the material and [willing to] elaborate on the material in more depth, which in turn leads to motivation in the lessons'. Studies into teachers' and learners' perspectives on feedback practices also highlight that learners who fully understand what is expected of them in relation to their learning objectives become more engaged, and this results in better performance (Van der Kleij, 2019).

c) Sub-theme 3.3: To reveal prior knowledge

The findings reveal that pre-service teachers implement formative assessment in order to elicit learners' prior knowledge before teaching, and to check whether there are any pre-existing misconceptions so that they can adjust lessons accordingly. During the document analysis, it was found that in their lesson planning, pre-service teachers make a point of recapping previous knowledge, asking questions about previous lessons. This prepared them for what they were about to learn. The researcher collected the PGCE preservice teachers lesson plans, Annual Teaching Plans 12 PGCE preservice teachers provided lesson plans and ATP to be evaluated by the researcher the this was meant to triangulate the findings with what was revealed by the participants during the first phase of data collection and during the focus group discussion. Lesson planning details the objectives, activities assigned to learners during teaching period. The documents revealed that students were prepared for classroom teaching from the (ATP). This was done to determine what formative assessment strategies were given to learners.

d) Sub-theme 3.4: To improve learner participation

The pre-service teachers used formative assessment as a way to engage learners in lesson content and to boost their own communication with learners, which enhanced learners' cooperation and participation. Pre-service teachers revealed that it was essential for them to understand formative assessment to improve their teaching ability, engage learners in lesson content, and communicate with learners so that they co-operate and participate. Pre-service teachers observed that learners participated more in certain activities than in others. They particularly enjoyed groupwork, projects and class discussions, all of which stimulate active engagement and even draw in learners who might otherwise tend to be passive.

Student engagement is central to academic success in education (Murray, 2018). Engagement is positively linked with academic achievement and student satisfaction (D' Errico, Paciello & Palestra, 2019). This finding echoes Du Plessis's (2020) finding that student teachers recognised the importance of learner participation and collaboration during lessons and tried to find ways to get learners actively engaged in their own knowledge construction. This is in line with one of the principles of Vygotsky's constructivist learning theory; he emphasised social interaction and collaboration as essential components of learning (Vygotsky, 1978). This finding furthermore concurs with the findings of a study by Joni and Adkins (2018), who found that students played an active role in various class activities. According to Abu Baker and Ismail (2020), active learning is any action that directly involves learners in the process of learning. The findings reveal that learners were actively engaged in certain activities, particularly when they were assigned research projects for which they could use the cell phones. Learning is a social activity, and through projects and

discussions, learners interact socially with one another and with the teacher, learning a great deal in the process, since they are involved in constructing their own knowledge. Projects also gave teachers the opportunity to support learners who are struggling. It is the responsibility of the teacher to identify and close gaps when he or she identifies a lack of understanding among learners. This finding is in line with Vygotsky's (1978) view that learners develop knowledge by being active and drawing from their experience.

e) Sub-theme 3.5: To give and elicit feedback

The findings reveal that pre-service teachers used formative assessment not only to give feedback to learners but also to elicit feedback from learners. Both aspects were found valuable. Feedback is essential to formative assessment. The findings reveal that the pre-service teachers used feedback to improve learning and adjust teaching. The findings are in line with Lee and Lim (2020:7), who found that more than half of the pre-service teachers in elementary (58%) school and 59% of pre-service teachers in secondary school demonstrated improvements in providing feedback after completing the module. In comparison, 40% of pre-service teachers remained at their pre-module level. Raphol and Ronnebeck (2019:2159) suggest that preservice teachers must learn what effective feedback looks like with respect to its layout, form and timing, and which components of feedback are the decisive ones. In this study, feedback was given to learners to close the gap between the learners' current understanding and the predefined learning objectives. Pre-service teachers gave descriptive feedback to learners and supported them to achieve intended lesson objectives, particularly during class activities and research projects. The majority of pre-service teachers felt that they were taught how to give feedback and did so successfully, enabling the learners to understand their own areas of weakness. They felt they had enough time to give feedback to learners, particularly on research projects, questionnaires, homework and class activities. This finding is in line with Lee and
Lim (2020:8), who assert that pre-service teachers achieved higher levels of competence after training in their ability to craft feedback comments that supported students' learning and reflective thinking.

Black (2018) contends that classroom dialogue between students can provide meaningful opportunities for feedback and learning. There is evidence in the current study that pre-service teachers were employing feedback to support learners' learning. Monitoring and observation provided pre-service teachers with opportunities to give task-related feedback and corrections on activities such as research projects, classwork and homework. The findings also suggest that feedback works for learners, since they acted on the feedback received by working with commitment and confidence once they fully understood what was required.

The provision of feedback documents was consistent with scholarly views that for feedback to be useful, there must be clear directives on how students can bridge the gap between current performance and desired performance (Nicol & Macfarlane-Dick, 2006). Pre-service teachers recognised that feedback should help learners to improve learning, and they adjusted instructions to suit learners' needs through feedback, so that learners could implement corrections. The findings revealed that pre-service teachers were aware that feedback is part of formative assessment, in line with the findings of Cowan (2009) that Bachelor of Education and Post Graduate Diploma in Education pre-service teachers displayed competency in detailed written feedback.

5.2.4 Theme 4: The integration of formative assessment into lessons

This theme was informed by the question: To what extent do you integrate formative assessment practices in your subjects during practice teaching? The findings reveal that pre-service teachers employed various formative assessment strategies during practice teaching. Sajjad, Nasir and Saif (2019) investigated 235 secondary school Grade 10 English language teachers' classroom assessment practices, and the challenges and opportunities faced by them. Results revealed that pre-service teachers employed a range of assessment strategies in their classrooms. The findings are in line with Asare (2021:184), who found that in Ghana, the dominant formative assessment strategies pre-service teachers engaged in were class participation, discussing feedback from assessment tasks with learners, the use of question-and-answer techniques during teaching and learning, making formative use of summative assessments, giving feedback to learners promptly, giving learners home assignments, and giving learners groupwork and projects. The findings reveal that there is still a challenge when it comes to self- and peer assessment.

a) Sub-theme 4.1: Classwork

Findings reveal that the majority of pre-service teachers regarded class work as an important formative assessment strategy for assessing learners' understanding. There was a direct link between active learner participation and classwork. Findings also revealed that there were learners who did not participate in class activities, although they were few, mostly because of the shortage of resources such as books, but also a degree of laziness and non-cooperation. Furthermore, the findings revealed that pre-service teachers usually gave some activity after their presentation of new content. The findings are consistent with Khizar, Daud and Asad (2021) who stated that pre-service teachers implemented formative assessment in every session to identify learners' improvements and understanding of topics. This notion is also affirmed by a number of participants' experiences in the survey and focus group, and it was evident in their lesson planning. A study

conducted by Burke and Depka (2016) revealed that activities used to identify students' progress and modify instructional methods based on learning needs are known as formative assessment.

b) Sub-theme 4.2: Homework

The findings revealed that pre-service teachers implemented homework as a formative assessment strategy almost every day to extend learning opportunities to the home, enabling learners to approach topics with the assistance of their parents, siblings and more knowledgeable others. The pre-service teachers revealed that they did corrections on the board when learners failed to give correct answers. This finding is in line with Veugen et al. (2022), who found that 74% of the learners in their study participated in homework more successfully in informal science activities than in formal tests. The finding is also consistent with findings by Rosario, Nunez, Vallejo, Cunha, Nunez, Mourao and Pinto (2015), who reported that homework assignments with the purpose of promoting the transfer of learning had a stronger positive impact on 6th graders' Mathematics achievement than homework with the purpose of practice or preparation. Educators use formative assessment tasks such as homework to identify where students are struggling in order to assist with and address their problems (Veerasmy et al, 2016).

c) Sub-theme 4.3: Groupwork

The findings revealed that pre-service teachers implemented groupwork as an effective teaching strategy during teaching and learning. The pre-service teachers furthermore revealed that they arranged opportunities to conduct groupwork to facilitate cooperative learning and encourage interaction among learners. During groupwork, learners used exercise books to complete their classroom activities, and worked collaboratively and well. Groupwork promoted a sense of excitement and motivation, along with a sense of competition among groups – each group wanted to outshine the others. Groupwork became a motivation to succeed when learners were engaged in class activities and did corrections in class. Some pre-service teachers cited overcrowding and time constraints as a contributing factor in their choice to group learners for marking purposes. Vygotsky (1978) stresses the role of interaction in the development of a child's cognitive structure, stating that 'the cognitive processes develop in social interactions with adults or more able peers'. In groupwork, learners co-constructed knowledge by reflecting on and defending their opinions, and judging what was good for the group. This finding is in line with Asare (2021:184), who found that Ghanaian teachers implemented different types of formative assessment to facilitate learning, such as giving students groupwork and projects. In addition, the findings of the study are in line with those of Walani (2009), who reported that most teachers used a variety of formative assessment strategies in their classrooms. These strategies included games, quizzes, groupwork, paired discussions, individual conferences, assignments, teacher-made tests and oral questioning.

d) Sub-theme 4.4: Questioning

According to Cumhur and Guven (2022:2), 'Pre-service teachers must gain the ability to develop students' answers during their training and realise the power of these questions in terms of teaching.' Findings revealed that pre-service teachers used questioning as the main type of formative assessment during practice teaching. They further reveal that observing mentors teaching every Wednesday during off-campus classroom observation periods contributed to their learning as student teachers. They maintained that they sometimes asked probing questions.

The findings concur with those of Kunci (2022:46), who found that 71% of pre-service teachers used the questioning strategy during teaching. These results indicate that pre-service teachers tend to focus on questioning as their main form of formative assessment in the classroom, which confirms the claim by Harlen (2007), that questioning is an essential element of formative assessment in the teaching and learning process. This is also in line with Gocke, AyadoganYenmez and Celik's (2020) assertion that training given to pre-service teaching in their preservice teaching period increased their questioning and argumentation skills. The questioning of learners during teaching and learning was evident from pre-service teachers' responses that when they were teaching, they asked learners questions to elicit learners' understanding, to identify gaps and to close gaps by correcting mistakes.

e) Sub-theme 4.5: Feedback

The findings revealed that pre-service teachers integrated formative assessment into classroom practice through feedback, giving oral feedback when learners had completed class activities, and assisting learners to make corrections on the board to improve their understanding of topics. Learners were given feedback immediately so that they could learn from their mistakes. This finding is consistent with findings by Tamba and Cendana (2022:46), who found that 23.2% of students paid attention to feedback. It is also in line with Xie (2021), who found that when preservice teachers talked about the common mistakes made by most learners, learners were able to identify their own errors and correct them. Shute (2008:154) stated, 'The premise underlying most of the research conducted is that good feedback can significantly improve learning process and outcomes if delivered correctly.' Learners were given direct, immediate feedback on their mistakes, and as a result, they began recognising and learning from their mistakes immediately.

Learning from mistakes is one of the most effective ways for a developing brain to learn (Dante Chialvo & Per Bak (2008). This finding is consistent with that of Lee and Lim (2020:8), who found that most elementary and secondary pre-service teachers achieved higher levels of competence in

their ability to craft feedback comments that supported students' learning and reflective thinking. Cowan (2009) found that formative assessment courses, coupled with classroom practicum placements, supported pre-service teachers' development of formative assessment approaches to assessment. However, she further revealed that at the end of the preservice programme, these teachers primarily implemented straightforward formative assessment practices such as sharing learning intentions and success criteria and using questioning, and rarely implemented more complex formative assessment practices such as self- and peer assessment. The current study made the same findings. Hattie (2012:128) discussed how immediate feedback to teachers and students during formative assessment could yield substantial results. He stated when feedback is regularly a part of the formative process, 'there can be a 70 to 80 per cent increase in the speed of student learning, even when this learning is measured by a standardised test'.

f) Sub-theme 4.6: Research projects

Pre-service teachers revealed that they implemented research projects as a formative assessment strategy as informed by the CAPS assessment policy statement and Annual Teaching Plan (ATP). The pre-service teachers who taught Tourism, Business Studies, Computer Application Technology and Economics revealed that they scaffolded learners' understanding of research projects, since marks for these projects would count towards the summative assessment. They required learners to submit draft projects, giving the teacher the opportunity to give constructive feedback on which the learners could base amendments to their projects. This was useful in projects where learners had a month in which to complete the project, and was a form of continuous feedback for improvement.

The finding is consistent with that of Kanjee (2009), who found that South African teachers implement projects as a form of formative assessment, with 61% of teachers giving projects once a month, 4% giving projects twice a month, 7% giving projects weekly, 2% giving projects daily and 1% giving one project per term. Vygotsky (1978) stresses scaffolding as the method of facilitating learning. In the current study, scaffolding and explicit teaching assisted learners to participate in activities such as research projects, homework, classwork, case studies and data response questions. The learners become less stressed and developed their abilities gradually, thus extending their zone of proximal development to become more independent, critical, higher-order thinkers. This finding concurs with that of Asare (2021), who found that giving students groupwork and projects was a useful part of formative assessment, as it fostered continuous feedback and promoted learning.

5.2.5 Theme 5: Formative assessment strategies

a) Sub-theme 5.1: Homework

Homework is generally defined as schoolwork done outside the school environment (Cooper, 2011a:185). Bang et al. (2009) opined that teachers use homework assignments to collect information about learners' understanding and plan subsequent lessons. The findings reveal that pre-service teachers assigned homework as a form of extended learning opportunity, to be done outside of school without the assistance of the teacher. Pre-service teachers used homework assignments to collect evidence of learning and for planning purposes. The findings are consistent with those of Yan and Pastore (2022), who revealed that Hong Kong teachers used homework to check students' learning progress, and Italian teachers used various assessment activities in the classroom to check students' mastery of content. Black and Wiliam (1998a) suggested that tests given in class and exercises assigned for homework are also a necessary means of promoting feedback. Black and Wiliam (1998b) concluded that the feedback given on tests, set work and homework should give each learner help and an opportunity to work on improvements. In addition, it facilitates interaction between teachers and learners in the classroom. This includes teacher observations and analysis of learners' classwork, homework, tests, essays, reports, practical procedures and classroom discussions (Amua-Skeyi, 2016).

b) Sub-theme 5.2: Questioning

According to Pulajanovna (2022:49), 'Questioning is an integral part of the learning process, and an even more important part is asking the right types of questions. Questions that promote discussion and reflection guide learners in terms of the kinds of thinking that is required. Pulajanovna's (2022) emphasis on the right kinds of questions is in line with comments made by the pre-service teachers in the current study, who noted that learners needed help in responding appropriately to higher-order questions.

Pre-service teachers indicated that during practice teaching, they focused on questioning, interacting, mediating learning through activities, and scaffolding higher-order thinking and comprehension. For this they used questioning throughout their teaching and learning. Questions were often used in a probing way, to elicit deeper and more detailed responses. This finding concurs with the finding of a study conducted by Khizar, Zarmina and Asad (2021), who found that teachers used questioning throughout the lesson, and Jiang (2014) who recommended that questioning be used as a teaching strategy by teachers. Yang (2006) stresses the importance of questioning in the process of classroom discussion, stating that it is a powerful tool for communication in the classroom. The findings of the study reveal that the majority of pre-service teachers used questioning as a teaching strategy through factual, guiding and probing types of questions. Pre-

service teachers revealed that questioning was the most efficient way of eliciting learners' understanding and misconceptions. Pre-service teachers also mentioned that they asked clarity-seeking questions during presentations to assess learners' understanding. This finding is consistent with several research studies that reported the use of these types of questions (Ergene & Bostan, 2022). Interestingly, the finding contradicts the findings of Inoue and Buczynski (2011), who found that even though pre-service teachers tried to ask open-ended questions, they could not benefit from learners' answers since they could not always fully grasp the answers.

Eliciting student thinking is a core teaching practice and essential in teaching. The combination of eliciting and interpreting underpins formative assessment (Shaughnessy & Boerst, 2018:42). Teachers pose questions or tasks that provoke or allow learners to share their thinking about specific academic content and to assess learners' understanding.

c) Sub-theme 5.3: Class tests

The findings reveal that pre-service teachers gave class test at the end of each unit in order to support learning. This was often done on Fridays. Class tests were administered in order to prepare learners for summative assessments at the end of the term or year and were especially important in the schools where these pre-service teachers practised, since they joined their schools in the third term, when learners needed to be prepared for end-of-year exams. They made use of previous trial examinations, as they were told by their mentors to assist their learners specifically with exam preparation. The class test is a form of accountability assessment; it was not for grading purposes, but was meant to help learners become motivated to learn and improve results. These findings are consistent with Zeng and Hueng (2019), who found that teachers used tests to analyse and diagnose learners' misunderstandings.

d) Sub-theme 5.4: Classwork

The findings reveal that pre-service teachers used classwork as a formative assessment strategy and a means to assess whether lesson objectives had been achieved. Classwork was also administered in order to extend learning opportunities, give feedback to learners, and improve learning. Pre-service teachers maintained that classwork allowed them to correct mistakes and misunderstandings. Like class tests, classwork was not for grading purposes; it was meant to improve learning.

In a case study of two teachers by Chen, May, Klenowski and Kettle (2014), it was found that despite a lack of knowledge and training in formative assessment, the teachers were able to implement assessment tasks efficiently. Formative assessments take place whenever teachers

interact with the students during any activity in the classroom; for example, during the process of questioning, while checking homework, or doing exercises at the end of a unit. The findings in this study suggest that pre-service teachers used classwork to elicit evidence of learning. However, some learners did not participate, making it difficult for the teacher to support them if they needed assistance. The theory of social constructivism shows that learners are active participants in their learning (Kalpana, 2014). It is difficult for a teacher to adapt teaching to learners' needs if they do not do their classwork, since non-participation means that they are not engaged in constructing learning.

Any assessment activity can help learning if it provides information that students can use as feedback to assess themselves. However, such assessment only becomes formative when teachers actually use the feedback to adapt their teaching to meet the learning needs of students (Miranda & Hermann, 2015). It appears that feedback is still generally conceptualised as a teacher responsibility, in which the teacher tells students what is right and what is wrong in their academic work, pointing out strengths and weaknesses. Feedback often seems to consist in telling learners what to do rather than allowing learners to play an active role in the feedback process, so that they develop critical thinking and evaluative skills (Covic & Jones, 2008).

Classwork comprises activities given to learners after a period of teaching, with the aim of checking learners' understanding. Preparing and monitoring students' activities is the responsibility of the teacher. However, a review of the literature shows that pre-service teachers often experience difficulties in this regard. Yieldere and Akkoc (2010) found that although preservice teachers' preparations for lessons seemed to be done properly, they did not effectively use assessments during their practice lessons.

e) Sub-theme 5.5: Activities

The study revealed that pre-service teachers employed activities to engage learners in the process of learning, and that activities both support learning and reveal learners who are struggling. Multiple activities were given to learners as a form of formative assessment without grading for reporting purposes. However, the shortage of resources such as textbooks negatively affected some of these activities. This finding about the important role of activities is in line with that of Singh, Mohammed, Mostafa, Yunus, Noordin and Darm (2022), who found that student involvement in activities and tasks provides hints to the teacher about where best to assist. Activities allow the teacher to uncover learners' strengths and weaknesses in learning. This is supported by Mulyadi, Wijayainingsih, Singh and Prastikawati (2021).

Any assessment activity can help learners' learning if it provides information that both teachers and learners can use as feedback in assessing themselves. However, such assessment only becomes formative when teachers actually use the feedback to adapt their teaching in response (Miranda & Hermann, 2015:80). Assessment may be defined as all the activities that teachers and learners undertake to obtain information that may be used to alter teaching and learning. This includes teacher observation and analysis of learners' homework, tests, essays, reports, practical procedures and classroom discussion of issues (Amua-Sekyi, 2016:1). The excerpts from the focus groups showed that learners were indeed given class activities during teaching and learning. According to Ruiz-Primo (2007:59), during formal formative assessment, teachers have the time to step back, analyse and interpret the information collected or gathered. Based on this interpretation, an action can be planned; for example, re-teaching a concept. One of the findings of this study is that learners were supported through clear explanations given by the teacher. This strategy has been referred to as critical scaffolding. 'Explanations are statements about what is being learned that are adjusted to fit the level of the students' understanding. Explanations which better serve scaffolding purposes provide information about why something is important when it is used, and how it is used' (Ruiz-Primo, 2011:20). Teachers who are skilful in implementing formative assessment provide feedback that is more frequent and more appropriate to learners' needs than that provided by less skilful teachers (Ruiz-Primo, 2011:20).

Bordoh, Bass and Eshum (2013) noted that formative assessment helps teachers to establish what students already know and what they need to learn. The findings of the current study indicate that pre-service teachers administered classwork to assist learners with learning and improving; however, the shortage of resources which participant D alluded to hindered teaching and learning. It is not possible for the teacher to support learners if they cannot do classwork as a result of lacking the necessary textbooks. The feedback that follows activities supports learners' learning and engages both learners and teachers in a dialogue on learners' work. (Attwood, 2009). The finding in this study regarding activities is that learners often did not submit work or submitted the work late largely as a result of a shortage of books. Thus, teachers were hindered in implementing formative assessment techniques to their full ability. Formative assessment is intended to benefit and support the provision of feedback, which is a component of formative assessment. Havens, Smith, Dysthe and Ludvigsen (2012:1) note that 'feedback is seen as a primary component in formative assessment and one of the factors that has the strongest influence of learning'. Quen and Khairan (2016) argue that when implementing formative assessment in the classroom, teachers are required to do additional work; for example, eliciting information on learners' learning, comparing learning outcomes, giving feedback, and adjusting instructions in order to satisfy the learning needs of individual students.

f) Sub-theme 5.6: Class activities

Class activities are tasks assigned by the PGCE preservice teachers to learners during teaching and learning in order to demonstrate understanding. The findings revealed that pre-service teachers implement formative assessment activities to assess learners' understanding; these included written responses that learners gave to questions in a handout, which enabled the pre-service teachers to identify gaps and misunderstandings. Primo (2011:15) points out that everyday learning activities provide potential for assessment since they give evidence of learners' abilities through different modes. Evidence may take the form of students' questions, oral responses, written responses in a handout, or student-to-student conversations. The main aim is to promote learning. The pre-service teachers assigned class activities in order to identify gaps and misconceptions and adjust teaching to meet learners' needs. Learners were engaged in tasks with the aim of learning, and to enable the teacher to assess understanding. During activities, learners wrote, discussed with peers, and sought assistance from the teacher and peers. Class activities were not always successful, which suggests that pre-service teachers were still learning how to use assessment formatively; however, their efforts were positive since they were still able to derive some assessment value from class activities.

To what extent do PGCE preservice teachers integrate formative assessment?

5.2.6 Theme 6: The integration of formative assessment into the teaching and learning process

a) Sub-theme 6.1: Questioning to check learners' understanding

Pre-service teachers revealed that they posed questions to check learners' understanding during the teaching and learning process. Popham (2014) explained that formative assessment is a process that begins with checking for student understanding. Formative assessment, whether planned or unplanned, can be used whenever there is a need to check for student understanding. This result is consistent with Kunci's (2021:47) finding that pre-service teachers used questioning to assess learners' understanding, and with findings by Gotwals, Phihower, Cisterna and Bennet (2015) and Lebak (2018).

Questioning is a part of formative assessment which occurs during teaching and learning, whereby teachers interact with learners and ask questions in order to ensure learners' understanding. Several studies have shown that to assess students' levels of understanding, teachers can use questioning (Shepard, 2005; William, 2011). Questioning also informs teachers about learners' insights and misconceptions in terms of understanding of content.

Questioning promotes active learner involvement in the learning process and is one of the many techniques that enhance learning through active engagement. In the study, the pre-service teachers had a strong appreciation for the value of active engagement in class. Active engagement improves understanding; when learners are actively engaged, assessment is more formative and creative, since learners are more likely to give considered answers to open-ended questions. Question and answer sessions can, in fact, develop into classroom discussions when learners are engaged. When teachers ask questions to assess learners' understanding, openended questions are especially useful.

The results of this study provide evidence that teaching and learning is promoted if there is interaction through questioning. The findings are in line with those of Keynon (2019:100), who found that teachers posed formative question to the whole class. They are also in line with Weiland et al. (2013).

b) Sub-theme 6.2: Feedback

Feedback was used by pre-service teachers in this study to integrate formative assessment into everyday teaching and learning. The majority of pre-service teachers revealed that they gave oral feedback, although some crafted written comments that supported student learning. This was particularly the case for projects in Business Studies, Tourism, English, Economics, Social Science and History. These teachers found that if feedback was written, learners would refer back to it. The finding about the value of feedback is in line with the findings of Tolgfos, Quennerstedt, Backman and Nyberg (2021:10), who reported that pre-service teachers gave feedback on specific disciplinary knowledge, which moved learning forward.

c) Sub-theme 6.3: Self-assessment and peer assessment

The findings revealed that the pre-service teachers did not promote self-assessment and peer assessment, other than in one case where a teacher asked learners to swap exercise books so that they marked their peers' work. However, this is not regarded a true peer assessment. The findings revealed that pre-service teachers need to be taught how to implement self-assessment and peer assessment in classes during teaching so that learners may benefit. This finding is consistent with that of Macken, MacPhail and Calderon (2020), and Tolgfors, Backman and Calderon (2021), who found that pre-service teachers rarely implemented self-assessment and peer assessment. Fallows and Chandramonhan (2001), Yan (2001), and Yan and Brown (2021) also found that student-directed formative assessment, self-assessment, and peer assessment were less implemented than teacher-directed formative assessment, in spite of the fact that student-directed formative assessment is recognised as a valuable form of formative assessment in academia (William & Thompson, 2008;

Yan & Brown, 2017; Heritage, 2010). This finding contradicts Zeng and Huang (2021), however, who revealed that teachers implemented peer assessment, giving their learners rating criteria in order to help them do so successfully.

How do PGCE preservice teachers implement different types of formative assessment strategies?

5.2.7 Theme 7: The most beneficial forms of formative assessment

a) Sub-theme 7.1: Questioning and interaction

The pre-service teachers in this study identified questioning and interaction as the most beneficial strategy for closing the gaps in learners' knowledge and correcting misconceptions. The pre-service teachers indicated that they used the questioning strategy primarily during classroom discussions and interacting with learners for verbal feedback. This finding is consistent with the literature, since several research studies have reported the use of different types of questions by pre-service and in-service teachers (Paelotti et al, 2018; Sahin & Kulm, 2008) and Walsh & Sattes, 2011). Pre-service teachers revealed that sometimes they answered their own questions if learners did not respond to them. This finding is consistent with Buczynski's (2011) study in which pre-service teachers answered their own questions when necessary. The findings in this study reveal that pre-service teachers understood questioning as an effective formative assessment strategy to check learners' understanding and close the gap during teaching and learning. The finding is consistent with Ergene and Boston's (2022) study, which found that the total number of questions asked during the teaching was higher than the number of questions the teachers planned to ask, according to their lessons plans. Vygotsky (1978) stressed that social interactions promote the cognitive process in children, with cognition always developed in social interactions with adults or more able peers. Black, Harrison, Lee, Marshall and William (2003) demonstrated how questioning can be used as a strategy in content subjects. They spent much time framing questions during teaching and learning, leading group discussions so as to promote deep thinking, and setting rich follow-up activities to create further learning opportunities. Particularly in relation to teacher feedback, it is believed that questioning can scaffold development and learning in teacher training education. Tan (2007), Cakmak (2009), Sardareh and Saad (2013) confirmed that quality questioning makes both teaching and learning more effective.

b) Sub-theme 7.2: Class tests

Pre-service teachers used class tests as a formative assessment strategy to prepare learners for the summative assessment at the end of the year. Class tests were used mainly for trial examination preparation, as the pre-service teachers started practice teaching during the third term, and were

required by their mentors to use previous examination questions in preparation for the exam. Class tests included data response questions, and various worksheets were used formatively in preparation for the exams in subjects such as Tourism, Geography, History and Economics.

The finding that class tests were used formatively is in line with Kilickaya (2021), who found that frequent testing and the provision of feedback helped students to notice their weaknesses. The finding further show that the pre-service teachers assessed every two weeks to determine problem areas so that they could focus on these during their teaching. The finding is consistent with Kanjee (2009), who found that in South Africa, teachers administer 34% of weekly class test as informal assessments. A combination of formative and summative assessment in the classroom is more effective than the use of formative assessment only (Mahshanian & Bahrami, 2019). The findings are consistent with Zang and Huang (2021:6).

c) Sub-theme 7.3: Feedback without grades

The findings reveal that pre-service teachers preferred to use feedback without grades through various classroom activities. Pre-service teachers revealed that they gave descriptive feedback and verbal feedback instead of marks, although they stated that some students preferred written feedback so that they could understand their mistakes and refer back to the written comments to improve their performance. Through feedback, teachers could give extra attention to the learners who needed it, which encouraged the weaker learners, as was found by Bagheri and Sadighi (2020).

The findings reveal that PSTs who taught Business Studies, Economics and Tourism identified case studies as the most beneficial kind of formative assessment. They stated that Business Studies is a practical subject in which learners are presented with practical business situations. This means that learners had to go through the material before the class and be ready with their insights and analysis for the class discussion. Bayrackta and Yalcin (2019:19) suggest that teachers should pay attention to providing effective feedback to students' responses.

d) Sub-theme 7.4: Classwork

The findings reveal that pre-service teachers used classwork as a form of formative assessment. In many subjects, learners were given worksheets, data response questions and case studies as class activities. The pre-service teachers noted that the learners struggled with data response questions, and had to be assisted. In such cases, they would show how the question was answered on the board, inviting leaners to participate in answering it. This finding concurs with the findings of Dorji (2022:114), who found that teachers entered information about the students' daily activities in their personal files and wrote a summary of students' learning. Furthermore, Dorji (2022) revealed that

teachers in their study implemented formative assessment daily in their classroom settings. This is also consistent with the findings of Joni and Adkins (2018:38), who showed that teachers scored work done in class as the highest in terms of promoting learning.

e) Sub-theme 7.5: Homework

The findings reveal that pre-service teachers gave learners homework, but not all learners did it, especially in Mathematics. Pre-service teachers lamented that learners would often do their homework in the morning before class, often copying from other learners. Those who had done the homework as required participated more in class than those who had not. The effectiveness of homework is attested to by Ilickaya (2021), who revealed that homework gives learners the opportunity to practise working with new concepts. One major finding of Nunez (2022) on homework was that learners whose teachers showed a greater interest in their homework, going through it thoroughly in class the following day, exerted greater homework effort, completed more assignments, and scored higher in Mathematics tests than those whose teachers set the homework but did not use it formatively in class.

f) Sub-theme 7.6: Research-based projects

Research-based learning activities create opportunities for students to work on real-world problems. A teacher mentioned that learners struggled to design a questionnaire, and that the teacher was required to help them with this. Some research projects are curriculum embedded and are meant for formative assessment, to assist learning. The pre-service teachers seemed in agreement that research-based projects are an effective teaching strategy, since they connect class activities with the real world.

The finding is consistent with Kanjee (2009), who found that 61% of South African teachers used research-based projects as a continuous formative assessment strategy. Muhammad (2015) opined that projects can build students' abilities to set personal goals and standards of excellence, and recommended that before students embark on projects, they should be given training in questionnaire designing, sample surveys, data analysis, and report writing.

g) Sub-theme 7.7: Assignments

The findings revealed that pre-service teachers implemented formative assessment through setting assignments for the learners to do. They revealed that assignments as a form of assessment are in line with the subject assessment policy, as informed by the Department of Education programme of assessments. The pre-service teachers frequently had to help the learners with assignments, but the process of checking their drafts and making suggestions for improvements assisted the learners to

develop their thinking and improve the quality of their assignments. Brinke (2016) found that students found clear and timely feedback extremely helpful. Brinke (2016) states that effective feedback informs students about their present achievement in relation to determined criteria and standards.

The findings about the value of assignments is consistent with Kanjee (2009), who found that South African teachers implement formative assessment in the form of assignments; 13% of teachers give assignment once a term, 25% give assignments once a month, 12% give assignments twice a month, 12% give assignment weekly and 6% give assignments daily.

5.2.8 Theme 8: Recommended kinds of formative assessment to support teaching and learning

During discussions, the pre-service teachers made a few useful recommendations for formative assessment in the classroom.

a) Sub-theme 8.1: Research projects

The findings revealed that pre-service teachers recommend research projects as the most valuable form of formative assessment. These are prescribed in the annual teaching plan (ATP) and are therefore curriculum embedded. Projects stimulated learner engagement and enthusiasm, which is a prerequisite for any real learning, as has been established. They particularly enjoyed using their cell phones to Google for information in class. Research projects are a prescribed activity for term three continuous assessment.

The pre-service teachers assisted learners by insisting that they submit drafts of their projects, which gave the learners the opportunity to refine their ideas and improve their presentation. They were then able to continue with their projects in their own time, making use of their cell phones as a learning tool. Pre-service teachers recognised cell phones as a learning tool and promoted learning through Google.

Research projects were popular for several reasons. They made use of tools the learners knew and liked – cell phones – and they involved the learners in independent thinking on a substantial matter which requited some measure of engagement with family members and others. They also gave learners a chance to show their individuality and personal style. Preservice teachers displayed a positive attitude towards cell phones as a teaching and learning tool, and this positive attitude to their cell phones, coming from a teacher, promoted the learners' willingness to cooperate.

Monteiro, Mata and Santos (2021:9) found that teachers used different formative assessment strategies such as individual and groupwork, questioning, observation, evaluation sheets, projects and tests to assess learners. The finding is also in line with that of Guangul et al (2020), who found that the majority of lecturers opted for assignments and project-based assessments, and with Du Plessis (2021), who found that PGCE teachers employed research projects and assignments as useful formative assessment methods in South African schools.

b) Sub-theme 8.2: Group discussions

Group discussions is a strategy for promoting learning through engagement with peers. The pre-service teachers recommended group discussions for formative assessment and a means to involve struggling learners; such learners were able to listen and learn from others, with the teacher guiding learners to move from comprehension and review questions to complex and critical thinking, as noted by Mohammad (2015). The findings are consistent with Monteiro, Mata and Santos (2022), who found that teachers created a supportive environment for learners when they used group discussions in class. The practice aligns with the social constructivist view of learning. The theory posits that learning is collaborative, being based on interaction and discussion. The pre-service teachers recommended that discussions be used in a variety of ways: class discussions, small group discussions or having students work in pairs on a given project or assignment. This is in line with the recommendations of Akpan, Igwe, Blessing, Mpamah and Okoro (2020:51). Discussion is a type of formative assessment which facilitates learning because learners learn from each other's responses during this time. In their study, Almossa and Alzahrani (2022) found that discussion was the most frequently used type of formative assessment.

c) Sub-theme 8.3: Classwork and feedback

The study reveals that pre-service teachers used and recommended frequent feedback to help learners improve their performance after the completion of classwork. They gave classwork at the end of the lesson, with learners completing the classwork while the pre-service teachers observed and offered guidance. The pre-service teachers would then mark the classwork with the learners, asking them for their answers and providing the correct answers, so that they could mark their own or one another’s work. This gave the pre-service teachers the chance to give feedback on why an answer was incorrect.

This finding is consistent with Khizar, Daud and Asad (2021:714), who found that teachers observed learners doing class activities and gave feedback on their progress. The finding also echoes Atjonen (2022), who found that learners participated in class activities such as filling in worksheets where they had to calculate rands from a dollar amount given. Lee and Lim (2020) revealed that 58% of

the elementary pre-service teachers and 59% of the secondary pre-service teachers they surveyed showed improvements in providing feedback after completing a module, while 40% of pre-service teachers remained at their pre-module level. Thus, their findings showed that the majority of both elementary and secondary pre-service teachers achieved higher levels of competence in their ability to craft feedback comments after they had been trained to do so. It is important that feedback be given in ways that support learners' learning and reflective thinking. This finding also supports research that shows that the 'feedforward' phase is the most potent stage of the formative assessment process, because that is when students are empowered to apply knowledge and skills that extend their learning and give them opportunities to create their own learning (Karlssom, 2019).

Formative assessment informs both the teacher and learners on the degree to which learners have mastered the material. Feedback to learners serves several functions: it reveals problem areas, gives reinforcement of successful learning and achievement, and enables the teacher to reflect on his or her own level of success in explaining a task. It can be used to distinguish between individual and group problems that can then be used to suggest solutions, revise teaching, set groupwork or guide learners on corrections they need to make (Stull, 2011).

d) Sub-theme 8.4: Homework

The findings revealed that pre-service teachers were in favour of setting homework as a formative assessment strategy in order to promote learning. The pre-service teachers gave homework as an opportunity to extend learners' learning and reinforce ideas they had been exposed to in class. Pre-service teachers revealed that homework provided an opportunity for learners to engage with the learning material, leading to successful learning through repeated exposure. This finding is in line with Fernandez-Alonso, Diaz, Alvarez and Muniz (2017), who found that 90% of the students in their study felt engaged in their learning during each phase of the homework process.

e) Sub-theme 8.5: Assignments

The pre-service teachers recommended assignments as a formative assessment strategy. Assignments are, in any case, stipulated in CAPS as a form of continuous assessment, with the assignment mark counting for the final assessment mark. This finding is consistent with Ugodulwana, Oligia and Ntasiobi (2022), who stated, 'The dominant formative assessment strategies used by teachers are take-home written assignments and oral questioning to support learning.' The finding is also in line Guangul et al. (2020), who found that the majority of teachers opted for assignments and project-based assessments. Khalit and Khidhir (2020) found that the 215 teachers in their study made great use of assignments during the Covid-19 pandemic.

f) Sub-theme 8.6: Questioning to elicits learners' understanding

The pre-service teachers viewed questioning as an essential teaching strategy for checking learners' understanding. They revealed that they used questioning frequently during teaching and learning and sometimes probed learners for deeper or better responses. The questioning strategy is one of the most common teaching strategies used by educators (Bayraktar & Yalcin, 2019:19); Heritage & Heritage, 2013; Fisher & Frey, 2014a; Gotwals, Philower, Cisterna & Benne, 2015; Lebak, 2018). Kunci (2022:46) found that 71% of pre-service teachers used questioning as a formative assessment strategy, and paid attention to the quality of their questions and of students' responses to questions. As in this study, they used questions to check learners' understanding.

5.2.9 Theme 9: The use of formative assessment as part of lesson planning

This theme was informed by the question: To what extent do you plan a lesson with formative assessment activities? The following sub-themes emerged.

a) Sub-theme 9.1: To establish lesson objectives

The analysis of pre-service teachers' documents revealed that the setting of lesson objectives or learning intentions was part of their lesson planning and demonstrated understanding and proficiency in designing lessons. However, the findings revealed that pre-service teachers did not display the assessment criteria in their lesson planning, a weakness in all 12 lesson plans examined; no assessment criteria were evident in any of them. The finding that teachers set objectives and shared these with the learners is in line with Macken et al. (2020:549), who found that informing learners of objectives helped to focus the lesson and promote learning. However, it was found through discussion in the current study that the way the pre-service teachers shared learning objectives may have lacked clarity.

The pre-service teachers revealed that during lesson planning, they decided which part of the lesson objectives they wanted to achieve and which activities would promote the attainment of those objectives. They had been taught how to write a lesson plan in their methods module. The pre-service teachers were aware that the teacher must unpack lesson objectives and align each objective with activities and assessments during teaching. The findings contrast with those of Kunci (2022:46), who found that only 44.9% of pre-service teachers stated their intention during teaching and learning. The findings are consistent with Rodgers, Reagan and Ward (2022), who found that pre-service teachers articulated clear and achievable learning objectives for each lesson, and showed evidence of planning to guide students toward asking increasingly complex questions of the text. The findings are furthermore consistent with those of Tolgfors, Quennerstedt, Backman and Nyberg

(2021), who revealed that pre-service physical education teachers sharing their lesson objectives with students in order to promote learning. Sural (2019), too, found that senior pre-service teachers in their fourth year of study had higher levels of competency in planning lessons that third-year pre-service teachers. Teachers who assist their students to develop learning goals and who give feedback in a format and manner that leads to academic improvement are setting their students on the path to success, according to Konopasek, Notcini and Krupat (2016).

b) Sub-theme 9.2: Homework

The pre-service teachers included homework as part of their lesson planning. They said that they checked whether learners did their homework and whether they made corrections as required. The finding that teachers include homework as part of their teaching plan is in line with Fernandez-Alonso, Diaz, Alvarez and Muniz (2017), who found that 90% of the students in their study felt engaged in their learning during each phase of the homework process because the teachers kept them engaged. Kanjee (2009) found that 50% of South African teachers in schools give homework to learners weekly, and 26% give it daily. The finding is also consistent with previous research showing that specific task-related feedback on homework increases students' interest, since it enhances students' competence more than simply giving numeric grades or no feedback (Buder & Nisan, 1986; Lipnevich & Smith, 2008). Educators use formative assessment tasks such as homework to identify where students are struggling in order to address their problems (Veerasamy et al, 2016). According to Fernandez-Alonso et al (2017), homework provides the opportunity for conceptual and procedural practice and should be accompanied by feedback and corrections. Homework provides learners with the opportunity to engage in the learning activities, leading to successful learning through repeated exposure (Fernandez-Alonso, et al, 2017).

c) Sub-theme 9.3: Questioning

Questioning is a fundamental practice in the teaching process (Moyer & Milner, 2022). Preservice teachers revealed that they planned to use questioning as a formative assessment strategy in order to check learners' understanding during the teaching and learning process. They used questioning to probe for understanding. This finding is in line with Macken et al. (2020) who stated that pre-service teachers used questioning to evoke responses from students during the teaching and learning process. Pre-service teachers also used follow-up questions to elicit evidence of understanding. Zeng and Huang (2021) also revealed that teachers implemented questioning as a teaching strategy to assess learners' comprehension of the learning materials.

d) Sub-theme 9.3: Classwork

The findings revealed that pre-service teachers planned their classwork as they saw the value of engaging learners in the teaching and learning process, and classwork was a means to get them actively engaged. In addition, classwork gave them the opportunity to correct errors in understanding as they observed them happening. They gave worksheets, case studies and data response questions as formative strategies in order to facilitate learning. This form of formative assessment is informed by the South African Basic Education Assessment Guidelines Policy (2011), and is in line with Kanjee's (2009) results, which showed that 72% of South African teachers in their study gave classwork to learners daily. The pre-service teachers' use of classwork to correct errors in understanding as they occurred is in line with Vygotsky (1978) who stresses that scaffolding assists learners to correct their own mistakes.

e) Sub-theme 9.4: Groupwork

The findings revealed that pre-service planned the use of groupwork as a formative assessment strategy during teaching practice. Groupwork was used in various form, including paired work, to encourage collaborative learning, in line with Vygotsky's (1978) theory of social constructivism. Document analysis in this study showed that groupwork was frequently referred to, particularly in Economics, English, Tourism, History, Business Studies and Social Sciences. The findings are consistent with Du Plessis (2021), who found that PGCE teachers used groups of four to discuss various topics, with each group having an opportunity to present their findings to the rest of the class. The findings are consistent with those of Khizar, Daud and Asad (2021), who found that teachers implemented group discussions as a teaching strategy, and Monteiro, Mata and Santos (2021:9), who found that teachers used individual and groupwork to collect information on learners' progress. Katherine and Kalina (2010) stated that groupwork got learners learning interactively, which improved understanding of topics, in keeping with Vygotsky's (1978) theory of social constructivism. These authors state that groupwork helps to extend the zone of proximal development (ZPD), in that learners' support and challenge each other when they discuss ideas. They are forced to reflect and defend their opinions and judge what is good for the group.

5.2.10 Theme 10: Skills that learners need to develop through formative assessment

This theme was informed by the question: What kind of skills do you believe learners need in order to improve learning when you are implementing formative assessment?

a) Sub-theme 10.1: Reading, writing and speaking

The findings reveal that pre-service teachers were critical of many learners' ability to read with comprehension, write correctly and express themselves articulately. For them, formative assessment

is implemented successfully if learners improve their skills of reading, writing and speaking. Mercer, Mercer and Pullen (2011:263) stated that 'reading skill is the most important pointer to achievement in life and in school. In school, learners need to read more independently and comprehend the printed material when given tasks in the various subjects that they have to learn'. This is in line with Nkonde et al. (2018), who are concerned that early transition from the mother tongue to English as the language of teaching and learning could have long-lasting negative effects on learners, as it takes time for learners to acquire and develop fluency in a second language. The finding is in line with Furtak and Ruiz-Primo (2008), who found that formative assessment could be effectively used to improve students' writing and discussion skills. South Africa has a literacy challenge. Howie et al (2017:2) revealed that in 2016 in South Africa, 61% of learners could not read or write at the appropriate age levels and 78% of Grade 4 learners were unable to read for meaning in any language, including their home language. Sigonyela (2020) also found that many learners do not acquire sufficient vocabulary and reading and writing proficiency to cope with the language demands of English medium teaching in Grade 4. Diana (2019) claims that when used effectively, formative assessment can provide information to learners on what they need to do to improve their understanding and learning skills. Pretorious et al. (2016) found that failure to read fluently and with comprehension results in high numbers of learners dropping out of school. This naturally has an effect on the social and economic fabric of the country as a whole.

The findings of the study reveal that PGCE pre-service teachers have some understanding of the components of formative assessment, such as identifying learning goals, questioning, engaging learners in discussions, and giving feedback. Most PSTs gave learners activities, homework, questioning, feedback, assignments, case studies, data response questions and research projects to encourage learner participation. They understood that active learner engagement was an essential foundation of learning.

It is clear that placement in schools gives pre-service teachers invaluable experience with classroom practices that they will rely on once they begin their careers. This finding is in line with Breverick et al (2017), who states that formal school placement experiences gives context to pre-service teachers' theories and helps them develop the skills they need for teaching and assessing. Macken et al (2020) found that with the appropriate support, PSTs can gain a great deal from the school placement, developing their knowledge of assessment and, in turn, becoming assessment-literate teachers. Based on the experiences narrated by the pre-service teachers, it is clear that they put formative assessment into practice in their practice teaching. In New Zealand, Smith, Hill Cowie and Gilmore (2014) found that as pre-service teachers' knowledge of assessment grew throughout a

teacher education programme, their ideas shifted from the view that assessment is primarily summative to the view that assessment supports student learning and informs teaching**.**

The findings of this study suggest that PSTs understand the importance of formative assessment, and that they employ a number of formative assessment strategies to facilitate learning. They displayed an understanding that learning has to be learner centred to be effective and that frequent interaction between the teacher and the learners, and between learners and learners, is an essential component of the learner-centred classroom.

5.3 Chapter Summary

This chapter highlighted the PGCE preservice teachers experiences of formative assessment implementation during practice teaching. The study analysed the experiences and determined how to prepare PGCE preservice teachers to be proficient in implementing formative assessment as it is a critical teaching strategy in schools. The findings revealed that they implemented different strategies like lesson objective, questioning and giving feedback. There was no evidence of self-assessment and peer-assessment. The next chapter discussed the model of PGCE preservice teacher knowledge, outlines the limitations, recommendations, implications of the study findings and outline's areas for further research.

CHAPTER 6 CONCLUSIONS, RECOMMENDATIONS AND FURTHER RESEARCH

6.1 Introduction

This chapter summarizes and concludes the study, outlines the recommendations limitations of the study, raises implications of the study findings and outlines further research and model of teacher knowledge. Formative assessment has been recognised as one of the most effective strategies for improving teaching and learning in secondary education, and many scientists and teachers' educators argue that it should be the core of teaching and learning (Black & Wiliam, 2018). Teacher education programmes have started to prepare teacher candidates to use assessment for multiple purposes. Today's pre-service teachers have been trained to engage with the complex nature of classroom assessment and to be capable of analysing practices regarding assessment principles, purposes and philosophies (Eyer, 2014).

6.2 Recommendations

The findings have implications for teacher educators, pre-service teachers, curriculum developers and subject mentors. Pre-service teachers' experiences with the implementation of formative assessment were the focus of this research, which aimed to shed light on the significant role of pre-service teachers' experiences and understanding of formative assessment during practice teaching.

6.2.1 Recommendations for teacher educators

Teacher educators are expected to teach and model formative assessment strategies to PGCE preservice teachers, showing how to use peer and self-assessment, effective questioning, assignments, homework, research projects, etc. to boost learner understanding and not just to assess their abilities. It is recommended that there should be an increase in the duration of practical learning for PGCE preservice teachers. Professional development must be encouraged over time for PGCE graduates to equip them with more formative assessment strategies activities during practice teaching. The findings revealed that pre-service teachers are aware of and implement the baseline elements of formative assessment; they establish and state their lesson objectives, they strive to promote active engagement through homework, classwork and feedback, and they make frequent use of questioning to stimulate prior learning and prompt thinking about topics. Teacher educators could use videos to show how peer and self-assessment is done, and could also get pre-service teachers to record their lessons and reflect on their practices with the assistance of teacher educators and their peers. Dann and O'Neill (2018:25) suggested that classroom observation has always been a part of pre-service teacher education, whether the pre-service teachers observe to learn from their supervising teachers' pedagogical modelling, or the supervising teachers observe and give feedback on the preservice teachers' classroom practices.

6.2.2 Recommendations for pre-service teachers

- Formative assessment is curriculum embedded and is part of the assessment policy in South Africa. Pre-service teachers are therefore expected to implement the policy; however, since they are novice teachers, they need practice in implementing both the fundamentals of formative assessment and the finer skills needed to enhance it. There is a need to introduce a model that explains formative assessment strategies for preservice teachers and to increase the time spent in developing formative assessment skills among pre-service teachers.
- The pre-service teachers need practical professional development on formative assessment strategies as part of their ongoing professional development. A programme on formative assessment strategies should pay particular attention to peer and self-assessment, since this area was identified as little used or understood by the pre-service teachers during teaching practice. Formative assessment is one of the top priorities in the South African education system, particularly in the wake of Covid-19, which has ushered in widespread changes in the way teaching and assessment are conducted.
- The pre-service teachers could learn from one another through the sharing of experiences. During practice teaching and observation, a need emerged for a rubric which would define formative assessment practices so that the teachers may assess their own practices through reflection, observing their mentors and themselves in light of what the policy prescribes. The Minimum Requirements for Teacher Education Qualifications Policy (2015) states that pre-service teachers must be competent in assessing learners, which is a core function of teaching. Pre-service teachers should share their experiences in order to collaborate and learn from one another, and thus benefit from peer-to-peer interactions in the same way that their learners do. They should also learn from mentor feedback, with mentors observing their lessons to assess and give feedback on their formative assessment strategies.

6.2.3 Recommendations for teacher mentors

- It is recommended that in-service teachers reinforce the implementation of formative assessment as a key teaching strategy, since it is included in government policy documents. Pre-service teachers observe what in-service teachers are practising and learn from them. The findings suggest that the strategy they observed most was questioning, which they then used. In-service teachers' ongoing professional learning should involve participation in continuous teacher development, and regular reflection and discussion of key formative assessment strategies. Through collaboration with preservice teachers, in-service teachers can create learning communities for enhancing school-wide formative assessment practices. The findings by Kuze and Shamba (2011:146) suggest that 'only two teachers could actually present in a lesson what formative assessment entails in reality'. Govender (2019:11) found

that in practice, the term 'formative assessment' emphasises the notion of assessment more than the intended forming of a pedagogy, in which learning is the key focus. Establishing learning communities in schools where experienced teachers and novice teachers together develop their formative assessment strategies could help to overcome this tendency.

- Mentors should reinforce formative assessment activities as they are part of policy and continuous assessment in basic education, and a growing component of education globally as the world moves to more online, collaborative, and independent learning.

6.3 Limitations and further research

Despite its strengths and important findings, this study had certain limitations which could be addressed in future research.

6.3.1 Limitations of the study

First, the study did not make use of a pilot study to test the validity of the instrument.

A pilot study may have revealed the need for some changes in the instrument. Second, this is a case study of pre-service teachers in one South African university which is not a representation of all South African universities. To provide a basis for more generalisable results for pre-service teachers in South Africa, a larger sample is needed. It is worth noting that the current study did not observe pre-service teachers' implementation of formative assessment. Thus, it relied on the pre-service teachers' own reporting of their formative assessment practices. Observations of their lessons may have revealed further useful data.

6.4 A proposed model for improving pre-service teachers' formative assessment practices during practice teaching

A model specifies or describes a procedure to be used based on theory or philosophical orientation. A model proposes a solution to a problem Zama and Endley (2021). The model is drawn from the findings of the study and proposed so that PGCE preservice teacher educators may employ it to introduce preservice teachers in terms of how to be integrate formative assessment during practice teaching. It is not a yardstick for all preservice teachers but is can be used to assist beginners in teaching. Globally, formative assessment has become an essential component of classroom teaching (Alsubaiai, 2021:107), but many pre-service teachers struggle to implement formative assessment practices in a coherent manner (Ateh, 2015). Researchers define formative assessment in different ways, and these various definitions may not represent a coherent set of practices (Bennet, 2011). Bennet (2011) argued that formative assessment needs to be made part of a coherent educational system for more effective teaching and learning. The effective use of the formative assessment process requires students and teachers to integrate and embed certain basic practices in the classroom.

These are: clarifying learning goals and success criteria; questioning and discussing; giving feedback; and engaging in self and peer assessment (William & Thompson, 2007). The researcher proposes a model that embodies the above five key formative assessment strategies according to William and Thompson (2007). These authors note that the use of formative assessment is based on answering three key questions: Where are learners in their learning? Where are learners going? What should be done to get learners there? Research on assessment for learning clearly shows that teachers who effectively use formative assessment see considerable learning gains among all learners, irrespective of their socio-economic backgrounds (Kalinec-Craig, 2017). The proposed model relates to William and Thompson's (2007) five key strategies of formative assessment to specific activities: class activities, homework, questioning and discussion, feedback, observation, assignments, research projects (ie problem-based learning) and class tests. The correct and regular implementation of these activities would result in greater learner achievement. In South Africa, government educational policies influence teachers' intentions to implement formative assessment. Policy level initiatives such as curriculum and assessment reforms promoted by government in 2020 and 2021 are explained in Circular 1 of 2020 and 2021. The circular outlined how learners should be assessed during the Covid-19 era (Republic of South Africa, DBE: 2020, 2021).

The proposed model shown in Figure 6.1 below gives guidance on the implementation of formative assessment and may be used by PGCE pre-service teacher's during the teacher training programme.

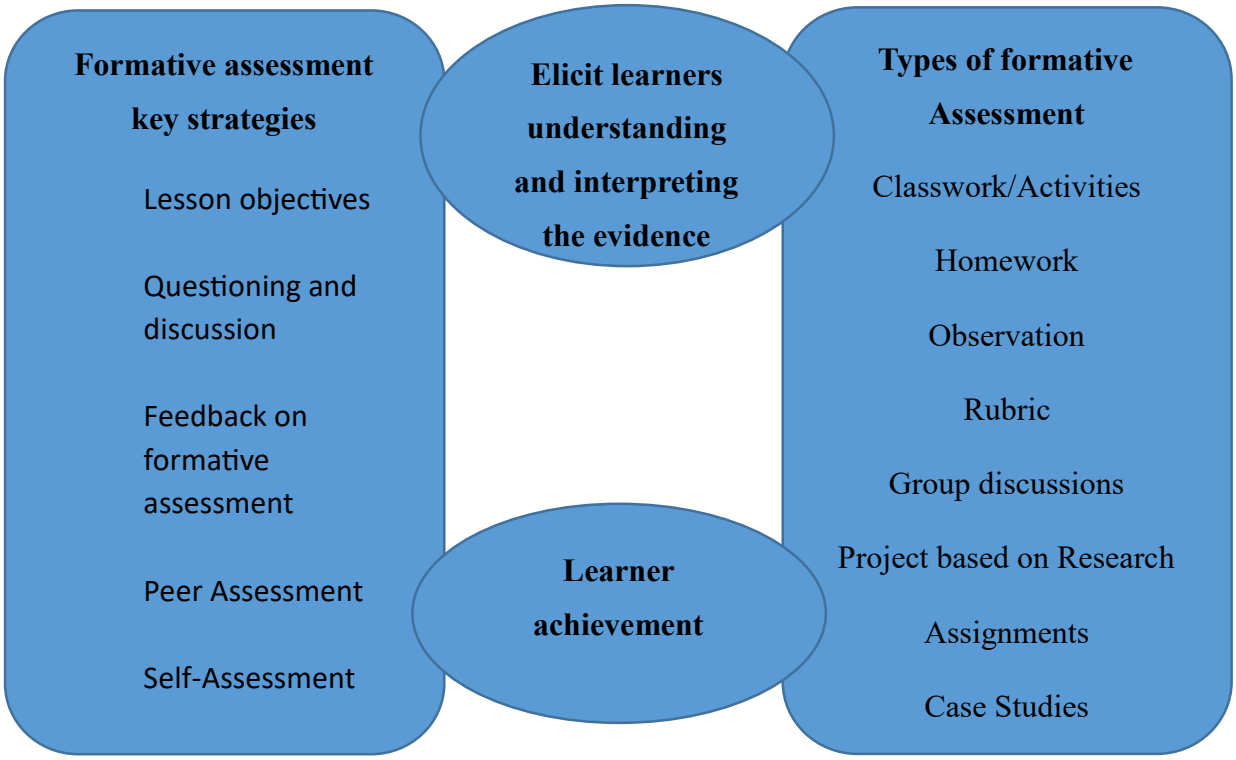

Figure 6. 1 Proposed formative assessment model for pre-service teachers

6.4.1 Overview of the model

The model uses William and Thompson's (2008) five key pillars of formative assessment which are known to elicit learners' understanding and interpreting during teaching and learning. Understanding and interpreting is shown as a bridge in the model, linking the five strategies to the activities, which appear on the right of the model. Learner achievement, shown at the base of the model, is the result of the implementation of these strategies and activities. When learners are able to demonstrate knowledge, skills and values in keeping with the objectives, they will have achieved to the desired level. This can only be achieving when the five strategies and their associated activities are implemented correctly and regularly. The success of formative assessment depends on how PGCE preservice teachers perceive and implement formative assessment activities in the classroom. The five key strategies of the model are discussed below.

6.4.1.1 Lesson objectives

Establishing learning objectives is the foundation of effective formative assessment. Lesson objectives should be developed and shared with the learners at the outset of each lesson. Objectives indicate what the teacher intends learners to learn during the lesson. It is possible that only some objectives may be met by the end of the lesson, in which case, the teacher would need to acknowledge this and continue to fulfil the unmet objectives in the following lesson. Every class needs to be objective oriented. To establish objectives, teachers should work from the syllabus, which informs the content to be taught in every grade. All lesson planning should be informed by the objectives or outcomes the teacher wants to achieve, and learners should be made aware of the objectives so that they have a sense of the direction of the lesson and what is expected of them.

The annual teaching plan informs the teacher which activities can be given to learners to meet learning outcomes. Objectives should align with the assessment activities that are prescribed as part of the curriculum. Clearly stated objectives support learners by making them aware of what is expected of them in a particular time, so that they become active participants, shaping the direction of their own learning. Sharing learning objectives with learners also guides them in terms of level of performance expected. When learners understand learning objectives, they can reflect on their current understanding in relation to the learning objectives.

6.4.1.2 Questioning and discussion

The active engagement of learners is a prerequisite to learning. Pre-service teachers should engage in dialogue and discussion with learners through social interaction since learning is a social activity. Asking questions, either orally or in writing, is crucial to the process of eliciting information about the learners' current state of understanding (James, 2017). When the teacher wants to elicit evidence

of learning from learners during teaching, he or she should use questioning as a teaching strategy. In this way, learners enter into dialogue with the teacher, who elicits understanding, giving learners the opportunity to think and respond to questions. The teacher can observe learners who seems to have misconceptions on the topic and correct these. Questioning should be informed by the intended lesson outcomes.

6.4.1.3 Feedback

Pre-service teachers should provide feedback that allows students to become aware of their own level of understanding and guides them in terms of needed next steps in the learning process. Feedback is always important and is the most powerful aspect of formative assessment (James, 2017). Feedback given as part of formative assessment helps learners become aware of any gaps that exist between their desired goal and their current knowledge, understanding or skill, and this guides them through the actions necessary to obtain their goals (Liu, 2015). Effective feedback should be clear, descriptive and related to learning objectives, and can come from the teacher or from peers (Hattie & Timperly, 2007). Good feedback is not just evaluative and does more than provide students with the right response; it should be descriptive in nature and really assist learners to see where the gaps are in their current understanding. In this way, feedback becomes a tool for learning.

6.4.1.4 Peer assessment

Ibarma, Rodgriguez and Gomez (2012:219) consider peer assessment the most important form of formative assessment. Pre-service teachers should employ this strategy while they are teaching but will need to educate learners on how to do so constructively and fairly. By experiencing peer assessment, learners may come to fully understand the teachers' requirements, which will guide their learning effort. Dividing students into several small groups will help during this process. Each member of the group should be assigned a role; for instance, the assessor can be asked to write comments on a peer's learning outcome, give descriptive feedback and offer advice for improvement. The assessed learner should reflect on the assessor's comments and work out a plan on his or her own to improve. Ibarma, Rodgriguez and Gomez (2012:219) claim that when students assess their peers, they feel more involved in the process and consider it sufficiently fair and accurate.

6.4.1.5 Self-assessment

Pre-service teachers should assist learners to assess their own performance in the process of learning, encouraging them to be active and to assess the quality of their own work in light of what is expected. Self-assessment has a positive effect on intrinsic motivation and on the development

of metacognitive skills and educates learners on the use of evaluation criteria. In this way, they develop the tools for reflection to guide their own learning path and personal growth. Pre-service teachers need to use a rubric in assessing learners and discuss the rubric with them, so that they are aware of the criteria against which their projects and assignments will be measured.

6.4.2 Formative assessment activities

The success of formative assessment implementation depends on how teachers perceive and implement formative assessment activities in classrooms (Yan, Panadero, Yang & Lao, 2021). Formative assessment is defined as a set of classroom procedures in which evidence about student learning outcomes is elicited, interpreted, and used by teachers, students, or their peers to make decision about the next steps in learning (Black & Wiliam, 2009).

6.4.2.1 Classwork/activities

Classwork and activities comprise various activities which are given to learners in class, and which may be extended after class in order to enhance learning. The aim should always be to use these to check learners' understanding and further develop their understanding. Class activities help teachers to assess whether learning objectives have been achieved. When learners are given class activities, they become engaged in learning. Teachers should observe, facilitate and assist learners who seem to be confused, struggling and non-participative. Miranda and Herman (2015) stated that any assessment activity can help student learning if it provides information that both teachers and students can use as feedback.

6.4.2.2 Homework

Homework refers to schoolwork that a student does outside of the classroom, to further their learning. Homework should be given to learners regularly as it builds a bridge from school to home and expands opportunities to grasp content. Homework provides a variety of opportunities for parents and siblings to get engaged in fostering learning in the home context. Haq, Shakil and Din (2020) are of the view that the learning of students increases when homework serves a specific goal and combines the skills of each student with the content of current subjects. They state that homework can enhance learning among students but must be tailored to the developmental stage of the child.

6.4.2.3 Observation

Observation is an informal assessment technique in which the teacher watches students to identify strengths and weaknesses, patterns of behaviour, and cognitive strategies. The teacher needs to act

as a guide and observe all students' involvement in problem solving. When the teacher observes learners engaged in work, there are opportunities to correct them before errors become entrenched.

6.4.2.4 Rubrics

Rubrics are useful for establishing standards for tasks and for measuring learners' work. Rubrics may be used by pre-service teachers and shared with learners to show them the criteria for various levels of attainment. They are useful for assessing a performance, product, portfolio, presentation, essay question or any student work that needs to be evaluated.

6.4.2.5 Group discussions

Pre-service teachers should assign students to work in heterogeneous groups so that they benefit from each other' strengths. In group discussions, ideas are shared and feedback on ideas is given, both by learners and by the teacher. This activity promotes social learning, in which 'more knowledgeable others' assist those who seem to be struggling. In addition, research has shown that working with peers in the classroom is an important means of promoting learning (Liu, 2015). Learners learn from each other and construct knowledge through social interaction, as Vygotsky (1978) showed in the theory of social constructivism. Through collaborative effort, learners can co-construct knowledge and acquire a deeper understanding of concepts.

6.4.2.6 Research-based projects

Project-based learning activities create opportunities for students to work on problems in the real world, in alignment with the curriculum and stated objectives. PGCE Pre-service teachers should give research projects relevant to the world outside the classroom and help learners to see and understand the connections between classroom activities and the world of work. Project can be individual, or group based. Learners must be given the assessment criteria and the rubric which informs the way they will be assessed. Research projects should form part of assessments. Research projects can get learners involved in their community, especially when the project involves questioning older people about historical events, or about business practices, or any other topic that community members may have knowledge of, and which align with the use of cellular phones.

This type of activity imparts skills such as research, writing and synthesising. Projects should assess different skills and the rubric should also be explicit so that learners can assess their project before it is submitted. This finding is in line with the findings of the study by Duplessis (2021) who found that formative assessment based on assignment and projects were administered by PGCE teachers at the end of the semester.

6.4.2.7 Assignments

Assignments comprise any work given to learners by the teacher to improve and extend learning, as informed by the objectives of the learning unit and the curriculum and assessment activities of the subject. Assignments should be guided by assessment criteria and a rubric.

Assignments support learning if they are well designed and explicit in terms of instructions.

6.4.2.8 Class tests

Class tests are given to learners at the end of the unit or chapter. The class test informs the teacher about the strengths and weaknesses of learners so that he or she may modify teaching to meet learners' needs. The purpose of the class test is to use the results formatively in order to prepare learners for the summative examination. Class tests should not be for grading purposes, but for formative purposes, in that they reveal what needs to be taught again or taught differently.

6.4.3 Learners' achievements

Scholars agree that formative assessment plays a critical role in influencing student outcomes at different levels of education (Alusabaiai, 2021). Pre-service teachers should make use of a variety of formative assessment activities, as discussed above, and use them to help learners correct their work. The whole thrust of formative assessment is to assist learners to understand their work better. Wherever possible, feedback should be given soon after the execution of the task. Asghar (2013) points out that many aspects determine whether or not formative assessment serves as a useful tool for modifying pedagogical practices. The teacher's ability in giving correct feedback is one of them. Specific, constructive feedback will show the learners how and why a particular answer, performance, project or assignment has or has not met the expected standard. McManus (2008:3) states that formative assessment is a process carried out to assist the learners' learning process, improve their understanding and help them achieve the instructional objectives.

6.5 Implications of the study

The findings of this study have implications for educational practices and teacher training, shedding light on the importance of correct formative assessment practices among pre-service teachers. PGCE preservice teachers highlighted that there was no evidence of self-assessment and peer-assessment strategies which they implement during practice teaching drawing form the theory of Social constructivism as a powerful strategy for teaching and learning which promotes cooperative learning amongst learners where they can learn from one another. The findings of the study informed the design of a model (see Figure 6.1) that shows the essential strategies of formative assessment, the activities through which these strategies can be implemented, and the bridge that link the two, which is learner understanding and interpretation. The model and its explanation have

shown that when these strategies are implemented through the recommended activities, learner achievement is the result. Hamodi,

Lopez-Pastor and Lopez Pastor (2017) argued that pre-service teachers' early experiences with formative assessment could result in actual implementation in their future career. Numerous studies have found that both theoretical and practical training in formative assessment results in increasing the frequency of formative assessment practices, by improving teachers' knowledge and understanding of it (Crichton & McDaid, 2016; Koloi-Keaikitse, 2016).

The findings reveal that PGCE pre-service teachers are not well acquainted with self-assessment and peer assessment as formative assessment strategies. Deliberate efforts will need to be exerted to teach pre-service teachers how to implement these more challenging aspects of formative assessment. Furthermore, deliberate practice can develop a mindset of continuous growth, a necessary outlook for pre-service teachers to carry with them into the profession to advance their knowledge and skills (Heritage & Wylie, 2019).

It is possible that pre-service teachers fail to make use of self-assessment and peer assessment because, in their view, learners are incapable of assessing their peers and their own performances objectively (William, 2007). Another reason may be that the pre-service teachers may perceive assessment as their responsibility only, since it is highly likely that this was what was modelled for them while they were at school.

The findings of this study imply that practice-embedded courses may be able to support PGCE preservice teachers in the implementation of formative assessment, but there is a need for ongoing professional support in the full use of formative assessment to enhance learning. The limitations that the pre-service teachers showed in their period of pre-service practice suggest that teacher preparation programmes may not be sufficiently developing their knowledge and practice of formative assessment. For the pre-service teachers in this study, school-based supports were important to their success in applying what was learned in the course. DeLuca, Chapman-Chin and Klinger (2019) state that purposeful training needs to be conducted until teachers are comfortable with implementing formative assessment in classrooms. When teachers have had sufficient training and sufficient support in practice, they develop the confidence to expand their practice of formative assessment.

This finding echoes the call to integrate formative assessment into the curriculum of pre-service teacher education and in-service professional development programmes (Anderson & Palm, 2017).

Dixon and Haigh (2009) found that professional development programmes improved teachers' knowledge about formative assessment and influenced their perceptions regarding the difficulty and effectiveness of formative assessment.

A further implication of this study is that teachers need to be cognisant of the many ways in which formative assessment may be conducted, and not adhere only to the tried and tested method of questioning and giving feedback after tests. Many activities may be used for formative assessment: questioning, homework, classwork, groupwork, research projects, assignments, class tests and orals, as outlined in the assessment policy document of the Department of Basic Education (2011. This finding echoes Kanjee (2009), who found that in South Africa, teachers used formative assessment strategies such as classwork, homework, orals and projects. However, pre-service teachers need further professional development on formative assessment implementation in terms of noticing gaps and adjusting teaching methods in order to meet learners' needs. They also need to develop greater use of problem-based learning and the use of case studies to bring out a variety of learnings. PGCE Pre-service programmes should foster habits of practice that will equip pre-service teachers to become reflective practitioners who subscribe to continual professional learning. Education and training can improve teachers' skills and abilities in implementing formative assessment by providing step-by-step guidance and practical tutorials (Grob, Holmeier & Labudde, 2017).

It is worth noting that practical constraints may largely hinder teachers' implementation of formative assessment even when they have knowledge and positive conceptions of it. The dearth of resources has been noted in this study. It is clear that a shortage of textbooks and other essentials is hindering the implementation of formative assessment. Hence, an encouraging school environment, supportive school-based policies and sufficient school support measures are necessary for pre-service teachers to be able to conduct formative assessment. A new study could be conducted to expand the field beyond PGCE teachers to include all pre-service teachers, including those in Early Childhood, Intermediate and Senior and Further Education programmes.

6.6 Implication of the study regarding Technology

PGCE preservice teachers revealed that learners enjoyed doing research project with cell phones. The schools do not allow learners to bring cell phone to schools. Technology should be incorporated in assessment practices to enhance learning.

6.7 Recommendations for future research

Formative assessment has been accepted as a powerful way of enhancing learning through various assessment activities (Black & Wiliam, 1998). The recommendations for future research are grounded in the strengths, limitations, findings, and literature reviewed as part of this study. Further research could be done by teacher educators, policymakers and researchers on why pre-service teachers seems to struggle to implement self-assessment and peer- assessment.

Teacher training programmes should consider focusing more on the knowledge and skills needed for teachers to implement formative assessment effectively in classrooms. The training can be done through ongoing professional development courses, which can improve teachers' skills in formative assessment, providing step-by step guidance and practical tutorials in various aspects of formative assessment.

In addition, PGCE pre-service teachers should be trained specifically on how to give constructive feedback that incorporates the cognitive, motivational and metacognitive domains. Further research could be done on ways to involve teachers in developing rubrics for learners to use when implementing self- and peer assessment, as there is a need to involve teachers more creatively in the design of their own learning and teaching tools. They should also be made more aware that self-assessment and peer assessment are key strategies in the implementation.

of formative assessment. The teacher training curriculum should have a consistent and ongoing plan for preservice teachers' professional development and modelling of formative assessment strategies by teacher educators who are teaching PGCE preservice teachers given the findings raised by the PGCE preservice teachers. Observations and learners' activities provide evidence of the usefulness of formative assessment strategies. By reviewing learners' activities, researchers will have a better understanding of what strategies are successful and how various activities may be used in classrooms during lesson presentation.

6.8 Conclusion

The study aimed to provide insight into PGCE pre-service teachers' experiences in the implementation of formative assessment during practice teaching and to provide insight into the impact of practice teaching on the development of formative assessment knowledge and practices among pre-service teachers. The study revealed that the experiences of most of the pre-service teachers regarding formative assessment were positive. This finding concurs with Ciu's (2021:1) findings, which showed that pre-service teachers could implement most formative assessment strategies appropriately.

In this study, among the more positive aspects of their implementation of formative assessment was the pre-service teachers' use of lesson objectives, questioning and feedback. In these areas they showed an ability to put theoretical knowledge into practice. Schutze, Rackozy, Klieme, Besser and Leiss (2017) reported that teachers' ability to employ their formative assessment knowledge and generate actual classroom implementation was positively moderated by their personal self-efficacy. The higher their level of confidence, the more likely they were to practise formative assessment.

The researcher proposes that teacher educators in the teacher preparation programme should approach formative assessment teaching from the perspective of deepening pre-service teachers' disciplinary knowledge, including their knowledge of how students learn, their pedagogical knowledge and skills, and their practical skills in formative assessment.

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APPENDICES

Appendix A: Ethical clearance

UNISA university of south africa

UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2017/08/16

Ref: **2017/08/16/30902231/12/MC**
Name: Ms PN Khumalo
Student: 30902231

Dear Ms Khumalo,

Decision: Ethics Approval from 2017/07/12 to 2022/08/16

Researcher:

Name: Ms PN Khumalo
Email: 035 902 6219
Telephone: khumalopn@unizulu.ac.za

Supervisor:
Name: Prof MC Maphalala
Email: maphalalam@unizulu.ac.za
Telephone: 035 902 6347

Title of research:

The experiences of preservice teachers in implementing formative assessment: A case study of a South African university

Qualification: PhD in Curriculum and Instructional Studies

Thank you for the application for research ethics clearance by the UNISA College of Education Ethics Review Committee for the above mentioned research. Ethics approval is granted for the period 2017/08/16 to 2022/08/16.

The low risk application was reviewed by the Ethics Review Committee on 2017/08/16 in compliance with the UNISA Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the UNISA College of Education Ethics Review Committee.
3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing.
5. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
6. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
7. No field work activities may continue after the expiry date 2022/08/15. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

The reference number **2017/08/16/30902231/12/MC** *should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.*

Kind regards,

Dr M Claassens

CHAIRPERSON: CEDU RERC
mcdtc@netactive.co.za

Prof V McKay

EXECUTIVE DEAN

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Appendix B: Permission to conduct research

The Registrar

University of Zululand

Private Bag X1001

KwaDlangezwa

3887

Request for permission to conduct research at University of Zululand

Title of the research: **THE IMPLEMENTATION OF PRE-SERVICE TEACHERS IN IMPLEMENTING FORMATIVE ASSESSMENT: A CASE STUDY OF A SOUTH AFRICAN UNIVERSITY**

26 May 2017

Mr D.E. Janse van Rensberg

Registrar's Office

Dear Mr Janse van Rensberg

I, Primrose Ntombenhle Khumalo am doing research under supervision of Prof MC Maphalala. I am studying towards a PhD in Curriculum Studies at the University of South Africa. We are inviting the university Pre- service Post Graduate Certificate in Education (PGCE) students to participate in a study entitled:
THE EXPERIENCESOF PRE-SERVICE TEACHERS IN IMPLEMENTING FORMATIVE ASSESSMENT A CASE STUDY OF A SOUTH AFRICAN UNIVERSITY

The aim of the study is to determine how pre-service teachers experience and implement formative assessment in schools as they to integrate theory and practice, and to understand to what extent to which teachers engage in true formative assessment. Your University has been selected because it is a university which is training pre-service teachers who practice formative assessment during teaching as well as university organised practice teaching.

The benefits of this study are that it will provide insights into pre-service teachers' experiences in formative assessment may create a space where teacher educators and pre-service teachers can participate in a dialogue about what is relevant and worthwhile learning. It might benefit design and development of initial teacher education curriculum policy for Initial Teacher Education.

The study entails analysis of documents, focus group discussions, and completing of questionnaires. There are no potential risks.

The feedback procedure will entail distribution of thesis documents. The findings will also be readily available in the thesis that will easily be accessible from University of South Africa (UNISA) library. Please note for the purposes of integrity of this research, UNISA as an institution and I as the researcher have ensured that good research practices and conduct are observed. In this regard I sought a full ethical clearance from the ethical committee (CEDU REC)

Yours sincerely

Primrose Ntombenhle Khumalo

For any questions and clarity concerning this study, do not hesitate to contact the researcher or the supervisor on the contacts below:

Supervisor: Prof. M.C. Maphalala, Tel: 035 9026702 / Cell No. 083301088

Researcher: Miss P.N.Khumalo, Tel: 035 9026219 /Cell no.0835965912

Appendix C: Letter requesting students to participate in questionnaire

Title of a questionnaire: The experiences of pre-service teachers in implementing formative assessment: A case study of a South African University

Dear Prospective Participant

My name is Primrose Ntombenhle Khumalo I am doing research under the supervision of Prof MC Maphalala a Professor in the Department of Curriculum and Instructional Studies towards PhD degree at the University of South Africa. We are inviting you to participate in a study.

This questionnaire forms part of my doctoral research entitled: **THE EXPERIENCES OF PRE-SERVICE TEACHERS IN IMPLEMENTING FORMATIVE ASSESSMENT: A CASE STUDY OF A SOUTH AFRICAN UNIVERSITY.**

The aim of this study is to investigate Post Graduate Certificate in Education (PGCE) pre-service teachers' formative assessment experiences in schools as they integrate theory and practice. The findings of the study may benefit PGCE pre-service design and development of Initial Teacher Education curriculum design and policy makers. The experiences of students can used to improve teacher education curriculum and design.

You are kindly requested to complete this questionnaire, comprising four sections as honestly and frankly as possible and according to your personal views and experience. No foreseeable risks are associated with the completion of the questionnaire which is for research purposes only. The questionnaire will take approximately 50 to 60 minutes to complete.

You are not required to indicate your name or organisation and anonymity will be ensured, however, indication of your age, gender, occupation position etcetera will contribute to a more comprehensive analysis. All information obtained from this questionnaire will be used for research purposes only and will remain confidential. Your participation in this questionnaire is voluntary and you have the right to omit any question if so desired, or to withdraw from answering this questionnaire without penalty at any stage. There will be no reimbursement or any incentive for participation in this study. After the completion of the study, an electronic summary of the findings of the research will be made available to you on request. Permission to undertake this questionnaire has been granted by the University of Zululand and the Ethics Committee of the College of Education, UNISA. If you have any research related enquiries, they can be addressed directly to me or my supervisor. My contact details are: 0359026219 email KhumaloPN@unizulu.ac.za and my supervisor can be reached at 035 9026702 Department of Curriculum, College of Education, UNISA,

By completing the questionnaire, you imply that you have agreed to participate in this research.

Please return the completed questionnaire to P.N. Khumalo before 1 October 2017

Student consent form

I ---------- (participant name), confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet

I have sufficient opportunity to ask questions and am prepared to participate in the study.

I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable)

I am aware that the findings of this study will be processed into a research report, journal publications and/or conference proceedings.

I have received a signed copy of informed consent agreement.

Participant Name & Surname (please print) ----------

Participant Signature Date

Researcher's Name & Surname (please print) Primrose Ntombenhle Khumalo

Researchers Signature **Date**

Appendix D: Letter requesting students to participate in focus group discussion

Dear Participant

Title: **The experiences of pre-service teachers in implementing formative assessment: A case study of a South African University**

DEAR PROSPECTIVE PARTICIPANT

My name is Primrose Ntombenhle Khumalo I am doing research under the supervision of Professor MC Maphalala in the Department of Curriculum and Instructional Studies towards a Doctor of Education degree at the University of South Africa. We are inviting you to participate in a study entitled

The experiences of pre-service teachers in implementing formative assessment: A case study of a South African university

The aim of the study is to amongst other things to determine the pre-service teachers' experiences in the implementing of formative assessment. I have purposefully identified you as a possible participant because you are a student teacher and you are doing or have experience teaching practice employing formative assessment in your teaching. I have obtained your personal details from your university registrar's office and your Post Graduate Certificate in Education (PGCE) coordinator. The study involves only 12 focus group participants.

I would like to provide you with more information about this research and what your involvement would entail if you should agree to take part. The use of formative assessment is well documented. One particular contribution of this study might be benefit design and development of Initial Teacher Education curriculum policy and design. It may be that the pre-service teacher's experiences in formative assessment practices in classrooms create a space where teacher educators and pre-service teachers can participate in a dialogue about what is relevant learning and worthwhile learning in teacher education. The research findings may have the potential to transform teaching practice into experiences that provides meaningful and transferable learning experiences for all pre-service teachers.

Your participation in this study is voluntary. It will involve an interview of approximately 60 minutes in length to take place in mutually agreed upon location at a time convenient to you. You may decline

to answer any of the interview question if you so wish. Furthermore, you may decide to withdraw from this study at any given time without any negative consequences.

With your kind permission, the interview will be recorded with a digital voice recorder, to facilitate collection of accurate information and later transcribed for analysis. Shortly after transcription has been completed, I will send you a copy of the transcript to give you an opportunity to confirm the accuracy of our conversation and to add or clarify any points. All information you provide is considered completely confidential. Your name will not appear in any publication resulting from this study and any identifying information will be omitted from the report. However, with your permission, anonymous quotations may be used. Data collected during this study will be retained on a password protected computer for 5 years in my safe. There are no known or anticipated risks to you as participant in this study.

If you have any questions regarding this study, or would like additional information to assist you in reaching a decision about participation, please contact me at 0835965912 or by e-mail KhumaloPN@unizulu.ac.za.

My Supervisor is Professor M.C. Maphalala contact number is 035 9026702/ 0834301088

Thank you for taking time to read this information sheet and for participating in this study. If you accept my invitation to participate, I would like you to sign the consent form which follows on the next page. Thank you

P.N.Khumalo

Appendix E: Focus group discussion consent form

I .....have granted consent that the information I shared during the group discussion [focus group interview] may be used by the researcher Primrose Ntombenhle Khumalo for research purposes.

I am aware that the group discussion will be audio recorded and I grant consent to ensure an accurate recording. I am also aware that excerpts from the interview may be included in publications to come from this research, with the understanding that the quotations will be anonymous.

I was informed that I may withdraw my consent at any time without penalty by advising the researcher. I am aware that I will not receive any remuneration for my participation.

Participant's Name: ----------

Participant's Signature ---------- Date: ----------

Researcher Name: P.N. Khumalo

Researcher's Signature Date:

Appendix F: Permission to analyse professional documents

Title of the research: THE EXPERIENCES OF PRE-SERVICE TEACHERS IN IMPLEMENTING FORMATIVE ASSESSMENT: A CASE STUDY OF A SOUTH AFRICAN UNIVERSITY

Dear participant

I am Primrose Ntombenhle Khumalo, a PhD student I am doing research under the supervision of Professor Mncedisi Christian Maphalala in the Department of Curriculum and Instructional Studies towards a Doctor of Education degree at the University of South Africa. We are inviting you to participate in a study entitled: **The experiences of pre-service teachers in implementing formative assessment: A case study of a South African university.**

The aim of the study is to investigate pre-service PGCE teachers' experiences in implementing formative assessment. I have purposefully identified you as a potential as a possible participant because of your valuable experience related to my research topic. The study might benefit design and development of initial teacher education curriculum and policy.

The documents submitted relate to my topic. I will be looking for Curriculum and Policy Assessment Statement (CAPS) student evaluation form and portfolio file. Your submission of the mentioned documents is voluntary. Furthermore, you may decide to withdraw your documents from this study at any time without any negative consequences. There are no potential risks expected in this study.

All the information is completely confidential. Your name will not appear in any publication resulting from this study and any identifying information will be omitted from the report. However, with your permission, anonymous excerpt from documents may be used. Data collected during this discussion will be retained on a password protected computer 5 years in my locked cabinet in my locked office.

Feedback procedure will entail distribution of thesis documents. The findings will readily available in an article that will be published in educational studies journal and in the thesis that will be accessible from University of South Africa (UNISA) library. Please note as that for the purpose of the integrity of this research, UNISA as an institution and I as the researcher have ensured that good research practices and conduct are observed. In this regard I sought a full ethical clearance from ethical committee (CEDU REC).

For any questions and clarity concerning this study, do not hesitate to contact the researcher or the supervisor on the contacts below:

Supervisor: Prof. M.C. Maphalala Tel: 035 902 6702 Researcher: Miss P. N. Khumalo 0835965912

Appendix G: Analysis of professional document consent form

I have read the information presented in the information letter about the study: The experiences of pre-service teachers in implementing formative assessment: A case study of a South African University

I have had the opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and add any additional details I wanted. I am aware that I have the option of allowing my documents to be analysed and the researcher has the permission to note down anything that might be relevant to this study.

I am also aware that excerpts from the documents may be included in publications to come from this research, with the understanding that the quotations will be anonymous.

I was informed that I may withdraw my consent at any time without penalty by advising the researcher.

With full knowledge of all foregoing, I agree, of my own free will, to have documents to be analysed in this study.

Participant's Name ----------

Participant's Signature ---------- Date: ----------

Researcher Name: PN Khumalo

Researcher's Signature: Date: ----------

Appendix H: Questionnaire

1. This study is on the experiences of pre-service teachers in implementing formative assessment: A case study of a South African University. You are kindly requested to respond to all the items in this questionnaire. Participation in this study is voluntary and your responses will remain confidential, your feedback will be helpful for future research and to provide insight into pre-service PGCE experiences in implementing formative assessment. The questionnaire should take 50 to 60 minutes to complete.

The instruction on how to respond to each item accompany this questionnaire. The information gathered will be treated as highly confidential as possible do not write your name. Some items require you to give your own answer, comments and recommendations

Your cooperation will be highly appreciated

Thank you for your time and assistance

Miss P.N. Khumalo
Faculty of Education
Department of Curriculum and Instructional studies
University of Zululand
Private Bag X1001
KwaDlangezwa
3886

SECTION A

BIOGRAPHIC/DEMOGRAPHIC AND GENERAL INFORMATION

Please cross (x) in the appropriate space or box provided.

1. Gender

1	2
Male	Female

2. Age in years

1	2	3	4	5

25 and below	26 – 35	36 – 45	46 – 55	56 and above

4. Highest qualification

1	**Degree (B.A. B.Sc. or B. Com)**
2	Diploma (Specify……)
3	Other (Specify……..)

SECTION B
FORMATIVE ASSESSMENT EXPERIENCES

The statements below are concerning your experiences in implementing formative assessment in classroom. Please make a cross(**X**) through the letter that best describe your position.

SA = Strongly Agree **A = Agree**
D = Disagree **SD = Strongly Disagree**

1.	I learnt how to define formative assessment	SA 4	A 3	D 2	SD 1
2.	I learnt the difference between formative and summative assessment	SA 4	A 3	D 2	SD 1
3.	I learnt how to instil in students the ability to find out what is missing in their work	SA 4	A 3	D 2	SD 1
4.	I learnt how to use formative assessment to adapt teaching and improve learning.	SA 4	A 3	D 2	SD 1
5.	Assessment for learning provides the opportunity to students to be actively involved in assessment through self -assessment	SA 4	A 3	D 2	SD 1

6.	I learnt how to provide to feedback to the learners to inform my teaching	SA 4	A 3	D 2	SD 1
7.	Feedback to learners is frequent, descriptive, constructive and immediate, helping students to know how to plan and improve learning	SA 4	A 3	D 2	SD 1
8.	I am capable of using formative assessment to influence students confidence	SA 4	A 3	D 2	SD 1
9.	I have substantial knowledge of classroom assessment	SA 1	A 2	D 3	SD 4
10	I need additional support in learning how to implement formative assessment strategies	SA 4	A 3	D 2	SD 1
11	I have demonstrated enough understanding of formative assessment practices	SA 1	A 2	D 3	SD 4
12	My lecturers integrated formative assessment strategies during teaching and learning for my professional development	SA 1	A 2	D 3	SD 4
13	Formative assessment strategies helps learners to improve learning	SA 1	A 2	D 3	SD 4
14	Collaboration during learning and teaching enhances students' understanding	SA 1	A 2	D 3	SD 4
15	I have interacted with learners through discussion to improve learning.	SA 1	A 2	D 3	SD 4

SECTION C

FORMATIVE ASSESSMENT IN THE CLASSROOM

In this section please indicate by putting a cross (**X**) in the space provided whether you used formative assessment strategies during teaching or you did not use any.

a) What are your experiences with the implementation of formative assessment?

---

b) How important it is for pre-service teachers to understand formative assessment?

---

c) To what extent do you integrate formative assessment practices in your subjects during practice teaching?

---

d) Indicate the formative assessment strategies you used in the classroom.

---

e) Please indicate your opinion of how much you have been exposed to the following: by putting a (**X**) in the box that correspond to your answer:

Covered in depth	Covered substantially	Covered partially	Covered	Never Covered

Appendix I: Interview guide for pre-service teachers

Official school policy

What grade and subjects were you teaching during practice teaching?

What topics are covered in the Curriculum and Assessment Policy Statement (CAPS) in your subjects during the third term?

What are your experiences of the nature of formative assessment promoted by CAPS document in your subjects?

To what extent do you integrate formative assessment during teaching practice?

In your experience, what are the most beneficial formative assessment strategies you employ during practice teaching?

If you were to recommend any changes to the implementation of formative assessment, what would they be?

Portfolio file

To what extent do you plan for your formative assessment activities in your lesson plan?

What formative assessment skills do you believe students need to master in order to be successful with their studies? Why do you think so?

Appendix J: Confidentiality agreement for research assistants

Confidentiality Agreement for Research Assistants (for collection, transcription and analysis of data)

Project title: The Experiences of Pre-service Teachers in Implementing Formative Assessment: A Case Study of a South African University

Principal Investigator: **Ms PN Khumalo**

[ ] I understand that all the material I will be asked to record and/or transcribe is confidential

[ ] I understand that the contents of the consent forms, interview tapes, sound files or interview notes can only be discussed with the researchers.

[ ] I will not keep any copies of the information nor allow third parties to access them.

[ ] I will delete all interview and other relevant files from my computer after transcription.

Research Assistant's signature: _____

Research Assistant's name: _____

Date: _____

Signature of Principal Investigator: _____

Name of Principal Investigator: _____

Note: The Research Assistant will be given a copy of this form to retain for her/his record

Section 6: Only for UNISA staff involved in research or the use of secondary data

Identifying particulars of head researcher (project leader) and other team members should be provided.

Attach only the abridged Curriculum Vitae of the principal investigator as an Appendix with the following information: ○ Experience relevant to the proposed research ○ Qualifications relevant to the proposed research ○ Publications and other research outputs

Section 7: Declaration

STATEMENT AGREEING TO COMPLY WITH ETHICAL PRINCIPLES SET OUT IN UNISA POLICY ON RESEARCH ETHICS

NO TYPED SIGNATURES MAY BE ACCEPTED ONLY ORIGINAL SIGNATURES OR SCANNED ORIGINAL SIGNATURES

I, ***Primrose Ntombenhle Khumalo.***(full name of main researcher), declare that I have read the Policy on Research Ethics of UNISA and the contents of this document are a true and accurate reflection of the methodological and ethical implications of my proposed study. I shall carry out the study in strict accordance with the approved proposal and the Policy on Research Ethics of UNISA. I further undertake to inform the relevant research ethics review committee of the College of Education in writing of any adverse events that occur arising from the injury or harm experienced by the participants in the study. I shall also notify the research ethics review committee if any changes to the study are proposed. I shall maintain the confidentiality of all data collected from or about the research participants, and impose strict controls in the maintenance of privacy. I shall record all data captured during interviews in accordance with ethical guidelines outlined in my proposal. The Policy on Research Ethics places huge emphasis on the integrity of the research and I shall ensure that I conduct the research with the highest integrity taking into account UNISA's Policy for Copyright Infringement and Plagiarism. No data that was gathered retrospectively will be used. I acknowledge that as main researcher it is my responsibility to ensure that the co-researchers, if any, to this research project adhere to the ethical principles set out in the UNISA Policy on Research Ethics.

31 August 2017

(Signature) (Date)

Approved by supervisor (if applicable)

I ***Prof MC Maphalala*** (name of supervisor) declare that I have checked that this form is correctly and honestly completed. I subsequently approve the submission of the proposal for ethical clearance. If applicable, I will ensure that the student reports unanticipated problems or serious adverse events to the Research Ethics Committee of the College of Education.

31 August 2017

(Signature) (Date)

Approved by co-supervisor (if applicable)

I..... (Name of supervisor) declare that I have checked that this form is correctly and honestly completed. I subsequently approve the submission of the proposal for ethical clearance. If applicable, I will ensure that the student reports unanticipated problems or serious adverse events to the Research Ethics Committee of the College of Education.

Appendix k: Lesson Plan	
LESSON PLAN	
1. General Information	
Student Name:	**Student Number:**
Name of the School:	
Subject:	**Date:**
Subject component:	
Topic:	
Grade:	**Duration:**
2. Lesson objectives/outcomes:	
3. Teaching approaches:	
4. Teaching methods:	
5. Resources / LTSM:	
6. Lesson Development	
6.1. Teacher's Activities: Pre-Phase/ Introduction	
6.2. Learners' Activities: Pre-Phase:	

6.3. Teacher's Activities: During Phase

6.4. Learners' Activities: During Phase

6.5. Classroom Assessment: (Group or Individual) Activity/ Task: Highlight what is to be done here.

6.6. Teacher's Activities: Post- Phase

6.7. Learners' Activities: Post- Phase
6.8. Expanded Opportunities: Indicate activities that will be assigned to learners
7. Teacher's Reflection: To be completed after the lesson has been delivered

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(Signature) (Date)