DEVELOPING A MODEL FOR ASSESSMENT IN PRIMARY SCHOOLS IN MASERU, LESOTHO

BY

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RESEARCH

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DEDICATION

I dedicate this thesis to my late mother, 'Maleihlo Anastacia Khechane, who did not live to see a doctor in her family. I wish she could be here to share this moment with me. However, her spirit served as a source of inspiration for me. Mom, I will always love you.

ABSTRACT

The purpose of this research was to investigate primary mathematics teachers' assessment practices in the context of the new integrated primary curriculum in Maseru, Lesotho, in an attempt to develop an assessment model applicable to their context. In an attempt to address this aim, teachers' assessment practices and their understanding of assessment for learning (AfL) before and after AfL training were established. Furthermore, teachers' classroom practices which reflect an understanding of AfL after training were explored. The research also examined the contextual tensions that exist for teachers when implementing AfL practices. The study was promoted by the fact that in the 1980s attempts were made in Lesotho to implement continuous assessment (CASS) but these were unsuccessful due to the lack of clarity of the concept among implementers and the contextual challenges experienced. Currently another policy on assessment, namely curriculum and assessment policy has been introduced in Lesotho primary schools and this research attempted to establish whether implementers were ready and clear about the innovation.

The study adopted both positivist and interpretivist positions in which both quantitative and qualitative approach were employed. Data was collected using a survey, classroom observation and a semi-structured interview. The survey was conducted on 250 primary school teachers out of which eight mathematics teachers from four primary schools were trained on AfL issues. The training was conducted in two stages and teachers were later observed and interviewed.

Findings from the survey revealed that teachers who participated in the study were not clear about AfL. However, after training, teachers were now clear about what AfL was all about though their classroom practices did not reflect much of that knowledge. There were some elements of AfL which teachers were able to implement and there were those which they could not. Teachers were able to communicate learning intentions and the success criteria at the beginning of the lessons. Learners were able use peer and self-assessments though informally as teachers did not provide them with the necessary tools for effective use. Learners also were able to use indicators correctly. However, findings showed that teachers were not providing descriptive feedback which showed learners' strengths and weaknesses. Use of symbols instead of crosses and ticks did not make any difference in indicating the level of learners' performance. The study revealed that there were some challenges which

teachers encountered as they implemented AfL. These challenges were lack proper training and support, shortage of resources, high teacher-pupil ratio, teachers' increased workload, reduced teaching time, lack of preparation time and lack of time to write performance statements. Generally, the training provided had positive impact on teachers' assessment practices and their understanding of AfL. There were some assessment practices such as writing and sharing success criteria which teachers could not do before training but were able to do afterwards and their understanding of AfL had also improved. The researcher developed a model which will improve primary teachers' implementation of AfL in mathematics. She also developed a model of teacher change for effective implementation of the assessment for learning policy.

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KEYWORDS

Curriculum and Assessment Policy

New Integrated Primary Curriculum

Assessment

Assessment Practices

Learning Intention

Teachers' Understanding

Primary Mathematics Teachers

Summative Assessment

Success Criteria

Formative Assessment

Assessment for Learning

DECLARATION

I Nkoja Claudia 'Makahlolo Khechane hereby declares that this research project submitted at the Central University of Technology, Welkom campus for the Degree on: Developing a Model for Assessment in Primary Schools in Maseru, Lesotho; and complies with the Code of Academic Integrity, as well as other relevant policies, procedures, rules and regulations of the Central University of Technology, Free State; and that this has not been submitted before to any institution by myself or any other person in fulfilment (or partial fulfilment) of the requirements for the attainment of any qualification

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DATE

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ACRONYMS AND ABBREVIATIONS

AfL	Assessment for learning
ARG	Assessment Reform Group
CASS	Continuous assessment
CAP	Curriculum and assessment policy
CBAM	Concerns-Based Adoption Model
CGDE	Centre for Global Development in Education
COSC	Cambridge Overseas School Certificate
FA	Formative assessment
FPE	Free primary education
JC	Junior certificate
LCE	Lesotho College of Education
MoET	Ministry of education and Training
NCCA	National Council for Curriculum and Assessment
NCTM	National Council of Teachers of Mathematics
OECD	The Organisation for Economic Co-operation and Development
SA	Summative assessment
SAQA	South African Qualifications Authority
ZPD	Zone of proximal development

CHAPTER 1

INTRODUCTION TO THE STUDY

1.1   INTRODUCTION AND BACKGROUND TO THE STUDY

1.1.1 Historical Context

Before Lesotho gained its independence in 1966 from British Government, churches played a significant role in providing education to the Basotho children and also in the training of teachers. These services continued even after independence, no fundamental changes were made in the way the schools were run. The churches, especially the Roman Catholic Church, the Lesotho Evangelical Church and the Anglican Church of Lesotho continued to manage the schools through school secretariats, thus, "*Lesotho government decided to continue to give the churches substantial powers over education and wishes to do so even in the future*" (Minister of Education and Culture, 1975: 1). However, the salaries of teachers and feeding of learners were the responsibility of the government. It was only in 1975 when the initial Teacher Training Colleges which were operated by the churches were replaced by the National Teacher Training College owned by the Lesotho Government.

In 1970, the government of Lesotho shortened the duration of primary education from eight to a seven-year period. The seven years of basic education was followed by five-year period for secondary education which was divided into three-year course leading to Junior Certificate (JC) and two-year course leading to Cambridge Overseas School Certificate (COSC). At the end of each of these three levels, national examinations were written. The first national assessment was at the end of the seventh year, the Primary School Leaving Examination, the Junior Certificate (JC) examination which was a syndicate between Lesotho, Botswana and Swaziland. The Cambridge Overseas School Certificate examination which was written after the JC examination was administered by Cambridge International

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Examinations in the United Kingdom which basically showed the influence the British government still had on the education system in Lesotho.

In terms of curriculum, the need to reform the educational system was felt by the Lesotho Government. The first National Education Dialogue "*Pitso*" was convened in Maseru the capital town of Lesotho in 1978, "*with a view to soliciting input towards designing a curriculum that would respond to the needs of the young nation*" (Raselimo & Mahao, 2015:2). The subsequent report criticized the then education system by indicating that "the main products of the system are 'failures' (those who have been forced out of the system) and 'passes' (those who can regurgitate undigested facts on the examination day to the satisfaction of the examiner)" (Ministry of Education, 1978:104).

The first National Education Dialogue was then followed by the establishment of an Education Sector Task Force in 1982. This task force which was established by the Cabinet was mandated to prepare a policy document in the field of education that could guide the government in planning an education system appropriate to the development needs of Lesotho. The task force recognized that:

> *Many of the problems with curriculum and instruction stem from the inordinate emphasis given to the preparation for terminal exams which undermine the attainment of certain education objectives that are critical for the country's economic development. These include problem solving; the practical application of concepts and skills; the spirit of co-operation and team-work; creativity and imagination; and the development of a moral, socially conscious character* (Ministry of Education, 1982:94).

The cited reports show that the education system had some limitations in as far as addressing the needs of the learners and those of the country at large. Assessment that was carried out did not show what learners could do and could not. As a signatory of the Dakar Framework for Action which reaffirms commitment to achieving "Education for All by the year 2015", Lesotho introduced Free Primary Education (FPE) in 2000 in an effort to realize universal primary education and also as a strategy towards achieving the education for all goals. In its 2001- 2006

Strategic Plan for the implementation of the Free Primary Education Programme, Ministry of Education and Training numerates the following as goals of providing FPE:

- Improving access, enrolment and retention up to Standard 7;
- Developing equality of opportunity and equity of achievement;
- Improving the quality of teaching and learning and the nature of classrooms interactions;
- Developing a curriculum and models of assessment which ensure human, practical and vocational relevance;
- Decentralizing the existing infrastructure and developing the human resource base and vocational relevance;
- Creating appropriate linkages between primary education and other sub-sectors in order to ultimately establish sector-wide planning (Ministry of Education and Training, 2001:3).

The goals listed above show that the government of Lesotho did not only focus on increasing the access to basic education but also providing relevant and quality education.

The FPE policy enabled a high percentage of Basotho children and adults to have access to primary education, resulting in an increased enrolment in the primary schools. FPE policy had further brought many challenges, amongst which were increased teacher-pupil ratio, infrastructure and the delay in supplying of teaching and learning materials to schools by the Ministry of Education and Training (MoET) in Lesotho. In fact Morojele (2012) indicates that the problems brought by the introduction of FPE were the influx of learners into schools, the need for more infrastructure and teaching and learning resources which were found to be either insufficient or not responsive to the local priorities and needs of the schools.

The challenges experienced in Lesotho due to implementation of FPE in the schools are similar to those experienced in other countries. Orodho, Waweru, Ndichu and Nthinguri (2014) point out that in Kenya, the implementation of FPE resulted in large classes and shortage of teachers and teaching resources which ended up

compromising the quality of teaching and learning. They indicate that where classes are large, teachers tend to give fewer assignments than before and they are not able to provide individualized attention especially to slow learners and those with special needs. For Ogola (2010), in large classes, the teacher may not be able to interact with individual learners and mark their work on daily basis. In other words, large classes make it impossible for teachers to administer tests, grade learners' work and to provide feedback on learners' performance on time (Chacha & Zani, 2015). In addition, Wachira, Mwenda, Muthaa and Mbugua (2011) illustrate that the introduction of FPE in schools also affects class management as teachers are unable to provide attention to individual learners in a class.

The above discussion clearly illustrates that the introduction of FPE in many countries brought about many challenges and some of them may have a direct impact on the quality of education provided to the learners. Assessment is an integral part of teaching and learning and if it could be compromised in any possible way, it would be difficult to achieve the desired learning outcomes. Teaching cannot be fully understood or happen smoothly without sound assessment. Hence, the next section discusses policies that were introduced in Lesotho primary schools in an attempt to improve teachers' assessment practices.

1.1.2 Current Educational Provision

In 2009, a comprehensive Curriculum and Assessment Policy (CAP) was developed by the government of Lesotho through the Ministry of Education and Training. As per the Ministry of Education and Training, this policy is meant to transform the teaching and learning as well as the assessment procedures so that they are in line with emerging needs of individuals and those of the nation at large (MoET, 2009). According to Raselimo and Mahao (2015:1), "*the policy serves as a strategy to minimize the negative influence of examinations on the education system by integrating the curriculum with assessment*". The policy also advocates for establishment of a very strong link between curriculum and assessment so that the feedback from the learning process can be used in formulating strategies that would improve the teaching and learning process. The policy further elaborates that if correctly done, assessment should indicate what the learner knows and can do in

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addition to the usual paper and pencil examinations (MoET, 2009). For a long time, the type of education provided to the Basotho children has been criticized for not responding to the needs of the Basotho people and also for not responding to the ever changing needs of education. Hence the policy is seen as "*directed towards addressing the needs of both the learner and the people of Lesotho at large*" (MoET, 2009: i).

CAP has brought a massive change in the education system of Lesotho. The integrated curriculum, as provided in the policy, no longer view school subjects as compartmentalized but as an integrated whole with no distinctive compartments. The policy sees integration as;

> *A holistic view and treatment of issues related to intelligence, maturity, personal and social development of the learner for survival purposes and economic development of the nation as opposed to the compartmentalized subject-based form of instruction* (MoET, 2009:15).

This policy is of its first kind ever in the history of education in Lesotho. It aims at integrating curriculum and assessment so as to strike a balance between the two. In terms of assessment, the policy introduces assessment for learning as the main strategy for implementing the integrated curriculum. This indicates the shift from Summative Assessments (SA) which according to the research was more visible in the Lesotho primary schools (LCE & CGDE, 2009) to Assessment for Learning (AfL) which is formative in nature and more involving on the part of the teacher and the learner.

The new integrated curriculum which enacted CAP was piloted in 2012 and was fully implemented at grades 1-3 in 2013. The policy has brought about major changes in the education system of Lesotho. It has rearranged the education system into two categories which are basic education and secondary education. Basic education covers the first ten years of schooling which consists of grades 1 to 10 while secondary education takes two years of schooling after completion of Basic Education (MoET, 2009). At the end of the ten-year Basic Education, learners have to sit for the first national examination which in the previous system was taken after seven years of formal schooling. Along with the implementation of the new

curriculum, the new ways of assessing which comprised of assessment for learning were also introduced in the said grades.

According to Wiliam (2011, 13-14), AfL is defined as "*the process of seeking and interpreting evidence for use by learners and their teachers to decide where the learners are in their learning, where they need to go and how best to get there*". The crux of this definition is that both the teacher and the learner are involved in assessing learner's work. Hence the introduction of AfL in Lesotho schools brought about a major shift in the way learners are assessed. Below are some of the major changes brought by the assessment policy:

- Abolition of ticks and crosses, and introduction of 'performance statements' which indicate what the learner has learned and is capable of doing.
- Use of symbols, $\triangle$, $\angle$ and ___ to indicate the level of performance.
- Sharing learning intentions and success criteria with the learners at the beginning and throughout the lesson.
- Use of peer and self-assessments as opposed to the teacher being the sole assessor of learners' learning.
- Allowing learners to progress at their own pace from one grade level to another instead of being categorized as passed or failed.

When implementing a policy of this magnitude which changes almost every aspect of teaching and learning, there are important factors to be considered. Elliott (2001) cautions that there is a need to use monitoring techniques which provide evidence of how well the policy is being implemented and also to use techniques which provide evidence of unintended as well as intended effects of the policy. However, Hord (1992) in Blair (2000) points out that in implementing a new policy, there is no one strategy that assures that a school will do well in implementing the policy, rather it takes a combination of strategies to ensure success. She described six strategies that foster change as creating a context conducive to change- where teachers work collaboratively to reflect on their instruction and on how they are working to achieve the set goals for learners. The second strategy involves developing and communicating a shared vision between policy makers and implementers as these parties have the responsibility for translating vision into action. Prior to

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implementation of a new policy, a comprehensive plan which serves as a road map to guide the implementers is needed. Furthermore, resources in terms of time, personnel, monetary, infrastructure and materials should be addressed before policy implementation. Even if all the strategies mentioned above can be taken care of, if teachers are not empowered and supported, the implementation of the new policy cannot be successful. It is through professional development programmes that teachers learn new strategies and get opportunities to practice them. Hord (1992) in Blair (2000) further highlights the importance of monitoring and checking progress during implementation of a new policy. She indicates that monitoring and checking process involves classroom visits by the school principal, standardized learners' testing and examination of learners' data. Lastly, teachers and school principals should be provided with continuing assistance as problems may arise during the implementation of the new policy (*ibid*).

The strategies discussed above have provided the researcher with an understanding of what needs to be done prior to and during implementation of the new policy. Hence the study looks into teachers' practices and understanding of assessment for learning in the context of the new integrated primary curriculum. The next section discusses the area of concern which triggered the researcher to carry out this study.

1.2   STATEMENT OF THE PROBLEM

Assessment for learning has been found to have many benefits on learners' learning as well as informing teachers' about learners' strengths and weaknesses and also about their instructional practices. However, when assessment for learning is not properly implemented, there are some challenges which may arise. Assessment for learning policy like any other policies requires that implementers be trained on how to use it, as it requires teachers to make major changes in their normal assessment practices. The teachers' inability to implement assessment for learning might pose a threat to quality in educational assessment. Sebatane (1985) in Raselimo and Mahao (2015) illustrates that there were attempts to implement Continuous Assessment (CASS) in the education system of Lesotho in the early 1980s. He indicates that there were problems regarding its implementation due to lack of clarity

of the concept among the implementers, which included school inspectors, principals and classroom teachers. The same problem can also be experienced even with this new policy on assessment for learning, given that teachers are used to assessing learners by summative method.

The study carried out by the Lesotho College of Education in collaboration with Centre for Global Development through Education in Ireland (2009) revealed that primary teachers in Lesotho were mostly using summative forms of assessment and were not familiar with other forms. This study also showed that teachers were unanimous in stating that they needed assistance in other forms of assessment. The findings of this study therefore revealed that teachers needed to be trained on issues pertaining to assessment for learning prior to its implementation. Miles (1986) in Hopkins (2001), demonstrates that for successful implementation of any new policy, adequate and sustained staff development and in-service training have to be provided to the implementers. However, with the implementation of assessment for learning, a minimal training was provided. Given the problems that were encountered earlier in implementing CASS, and also with the findings of the above-mentioned study, the implementation of assessment for learning could also face the same challenges. The study sought to find out what teachers' assessment practices were and provided them with an intervention that would help them to implement assessment for learning properly in their classes.

1.3   AIM OF THE STUDY

This research was set to investigate primary mathematics teachers' assessment practices and their understanding of AfL in the context of the new integrated primary curriculum.

1.4   RESEARCH QUESTIONS

In an attempt to investigate primary mathematics teachers' assessment practices and their understanding of AfL in the context of the new integrated primary curriculum, this study sought to answer the following research questions:

a. What are primary mathematics teachers' assessment practices before training?

b. What are primary mathematics teachers' understandings of AfL before training?

c. How do primary mathematics teachers understand and implement assessment for learning after training?

d. How do contextual challenges influence teachers in implementing AfL practices?

To answer these questions, the following objectives were addressed;

a. Establish teachers' perception on assessment for learning.

b. Determine teachers' assessment for learning skills used in their classrooms.

c. Establish the effects of AfL training on teachers assessment practices

d. Determine teachers' experiences when using AfL.

1.5   SIGNIFICANCE OF THE STUDY

This study is significant in many different ways. Currently there is limited literature on primary teachers' understanding and practices of assessment for learning, especially in primary mathematics teachers in Lesotho. Therefore, the findings of this study will inform all stakeholders on teachers' knowledge of assessment for learning and their classroom assessment practices. Secondly, the findings of this study would inform the curriculum developers, education officers and school principals about the challenges or contextual tensions that exist during implementation of assessment for learning policy. The significance of knowing these challenges would enable the curriculum developers and education officers to address them in time. Thirdly, the findings of this study will inform all stakeholders about the effects of implementing different strategies of assessment for learning. The findings of this study in the context of Lesotho may also add to the already existing knowledge about implementation of AfL/new policy, as Lesotho is different (geographically and economically) from all other countries where this form of assessment has been implemented before. Furthermore, the results of this study may also influence the

review of the policy to incorporate some of the emerging issues. Finally, the findings of this research may provide insight into a suitable model that could be used in the implementation of assessment for a learning policy in Lesotho primary schools. The next section presents a brief literature on assessment.

1.6   CONCEPTUAL FRAMEWORK

Assessment forms an integral part of teaching and learning process such that the two are inseparable. Assessment of learners' learning is described as a systematic ongoing process of collecting information about learners' progress towards learning goals (Linn & Miller, 2005). According to Huba and Freed (2000), assessment is the process of gathering and discussing information from multiple and diverse sources in order to develop a deep understanding of what learners know, understand, and can do with their knowledge as a result of educational experiences. Traditionally, there are two purposes of assessment, which are usually classified as being either formative or summative. Generally, assessment gives a justification for certifying the achievement or potential of individuals (summative) and supporting learning (formative).

Summative or formal assessment, takes place at the end of the unit of study. Its primary purpose is to document learners' performance after instruction is completed. In addition, Lambert and Lines indicate that summative assessment can be used to "*judge the effectiveness of teachers, schools and the system at large, at least in part, by the use of output measures*" (p. 191) .

Formative Assessment (FA), on the other hand, occurs during a lesson or a unit to provide ongoing feedback to the teacher and learner. The purpose of formative assessment is to provide corrective actions as instruction occurs to enhance learner's learning. Tuttle (2009) asserts that FA occurs when information is fed back to the learners in ways that enable them to learn better, or in a manner that can engage them in a similar self-reflective process. He further expands the concept by saying that it involves obtaining evidence about learner's learning, providing

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feedback to learners, closing the gap between the learner's current and desired state. Formative assessment helps identify strengths and weakness of learners, and indicate areas where they need assistance. It also involves learners in active learning, keeps them on task, and helps them to focus on learning goals and most importantly, it allows learners to receive feedback on precisely what they need to do to improve (Brookhart, 2010).

Formative assessment is sometimes used interchangeably with assessment for learning though Stiggins (2002) argues that they are not necessarily the same. He elaborates that AfL is more than providing teachers with evidence about learners' learning so that they can be able to modify their instruction. He further points out that in addition, AfL involves learners in the process.

AfL is therefore seen as part of everyday practice by learners, teachers and peers as they look for, reflect upon and respond to information from their discussions in ways that enhance ongoing learning (Berry & Adamson, 2011). Furthermore, Black, Harrison, Lee, Marshall and Wiliam (2003) in Ecclestone, Davis, Derrick and Gawn (2010) indicate that in assessment for learning, the learners' task is to notice the gap between their current performance and the targeted performance and to close this gap.

The Assessment Reform Group (2003:7) illustrates that AfL is characterised by sharing learning goals with learners. This is usually done at the beginning of the lesson where the teacher communicates the learning intentions to the learners so that they know and understand what they are going to learn. AfL also helps learners to know and recognize the standards they are aiming for and this helps both the teacher and the learners to understand what to look for during the teaching/learning process. In other words, when communicating the standards, learners should aim for, teachers make learning explicit and transparent. AfL further involves learners in self-assessment. Once the standards are clearly communicated, learners can be able to use them to assess their own work and also improve their learning. Another

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important strategy is provision of feedback which assists learners to recognize gaps in their learning. When learners have clear understanding of the learning goals and the standards they are aiming for, they will be able to take corrective measures to close the gaps in their learning. AfL is therefore, underpinned by confidence that every learner can improve.

Though the above discussion shows that FA and AfL cannot be equated, for the purpose of this study they are going to be used interchangeably as they are closely connected. Hence, in the light of the discussion on FA/AfL, the study sought to establish teachers' assessment practices in context of the New Integrated Curriculum which advocates for the use of AfL. The next section gives a brief description of the methodology that was adopted in this study.

1.7   METHODOLOGY

This section briefly highlights the research design and procedure that were followed in this research. It also explains how data was analysed.

1.7.1 Research Design

This study employed mixed methods design which Creswell and Plano (2007) defines as:

> *a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems that either approach alone cannot* (p. 5).

This research has adopted the sequential transformative mixed method design in that two phases of data collection were employed. During the first phase, quantitative data were collected using a survey. Teachers who wished to participate in the

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second phase of the research had to indicate their names and contact details on the questionnaire. These were the teachers who received the training on AfL issues and were later observed and interviewed. The reasons for using both approaches in this research were to "*offset the weaknesses inherent within one method with the strengths of the other method*" Cresswell, Plano, Clark, Gutmann and Hanson (2003: 183). Quantitatively, teachers' demographic data, their assessment practices and understanding of AfL were collected using a survey. Qualitatively, teachers 'assessment practices, their understanding of AfL and the contextual challenges they face during implementation of AfL were collected using both classroom observations and individual interviews. The procedure that was followed in carrying out this study is discussed in the next section.

1.7.2 Procedure

The procedure for carrying out this study consisted of two stages, which are briefly discussed below.

Stage 1: Questionnaires were administered to 250 primary mathematics teachers in Maseru who were randomly selected to determine their assessment practices and understanding of assessment for learning prior to AfL training. Teachers who were interested to participate in AfL training were asked to indicate their personal details on the questionnaire so that the researcher could contact them. Since almost all teachers who completed the questionnaire provided their details, the researcher decided to purposefully select eight teachers from four schools whom she thought were knowledgeable about AfL and would also allow her to effectively use the limited resources she had.

Stage 2: Eight teachers from four selected schools attended a one-day training workshop on issues pertaining to AfL. A week after the first workshop, a follow-up workshop was conducted in the respective schools. This was meant to provide teachers with necessary support during implementation phase. Then teachers were given an opportunity to implement assessment for learning on their own. It was at

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this stage where three teachers discontinued their participation in the study. Hence only five teachers were observed and were later interviewed. The procedure for analysing the data that was collected is presented in the section below.

1.7.3 Data Analysis

Data collected through the questionnaires were analysed using both descriptive and inferential statistics. Percentages, means and standard deviations were generated using Statistical Package for Social Science version 24.

Data collected from the interviews and observations were analysed concurrently using codes from which themes were generated. In this study, three broad themes which emerged were teachers' understanding of assessment for learning, teachers' assessment practices and challenges experienced during the implementation of AfL. The limitations that were encountered in carrying out this study are briefly discussed in the section below.

1.8   LIMITATIONS OF THE STUDY

The time available to investigate the research problem and measure teachers' change in their assessment practices over time was constrained by the due date of the study. Lack of financial, audio visual and human resources also impacted on the choice of the sample for the study. Due to limited resources available, a smaller sample was used as a larger sample would mean more resources and more time invested in the study of this magnitude. Hence the results could not be generalized or transferred to a wider population except the intended sample. However, this was not the intention of the researcher to generalize the findings. The researcher was just interested to see the enactment of the new assessment mode.

The findings of this study were obtained from the small sample of teachers who were from public and church owned schools in Maseru and they cannot be generalized to teachers teaching in similar grades and in the same geographical location as

teachers in privately owned schools have better resources than those in public schools. Nevertheless, the study has provided a detailed account of how teachers who participated in this study implemented assessment for learning after receiving training. Hence, the model that emerged from this study could be used as a basis for similar studies in other similar situations.

Another limitation which constrained the study was time factor. Since this was an academic study that was supposed to be completed within a given period of time, the researcher did not have a chance to follow-up on teachers participating in this study to see the effect of the training after a longer period of time. The training provided was also not very intensive and the support provided was minimal due to time constraints. Another major challenge that impacted negatively on this study was funding. The researcher had no sponsorship and as a result had to hold only one workshop for all teachers who participated in the study. Even the manner in which the school-based workshops were conducted was not what the researcher wanted. Supporting teachers in their schools was quite expensive for the researcher and had to cut some of the visits. Lack of financial resources also impacted negatively on this study as the researcher could not afford to buy audio visual equipment which would be helpful during classroom observations. The next section presents the definitions of the most commonly used terms in this study.

1.9   DEFINITION OF TERMS

Assessment: It is the process teachers use to collect data about their teaching and their learners' learning (Hanna & Dettmer, 2004). This process involves gathering information from multiple and diverse sources in order to develop a deep understanding of what learners know, understand, and can do with their knowledge as a result of their educational experiences (Huba & Freed, 2000).

Summative assessment or assessment of learning: One-time assessment done at the end of a unit, quarter or a year for the purpose of accountability (Black &

Wiliam, 1998). It provides a summary of learner's performance at the particular time and suggests that the learning has come to a reportable end (Stiggins, 2002).

Formative assessment or assessment for learning: It is an assessment carried out during the instructional process for the purpose of improving teaching and learning. The results obtained are used immediately to inform both the teacher and the learner (Shepard, 2005).

Assessment Techniques: They are methods or techniques that generally describe how the information relating to learners learning will be collected, which may involve either direct or indirect measurement. The direct measurement requires learners to display their knowledge and skills while indirect measurement requires learners to reflect on their learning (Maki, 2004).

1.10   SUMMARY OF CHAPTERS

This thesis consists of six chapters where the **first chapter** comprises the background of the study which included both historical and current educational background of education system in Lesotho. This is followed by statement of the problem, aim of the study, research questions which the study sought to answer, the study objectives, significance of the study, limitations, definition of terms and a brief summary of chapters in this thesis.

Chapter Two outlines the relevant literature review for the study on assessment for learning/formative assessment and the role it plays in learners learning. Evidence from studies conducted by other researchers on the importance and impact of AfL on learner's achievement were also looked into. This chapter also highlights some of the challenges experienced during implementation of assessment for learning.

Chapter Three presents the theoretical framework for the study. The chapter starts by defining what educational change is and how it impacts on the teachers. It also discusses different models which outline different stages of teacher –change, while these models only provide the stages through which the teacher undergoes before real change can occur. These models however, do not clarify the concerns the

teachers have during the process of change, hence the discussion of the concerns based model.

Chapter Four is the methodology chapter which includes the philosophical assumptions guiding this study. It covers the design of the study, sample and sampling techniques, description of the AfL intervention, data collection techniques, procedure for data collection, data analysis, issues of validity and reliability, ethical issues, as well as limitations of the study.

Chapter Five presents the findings of this study. The chapter starts by presenting results from descriptive statistics, then factor analysis results, inferential statistics results as well as qualitative results which are organised into three themes. The chapter has also summarised and interpreted both quantitative and qualitative findings. These finding are then merged.

Chapter Six summarises all the chapters in this study and draws conclusions on the basis of the research questions, literature and the theoretical framework. The chapter also concludes by providing the emerged models of assessment for learning and teacher change that can be followed in Lesotho. The chapter further provides recommendations made to different stakeholders in Lesotho.

1.11   SUMMARY

History shows that around 1985, Lesotho introduced CASS in schools but this method of assessment failed because teachers as implementers of any innovation did not have knowledge and skills necessary for its effective implementation. With the introduction of AfL in Lesotho primary schools, which is a study that was set to investigate how primary mathematics teachers in Maseru understand and implement assessment for learning in the context of the new integrated primary curriculum. The study sought to answer the following research questions; what are teachers' assessment practices and understandings of AfL before training? What do teachers' classroom practices reflect as an understanding of assessment for learning after training?   Which contextual tensions exist for teachers in implementing AfL practices? This chapter presented a brief background on curriculum reforms which took place since 1966 when Lesotho gained its independence. The most recent

reforms were the introduction of FPE in Lesotho in 2000 and the curriculum and assessment policy in 2009. These policies had a massive impact on the education system in Lesotho and in particular on how learners were assessed. This chapter also outlined the chapters in this study. In the next chapter, different forms of assessment are discussed and more attention is given to assessment for learning.

CHAPTER 2

ASSESSMENT FOR LEARNING

"The goal of assessment has to be, above all, to support the improvement of teaching and learning" (Frederiksen and Collins, 1989:32)

2.1   INTRODUCTION

The aim of this study was to investigate primary mathematics teachers' assessment practices in the context of the new integrated primary curriculum in Maseru Lesotho. This chapter provides a report on the literature review on assessment. Literature review chapter assists the researcher to place the research study in context. Ridley (2008) succinctly defines literature review as "*the part of the thesis where there is extensive reference to related research and theory in your field; it is where connections are made between the source tests that you draw on and where you position yourselves and your research among these sources*" (p.2). Likewise, Fink (2005) in Booth, Papaioannou and Sutton (2012) describes literature review as a "*systematic, explicit and reproducible method for identifying, evaluating, and synthesising the existing body of completed and recorded work produced by researchers, scholars and practitioners*" (p.1-2). Thus, this literature review chapter looks into scholarly information by reviewing what is known about assessment.

The chapter first outlines in general terms what an assessment is in educational settings, its characteristics and purposes. The chapter further looks into factors influencing teachers' assessment practices. It also pays special attention to tensions between different types of assessment and challenges encountered in implementing assessment for learning in the classroom.   Since assessment is a vital tool in enhancing learners' learning, it is important to see how it relates to current theories of learning. Hence this chapter highlights learning theories that support the use of assessment for learning in class. Lastly, the importance or role played by teacher

professional development especially during implementation of new ideas in the classroom has been looked into.

2.2   ASSESSMENT

Black and Wiliam (1998) define assessment as "*all those activities undertaken by the teacher – and their students in assessing themselves – that provide information to be used as feedback to modify teaching and learning activities*" (p. 140). Similarly, Kapukaya (2013) describes assessment as a systematic collection, review, interpretation, and use of information about learners' achievements and educational programmes for the purpose of improving learners' learning and development. In general assessment provides learners with an opportunity to understand their strengths as well as weaknesses in the teaching and learning process. It is through assessment that learners have a chance to learn better and improve their performance.

Saliu in Kapukaya (2013) argues that "assessment is an important aspect of teaching and learning activities that has a substantial impact on students learning" (p. 84). Since assessment is used for different purposes, its definitions also differ depending on the uses. Hence Huba and Freed (2000) see assessment as:

> *Process of gathering and discussing information from multiple and diverse sources in order to develop a deep understanding of what learners know, understand, and can do with their knowledge as a result of their educational experiences. The process culminates when the assessment results are used to improve subsequent learning* (p.8).

For Matovu and Zubairi (2014), assessment provides evidence about the learning outcomes, learning process, individual learner, institutions, and programmes to the teachers, learners, administrators, and other education stakeholders.

Summarising the above definitions, assessment can be defined as all the actions and activities that the teacher uses during the teaching and learning process to measure learner's learning as defined by the learning outcome. Thus, assessment is

considered as a way of improving classroom activities which are geared towards improving learners' learning and the quality of education in general.

According to Lambert and Lines (2000), the idea behind all assessment is to discover something about the person being tested, and also to give the person being tested information about his/her achievement. For Lambert and Lines (2000) "*whatever the precise use or circumstances, it is vital that what the test says about that individual is correct*" (p.7). This means that for assessment to be effective, all the attributes that may lead to misinterpretation of assessment feedback should be minimized. For an assessment to be effective it should have certain characteristics and these are presented in the next section.

2.2.1   Characteristics of Educational Assessment

Assessment is an integral part of the learning process. Conner (2000) asserts that the main role of assessment in the classroom is to support learning. He further illustrates that for assessment to be effective and credible to consumers of educational services (such as learners, parents and employers) and implementers (teachers), it should be sound in many different ways. In particular, assessment should be valid, reliable, practical, fair, useful and timely. These different assessment attributes are discussed below.

2.2.1.1   Validity

Validity is the extent to which a test measures what it was designed to measure (Stuart, 2013, Lambert & Lines, 2000). Thus, if the test does not measure what it alleges to measure, then its use is considered to be misleading. SAQA (2001) defines validity as "*measuring what it says it is measuring, be it knowledge, understanding, subject matter, skills, information and behaviors*" (p.17).   In other words validity measures the behaviour described by the stated learning outcomes which normally match the content, knowledge and skills taught. The task should assess learners on the appropriate learning outcomes that learners are expected to

achieve or the content they are expected to understand. Hence validity is function of the match between the purpose of assessment, the information it provides, and the claims made on the basis of this information (Cruickshank, Jenkins & Metcalf, 2009). A balanced assessment should also be reliable.

2.2.1.2 Reliability

According to Stuart (2013), reliability is concerned with the degree to which a result reflects all possible measurements of the same aspect of competence or performance. Thus, reliability addresses the question of how accurately the test measures the performance it is designed to measure. Stuart (2013) further indicates that a test or assessment is said to be reliable if it gives similar results when used on separate occasions and with different assessors. Similarly, ARG (2003) points out that assessment should be designed so that users can have confidence that the results are sufficiently accurate and consistent for their purpose. Generally, reliability means that assessment items administered under different but comparable conditions would produce similar results. For an assessment task to be reliable, it should also reflect the learning objective. In the situation where a task lacks reliability, the results produced may not accurately reflect the actual learner's understanding or ability leading to inaccurate conclusions about learner's learning. It is very important for teachers to ensure that their assessment tasks are also practical and realistic.

2.2.1.3 Practicability

Practicability here means that assessment should be realistic. SAQA (2005) points out that practicability refer to "*ensuring that assessments take into account financial resources, facilities, equipment and time*" (p.19). In the same manner, ARG (2003) indicates that resources required to provide practicability include teacher's time, expertise and cost, and learners' learning time. Thus, assessment procedures should be practical in terms of their costs, time taken and ease of application. If these factors are compromised, then the validity of the assessment task may be

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greatly affected. Assessment tasks should also be fair and useful to both teachers and learners.

2.2.1.4   Fairness and Usefulness

An assessment should not in any way hinder or advantage a learner (SAQA, 2005). This means that assessment must be fair in terms of equal opportunities, resources and appropriate teaching and learning strategies. Assessment process should also be clear, transparent and available to all learners (SAQA, 2005). This means that assessment process should be fair for all concerned. It should not privilege certain groups/individuals or make them suffer in terms of academic judgments made about their performance.

Assessment should not only be fair to all learners, but should also be useful. It can be considered useful when it indicates learner's strengths and weaknesses. For learners to be able to identify their strengths and weaknesses and close the gap in their learning, assessment should be timely.

2.2.1.5   Timely

In order for the feedback to be effective, it should be provided in time. If feedback is provided in time, learners would be in the position to address their weaknesses while the content is still fresh in their minds. It is important that learners' misconceptions or misunderstandings are addressed in time so that their learning could be improved. According to Jacobs, Vakalisa and Gawe (2011), feedback cannot enhance learning and teaching if assessment occurs at the end of the learning.

The assessment information gathered can be used for a variety of purposes. Hence, the next section outlines the broad purposes of assessment.

2.2.2 Purposes of Assessment

There are various purposes of assessment in the teaching and learning process. These purposes include monitoring of educational progress, providing both teachers and learners with feedback, motivating learning and accountability. Assessment is a crucial tool in monitoring educational progress or improvement. All stakeholders in education are eager to know how learners are learning in comparison with the set standards of performance or with their peers (Bell & Cowie, 2001).

According to Carr (2008), the purposes of assessment are to help teachers in enhancing learners' learning through provision of information about their (learners) knowledge, their understanding of concepts and their mastery of skills with a view to planning learning programmes for individual learners; identification of learners' with learning difficulties; reporting to parents, and other stakeholders about learners' performance; and for accountability. Likewise, Black and Wiliam (1998) point out that, teachers need to know how their learners' are progressing and the difficulties they encounter with their learning so that appropriate measures can be put in place to meet their needs. For NCCA (2008), assessment process

> *provides teachers with the information they need in order to make important decisions about the teaching and learning process - selecting curriculum objectives, identifying appropriate teaching methodologies, designing learning activities, choosing suitable resources, differentiating learning, and giving feedback to learners about their performance* (p.7).

Thus, assessment if done correctly should provide feedback that helps teachers to have a clear picture of how learners are performing and on the basis of that revise and improve their classroom practices accordingly (Bell & Cowie, 2001). For teachers to carry out these, they must have a clear understanding of what assessment is and what it requires. In this study, it is important that teachers have a clear understanding of how feedback in AfL is used to inform their own teaching and to identify learners' strengths and weaknesses.

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Another purpose of assessment results is to inform learners about their learning. It is through feedback that learners become aware of their strengths and weaknesses in their learning. O'Leary (2006) argues that "*learners are the most important users of assessment information. And the most important assessment information learners need is that which allows them to decide where they are now in terms of their learning and what they need to do to progress beyond that point*" (p.15). He further points out that, learners make crucially important decisions about themselves based on the feedback they receive. These decisions include monitoring their own learning by identifying their strengths and weaknesses and taking necessary action on time. According to Stiggins (2006), assessment must go beyond providing mere scores and corresponding judgments about learners learning, it should provide rich descriptions of the current state of learner achievement. That is, assessment should inform learners on how to do better next time by communicating feedback that transmits sufficient understandable detail to guide the learner's actions. In other words both teachers and learners can use the feedback from assessment to determine the next step in the teaching and learning process.

Assessment is also regarded as motivating learning. When learners see improvements in their learning, they get motivated to learn more. Stiggins (2005) illustrates that if learners see a proof of success,

> *What grow in them is a sense of hopefulness and an expectation of more success in the future. This in turn fuels enthusiasm and the motivation to try hard, which fuels even more success. The basis of this upward spiral is the evidence of their own achievement, which students receive from their teachers based on ongoing classroom assessments. Thus, classroom assessment information is the essential fuel that powers the learning system for students* (p. 19).

Thus, learners get motivated and become confident when they see themselves progressing in their learning and improving in their achievements. On the other hand learners get demotivated when they experience failure and defeat especially when compared with others and the set standards.

Accountability is also a key purpose of assessment. Herman (2008) defines accountability as "*the quality or state of being accountable, especially an obligation or willingness to accept responsibility or to account for one's actions*" (p. 213). He also indicates that in educational contexts, accountability carries with it the idea that individuals, organizations, and the community are not only responsible for their actions but must answer for their performance to authorities that may impose a penalty for failure or reward for success. In other words, it is appropriate for those who pay the bills, school fees, provide resources (teachers, infrastructure, books, financial etc.) for learners, to evaluate critically what they get for their money from an education system. The state is entitled to information relating to the progress in the education. Schools are accountable to the state for the use of resources and for the provision of education to its learners (Carr, 2008). On the other hand, schooling is also meant to prepare learners for specific career opportunities; hence employers are interested to know what school leaving learners can contribute towards their economic development. Brady and Kennedy (2009) argue that employers are "*concerned with knowledge and skills that can be applied immediately to specific work requirements*" (p. 5). Thus, different stakeholders in education can use assessment for different purposes as education officers may use it to advice schools on how to improve and also to undertake policy reviews. School authorities may also use assessment for planning, supporting teachers and for determining professional developmental needs of teachers.

Assessment is also used to inform parents about learners' progress. In essence, each and every parent would like to know how his/her child is progressing throughout the year and on the basis of this, makes informed decision about the future of his/her child. O'Leary (2006) asserts that parents need "*a clear statement of strengths and weaknesses at the end of the school year and as part of the process of choosing a school for their child they need access to assessment information that will help them to evaluate the extent to which the school is likely to meet the social, emotional and cognitive development needs of their child*" (p.16). He also mentions that teachers should also be able to provide parents/guardians with progress information at any point during the school year.

From what has been outlined in the above paragraphs, assessment is vital and used for variety of purposes by teachers, learners and other stakeholders in education. It is through assessment that teachers construct a complete and a clear picture of the necessities of each and every learner in the class and plan their immediate and future work accordingly. Thus assessment helps teachers to evaluate their own teaching, to determine the strengths and weaknesses of the curriculum, to diagnose difficulties with individual learners and allow them to pass on information to parent about learners. Assessment can also determine the way in which learners learn as it directs learners on what to study and how to study. Some assessment tasks may require surface level thinking while others may require deep level thinking. The feedback, learners receive can also learners about their level of performance, their strengths and weaknesses. Though assessment serves many purposes, there are a number of factors which influence it. These factors are discussed in the section below.

2.2.3 Factors Influencing Teacher's Assessment Practices

Research studies indicate that there are numerous factors that influence teachers' assessment practices. Matovu and Zubairi (2014) point out that, factors such as academic qualification and teaching experience, class size, training on assessment issues and teacher's assessment beliefs influence teachers' assessment practices. Similarly, Braun, Kanjee, Bettinga and Kremer (2006) indicate that factors such as inappropriate policies, inexperienced teaching force, inadequate facilities, and limited human and financial resources influence teachers' assessment practices.

2.2.3.1 Academic Qualification and Teaching Experience

Matovu and Zubairi (2014) indicate that research conducted on assessment highlighted that teachers' teaching experience influences their assessment practices. They mention that teachers who have taught for longer time, with more experience and high academic qualifications have good assessment practices because they have had continuous interaction with learners' assessment activities. This is not surprising because teachers who have taught for a long period of time may combine their experience with other habits to produce better learning outcomes for their learners. This suggests that teachers with more teaching experience and high

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academic qualification may have better knowledge and skills that would increase their ease in implementing assessment for learning.

However, in their study, Gonzales and Aliponga (2012) found that teachers' qualification did not influence their assessment practices. They further showed that assessment practices of teachers depended largely on the purpose they had set for the class, rather than their educational experiences. The size of the class also influences teacher assessment practices.

2.2.3.2   Class Size

Research in assessment show that the size of the class influences the way teachers assess their learners. Large classes may have a negative impact on teachers' assessment practices especially where a teacher has to write performance statements for individual learners. Matovu and Zubairi (2014) indicate that research studies done in assessment revealed that the number of learners in a class influences the way teachers assess their learners. They point out that large class sizes in assessment are viewed as a threat to the quality of assessments on the side of the teacher because large class sizes lead to poor use of assessment tools and resources, ineffective feedback provided to learners by teachers, lack of concentration by teachers when assessing and lack of time to carry out assessment effectively.

The results of the study carried out by Duncan and Noonan (2007) indicated that the effect of class size on teachers' assessment preferences was very small. On the other hand the results of the study carried out by Gonzales and Aliponga (2012) revealed that teachers with different class sizes significantly differed in their assessment preferences. They concluded that the number of learners in class can influence the assessment practices of teachers. For teachers to effective assess their learners, they should be provided with training that would equip them with effective assessment skills and techniques.

2.2.3.3   Training of Teachers on Assessment

Effective classroom assessment depends on various factors, one of which is the quality of training of teachers' on assessment (Phamotse, Nenty and Odili, 2011). For teachers to implement assessment for learning effectively, they need to be trained on aspects pertaining to this assessment, especially in Lesotho where traditional forms of assessment are still accorded high recognition by all stakeholders (Khalanyane & Hala-Hala, 2014). Professional development programmes therefore, play pivotal role in providing teachers who are already practicing with the skills, knowledge and ways to assess learners, especially with this shift from traditional assessment in which learners display what they have memorised, to assessment for learning in which learners are assessed in context of their own (Al-Nouh, Taqi & Abdul-Kareem, 2014). According to Matovu and Zubairi (2014) empirical studies that have been undertaken in assessment-based training have highlighted that training influences teachers' assessment practices. Hence teachers must be provided with training that would equip them with knowledge and skills about new assessment practices. Teacher's knowledge of assessment would assist in determining the type of assessment to be used for different purposes. The section below discusses different types of assessment.

2.3   TYPES OF ASSESSMENT

Assessment serves multiple purposes, and one way of determining what constitutes effective assessment is in terms of its fitness of purpose. Scriven (1967) was the person to distinguish between two forms of evaluation depending on the role they play. He indicated that evaluation "*may have a role in the on-going improvement of the curriculum*" (p. 41) or it may "*serve to enable administrators to decide whether the entire finished curriculum, refined by use of the evaluation process in its first role, represent a sufficiently significant advance on the available alternatives to justify the expense of adoption by a school system*" (p. 41-42). He suggested "*the terms 'formative' and 'summative' evaluation to qualify evaluation in these roles*" (p. 43). In summary, Scriven (1967) saw summative evaluation as a means of providing information to judge the overall value of an educational programme while the results of formative evaluation were targeted at facilitating programme improvement (Bennett, 2009). Two years later, Bloom and colleagues used the same terminology to make similar distinction but with respect to learners learning. This is what is now

referred to as 'assessment' (Bennett, 2009; Sardareh & Saad, 2013). The two broad categories of assessment are summative and formative assessments.

Summative and formative assessments differ in their characteristics. The distinguishing characteristics are the purpose for which assessment information is used, the frequency at which it is carried out, and level of generalization sought by the items used to collect data for the evaluation (Bloom, Hastings, & Madaus in Taras, 2009). These types of assessments are discussed below.

2.3.1 Summative Assessment

Summative assessment is defined as a process of summing up achievement in some way or conducting a status check on accomplishments at a given point in time (Orlich, Harder, Callahan, Trevisan, & Brown, 2012). This indicates that SA is a tool that is used to measure learners' achievement after instruction has occurred. In summarising the definition of SA, Clarke (2006) indicates that SA is all about summarizing learners' progress at a particular point in time for the purpose of reporting, motivating and evaluating their standards and progress. Summative assessment is an assessment done for the purpose of accountability so as to determine learners' performance level on a specific task, at the conclusion of a unit of teaching and learning or at the end of the year for learners' progression or certification. Research conducted in Lesotho on primary teachers' assessment practices indicated that prior to introduction of AfL, primary teachers were predominately using this form of assessment in assessing their learners and also indicated their limited knowledge about other forms of assessment (LCE & CGDE, 2009, Khalanyane & Halahala, 2014).

Summative assessment has its own characteristics which distinguish it from other forms of assessment. The key characteristics of SA are that it takes place at certain times when achievement is to be reported, it is neither ongoing nor cyclic but periodic. It also relates to achievement of broad goals expressed in general terms rather than the goals of particular learning activities. In this form of assessment, achievement of learners is judged against the same criteria not on the basis of the performance of an individual learner and the judgment is reported in terms of levels

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which need to be underpinned by some quality assurance procedures (Harlen, 2013).

Summative assessment has many uses in education as it is used to inform parents, learners and other stakeholders about learners' achievements at certain intervals of the school year as well as to certify learners' knowledge and competencies. For Boud and Falchikov (2006),

> *Summative assessment enables students to graduate with a validated record of their performance in the program in which they have participated. Certification is used by employers and by educational institutions, typically to make judgments about acceptability for employment and further study* (p. 401).

Likewise, Orlich, Harder, Callahan, Trevisan and Brown (2012) assert that the central purpose of summative assessment is to certify completion of projects, classes, and programmes. They further highlight that the users of summative results include not only learners but also their parents and perhaps future schools and employers. Generally, SA is used to provide information to public about learners' achievement over a specified period of time and also give an indication of learners' potential to progress to other grades or other academic institutions. Though SA is passive and does not normally have immediate impact on learning, it recognizes learners' achievement at different levels of their study.

On the other hand, SA can have negative effects on learners' learning. The study carried out by Paris, Lawton, Turner and Roth (1991) revealed that learners felt "*greater resentment, anxiety, cynicism, and mistrust of standardized achievement test*" (Kapukaya, 2013:16). The conditions under which SA is carried out pose stress on learners that can prevent them from performing up to their level best and it does not give a clear picture of learner's potential. Another negative consequence of SA is that it includes narrowing of the curriculum to include only those aspects which are assessed by the tests. This results in teachers using teaching methods which encourage shallow and superficial learning rather than deep understanding of facts. Basically, teachers end up 'teaching for the test'. Furthermore, summative

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assessments do not provide rich and immediate feedback capable of improving learning outcomes for the learners being assessed since they are carried out at the end of learning.

Recently, SA is equated to assessment of learning. Crooks (2002:240/241) explains that "*assessment of learning (often described as summative assessment) aims to provide a well founded, clear and up-to-date picture of a student's current capabilities or attitudes, progress over time or further growth needs and potential*" (p.240-241). Assessment of learning like summative assessment happens after learning to determine if learning has occurred. It is used to understand whether the students have attained the required knowledge at the end of the course or the unit. As the name suggests, assessment of learning assesses what has been learnt to confirm what learners know and also to see if instructional goals have been achieved. The primary purpose of SA is not to adapt instruction or to remedy learning deficiencies but to summarise learners' achievement over a period of time. It is important that teachers are also familiar with formative assessment which will enable them to improve their instruction thereby improving learners' performance.

2.3.2 Formative Assessment

According Black, Harrison, Lee, Marshall and Wiliam (2003), FA is a process of gathering evidence within the stream of instruction in order to inform teaching and learning. This evidence must be "*elicited, interpreted and used so that formative assessment involves getting the best possible evidence about both teachers and learners*" (Wiliam, 2011: 43). Elaborating on what formative assessment is, Assessment Reform Group (2002) emphasizes that:

> *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 instructions 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* (p.9).

The implication of the above quotation is that in FA, teachers use evidence gathered to adjust their ways of delivering instruction which may lead to improved learners

learning. On the other hand, learners also use this evidence about their performance to improve their learning. Unlike summative assessment which takes place periodically, FA happens throughout the learning process.

Popham (2008) illustrates that FA is a planned process in which the evidence elicited about learners' learning is used by teachers to adjust their ongoing instructional procedures or by learners to adjust their learning strategies. Formative assessment is regarded as an important tool that simultaneously improves teachers' classroom practices and learners' performance (Petit and Zawojewski, 2011). Other proponents of assessment consider formative assessment as "*a systematic process to continuously gather evidence and provide feedback about learning while instruction is underway*" (Sadler in Heritage, Kim, Vendlinski & Herman, 2009, p.24). Hence the general goal of FA is to collect detailed evidence that can be used to improve teaching and learning while it is happening.

Wiliam (2011) indicates that FA involves getting the best possible evidence about what learners have learned and then using this information to decide what to do next. Leahy, Lyon, Thompson and Wiliam (2005) reiterate that in a classroom that uses formative assessment to support learners' learning, the distinction between instruction and assessment is unclear as everything learners do during learning process is a potential source of information about how much they understand. This kind of evidence can be gathered through use of class work, homework, quizzes, class discussions, teacher observations, question and answer sessions, projects, performance assessments, learners' conferences where the feedback gained from these activities is used to enhance individual learner's learning (Douglas, 2008).

Due to its characteristics, formative assessment has increasingly become a focus of policy reform in many countries. Cizek (2010) illustrates that the key characteristics of FA are that learners should take the responsibility for their own learning, while teachers are required to develop plans for attaining desired goals and are urged to communicate these learning goals to learners at the beginning of every lesson so that learners have a clear picture of what they are expected to learn. The other characteristic of FA is that teachers should encourage learners to self-monitor their

progress towards attainment of the learning goals. Formative assessment is also characterized by provision of frequent assessment which includes peer and self-assessment. Feedback that is non-evaluative, specific, timely and related to learning goals is another important characteristic of FA as it provides opportunities for the learners to revise, improve their work, and deepen their understandings.

In addition, Harlen (2005) demonstrates that some of the key characteristics of FA are that evidence gathered about ongoing learning activities can be used to make decisions about further learning; evidence is judged in terms of progress toward the detailed lesson goals, where the goals may vary for different individual learners or for groups and so comparison between learners is not sensible or justified; learners are aware of their lesson goals and can help in deciding their next steps toward the attainment of these goals; the process is cyclical and ongoing and the information gathered is used as an integral part of teaching and learning and no judgment of grade or level is involved.

All the above-mentioned characteristics illustrate that formative assessment occurs many times during the lesson (ongoing), involves different methods which encourage learners to express their thinking and enable teachers to provide learners with immediate feedback which has to be acted upon.

On the basis of the key characteristics of formative assessment, Black and Wiliam (1998) recommend that in classroom where FA is practised, opportunities for learners to express their understanding should be designed into any piece of teaching, for this will initiate the interaction through which formative assessment aids learning. The dialogue between learners and teachers should also be thoughtful, reflective, focused to evoke and explore understanding, and be conducted so that all learners have an opportunity to think and to express their ideas. Feedback provided to an individual learner should be about the particular qualities of his or her work, with advice on what he or she can do to improve, and should avoid comparison with other learners. Finally, learners should be trained in self-assessment so that they can understand the main purposes of their learning and thereby grasp what they need to do to achieve.

The opportunities for teacher–learner interactions which occur during FA enable learners to receive feedback on what they know, understand, and can do. It is through this process that learners recognize, evaluate, and react to their own or others' evaluations of their learning. Thus, the process of formative assessment includes both the teacher and the learner. Both the teacher and the learner adjust on-going instructional activities and procedures used in the learning process. Thus, for teachers to adjust their teaching, they need to know what action to take based on the evidence elicited through FA so that they meet the learning needs of their learners. Hence the strength of FA centres on active feedback that assists both teaching and learning processes (Black & Wiliam, 2004).

Though formative assessment is crucial in the teaching and learning process, the importance of summative assessment cannot be overlooked. Both forms of assessment have important role to play in education. However, research evidence shows that there are some tensions between the use of formative and summative assessment. These tensions are discussed in the section to follow.

2.3.3   Tension between summative and formative

Assessments, whether formative or summative, influence learning in one way or the other as they play an essential role in the teaching and learning process. Formative and summative assessments differ in the purpose for which they are carried out and the timing for administering them. Formative assessment is carried out during the instructional process for the purpose of improving teaching and learning, while summative assessment is carried out at the end of an instructional unit or course of study for the purpose of giving grades or certifying learning. Harlen (2013) points out that FA is not something that happens occasionally; it is integral to the process of making decisions that are happening all the time in the teaching and learning process. On the other hand, SA is carried out for the purpose of reporting achievement at a particular time.

Wiliam (2001) points out that the major difference between formative and summative assessment lies in their use rather than the timing of the assessment. An

assessment can be summative and formative at the same time, based on its functions. That is, the evidence gathered for formative purposes can also be used summatively. When used formatively, assessment supports and enhances learners' learning and when it is used summatively, assessment makes judgments about learners' achievement at the specific point in time.

On the other hand, Gioka (2009) illustrates that the difference between formative and summative assessments lies in the way in which evidence is interpreted and used and not so much in the way it is collected. Harlen (2013) demonstrates that in SA, evidence is interpreted by comparing a set criteria relating to overall goals rather than the goals relating to specific lessons or topics, as in the case of FA. He also mentions that in SA, marking can be done by the teacher or external agency whereas in FA, learners have a role to play in an assessment process.

Summative assessments are frequently criticized for providing information too late on a learner's performance as it happens too far down the learning path to provide information at the classroom level that can be used to make instructional adjustments and interventions during the teaching and learning process. Since summative assessment takes place at the end of the term or unit, only a small amount of content covered can be assessed at the time and this indicates that only those content areas in which the teacher is comfortable with might be assessed and this can have negative impact on learners' learning because assessment guides learning.

Taras (2005: 476) indicates that "… *we must refuse to accept the incompatibility of summative assessment and formative assessment. Instead we must find ways of mitigating the tension, by whatever means we can*". He also argues that summative and formative assessments are inseparably linked and that SA is a necessary starting point for all assessment (Taras, 2010). Hence both formative and summative assessments are integral to teaching and learning process.

It is important to note that both summative and formative assessments support the process of teaching and learning as they are used to report on learners' progress to teachers, parents, and to learners themselves and for accountability purposes (Carr,

2008). Teachers use assessment result to identify successful teaching strategies and to get a holistic view of learners' knowledge, skills and values. In essence, the process of continuous formative assessment leads to summative assessment where learning is evaluated and judgment is passed to establish whether the learner is ready to tackle the content at higher levels (Jacobs et al., 2011). The integration of summative and formative assessments can therefore make the assessment process more meaningful for learners by providing regular feedback that supports learning whilst contributing towards an overall picture of learners learning. Though summative assessment is not intended to have direct impact on learning as it takes place very late in the learning process, it can however, be used to assist learners in their learning in a less direct but necessary way by informing them about their overall performance and their performance in relation to other learners and the set standards. Moreover, FA is an essential way of assuring social recognition of learners' successes both in school and outside. Harlen (2013) indicates that summative assessment enables teachers, parents and schools to keep track of learners' learning, both as individuals and members of a group. Hence, integrating summative and formative assessments can make learning process more authentic in the sense that it would provide both immediate and long term progress of the learner.

It is in this sense that the Curriculum and Assessment Policy (2009) of Lesotho also supports the use of both summative and formative assessments. This policy stipulates that "*there is a need to broaden the modes of assessment to include the following: formative assessment (assessment for learning), which comprises both diagnostic and continuous classroom based assessment and summative assessment for selection and certification purposes*" (p. viii). The implementation of this policy was meant to improve the quality of education provided to Basotho children by ensuring that the reliance on summative forms of assessment are supplemented by authentic assessment strategies that indicate what the learner knows and is able to do. The next section gives an overview of assessment for learning.

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2.3.4 Assessment for Learning

Black and Wiliam (1998) have equated the term formative assessment to assessment for learning as they both describe all the activities undertaken by learners and teachers for the purpose of assisting the learners in finding out where they are in their learning, where they are going, and how to get there. For Gioka (2009), assessment for learning serves its formative function when the evidence fed back to the learners, and the subsequent activities in which they engage lead directly to learning. However, formative assessment may not necessarily be assessment for learning. Broadfoot *et al.* (2002) in Wiliam (2010) argue that though FA is crucial in learning,

> *it may be formative in helping the teacher to identify areas where more explanation or practice is needed. But for the pupils, the marks or remarks on their work may tell them about their success or failure but not about how to make progress towards further learning* (p.23).

Similar concern that FA may be interpreted differently by teachers was also raised by Black *et al.* (2003) who indicated that formative assessment can often mean that assessment is planned and done frequently during teaching process though it may be formative for the teacher, but not for the learners, while in essence formative assessment for the learner should take precedence. Stiggins (2002) states that assessment for learning, is far more than testing frequently or providing teachers with evidence so that they can revise instruction, but it is about putting the learner's learning at the centre of the process.

The enlarged conception of formative assessment where the learner takes precedence is called assessment for learning. According to Sardareh and Saad (2013), the term assessment for learning was first used by Mary James in 1992 and was later used to explain a shift from traditional assessment model that included checking whether the information had been received to a more holistic assessment of the structure and quality of learners learning and understanding.

For Swaffield (2011), AfL differs from FA in a number of ways as assessment for learning is a learning and teaching process, while formative assessment is a purpose and function of certain assessments. For Swaffield (2011), assessment for learning is also concerned with the immediate and near future, while formative assessment can have a very long time span. Furthermore, in assessment for learning learners exercise autonomy, while in formative assessment they can be passive recipients of teachers' decisions and actions. Assessment for learning is regarded as a learning process in itself, while formative assessment provides information that guides future learning.

This new conception of FA which is now referred to as assessment for learning, is more learner-centred as it puts more emphasis on learners' learning. According to Swaffield (2011), assessment that claims to be 'for learning' must have at its core practices to support learners' learning. Assessment for learning is compatible with the theories of learning which regards learners as active role-players in their learning.

Assessment Reform Group (2002) defines assessment for learning as a "*process of seeking and interpreting evidence used by learners and their teachers to decide where the learners are in their learning, where they need to go and how best to get there*" (p. 2). The whole purpose of AfL is to guide the learner from the beginning of the learning process to the attainment of the desired learning outcome.

Likewise, Black *et al*. (2003) succinctly describe assessment for learning as
> *any assessment for which the first priority in its design and practice is to serve the purpose of promoting students' learning…an assessment activity can help learning if it provides information that teachers and their students can use as feedback in assessing themselves and one another and in modifying the teaching and learning activities in which they are engaged. Such assessment becomes "formative assessment" when the evidence is actually used to adapt the teaching work to meet learning needs* (p. 10).

However, in the context of Lesotho, the curriculum and assessment policy has merged formative assessment and assessment for learning (MOET, 2012). Hence in this study, the two forms of assessment have been used interchangeably. Ainsworth

and Viegut (2006), Klenowski (2009), and Matovu and Zubairi (2014) argue that AfL has a number of benefits to both the teacher and the learner. These benefits are discussed in the next section.

2.3.4.1   Benefits of Assessment for Learning

Assessment for learning has varied benefits to both teachers and learners. Assessment for learning allows teachers to adjust their instruction based on evidence, making modifications and improvements that will produce immediate benefits for the learners' learning. It also gives learners evidence of their current progress to actively manage and adjust their own learning. According to Matovu and Zubairi (2014), assessment for learning helps learners to revisit their mistakes, learn from their peers and their past experiences to improve their learning. Similarly, Klenowski (2009), illustrates that "*assessment for learning is 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*" (p. 265). In AfL, teachers use learners past experiences to improve learners' current learning in that when assessing learners, they have to know where learners are in terms of prior knowledge which is then used to guide the acquisition of the new knowledge and skills. In addition, when teachers use AfL, they are better able to determine what standards learners already know and to what extent, they can decide what changes to make in instruction; so that all learners succeed (Ainsworth & Viegut, 2006).

According to Stiggins, Arter, Chappuis and Chappuis (2007), assessment for learning happens while learning is still underway to diagnose learners' needs, plan next steps in instruction, provide learners with feedback they can use to improve the quality of their work and help them see and feel in control of their journey to success. It reveals to learners improvements in their performance and also gives them guidance on how to do better the next time. In a way, it helps learners to identify their strength and weaknesses and to take necessary steps to make timely adjustments and corrections. Through AfL, learners gain a sense of ownership, develop a clear

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understanding of relevant expectations, and track their own achievement (Sayed & Moore, 2010).

Stiggins (2002) reinforces the notion that all parties interested in the teaching and learning process benefit through assessment for learning in several ways:

First they become more confident learners because they get to watch themselves succeeding. Furthermore, learners come to understand what it means to be in charge of their own learning. Teachers benefit because their learners become more motivated to learn. Parents benefit as well in seeing higher achievement and greater enthusiasm for learning in their children. School administrators and instructional leaders benefit from the reality of accountability standards and from public recognition of doing so (p.764).

The above quotation highlights that if regularly used, assessment for learning can benefit all the stakeholders in education, most importantly the learner. For this to happen, teachers should become assessment literate and be able to transform their expectations into assessment exercises and scoring procedure that accurately reflect learner achievement. They should understand and articulate in advance of teaching, the achievement targets that the learners are to hit and these targets should be communicated to learners from the beginning of the learning process. In addition, teachers should use classroom assessment to build learners confidence in them as learners and help them take responsibility of their learning, so as to lay a foundation for life-long learning. Furthermore, teachers should be able to translate classroom assessment results into frequent descriptive feedback for learners which provide them with specific insights as to how to improve. More importantly, teachers should engage learners in regular self–assessment, with standards held constant so that learners can watch themselves grow over time and thus feel in charge of their own success. Finally, teachers should actively involve learners in communicating with their peers, teachers and their families about their achievement and success (Stiggins, 2002:761). All the mentioned principles of AfL suggest that teachers should be knowledgeable about these principles in order for them to effectively implement AfL in their classrooms.

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Research evidence gathered in numerous studies shows that the regular application of principles of assessment for learning can give rise to exceptional gains in learners' achievement, especially for low achievers (Wiliam, Lee, Harrison and Black, 2004 and Chappius, 2009). Black and Wiliam (1998) identified four main features of assessment for learning which give rise to gains in learners' achievement. These features are sharing criteria with learners; developing classroom talk and questioning; giving appropriate feedback; peer and self assessment. Likewise, in their study, James et al in Swaffield (2011) identified three principles of assessment for learning at classroom level. These principles are making learning explicit, promoting learning autonomy and focusing on learning as opposed to performance.

The mostly cited research evidence of Black and Wiliam (1998) watershed research review of more than 250 studies carried around the world on the effect of formative assessment on learners' achievement indicated that "*formative assessment does improve learning and that gains in learners' achievement attributed to formative assessment are amongst the largest ever reported for educational interventions*" (p. 61). They found that FA has substantial positive effects on learners' achievement, with effect size ranging from 0.3 to 0.7 standard deviations (12-26 percentile gains). In particular, they found that FA is more effective for low achievers than other learners, that is, closing an achievement gap and at the same time raising overall achievement of learners.

The results of the study carried out by Wiliam *et al.* (2004) also provided firm evidence that improving FA does produce tangible benefits in terms of externally mandated assessments. They reported that placing a quantitative estimate on the size of the effect is difficult, but it seems likely that improvements equivalent to approximately one-half of a GCSE grade per student per subject are achievable.

On the other hand, Stiggins *et al.* (2007) state that the effect of AfL on learner achievement is some four to five times greater than the effect of reduced class size. They also indicate that few interventions in education come close to having the same level of impact as assessment for learning. They further mention that the most "*intriguing result is that, while all learners show achievement gains, the largest gains*

accrue to the lowest achievers – everyone wins, with those who have the most to win, winning the most" (p. 37).

The most important component of AfL is the clearly stated learning intentions which help teachers to be mindful of what the goals of their lessons are. The learning intentions are the focus of every lesson as teachers have to effectively plan and deliver the lessons with the purpose of achieving the learning intentions. Teachers also facilitate learners learning by communicating these learning intentions so that learners know what is expected of them. This helps learners to understand the purpose of the instruction and may get motivated to engage in learning. Generally, this guided instruction may yield better understanding of the concepts which in turn may improve learners' performance.

In summing up the importance of AfL, Stiggins *et al.* (2007) show that used with skill,

> *assessment can motivate the unmotivated, restore the desire to learn, and encourage students to keep learning, and it can actually create – not simple measure – increased achievement. None of this happens if assessment functions solely as accountability measure, as it does in the case of standardized testing and in determining grades. Because we now understand that assessment can work in positive ways to benefit learning, the time is right to add to our definition of good teaching the skillful use of assessment – doing it right and using it well* (p 3).

The above discussion shows that assessment for learning has many benefits not only to the teachers and learners but to all the stakeholders. It is therefore not surprising that it is often considered to be one of the most effective strategy for promoting high learner performance and quality education.

The Lesotho integrated primary curriculum clearly stipulates assessment for learning principles which primary teachers are expected to adhere to in carrying out their daily assessment practices. One of the objectives of this study was to establish whether teachers' assessment practices were in line with the policy. The principles of AfL stipulated by the policy include among others sharing of learning outcomes and success criteria with the learners, provision of feedback that helps learners to identify

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improvement and use of self and peer assessment techniques to discover areas of improvement (MOET, 2012). The next section discusses the principles of AfL.

2.3.4.2 Principles of Assessment for Learning

Research has indicated that there are seven important principles of assessment for learning. These principles address the three important features of assessment for learning which emanate from its definition. Features of assessment for learning indicate where the learner is in terms of his/her learning, where the learner is going and how best the learner can get there. According to Stiggins *et al.* (2007), the seven elements of assessment for learning are sharing learning intentions with the learners; communicating success criteria to the learners, sharing of exemplars and models of good or bad work, providing learners with descriptive feedback on their performance, guiding learners to self-assess and assess their peers, the teacher designing lessons that assist learners in closing the gap, and focusing on revision and engaging learners in self-reflection.

For Bennett (2011), "*these strategies are used to direct the instructional processes of establishing where learners are (e.g., through questioning), where they are going (by sharing learning expectations), and how to get them there (through feedback)*" (p.8). He further demonstrates that sharing expectations, questioning, providing feedback, engaging in self-assessment and peer assessment are intended to help learners develop internal standards for their work by reflecting upon it and by also taking ownership of learning (*ibid*). Black and Wiliam (2003) illustrate that if these elements are effectively implemented, learners have a good chance of improving their learning. As indicated above, one important principle of AfL is sharing learning intentions with learners so that they know where they are going. This principle has been elaborated in the next section.

Sharing Learning Intentions with the Learner

Learning intentions are important aspects of assessment for learning as they guide learners learning. According to Rashid and Jaidin (2014), learning intention is

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defined as "*a statement that describes clearly what the teacher wants the student to know, understand and be able to do in a lesson*" (p. 74). Clarifying and sharing learning goals with learners should be done right at the beginning of the lesson in order to articulate, and share with learners, the learning that the teacher intends to happen in a lesson. For Wilson (2014), when learners understand very clearly what the learning intention is, and what is necessary to meet this intention, they are more able to take control of their own learning. He further illustrates that it can be extremely demotivating for learners not to know what is expected of them. In the study carried out by Rashid and Jaidin (2014) in Brunei, one teacher showed that "*Learning objectives are important; they help the learners to focus on what they are supposed to learn for that day*" (p. 74). In sharing the success criteria, learners are assisted to attain the learning intentions. The importance of sharing the success criteria with the learners is outlined below.

Communicating Success Criteria to the Learners and Sharing of Exemplars

In assessment for learning, success criteria are regarded as road map that helps learners achieve the learning intention. According to Wilson (2014), "*success criteria are the details of the learning objectives. They break the learning objective down into smaller parts, telling learners exactly what they need to do to meet the objective, and helping learners see where they need to improve*" (p.425). In addition, Rashid and Jaidin (2014) illustrate that success criteria are intended to guide learners' learning, providing a framework within which assessment for learning exists and makes possible the interpretation of evidence. A well developed success criteria make the learning explicit and transparent for learners and teachers alike. It is important that teachers should communicate the success criteria right at the beginning of the lesson when they clarify and share the learning intentions with learners. However, Black and Wiliam (2003) recommend that success criteria should be communicated throughout the learning process as this would assist both the teacher and the learners to stay focused. This is important because Heritage (2010) shows that learners use success criteria to keep track of how well they are moving toward the learning intention, and to make adjustments to their learning whenever necessary.

Evidence taken from a study carried out by Heritage (2010) showed the importance of sharing the success criteria with the learners. In this study, one teacher demonstrated that:

> "*The transparency that sharing learning goals and success criteria creates, allows for so much growth for both teacher and learners. The learners know I am there because I have a goal for them to reach and I want them to succeed. They also know I take every opportunity to gather evidence of what they know. Formative assessment has not only changed me as a teacher, but I believe it has changed the students as learners*" (p. 6).

In AfL, sharing the success criteria with the learners is of utmost importance as they guide learners to reach the desired learning intention. Hence it is important that success criteria are not kept as a secret to the learners and should be made available to the learners throughout the whole lesson.

Apart from using success criteria to clarify the learning intentions, Chappuis (2009) states that carefully chosen examples of the range of quality work can be used to refine learners' understanding of the learning goal. Wiliam (2013) reiterates that a common method for doing this is for the teacher to provide learners with a number of samples of work of varying quality that is, from good to weak, then ask learners to rank them and identify features that distinguish the stronger work from the weaker one. Once the teacher has clearly shared and stipulated the success criteria, it becomes easy for her/him to provide descriptive feedback to learners as per stages provided by the success criteria. The importance of providing descriptive feedback to the learners has been presented in the section to follow.

Providing Learners with Descriptive Feedback

Feedback is another key element of assessment for learning. It is defined in terms of information about how successful the learning intention has been achieved. Ramaprasad in Taras (2005) defines feedback in terms of its effect rather than its informational content. He defines feedback as "*information about the gap between the actual level and the reference level of a system parameter which is used to alter the gap in some way*" (p. 470). For Brown (2004-05), if assessment is to be integral

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to learning, feedback must be at the heart of the process because it helps learners to understand not only where they have gone wrong, but also what they need to do to improve. If feedback is to benefit learners, it should be descriptive as descriptive feedback identifies what learners are doing right, as well as what they need to work on next. At least all learners need to know that there is something that they know and have done it right.

Wiliam (2011) reiterates that feedback functions formatively only if information fed back to the learner is used by the learner to improve performance. In addition, Black and Wiliam (1998) point out that feedback in assessment for learning should be given regularly in the form of comments and should provide information to the learners regarding the learning objectives. When providing descriptive feedback to learners, teachers participating in this study were expected to write performance statements which indicate where the learner went wrong and how the learner can address his/her mistakes as per integrated primary curriculum. For Sadler (1989), effective feedback should provide descriptive and criterion-based information that informs the learners about their learning progression, how their understanding differs from the desired learning intention and how they can move forward.

Elaborating on the importance of feedback, Chappuis and Chappuis (2007-08) show that effective descriptive feedback focuses on the intended learning, identifies strengths, points to areas needing improvement, suggests a route of action learners can take to close the gap between where they are now and where they need to be in terms of their learning. NCTM (2007) supports by giving research evidence which shows that in studies where feedback was most effective; learners were not just told what to do to improve but also how to go about it. Similarly, teachers who participated in Rashid and Jaidin (2014) study showed that AfL provided them with avenue to give learners feedback indicating where learners were on their path to attaining the intended learning intention. An example of an excerpt from one of the teachers illustrates that:

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AfL requires us to give immediate feedback as well, if we let the students know about what they need to correct during the lesson, then the learners will be able to understand the concepts that they're learning (p. 74).

More evidence on the importance of providing descriptive feedback was raised by McMillan, Venable and Varier (2013) who reported that studies on the effect of feedback on learners' learning revealed that "*feedback encouraged students to reflect on their understanding of what was being learned through conversation, debate, and revision, though self-assessment*" (p. 5).

In a nutshell, good feedback practice helps learners understand what good performance entails as it provides learners with exemplars of good/poor work and these exemplars in turn help them to assess their own and peers' work. Good feedback practice also provides learners with opportunities to judge their capabilities against the set standards and to try and close the gap between current and desired performance. Furthermore, good feedback practice can provide teachers with valuable information that can be used to inform their teaching. It is through descriptive feedback that learners can also be able to reflect on their performance and adjust their learning accordingly.

Self-Assessment

Assessment for learning advocates that learners should be involved in the assessment of their own work and progress. The more the learners are involved in their own assessment, the more they are likely to understand the subject matter. If learners are not given a chance to be directly involved in their own assessment, the more difficulties they may face in understanding the subject matter. Self-assessment is an important principle of assessment for learning in which learners take an active role in assessing themselves. Andrade and Du (2007) define self-assessment as

a process of formative assessment during which students reflect and evaluate the quality of their work and their learning, judge the degree to

which they reflect explicitly stated goals or criteria, identify strengths and weaknesses in their work, and revise accordingly (p. 160).

The above definition highlights that self-assessment requires learners to identify their own strength and areas for improvement and use feedback from their own self-assessment to identify what they need to work on. This definition therefore demonstrates that when learners take an active part in monitoring and regulating their own learning, the rate of their learning would dramatically be increased (NCTM, 2007). The implication of this is that teachers should create opportunities for learners to self-assess themselves and take charge of their own learning. To engage in self-assessment, learners should identify criteria to apply to their work and make judgements about the extent to which they have met these criteria and standards (Boud, 2003). Both teachers and learners should understand the importance of self-assessment as it is not about go-away and mark it yourself, but involves an understanding and acceptance of the targets set for the lesson.

For Frankland (2007), self-assessment is an important learning process which can help learners to develop critical reflection, as they have to evaluate their own and other learners' work, to learn responsibility towards others through assessment, and to learn to make critical judgements. Evidence from the study carried out by Carless (2005) showed that learners were able to develop sensible responsibility for the errors they made and also found ways of correcting them.

It is therefore important in teaching and learning to encourage learners to engage in self-assessment as a way of improving their learning and developing a skill for lifelong learning through reflection. Once learners are able to assess themselves, they can also be able to assess their peers, hence the section below elaborates on peer assessment.

Peer - Assessment

Peer assessment is another strategy which is very effective in teaching and learning process. Through the use of the learning intentions and success criteria, learners can critically assess each other and indicate the improvements that need to be made on their peers' work. Wilson (2002) in Frankland (2007) defines peer assessment as the assessment of the work of others with equal status and normally has an element of mutuality. There are several benefits of peer assessment in the teaching and learning process. Some of these benefits are that teachers are alleviated from their heavy workloads (Patri, 2002). Getting learners involved in peer assessment makes the assessment more transparent. Through use of peer assessment, learners tend to learn more deeply as they have a sense of ownership of what is being assessed. Thus, when applying the marking criteria to someone else's work, learners engage in one of the most productive ways of developing and deepening understanding of the subject matter involved in the process. In addition, working with peers could be more relaxing for other learners than working with the teacher as this creates a non-threatening environment which can promote learning. Peer assessment also allows learners to learn from each other's successes and weaknesses (Race, 2001 in Roberts, 2006).

For Wiliam (2006), peer assessment has benefits both for learners who are providing the feedback as well as those who are receiving it. He illustrates that, "*research shows that the people providing the feedback benefit just as much as the recipient, because they are forced to internalize [the] learning intentions and success criteria in the context of someone else's work, which is less emotionally charged than one's own*" (p. 6).

In summarising the active role played by learners during both self and peer assessments, McConnell (2000) in Roberts (2006) says that:

> ... *if learners are actively involved in decisions about how to learn, what to learn and why they are learning, and are also involved in decisions about criteria for assessment and the process of judging their own and*

others' work, then their relationship to their studies will be qualitatively different to those learners who are treated as recipients of teaching and who are the object of others' unilateral assessment (p. 6).

Peer and self-assessments can be used to promote deep learning. However, this can happen if learners have a sufficiently clear picture of the targets that their learning is meant to attain and the success criteria that will guide them to meet the target. Hence learners should be trained in peer and self assessments so that they can understand their role in assessment of their work and the work of their peers. For learners to engage in both peer and self-assessments, the teacher should design a lesson in such a way that it focuses on one aspect of quality at a given time. This aspect is elaborated in the next section.

Design lessons to focus on one aspect of quality at a time

Stiggins *et al.* (2007) suggest that when teachers are working on a learning target with more than one aspect of quality, they should build competence on one concept at a time, making sure that learners understand that all the parts ultimately must come together. They further emphasize that the teacher can then offer feedback focused on the components that have just been taught, which narrows the amount of feedback learners need to act on at the given time. Focusing on one aspect at a time in a lesson, helps learners master a specific learning goal or to address misconceptions or problems arising from the aspect (Chappius, 2009). In a case where the aspect proves to be difficult for learners, teachers can let them practice it in smaller sections and provide them with feedback on the aspects they are practicing and in that way; learners are allowed to revise their initial work with a focus on a manageable number of learning targets or aspects of quality (*ibid)*. A lesson which focuses on one concept at a time helps learners to easily reflect upon their progress. When engaging learners in assessment for learning, teachers should not only focus on one aspect of quality at a time but should also engage learners in activities that will require them to reflect about their learning.

Engage learners in self-reflection

Engaging learners in self-reflection involves them in tracking, reflecting on and communicating about their own progress. According to Stiggins *et al*. (2007),

> *any activity that requires learners to reflect on what they are learning and to share their progress, both reinforces the learning and helps them develop insights into themselves as learners; and these kind of activities give learners the opportunity to notice their own strengths, to see how far they have come, and to feel in control of the conditions of their success* (p. 45).

When learners are reflecting, looking back on their journey, reflecting on their learning and sharing their achievement with others, they get an opportunity to recognise their growth and achievements as well as realising areas which need some improvement.

The elements of assessment for learning discussed above are very important in promoting learners learning. They enable learners to take control of their own learning by providing a clear vision of the learning targets they are to attain guided by the success criteria which assist them to assess where they are with respect to the desired learning outcome. The above AfL strategies, especially self and peer assessments are underpinned and supported by constructivist theories which advocate for active involvement of learners in their own learning. These theories are discussed in the next section.

2.4   LEARNING THEORIES AND ASSESSMENT FOR LEARNING

Current Learning theories emphasise the importance of learning with understanding as opposed to rote learning. The two major theories which advocate for this kind of learning are the Piaget's cognitive constructivism and Vygotsky's social constructivism. Piaget as one of the earliest cognitive constructivists believed that children learn by interacting with the environments in which they find themselves. He maintained that learning occurs through the cognitive processing of environmental interactions and the corresponding construction of mental structures to make sense

of them. Jarvela (2011) indicates that from "*Piagetian perspective, the learning process at large is triggered by states of cognitive conflict between what is understood and what is encountered in active interaction with manipulation of the environment*" (p.156). Alternatively, Edmond (2009) states that cognitive constructivist approaches focus attention on the mental models that a learner uses when responding to new information or problems.

On the other hand, Vygotsky (1978), the founding father of social constructivism, believed that social interaction is an integral part of learning. He believed that learning always precedes development along what he calls "the Zone of Proximal Development (ZPD)". The ZPD is defined as "*the distance between the actual developmental level as determined by independent problem-solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers*" (p. 86). Elaborating on the importance of the more capable peer/ teacher, Vygotsky (1978) stated that with the help of the more-skilled person, a process of negotiation and transformation enables the less competent person to carry out a task or solve a problem that the latter person could not perform without assistance – a process which he referred to as scaffolding or guided participation.

Both Piaget's and Vygotsky's theories stress that learners are in charge of constructing their own knowledge while the teacher's role is that of a facilitator who creates learning opportunities and scaffolds each learner's learning (Hagan & Richmond, 2012). In summary, both theories illustrate that learners construct knowledge and understandings on the basis of what they already know and believe, they learn and create understandings through social interaction and that meaningful learning occurs when learners are actively involved and have the opportunity to take control of their own learning. The two theories, however, are slightly different in that Vygotsky's social constructivism stresses the importance of collaborative learning, discussions and reciprocal teaching while Piaget's cognitive constructivism emphasises the importance of individual engagement with materials through active learning (Hagan & Richmond, 2012).

The two theories have implications on assessment practices. In constructivists' view, assessment focuses on the understandings and the processes by which that understanding has taken place. According to the Report by the Department of Education & Training, Victoria (2005), constructivist view of assessment indicates a shift from;

decontextualised to authentic, contextualised assessment practices; from using one single measure to using multiple measures to build a student's learning profile; from assessing low level of competence and understanding to assessing high level skills; from assessing a few to assessing many dimensions of intelligence; from isolated assessment to integrating assessment within the learning and teaching practices; and from teacher directed assessment to increasing student responsibility in the assessment process (p.3).

James, Black, Carmichael, Drummond, Fox, MacBeath, McCormick, Pedder, Procter, Swaffield, Swann and Wiliam (2007) affirm that most approaches to assessment for learning have been developed within a cognitive constructivist framework for understanding learning, although, Black and Wiliam (1998) have begun to develop a theory of formative assessment drawing on socio-cultural perspectives. In other words assessment for learning blends both cognition and social interaction into a functional theoretical framework by situating individual cognitive development in a context of collective classroom activity (Clark, 2011).

From the cognitive constructivist perspective, assessment for learning can be used as a tool for promoting learning. Baird, Hopfenbeck, Newton, Stobart and Steen-Utheim (2014) point out that cognitive approach to assessment for learning focuses on how information is processed and how learners make sense of this information. One of the strategies of assessment for learning which could be used to promote learning is self-assessment. In this strategy, learners identify their own strength and areas for improvement, they record key points they have learned and questions they still have and use feedback from their own self-assessment to identify what they need to work on.

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Sherpard (2001) in McMillan and Hearn (2008) reveal that learners self monitoring of learning and thinking are important in the knowledge construction that lies at the heart of cognitive constructivism – thus, learners construct meaning, in part, by self assessing prior to, during and after learning. They further point out that through self assessment, learners connect new knowledge, understandings, and skills with what they have already stored and used. Thus, assessment for learning encourages the active involvement of learners in their learning. Peer assessment is another strategy that can be used to promote cognitive conflict by exposing discrepancies between different learners' level of knowledge resulting in a state of disequilibrium. In elaborating how peer assessment impact on learning especially from cognitive point of view, Jarvela (2011) demonstrates that:

> *Interacting with others may encourage students to restructure their own knowledge and understanding. Specifically, explaining the material to others may promote learning by encouraging explainers to rehearse information, recognize and clarify material, recognize misconceptions, fill in the gaps in their understanding, strengthen connections between new information and previously learned information, internalize and acquire new strategies and knowledge, and develop new perspectives and understanding* (p. 163).

Some of the attributes of an effective AfL include collaboration between teachers, and learners, active involvement of learners in self and peer assessments, classroom discourse and descriptive feedback. These attributes are underpinned by constructivist view of learning in which the learner is expected to take an active role in their own assessment. McManus (2008) is of the same view that these attributes are compatible with social constructivist theory of teaching and learning as it recognizes that all learners are capable of constructing their knowledge with the help of the more knowledgeable other (teacher) and their peers. Descriptive feedback which normally comes in various forms enables the learner to identify his/her strengths and weaknesses and then close the "gap" between where the learner is in terms of his/her learning and where he/she is expected to be. In this sense, feedback becomes instructional scaffolding in the ZPD.

Assessment in constructivist view also requires the change in teacher's assessment practices. Teachers' assessment practices should enable learners to demonstrate deep understanding of concepts rather than surface knowledge and recall of facts. In other words, assessment practices should help in exposing learners' thinking processes to themselves and their teachers, they should also provide feedback which could be used by learners to modify and refine their thinking, and by teachers to modify their instruction. These assessment practices should reflect where learners are and how they could be supported to reach the desired performance. Most importantly, these assessment practices should emphasise the use of self-assessment and peer-assessment as these are the vehicles through which learners can reflect upon their learning and make some improvements where necessary. While it is important for teachers to create opportunities for learners to engage in both self and peer- assessments, teachers also have important role to play in assessing learners. The next section outlines the role played by teachers in assessment for learning.

2.5   THE ROLE OF A TEACHER IN ASSESSMENT FOR LEARNING

Assessment for learning has proved to be a valuable tool in providing teachers and their learners with information they need in promoting learning especially when effectively used. However, for this to happen, teachers should play certain roles. These roles include selecting appropriate assessment tasks, creating an environment that allows learners to freely participate in classroom activities, posing of questions to check on learning, marking of written work and providing immediate feedback, teaching learners to assess their own learning and the learning of their peers (Black, 1998 and Heritage, 2007).

Black and Harrison (2000) stipulate that the choice and structure of tasks to stimulate learning is of central importance. They point out that teachers have to select tasks that are justified in terms of the learning aims they serve. Teachers should also create conducive environment that allows learners to participate freely in classroom activities. They must create a classroom culture where all learners feel that the classroom is a place where they are respected and valued and they have an important contribution to make. Heritage (2007) points out that;

teachers must have the skill to build a community of learners, characterized by a recognition and appreciation of individual differences. Classroom norms of listening respectively to one another, responding positively and constructively, and appreciating the different skill level among peers will enable all learners to feel safe in the learning environment and learn with and from one another (p. 144).

Questioning is one of the strategies that is also regarded as important in AfL. Through questioning, the teacher finds out what learners already know, identifies learning gaps in learners' knowledge and understanding and help them to close the gap between what they know and the learning goals. According to Johnston-Wilder (2005), through questioning, teachers can find out what learners know, understand and can do; they can also explore learners' misconceptions and help them to learn to ask effective questions of themselves. In asking questions that require learners to identify, explain, or demonstrate what they know, the teacher can identify gaps and misconceptions learners have. While asking questions, Johnston-Wilder (2005) asserts that it is important that teachers allow the learners thinking time in order to consider their questions and possible answers before responding to the question, so that all learners could be expected to become actively involved in the question and answer discussion.   Elaborating on the importance of questions in AfL, King (1992) in White (2009) shows that:

Formulating high-level questions based on the presented content forces students to identify the main ideas presented and think about how those ideas relate to each other and to the learners' own prior knowledge and experience. Responding to others questions further extends such high-level of thinking. When learners think about and elaborate on course materials in these ways, they process the ideas more thoroughly and construct extensive cognitive networks connecting the new ideas together and linking them to what they already know. Developing such cognitive representations of the new material facilitates understanding (p. 210).

In a nutshell, when teachers ask questions that require learners to explain their thinking that provide examples of metacognition, these can elicit the type of evidence

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that AfL requires. During instruction, questioning is the only type of assessment that can operate continuously during the course of teaching and learning to provide both teachers and learners with feedback (Walsh & Sattes, 2011). Hence the teacher's role is to ask questions that provoke learners' thinking and promote metacognition.

Feedback is another important feature of AfL. The use of AfL provides feedback to the teacher about the current levels of learners' understanding which informs what the next step in learning should be. Feedback is also central in guiding learners in rectifying their own mistakes. Brown (2004-05) shows that formative feedback is crucial and should be detailed, comprehensive, meaningful to individual learners, fair, challenging and supportive. Likewise, Heritage (2010) indicates that feedback designed to improve learning is more effective when it is focused on the task and provides learners with suggestions, hints, or cues, rather than given in the form of praise or comments about performance. This therefore, suggests that if teachers give learners marks or grades only, learners do not benefit that much from this kind of feedback because it does not guide them on which aspects they should improve and how they should do that.

However, learners who are given relevant and elaborate comments are the ones who benefit more, as this kind of feedback provides specific guidance on learners' strengths and weaknesses. Therefore, the work of the teacher is to provide learners with feedback based on the learning intentions and success criteria, indicating what they have done well and where they need to improve, and also how they can improve their performance. The teacher should avoid feedback that compares learners' performances. The role played by the teacher during AfL is greatly influenced by the knowledge and skills they have about it. Furthermore, the effective use of AfL can also be influenced by a number of factors. These factors are discussed in the next section.

2.6 FACTORS INFLUENCING SUCCESSFUL IMPLEMENTATION OF ASSESSMENT FOR LEARNING

There are several factors that may influence teachers' ability to implement assessment for learning. These factors may affect the implementation of AfL positively or negatively. Teachers' understanding of AfL is one of the key factors that may affect successful implementation of AfL in the schools. In implementing any innovation, the importance of training cannot be overlooked as it is believed to initiate change in beliefs, attitudes and perceptions of teachers. Training may increase teachers' self-efficacy and confidence in an implementation of an innovation. Continued support and follow-up are very critical especially after the initial training as teachers need some time to experiment an innovation in their classrooms (Guskey,1985). Resources also play an important role in successful implementation of an innovation. The concerns teachers may have about an innovation may also affect the implementation of the innovation. Since the present study was looking at teachers' assessment practices especially in the light of the new policy which advocates for the use of assessment for learning, it was important for the researcher to establish how some of these factors may influence teachers participating in the study. These factors are individually discussed in the next section.

2.6.1 Clarity of Assessment for Learning Policy

Clarity is an important factor for implementing change as Teachers are often asked to implement a curriculum change without being given a clear explanation and guideline of how to put the change into practice. Fullan (2007) defines clarity as a clear understanding of goals and means of what needs to be changed and whether that change is necessary. He warns that "lack of clarity, diffuse goals, unspecified means of implementation represent a major problem at the implementation stage, teachers and others find that change is simply not very clear as to what it means in practice" He goes further to suggest that "unclear and unspecified changes can cause great anxiety and frustration to those sincerely trying to implement them". (Fullan, 2001:77). Hence, the issue of clarity should be addressed prior and during implementation process because if it is not addressed in time, teachers may have

different perceptions of the implemented change which may cause some them to go back to their old ways of doing things. This may happen not because teachers are resistant to change but are unclear about what they are expected to do and how to do it. If policy implementers are not clear about their roles in the implementation of the policy, they may sometimes demonstrate what Fullan (2001) refers to as 'false clarity'. He illustrates that false clarity "occurs when change is interpreted in an oversimplified way; that is, the proposed change has more to it than people perceive or realize" (p. 89). In this case teachers would think that they have changed while they would have only assimilated superficial meanings of the new practice. That is, teachers may think that they know and understand what the innovation requires yet they do not know.

In this study, teachers' perceptions of assessment for learning and their enactment of assessment for learning practices were examined.   This was done in order to establish whether primary teachers in Lesotho have a clear understanding of what AfL policy is all about.

Assessment for learning is one form of assessment which is very demanding on both teachers and learners. As a result, if Lesotho primary teachers are to implement AfL effectively as required by the policy, they need to have a clear understanding of what it is and the roles they have to play in its implementation. Hence teachers have to be given a proper training on what AfL is and other issues relating to it, prior to its implementation. The importance of training in the implementation of an innovation has been elaborately discussed below.

2.6.2 Training

At the heart of any educational change is the learning of new ways of thinking and doing things which can only be achieved through training of those who are involved in the process of change. In this study, for teachers to be able to learn new ways of assessing learners as per the curriculum and assessment policy, they have to undergo professional development training that would change their ways of thinking

and their assessment practices. For Guskey (2002), professional development training programmes are "*systematic efforts to bring about change in the classroom practices of teachers, in their attitudes and beliefs, and in the learning outcomes of learners*" (p.381). Prior to implementation of any new practice, teachers need training so that they are exposed to a variety of approaches in handling the practice and also in making sense of it. Wylie and Lyon (2012) indicate that to successfully implement AfL, teachers should be provided with a professional development programme that will help them develop an understanding of how to collect, analyse and interpret evidence of learners' learning, how to make strategic adjustments, and how to provide feedback that supports learning.

Similarly, Hargreaves (2003) in Reyneke *et al.* (2010) state that literature makes it clear that it is impossible to successfully implement change in an education system if serious investments are not made in the professional development of teachers. Implementing assessment for learning requires teachers to unpack a number of concepts and different strategies. To do this, teachers should be equipped with knowledge and skills about assessment for learning. Failure to equip teachers with relevant knowledge and skill may result in teachers who may not be able to implement the innovation as expected.

In the study carried out by Hashim, Ariffin and Hashim (2014), one of the respondents indicated that teachers need to be given a clear assessment requirement and detailed guidelines so that they could do their job well, otherwise they become frustrated, dissatisfied and feel that they are forced to implement the system which they are not familiar with.

Norzila (2013) in Raman and Yamat (2014) also reported similar findings that lack of training is one of the major challenges in the implementation of the assessment for learning. She illustrated that teachers' skills had been found to be inadequate especially in the aspect of developing various assessment instruments other than written tests which they were used to. Similarly, the study carried out by Raman and Yamat (2014) revealed that teachers were also constrained by lack of training in implementing school-based assessment. One of the teachers said "o*ur lack of*

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knowledge on such type of assessment is being a major barrier for us to implement the new system" (p. 69).

It is important to note that making changes in classroom assessment is a big change for teachers and learners alike. For teachers to implement an AfL as expected, they require training in this area in order to provide them with knowledge and skills necessary to make the required changes. However, providing teachers with training on assessment for learning is not enough if they are not given the required support especially at the initial and during implementation phases. The next section elaborates on the need for support in implementation of an innovation.

2.6.3 Support

Follow-up support to teachers during the implementation stage of an educational reform is one of the most important features of professional development programme. For Ingvarson, Meiers and Beavis (2005), professional development programme must have a provision for 'at the elbow' support for teachers as they apply the new ideas and skills in their classrooms. This is because provision of support allows teachers who are implementing the new practice to tolerate the anxiety of the challenges they meet. O'Sullivan (2002) illustrates that if teachers are not provided with necessary support upon completion of a training programme, they have high chances of going back to their old practices under a new name. He further posits that the process of implementing a change is complex, difficult and often painful as it involves loss, anxiety, uncertainty and struggle as teachers grapple with the meaning of change. Hence teachers need adequate support during an implementation of assessment for learning to enable them to cope with challenges that may arise.

The study carried out by Truesdale (2003) found that teachers who attended the professional training workshop and were supported during implementation were able to transfer the newly learned teaching practices in their classrooms while those who attended the workshop only quickly lost interest in the skill and did not continue to

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use it in their classrooms. O'Sullivan (2002) also reports that the study carried out by Harvey (1999) revealed that teachers who received support made substantial changes in their classroom teaching, whereas most teachers who received workshops only remained similar to those who did not receive any training.

Provision of support and follow-ups are critical in ensuring effective implementation of knowledge and skills acquired from professional development programmes. Provision of support helps teachers to explore the challenges that come with the implementation of the new practices. Although teachers may be willing to implement AfL in their classrooms, there are some factors which may hinder them from implementing it. These factors are discussed in the next section.

2.7 FACTORS HINDERING IMPLEMENTION OF ASSESSMENT FOR LEARNING

Implementing a new practice such as assessment for learning is a complex process which is influenced by numerous factors. Teachers as implementers of a change have their own reservations and concerns regarding implementation of a new practice. These reservations and concerns may impact the implementation of the new practice negatively. Hord, Rutherford, Huling-Austin, and Hall (1987) point out that as teachers change their practices by adopting the new ones; they have different types of concerns. These concerns can be classified into teacher-related, school-related and system-related.

2.7.1 Teacher-Related Concerns

In implementing any educational change, teachers as implementers of change have some worries concerning how the change is going to affect them. Some of the worries include lack of ownership or understanding of the innovation itself; whether there will be provision of professional development training; whether the change will be fitting well with their existing values and beliefs; whether they will be able to address all the challenges they meet as they implement the change and whether

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they will be provided with the necessary support during implementation. For Hargreaves (2001), teacher-related concerns focus on the feelings and personal beliefs of teachers during implementation of change. He indicates that in implementing change, teachers are concerned with the "*meanings and interpretations they assign to change, how changes affect and even confront their beliefs as well as their practices, how they understand the changes that face them, and the impact of change on teachers' ideas, beliefs, emotions, experiences, and lives*" (p. 117). Summarising teacher-related concerns, Fuller, Parsons, and Watkins (1974) indicate that teachers' concerns at this stage are focused on gaining information about the innovation and finding out how it will affect them personally. Some of the research evidence on teacher-related concerns is discussed below.

The study carried out by Weeden, Winter and Broadfoot (2002) illustrated that the challenge for teachers was to clarify what they understood by 'assessment for learning'. Likewise, Kapambwe (2010) in his study also noticed that AfL had been subjected to great deal of abuse and misinterpretation by teachers as most of them appeared not to understand the rational for this kind of assessment in the school system. These results were similar to those obtained by Oduro-Okyireh, Akyina, Ansah-Hughes and Torkornoo (2015) who observed that teachers who participated in their study lacked the conception of formative assessment and were generally involved in certain formative assessment practices which they did not associate them with formative assessment. Apart from teacher-related concerns, teachers also have concerns emanating from the school.

2.7.2 School-Related Concerns

According to Fuller, Parsons, and Watkins (1974), when teachers' self-concerns decrease, the teaching-situation concerns increase. These are the concerns in which the teachers learn how to manage the innovation and incorporate it into their routines in an efficient manner (Hall, George & Rutherford, 1979). Thus, when implementing change in the school, there are certain 'forces' which impact negatively on the implementation of the change. These concerns relate to what teachers are required

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to do. It may be whether the school culture will support the change; whether there will be adequate school-based resources that will enable them to implement change successfully; whether they will have enough time to learn and put the new ideas into practice and whether they will be able to manage the workload they have as a result of the implementation of the change. Evidence emanating from research studies on school-based concerns is given below.

A teacher who participated in Raman and Yamat (2014) study revealed that

> *I spend a lot of time to do the assessment especially in a class that has more than forty or fifty students. They have to repeat the task if answered wrongly. So, I have to reassess those students and at the same time have to manage the classroom. Additionally, I need to prepare extra exercises for the rest during individual assessment* (p. 68).

In addition, Raman and Yamat (2014) point out that "*besides occupying their working hours fully, teachers still have to work on their extra heavy workload after school hours. Assessment on each student in each classroom needs additional time than the usual lesson hour*" (p. 69). They further indicate that teachers in their study felt that assessment for learning added extra workload and pressure to their daily routines of packed timetables. Raman and Yamat (2014) report that one of the teachers in their study indicated that in "*addition to their daily teaching preparations, they had to do extra marking, filing, documentation, paperwork and reassessment, extensive record keeping and monitoring of individual learners*" (p.69). They illustrate that all the additional workload needs additional time to accomplish.

Weeden (2002) shows that the introduction of AfL strategies such as sharing objectives, self and peer assessments, may appear to reduce the time for teaching. He further states that teachers may need to spend more time marking learners work and feeding back comments. This issue is even worse in classes where enrolment is large as teachers have to provide individualistic feedback. The number of learners in

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a class makes it difficult for teachers to be sensitive or observant of individual learner's progress. Raman and Yamat (2014) state that in a situation where a teacher has too many learners in a class, it becomes very difficult for the teacher to get to know each and every learner's strengths and weaknesses. This is further evidenced in the study carried by Kapambwe (2010) in which teachers indicated that the "*workload became higher as they were required to mark and keep records of the progress of all learners*" (p.104). The challenge of large classes is also exacerbated by shortage of teachers in the schools. The study carried by Kapambwe (2010) revealed that high pupil to teacher ratio was another challenge for teachers who participated in his study. Huge class sizes are likely to have an effect on resources that are needed for effective implementation of AfL.

Resources have been presented as one of the major challenges facing effective implementation of assessment for learning in schools. OECD (2005) indicates that one of the challenges of implementing AfL is the fear that it is too resource – intensive. Kapambwe (2010) indicated that the majority of teachers who participated in his study complained that they had inadequate teaching and learning materials, and they needed a lot of support in the form of materials and equipment. Norzila (2013) in Raman and Yamat (2014) also stated that materials on AfL were found to be insufficient for teachers to refer to whenever they met a problem or had uncertainties on how to implement it successfully. Similarly, teachers who participated in Raman and Yamat (2014) study pointed out that "*we do not have sufficient materials to implement the school-based assessment*" (p. 69).

Evidence from the study carried out by Reyneke, Meyer and Nel (2010) showed that participants were concerned about lack of resources. According to Reyneke *et al.* (2010), participants in their study indicated that even basic furniture such as desks and chairs were not enough. The study further revealed that important policy documents which teachers needed for referral were not supplied by the relevant authorities - "*the supply of some of the documents that I (am) supposed to use still present a challenge and still others are outdated and there is not efficient help from*

either the department or subject advisor or curriculum advisor" (Reyneke *et al.*, 2010:285).

In the study carried out by Lumadi (2013), one teacher who participated in the study indicated a concern about the amount of paper work involved in the new assessment approach. This teacher illustrated that they tend to focus more on paper work than on actual teaching and this has increased her workload. Besides the school-related concerns, teachers still have concerns related to the system itself. These concerns are presented below.

2.7.3 System-related Concerns

For Fuller, Parsons, and Watkins (1974) when the school-related concerns also decrease, the system-related concerns become dominant. This is the stage where teachers are concerned about the effects of an innovation on the learners and what can be done to improve the effectiveness of the innovation (Hord, Rutherford, Austin & Hall, 1987). For Hord *et al.* (1987), these types of concerns are not popular amongst many teachers though they still occur in some cases.

The above discussion illustrates that teachers usually have concerns regarding the implementation of any new practice and these concerns should be addressed prior and during implementation so that the new practice could be effectively implemented. The present study will therefore inform the policy developers about teachers' concerns regarding the implementation of assessment for learning and this will help them to address these concerns before more damage is done.

2.8 SUMMARY

In this chapter, the wide literature on the definition of assessment, its purposes as an importantant tool that monitors learners learning progress were reviewed. The literature continued to discuss factors that influence teachers assessment practices

which included teacher academic qualification, teaching experience, class size, and the type of training they received. There are two main types of assessment which this chapter looked into, namely summative and formative. The tensions that are percived to be there between them were also discussed. Of these two types of assessment, FA was discussed in relation to the learners' learning. The chapter went further to relate FA with AfL which forms the basis for this study.   All aspects of AfL, including its definition, strategies and the factors which influenced and hindered its implementation were broadly reviewed. Learning theories supporting AfL formed part of this chapter. The next chapter discusses the theories underpinning this study.

CHAPTER 3

THEORETICAL FRAMEWORK

"*If reforms are to be successful, individuals and groups must find meaning concerning what should change as well as how to go about it" (Fullan, 2001:xi)*

3.1   INTRODUCTION

Research has shown that primary teachers in Lesotho mostly use summative forms of assessment (LCE & CGDE Report, 2010). These forms of assessment do not promote or enhance learners' understanding of mathematics on day to day basis. If teachers are to strive to teach for learners' understanding of mathematics, they need to use formative forms of assessment which assess learners' understanding in ways that inform instruction and support learners' learning. Teachers also need to see assessment as an integral part of the instruction process and also as a crucial endeavour for helping learners learn (Guskey, 2003).

Unfortunately, a study conducted by LCE and CGDE (2010) on assessment issues in primary schools in Lesotho, indicated that teachers had admitted limited expertise on assessment and had indicated their need for assistance on issues pertaining to assessment strategies. Similarly, Guskey (2003) indicates that in situations where teachers have limited expertise on assessment, "*they rely heavily on the assessments offered by the publisher of their text-books or instructional materials*" (p.7). He further points out that in the case where there are no suitable assessments available for teachers; they tend to construct their own in a haphazard manner, "*with questions and essay prompts similar to the ones that their teachers used*" (p.7). In their study conducted in Maseru, Lesotho, on the extent to which teachers' assessment practices enhance learners' understanding of mathematics, Khechane and Makara (2013) noted that almost all primary teachers who participated in their study relied heavily on assessments that were provided in the prescribed learners'

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textbooks. This according to Guskey (2003) is an indication of the teachers' deficiency towards classroom assessment.

In 2009, MoET developed and introduced CAP in Lesotho primary schools. This Policy stipulates that "*there is a need to broaden the modes of assessments to include formative assessment/assessment for learning which comprises both diagnostic and continuous assessment/classroom based assessment*" (p. viii). The policy further points out that FA/AfL should be used in schools at all levels to check the learning progress. The policy urges teachers at primary level to use FA/AfL for diagnosis of learning difficulties and identifying areas requiring attention. This policy gave rise to the new Integrated Primary Curriculum which was implemented in 2010. The new integrated primary curriculum was introduced together with AfL policy. Both policies came with a lot of changes which required teachers to adjust their current teaching and assessment practices in implementing them.

The next section discusses educational change process and how it affects teachers as agents of change. In order to understand how teachers as agents of change react in the way they do, different models of teacher change are also discussed in this chapter. Since every innovation comes with its challenges, the Concerns-Based Adoption Model (CBAM) is also used in this study to provide a framework for understanding teachers' challenges during implementation of assessment for learning. The CBAM is also discussed in this chapter.

3.2   THE TEACHER AND THE CHANGE PROCESS

Change is a process that does not happen within a short period of time, but it is a progressive process that takes time and persistence (Bishop, O'Sullivan & Berryman, 2010). It is therefore important to understand what change is and how different individuals react to it. According to Carlopio (1998) in Shen (2008), "*change can be described as the adoption of an innovation, where the ultimate goal is to improve outcomes through an alteration of practices*" (p.73). On the other hand Fullan (1992) claims that "*change is a process of learning new ideas and things. It is*

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learning to do and learning to understand something new" (p.22). Both of these definitions imply that people who are directly involved in the process of change are required to alter certain practices they have, as the purpose of any educational change is to help teachers replace some of their practices with better ones. Shen (2008) shows that there are a number of strategies that are used to implement change. He asserts that implementing change is not easy as it can sometimes be painful. Reasons why change can sometimes be painful could be that, it naturally creates uncertainty and can be emotionally challenging as it creates a sense of overload among teachers (Hargreaves, 1994 and Bowers, 2011). Fullan (2001) outlines some of the reasons which make educational change difficult to implement as follows:

- Poor conceptualization or lack of clear demonstration about the change itself. That is, it is not obvious who will benefit and how. What the change will achieve for students is not particularly spelled out;

- The change is too broad and ambitious so that teachers have to work on too many fronts, or it is too limited and specific so that little real change occurs at all;

- Change is too fast for people to cope with, or too slow such that teachers become impatient or bored and move on to something else;

- Change is poorly resourced or resources are withdrawn once the first flush of innovation is over. There is not enough money for materials or time for teachers to plan. The change is built on the backs of teachers, who cannot bear it for long without additional support; and,

- There is no long-term commitment to the change to carry people through the anxiety, frustration and despair of early experimentation and unavoidable setbacks (p. 1).

If reasons outlined above are not addressed, it is likely that many innovations in education will not be implemented successfully by the teachers. Fullan (1991) as cited by Shepardson (2001) believes that "*the key to successful implementation of any change is the clear, coherent, and common meaning for all individuals involved about the purpose, the requirements and process of change*" (p.53). For Fullan and Miles (1992, pp.745-752), the successful change could be achieved through seven

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orientations that have to be incorporated into thinking and reflected in the actions of those involved in the change process. These seven orientations are discussed below.

1. Change is learning- loaded with uncertainty. It is a process of coming to grips with new personal meaning, and so it is a learning process. Even well-developed innovations represent new meaning and new learning for those who encounter them initially and require time to assimilate them.

2. Change is a journey, not a blueprint as rational planning models for complex social change do not work; rather what is needed is a guided journey.

3. Problems are our friends. The key to solving problems of reform appears to be more likely when schools are working on a clear, shared vision of where they are heading and when they create an active coping structure that steadily and actively tracks problems and monitors the results of coping efforts.

4. Change is resource hungry as it demands additional resources for training, for substitutes, for new materials, for new space, and, above all, for time.

5. Change requires the power to manage and this management lies in the effort of all parties involved in change.

6. Change is systemic and does not only focus on structure, policies, and regulations but also focus on deeper issues such as the culture of the system.

7. All large-scale change is implemented locally as change cannot be accomplished from afar.

From the above discussion, it is evident that teachers can change their assessment practices if they understand what AfL is and are clear about their role during implementation phase. In addition, teachers cannot resist change if they find that the ideas about AfL are beneficial to them and their learners, and also if they are provided with continual support for sustenance of the practice. Richardson and Placier (2001) in Alexander and Winne (2012) identify teacher change as work described in terms of learning, development, socialization, growth, improvement, implementation of something new or different, cognitive and affective change, and self-study.

On the other hand, Davis (2003) illustrates that the key elements in promoting teacher change are enabling teachers to reflect upon and make explicit their personal practical knowledge, beliefs, attitudes and concerns; considering teachers' knowledge and practices as the starting point of change; providing teachers with training in reform-based strategies; giving teachers opportunities to see reform strategies modeled and reflected upon; enabling teachers to design inquiry-based instructions and practice them in the context of supportive classroom environments where feedback is provided; and provide teachers with collaborative settings with other teachers.

Changing teachers' practices takes a long time, and several cycles of trial and error in an effort to understand and affirm that an innovation is necessary. Elmore (1996) in Smith *et al.* (2003) points out that "*teachers have to feel that there is some compelling reason for them to practice differently, with the best direct evidence being that students learn better; and teachers need feedback from sources they trust about whether students are actually learning what they are taught*" (p.12). In order to understand the process of educational change, Fullan's model of educational change which provides an outline on how the change process occurs has been presented in the next section.

3.2.1 Educational Change Model

The seminal work of Fullan (1991) provides a framework in understanding how the change process occurs. This framework suggests that the process of educational change consists of three overlapping stages, namely, initiation, implementation and institutionalisation. These three stages are discussed in the next section.

Stage 1: Initiation

Initiation stage involves deciding to embark on innovation, and of developing commitment towards the process of change (Hopkins, 2001). According to Fogarty and Pete (2007), "*this stage involves planning an introductory awareness that*

establishes the context, goals, process and time line for all who are involved" (p. 9). Miles (1986) in Hopkins (2001) identifies factors which he believed make successful initiation. These factors are that the innovation should be tied to a local agenda and high profile local need. Furthermore, Miles points out that there should be a clear, well-structured approach to change and an active advocate or champion who understands the innovation and supports it. For Miles, there should be an active initiation to start the innovation which must be of good quality. These factors show that at initiation stage, accurate and relevant evidence about an innovation is made available to guide decision making.

Stage 2: Implementation

Implementation stage is where the innovation is now put into practice. The key factors here are following the action plan, the development of commitment and solving of problems that arise as a result of changing practices (Hopkins, 2001). For Miles (1986) in Hopkins (2001:40), factors which result in successful implementation of an innovation include clear responsibility for orchestration/coordination, shared control over implementation, that is, empowerment of both individuals and the school; mix of pressure, insistence on doing it right, and support; adequate and sustained staff development and in-service training; and rewards for teachers. Fogarty and Pete (2007) illustrate that it is in this stage that attention should be given to the appropriate practice, feedback, and coaching that are needed to ensure success.

Stage 3: Institutionalisation

At this stage, innovation and change stop being regarded as something new and become part of a daily routine. According to Fogarty and Pete (2007), to institutionalise change means that *"the initial innovation permeates every aspect of the institution, becoming ingrained in its very principles, practices, and policies"*. At this stage, innovation is assimilated into institutional structures. Fogarty and Pete (2007) elaborate that institutionalising an idea is usually a long and difficult journey with stops and goes along the way which is characterised by obstacle and challenges, and readiness and rewards.

Miles (1986) in Hopkins (2001:40) identifies a number of factors which he believed make successful institutionalisation. These factors are elimination of competing or contradictory practices; emphasis on embedding the change within the school's structures, its organisation and resources; elimination of competing or contradictory practices; strong and purposeful links to other change efforts, the curriculum and classroom teaching; widespread use of an innovation in the school and local area; and adequate bank of local facilitators for skills training.

In summarising the process of educational change, Fogarty and Pete (2007), warn that if the initiation process goes overboard, when it becomes too comprehensive, too complicated, and too complex, participants would become overwhelmed and worn out right at the beginning of the process. They further caution that by the time the implementation stage begins, people may be burned out, negative, and too resistant to do anything more. Since educational change impacts on teachers, implementation of educational change should also change their beliefs, practices and the attitudes. The next section discusses some of the models elaborating on the process of teacher change.

3.2.2 Teacher Change Models

There are different theoretical models which elaborate the stages in the process of teacher change. One of the earliest teacher change model was developed by Lewin in 1951 (Guskey, 2002). This model offers a three step approach to implementing structured change. The three steps are unfreezing, transition and refreezing. During unfreezing stage, old behaviors should be discarded and the new ones be successfully adopted. During this period some confusion might be experienced as a result of moving from old ways of doing things to the new ones (Sarayreh, Khudair & Barakat (2013). According Kritsonis (2005), this first stage involves unfreezing the existing situation or status quo where unfreezing is necessary to overcome the strains of individual resistance.

In transition phase, individuals develop new behaviors, values and attitudes thereby moving to a more acceptable set of behaviors (Sarayreh *et al.* 2013). On the other hand, Kritsonis (2005) indicates that in this stage, it is necessary to move the target system to a new level of equilibrium by persuading individual teachers to agree that

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the status quo is not beneficial to them and encouraging them to view the problem from a fresh perspective, work together on a quest for new, relevant information.

The final stage which is refreezing takes place after the change has been implemented in order for it to be sustained or to last for a long time (Kritsonis, 2005). He further demonstrates that the purpose of refreezing stage is to stabilize the new equilibrium resulting from the change by balancing both the driving and restraining forces.

This model, however assumes that change happens in a linear manner and does not consider human feelings and experiences which can have negative consequences on the implementation of an innovation. Another linear model similar to that of Lewin was developed by Guskey.

3.2.2.1   *Guskey's Model of Teacher change*

According to Guskey (1986), teacher professional learning programmes are vehicles in bringing "*change in the classroom practices of teachers, change in their beliefs and attitude, and change in the learning outcomes of learners*" (p.5). Guskey's model maintains the linear nature similar to that of Lewin, except it assumes that changes in teachers' attitudes and beliefs occur only after changes in classroom practices have led to change in learners learning outcomes as shown in Figure 3.1. The theory suggests that professional development program itself is not necessarily the important component in changing one's practices. In other words Guskey's model indicates that the impact on teachers' beliefs and attitudes is much more likely to become a reality only after teachers have seen an improvement in their learners' learning outcomes.

According to Guskey (2002), becoming a better teacher means enhancing learner learning outcomes. He indicates that significant changes in knowledge, beliefs and attitudes of teachers are likely to take place only after changes in learning learning outcomes have become evident. The model does not cater for any change in knowledge, beliefs and attitudes that may come as a result of change in teachers'

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classroom practices initiated by professional development. Richardson and Placier (2001) in Zwart, Wubbels, Bergen and Bolhuis (2007) assert that changes in beliefs appear often to precede changes in practices, or that the process of changing beliefs and practices is at least interactive and synergistic. On the other hand, Brown and Renshaw (2006) argue that change in teaching practices requires teacher to negotiate with past practices, while maintaining useful skills and techniques that work.
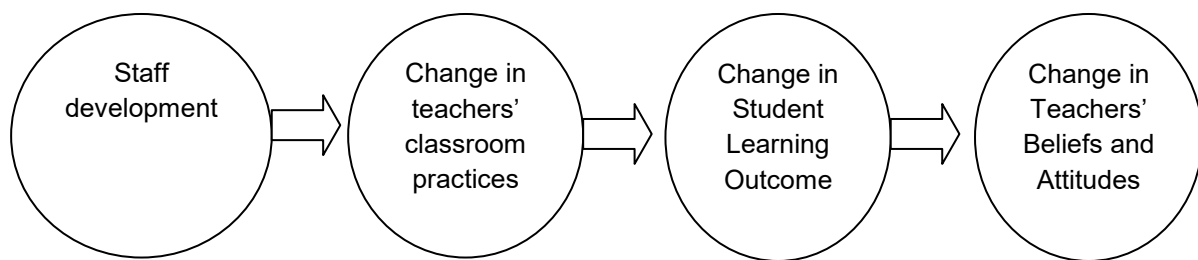
Figure 3.1: Guskey's model of teacher change (Guskey, 2002:383)

However, Clarke and Hollingsworth (2002) criticize Guskey's model in that it does not recognize the individuality of every teacher's learning and practice as each teacher can learn or change at any of the stages. Furthermore, they point out that the model does not "*anticipate the possibility of multiple change sequence and the variety of possible teacher growth networks*" (Clarke & Hollingsworth, 2002, p.965). In addition, Lewin's and Guskey's models have been challenged for oversimplifying a highly complex process of teacher change as change is nonlinear, unpredictable and exciting and can happen at any stage after provision of staff development. Rogers (2007) points out that the process of teacher change is not linear and appears to be cyclic in nature as many changes in practice may need to be made before changes in learners' learning is observed. The challenges presented by Guskey's model have been addressed by Clarke and Hollingsworth cyclic model.

3.2.2.2   *Clarke and Hollingsworth's Model of Teacher Change*

Clarke and Hollingsworth (2002) came up with an Interconnected Model of Teacher Professional Growth. Within this model, teachers' 'world' is still constituted by four

phases which change through the mediating process of reflection and enactment (Justi & van Driel, 2006). In addition, this model includes more possible reflection and enactment arrows linking the phases. These new links indicate that reflection upon teachers' classroom practices could result in teachers' change in knowledge and beliefs and the enactment of learning outcomes could also lead to change in teachers' classroom practices (Figure 3.2). Clarke and Hollingsworth (2002) describe this model as offering "*a powerful framework to support the analyses of those studying teacher change (or growth) and the planning of those responsible for teacher professional development*" (p. 947).
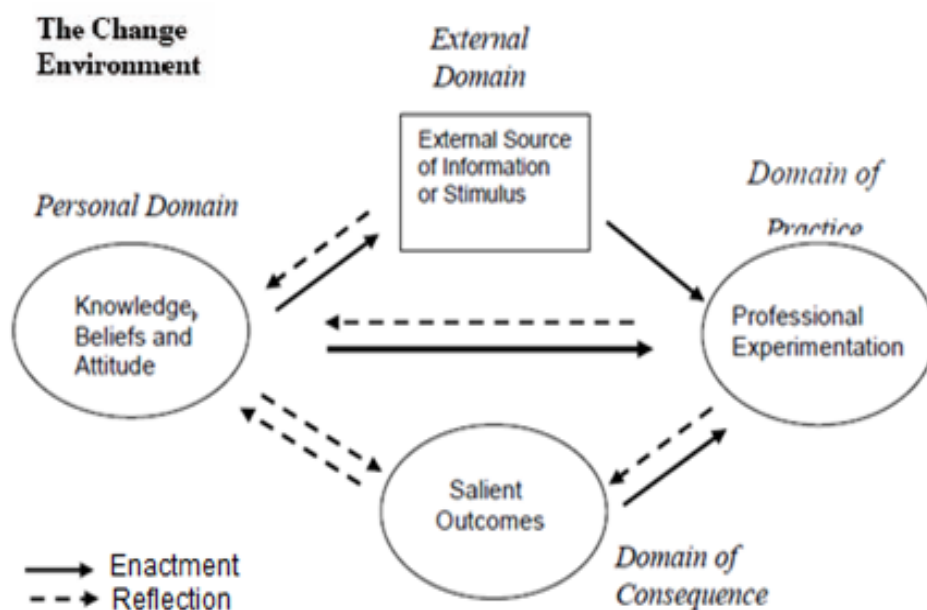
Figure 3.2: The Interconnected Model of Professional Growth (Clarke & Hollingsworth, 2002:951)

Though the model in Figure 3.2 indicates more general application, Clarke and Hollingsworth (2002) point out that it could also be described in terms of individual or a single teacher's growth. They provided an individualized version of the model, explicitly putting more emphasis on a particular teacher as shown in Figure 3.3. Within this individualized model, all domains are now personalized. For instance, a teacher obtains new innovation from an in-service program, tries it in the classroom, and connects it to the learning outcomes which may in turn influence him/her to

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reflect upon his/her beliefs, attitudes and knowledge. Clarke and Hollingsworth (2002), indicate that:

> Changes in teacher beliefs regarding the efficacy of new practices are mediated by the teacher's inferences linking the new practices to salient outcomes. These salient outcomes will inevitably reflect the teacher's existing conception of goals of instruction, and of acceptable classroom practice; that is, the teacher's knowledge and beliefs (p. 957).
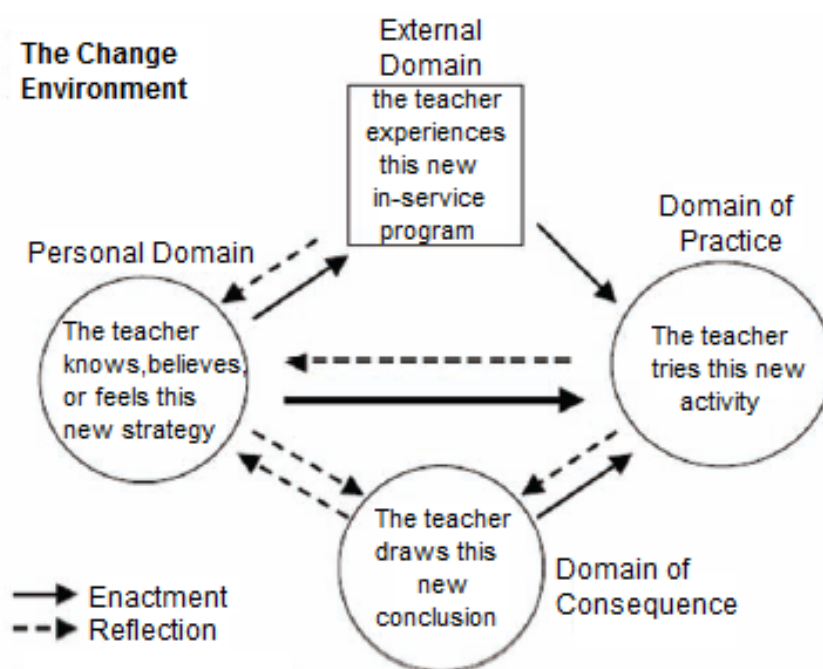
Figure 3.3: Individualized-Interconnected Model of Professional Growth (Clarke & Hollingsworth, 2002:957)

Though the two models presented above have different layouts, they both show that teacher change can be effected through provision of professional development programmes which are meant to improve teacher knowledge and skills towards implementation of an innovation. The present study also followed what is suggested by the two models in that it started by providing teachers with professional development training on assessment for learning which was done in two stages. The reason for providing training was that the introduction of the new integrated primary

curriculum required teachers to understand what assessment for learning is and how it is used in assessing learners. The second reason for provision of the professional development training was to address the research question on 'how do primary mathematics teachers understand and implement assessment for learning after training?'

Teacher change models described above provide the framework for understanding how change in teachers occurs. These models, however, do not elaborate on how each individual teacher reacts to change during implementation process. It should be noted that any change introduced in the school creates concerns for the teacher especially during its implementation. These concerns include teachers' thoughts about the innovation, worries about their long held practices and availability of resources. Burns (2007) states that teachers' attitudes, beliefs, and behaviours must be addressed for sustained change to occur and for reform to last as "*failure to consider those who implement the change will doom [change] to failure*" (p. 38). In addition, Hargreaves (2004) shows that one of the concerns that teachers may have about any change that is being implemented is its effect on themselves.

It is therefore important for administrators to identify and understand the concerns and needs of teachers prior and during implementation of an innovation, so that appropriate interventions can be provided in time to assist teachers in implementing an innovation effectively. Hence, in implementing the new integrated primary curriculum in the Lesotho primary schools, it is important that teachers concerns about this new curriculum be identified and addressed in time in order to facilitate the implementation process. If teachers' concerns are not taken care of, they could prevent them from undergoing a significant change.

Hence the Concerns–Based Adoption Model (CBAM) has also been used in this research as a theoretical framework for understanding teachers' concerns during implementation of assessment for learning in their classrooms. The use of this model assisted in answering the research question 'how do contextual challenges influence teachers in implementing AfL practices?' Hence the next section discusses how CBAM is used to understand teachers' concerns during change process.

3.2.3 Concerns Based Adoption Model (CBAM)

The concerns based adoption model is a conceptual framework for studying teacher adoption of an educational innovation. This model was initially proposed by Hall, Wallace and Dossett in 1973 and was further developed by Hall and Hord in 1987 (Wang, 2014). According to George, Hall and Steigelbauer (2006:1), CBAM "*evolved out of the work of Frances Fuller (1969) and others in response to the innovation focus approach to educational change*". This model conceptualizes change as a developmental process of attitudes and behaviours for individuals attempting to put an innovation into use (Hall & Loucks, 1979).

According to Gundy and Berger (2016), CBAM is identified as a model to study externally motivated, top-down change facilitated by an agent who understands the innovation being implemented from the point of view of the teachers. Hall and Hord (2006) in Warner and Myers (2011:113) point out that CBAM is based on various assumptions. These assumptions are:

1. Change is a process not an event;

2. There are significant differences in what is entailed in development and implementation of an innovation;

3. An organization does not change until the people within it change;

4. Innovations come in different sizes;

5. Interventions are the actions and events that are key to the success of the change process;

6. There will be no change in outcomes until new practices are implemented;

7. Administrator leadership is essential to long-term change success;

8. Mandates can work;

9. The school is the primary unit for change;

10. Facilitating change is a team effort;

11. Appropriate interventions reduce resistance to change and

12. The context of the school influences the process of change.

The assumptions stated above suggest that change is not a simple process as it takes time to happen. It also involves commitment from all the stakeholders including teachers, support by the administrators and the change of environment within the school that supports the innovation. The stated assumptions further highlight the importance of interventions as the key to the success of any change process as they may reduce teacher resistance to the change process. Teachers who participated in this study were also provided with an intervention which was meant to equip them with knowledge and skills regarding implementation of AfL.

The CBAM is comprised of three dimensions namely stages of concerns which show teachers' views and feelings about an innovation, levels of use which illustrate how teachers implement innovations and innovation configurations which demonstrate the different ways on how an innovation is implemented. These dimensions are fully discussed in the next section.

3.2.3.1   *Seven Stages of Concern*

There are seven stages of concerns which can be categorized into three main themes, namely, self, task and impact.

SELF

There are three stages under self category and these are awareness, informational and personal (George *et al*., 2006). The self concerns category usually occurs before the actual implementation of an innovation. This category includes the first three stages of concerns, namely awareness, informational and personal.

Awareness Concerns

According to Tan, Haron, Yahya, Dahlan, Goh and Ashaari (2012) this stage is where individuals have little or no knowledge of the innovation and they are also expressing little or no concern and involvement in the innovation. Dubey and Alam (2014) demonstrate that at this stage, the teachers are not often aware of the innovation and are not even concerned about it.

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For Hosman and Cvetanoska (2013) teachers are the key implementers of any educational innovation and their knowledge and willingness to adapt it will determine to a large extent whether innovations succeed or fail. They further indicate that teachers must become convinced of the usefulness of innovations. For teachers to be convinced of the usefulness of innovation, they should have full information regarding the innovation so as to become part of it.

Informational Concerns

In this stage, individuals show general awareness of the innovation and are expressing positive interest in learning more about it (Tan *et al*., 2012). According to Dubey and Alam (2014), this is the stage where the teachers want to learn more about the innovation and demand the knowledge related to the innovation. This is a very important stage in which teachers should be given as much information as possible about the innovation. For Hosman and Cvetanoska (2013), the more teachers are involved in the change process, respected as stakeholders in the change-promoting effort, and offered multiple forms of appropriate support and incentives by change facilitators, the greater the chances of successful implementation of an innovation.

Personal Concern

Tan *et al*. (2012) illustrate that at this stage, individual teachers are uncertain about the demands of innovation, personal adequacy to meet those demands, and their role with the organization. They further point out that there are also concerns about potential conflicts with existing structures or personal commitments. Similarly, Dubey and Alam (2014) show that teachers in this stage are concerned about the effect the innovation can have on them and are interested in how the innovation will affect them. Yilmaz and Kilicoglu (2013) indicate that during the process of change, teachers may feel that the proposed changes in the schools violate their deeply held values, lead to loss of control over their work and change their working conditions, and may therefore exhibit fear and anxiety. Once the personal concerns decrease, then the task concerns increase. The concerns that are task-related are discussed in the next section.

TASK

This category relates to the mastery of tasks. In this category, teachers understand what the innovation is all about though they are concerned about process and tasks of implementing an innovation. This category comprises of the fourth stage which is management concerns.

Management Concerns

In this stage, teachers' attention is focused on the processes and tasks related to efficiency, organization, management, scheduling and time demands (Tan *et al.*, 2012). It is at this stage where teachers focus on the best use of gained information, increase their personal knowledge and skills about implementation of an innovation and acquire resources to support the implementation of an innovation. Thus, knowledge of teachers' concerns at management stage helps know what kind of resources teachers need in order to successfully implement an innovation. According Cetinkaya (2012), management concerns stage is characterized by concerns about class sizes, time pressures, and the lack of instructional materials. When Teachers have finally accepted that they have work within certain task-related concerns, they start worrying about the impact an innovation might have on their learners.

IMPACT

This category is associated with the impact of the innovation on learners and concerns with improving the practices pertinent to the innovation (Cetinkaya, 2012). The category includes the last three stages of concern which are consequence, collaboration and refocusing.

Consequence Concerns

Tan *et al.* (2012) point out that at this stage individuals are concerned about the impact of the innovation on their immediate community. According to Dubey and Alam (2014), at this stage, teachers have already accepted the innovation and now they are concerned about the impact that this innovation can have on their learners They further point out that teachers are concerned about the performance and the competencies of the learners while using the innovation.

Collaboration Concerns

According to Tan *et al.* (2012) the focus at this stage is on the coordination, co-operation and collaboration amongst the use of the innovation. For Dubey and Alam (2014), at this stage teachers are expected to share information among themselves for improved performance. The issue of collaboration especially amongst people who are implementing the innovation is important. According to Sharma and Mishra (2007), teachers implementing innovation should develop communication support structures that allow them to resolve contradictions that may arise during implementation of innovation.

Refocusing Concerns

Tan *et al.* (2012) show that the focus at this stage is on exploration of more universal benefits from the innovation including new alternatives to be proposed or major modifications on existing forms of the innovation. For Dubey and Alam (2014), this stage mainly focuses on the teachers who have high concerns about the time and cost of the innovation, and are ready to implement the alternatives of the innovation that may perform even better. Elaborating further on this stage, Cetinkaya (2012) illustrates that teachers begin to evaluate the innovation, think about it and propose modification where necessary. He also points out that teachers produce more effective alternatives to ensure that the proposed modifications work better.

In summarising the seven stages of concerns, Anderson (1997) in Warner and Myers (2011:112) points out that CBAM model *"idealises the stages of concern as a developmental progression in which teachers implementing a change have concerns of varying intensity across all seven stages at different points in the change process"*. Warner and Myers (2011) show that teachers' concerns may not progress through all stages in the suggested order.

The seven stages of concerns are very relevant in this study as the introduction of the new integrated primary curriculum and its assessment packages brought a massive change in teachers' practices. Hence it is important to establish what kind of challenges (personal, managerial and learners' related) teachers have encountered as they implement AfL in their classes. In addition to the stages of concern, CBAM also provides a tool that can be used to determine the levels of use of an innovation.

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3.2.3.2 Levels of Use

As an implementation tool, CBAM can also be used to study the performance of the teachers while using the innovation. According to Gundy and Berger (2016) "*levels of use describe the teacher' developmental progression in acquiring new skills as the attempt to use the innovation*" (p.234). In this research, the researcher observed teachers to see how they implemented AfL in their classes after training. The findings helped the researcher to establish the level of use of AfL by teachers.

Non-use: At this level, the individual shows no behaviour related to the innovation at all, he/she is doing absolutely nothing toward being involved with the innovation (Hord, 1987). For Gundy and Berger (2016), this is the stage where teachers have little or no knowledge of the innovation; they are not involved with it and are doing nothing towards becoming involved in it.

Orientation: This is where the user is actively seeking information about the innovation (Hord, 1987). For Jennings and Dirksen (1997), this is the state in which the user has just acquired information about the innovation and is exploring its values and demands. Thus, teachers are acquiring knowledge of the innovation and are exploring its values and its demands upon them and their classrooms.

Preparation: This is where teachers indicate intention to use the innovation by acquiring materials and resources necessary for use (Hord, 1987). This is the stage where the user is preparing to use the innovation for the first time (Jennings & Dirksen, 1997).

Mechanical Use: Teachers focus most of their efforts on the short term, day-to-day use of the innovation and have little time for reflection (Jennings & Dirksen, 1997). For Jennings and Dirksen (1997), the changes made are geared more towards meeting the needs of the teachers than for the benefit of the learners.

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Routine and Refinement.

Routine: This is where teachers' use of the innovation has been stabilized with few changes being made on an ongoing basis and little preparation is given to improving the use of the innovation (Jennings & Dirksen, 1997).

Refinement: At this level, teachers vary the use of innovation to increase the impact on the learners in the classroom and these variations are based on the teachers' knowledge of short and long-term consequences for the learners' learning (Jennings & Dirksen, 1997).

a) **Integration:** This is the level at which teachers are combining their personal efforts to use the innovation with the related activities of their colleagues to achieve a collective impact on learners within their sphere of influence (Jennings & Dirksen, 1997).

b) **Renewal**: At this point, "*the original innovation has already been outgrown*" (Hord, 1987: 114). This is where teachers are re-evaluating the quality of their use of the innovation, seek for major modifications to present innovation, and examine modifications of the present innovation to the extent of even replacing it (Jennings & Dirksen, 1997).

By understanding and determining the teachers' concerns and the levels of use of innovation, the change facilitator can devise strategies that would assist and support teachers in implementing the innovation effectively. Through classroom observations and interviews, the researcher established teachers' concerns with regard to the use of AfL in their classes.

The next section discusses innovation configurations which show the general pattern of use of innovation.

3.2.3.3   **Innovation Configurations**

As teachers implement an innovation, there are certain adjustments which they make depending on the situation in which they are. Sometimes when teachers implement an innovation, they may change an innovation such that it meets their needs and the needs of their learners. For Roach, Kratochwill and Frank (2009), the underlying assumption of innovation configurations is that individual users' patterns of implementation of an innovation are not identical. Hall and Hord (2001) in Roach *et al.* (2009), illustrate that the primary purpose of innovation configurations is the recognition that in most change efforts, adaptations will occur and these have direct and indirect implications for facilitating and assessing change processes. Thus, in implementing an innovation, some teachers may make changes that are minor or major such that an innovation may be completely unrecognisable. Hence, in this study, the researcher wanted to establish the general patterns of teachers' use of AfL.

At the centre of any educational reform, effective professional development is considered as the key strategy. Therefore, the section below elaborates on the key aspects of teacher professional development.

3.3   TEACHER PROFESSIONAL DEVELOPMENT

Changing teachers' practices requires provision of staff development training that emphasizes the presentation of new ideas and techniques for using newly adopted innovation. For Hord *et al.* (1987), change cannot succeed without effective staff development programmes that enable innovation users to acquire necessary knowledge and skills for the implementation process. Similarly, Purzer, Strobel and Cardella (2014) show that teachers are not likely to adopt an innovation or change in their teaching practice unless they are confident of its effective implementation which could be acquired through professional development programmes that meet the immediate concerns of individual teachers.

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According to Fullan (1991), teacher professional development program is one of the ways of improving school effectiveness and responding to changes. He further asserts that traditional staff development programmes are unlikely to have long-lasting impact on teacher development and learner outcomes because even if teachers have acquired new ideas and learnt some effective practices, they may encounter difficulties in applying these in their classrooms, especially if they are not supported or have limited ongoing follow ups.

Guskey (2002) defines professional development programmes as systematic efforts to bring about change in the classroom practices of teachers, in their attitudes and beliefs, and in the learning outcomes of learners. He suggests that professional development designed to facilitate change must be teacher specific and focus on daily activities at the classroom level. Hassel (1999) in Moeini (2008) considers professional development as "*the process of improving staff skills and competencies needed to produce outstanding educational results for students*" (p. 2). Olivia and Pawlas (1997) in Moeni (2008) extend this definition further by saying that professional development is a program of activities planned and carried out to promote the personal and professional growth of teachers. In short, teacher professional development programmes are crucial as they have the capability of enabling teachers to become better by improving, increasing and advancing their knowledge and skills. Similarly, Fullan (1991) defines professional development program as a learning process, through which teachers increase their capacity to respond to changing environments. He further describes professional development as learning experiences which teachers gain formally and informally throughout their career.

In spite of the importance of professional development programmes in teaching and learning, there seems to be a problem in which they are planned and run. Clarke and Hollingsworth (2002) point out that most professional development programmes consist of "one-shot" workshops aimed at teacher mastery of prescribed skills and knowledge. These professional development programmes are usually packaged into an afternoon or a full day in-service session, which seems to be designed as a quick-fix for teachers' inadequacies and incompetence (Guskey & Huberman, 1995 in Dass & Yager, 2009). These kind of professional development programmes are

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criticized for being ineffective as in most cases there is no support provided or follow ups after implementation. Elmore (1996) in Smith, Hofer, Gillespie, Solomon and Rowe (2003) points out that if professional development is short-term or one-shot, there should be strong support mechanisms to help teachers implement the new approaches because "*teachers are more likely to learn from direct observation of practice and trial and error in their own classrooms than they are from abstract descriptions of teaching*" (p. 14).

On the other hand Guskey (1986) cautions that majority of professional development programmes fail because they do not take into account two crucial factors, that is, what motivates teachers to engage in professional development and the process by which change in teachers typically occurs. He further points out that most professional development programmes provide limited demonstration and minimal opportunity for hands on involvement from the teachers. These programmes, seldomly have follow-up sessions that support teachers during experimentation, implementation, reflection, and evaluation of new approaches (Schmoker, 2004). He further asserts that lack of continuity, follow-up; support and evaluation involved in these professional development programmes have an insignificant impact on the professional growth of teachers.

According to Guskey (2003), for professional development to be effective, it must truly have an impact on teacher learning and ultimately enhance learners' achievement. Similarly, Garet, Porter, Desimone, Birman and Yoon (2001) point out that for professional development programmes to be effective, they must provide teachers with a way to directly apply what they have learnt to their own situation. Harwell (2003) illustrates that when teachers are given opportunity through high quality professional development, they report change in their classroom practices that leads to improved learner learning. Dass and Yager (2009) indicate that for professional development programmes to be effective, they should be ongoing rather than a series of discrete remedial events to fix their inadequacies; school-based learning which is tailored to the needs of all; teachers should be seen as taking an active role in their own growth, and embedded in the job and closely related to both learner and teacher needs. Guskey (1986) points out that "*teachers are attracted to staff development programmes because they believe these activities can potentially*

expand their knowledge and skills, contribute to their growth, and enhance their effectiveness with students" (p.6). He further adds that the most effective professional development programmes are those that approach change in a gradual and incremental fashion, not expecting too much at one time and must offer teachers practical ideas that can be efficiently used to directly enhance desired learning outcomes in learners.

It is however important to note that changing one's practices does not happen overnight, it is a complicated process. Smith *et al.* (2003) indicate that change is slow as it occurs over time; it requires support especially during implementation phase; it is not easy as it threatens one's assumptions; it is not always direct or guaranteed as teachers for some reasons may opt not to effect it, and it is not always linear. According to Harlen and Allende (2009), "*change takes time and effort for existing practices to be either replaced or modified and, unless underpinned by understanding and conviction of the value of new practices, it is all too easy for them to be implemented only superficially and soon fade away*" (p.17). Richards (2002) found that teachers are resistant to change for several reasons. He indicates that some of these reasons include, teachers equating change to being devalued, a feeling that discounts what they are currently doing; at times, they are aware of the need for change, however, they simply lack time and energy for it; moreover, change often comes from outside, as a result teachers have no choice or voice in the change and therefore feel powerless and finally teachers are provided with in-service training with no follow ups. Therefore, in an endeavour to nurture teacher change, there must be an intensive and extensive follow up activities of the professional development program.

Guskey (1985) indicates that "*teachers seldom become committed to a new program or innovation until they have seen that the new practices work well in their classrooms with their students*" (p.5). Furthermore, Guskey (2002) states that teachers are more than willing to change their practices if they see improvements in learners' learning outcomes which may include changes in attendance, involvement in class activities, behaviour, motivation as well as improvements in knowledge and understanding. It is therefore apparent that teachers become committed to change if they are involved in planning and development of new innovation, its implementation

and are provided with enough support during the trial and error phase. Hall and Hord (2001) argue that teachers who attend staff development training, with no follow up support are less likely to implement changes. They further point out that implementation of an innovation increases considerably when regular support follows initial presentation during staff development training. Thus, effective change requires continuous support and understanding of participants' concerns and the levels of use of an innovation.

3.4   SUMMARY

The chapter firstly started by defining what educational change is, reasons making adoption of change difficult and various elements to be considered in implementing educational change. The impact of educational change on teachers has also been discussed. Key elements that should be considered in promoting teacher- change have been outlined. In an effort to understand the process of change, Fullan's model of educational change has been discussed. This model consists of three stages namely, initiation, implementation and institutionalization. In order to gain more knowledge on teacher, Guskey's model which emphasizes that for teachers to change their practices, they must first see improvements in learners' learning, though the model acknowledges the importance of teacher profession development programmes. Since Guskey' model was criticized for being linear, Clarke and Hollingsworth's Interconnected Model of Teacher Professional Growth (IMTP) was also looked into. This model is different from Guskey's in that it is cyclic and acknowledges that teacher- change process is cycle as it could be triggered at any of the four stages.

The model of teacher- change did not elaborate on how teachers feel during the change process. This chapter therefore explored different concepts in Concerns-Based Adoption Model to understand teachers' concerns during change process. Finally, the importance of teachers being exposed to professional development programmes in relation to adoption of an innovation has also been discussed. The next chapter presents the methodology followed in carry out this study.

CHAPTER 4

METHODOLOGY AND RESEARCH DESIGN

4.1   INTRODUCTION

All research is guided by underlying philosophical assumptions about what constitutes 'valid' research and which research methods are appropriate for the development of knowledge in a given study (Antwi and Hamza, 2015). In order to conduct any scientific research, it is therefore important to know which philosophical assumptions will guide the study. Hence to gain a better understanding of why and how the researcher chose the methodological approach used in this study, first the discussion on philosophical assumptions guiding the study will be made. Since the philosophical assumptions about the research impact on the research paradigms, a brief discussion on the paradigms which guided the selection of the methodology followed in this study will be provided. In order to address all the research questions, the study adopted both positivist and interpretive paradigms. Following the discussion of the research paradigms, research design and the methodology followed in carrying out this study will also be presented.

4.1.1   Research Aim and Questions

The aim of the research was to investigate primary mathematics teachers' assessment practices in the context of the new integrated primary curriculum.
In an attempt to address this aim, the study sought to answer the following questions:

  a.   What are primary mathematics teachers' assessment practices before training?

  b.   What are primary mathematics teachers' understandings of AfL before training?

c.   How do primary mathematics teachers understand and implement assessment for learning after training?

d.   How do contextual challenges influence teachers in implementing AfL practices?

In order to address the above research questions, the philosophical assumptions, underpinning the study are discussed in the next section.

4.2   PHILOSOPHICAL ISSUES IN RESEARCH

In conducting research, it is important to consider philosophical issues relating to research paradigms, as they describe perceptions, beliefs, assumptions and the nature of reality and truth. These issues are critical because they can impact the way in which the research is conducted. According to Eusafzai (2014), paradigm is at the basis of all research approaches. It forms a foundation for differentiating one type of approach from another and could also be used to provide a reason for choosing different research methodologies. A paradigm is defined as a cluster of beliefs which dictate and influence what should be studied, how research should be done and how results should be interpreted (Bryman & Bell, 2011). Likewise Bogdan and Biklen (1998) define research paradigm as "*a loose collection of logically related assumptions, concepts, or propositions that orient thinking and research*" (p.22). In the same manner Eslami (2013) view paradigm as a "*basic system or world view that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways*" (p.2375). According to Carter and Little (2007), there are four fundamental elements of research paradigm namely, ontology, epistemology, methodology, and methods that provide the framework for planning, implementing, and evaluating the quality of any research.

Ontology is defined as the science or study which encompasses claims about what exists, what it looks like, what units make it up and how these units interact with each other (Blaikie;1993). Thus, ontology is concerned with the nature of existence of the reality being investigated. In research, ontological assumptions describe researcher's view on the nature of reality, that is, if the reality being studied is

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objective or subjective. Easterby-Smith, Thorpe and Lowe (2004) indicate that there are two types of ontology, namely objective ontology and subjective ontology. Objective ontology employs physical science approach which deals with facts, measurement and objective reality in which the truth holds regardless of who the observer is. Objective ontology aims to discover what is out there while subjective ontology deals with constructed reality where the nature of the reality out there is not solid but changes on the basis of who the observer is. Here the truth depends on who finds it. Subjective ontology aims at understanding people's interpretations and perceptions and it was important in this research to establish teachers' understanding and perceptions of AfL after being provided with training. .

Crotty (1998) defines epistemology as the "*theory of knowledge embedded in the theoretical perspective and thereby in the methodology*" (p. 3). For Ritchie and Lewis (2003), epistemology is concerned with ways of knowing and learning about the social world and focuses on issues of how reality can be known and the basis of such knowledge. Maynard (1994) also points out that "*epistemology is concerned with providing a philosophical grounding for deciding what kinds of knowledge are possible and how we can ensure that they are both adequate and legitimate*" (p. 10). Thus, epistemology is concerned with how knowledge can be created, acquired and communicated. In this study the researcher played two different roles in collecting data. At one level the researcher administered the questionnaires on teachers' understanding of AfL and their assessment practices without interfering with them (objective and detached). At another level, the researcher observed and interviewed teachers; this indicates that she played a participatory role (subjective).

Methodology is perceived as the "*strategy, plan of action, process or design lying behind the choice and use of particular methods and linking the choice and use of methods to the desired outcomes*" (Crotty, 1998: 3). For Carter and Little (2007), methodology translates the principles of a paradigm into a research language, and shows how the world can be explained, handled, approached or studied. Thus, methodology provides justification for the choice of the research design used. In this research, mixed methods approach was adopted hence the use of sequential transformative mixed method design.

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Methods on the other hand refer to "*the techniques or procedures used to gather and analyze data related to some research questions or hypothesis*" (Crotty, 1998: 3). According to Gray (2013), the choice of methods used in the study is influenced by the research methodology chosen which in turn is influenced by the theoretical perspectives adopted by the researcher, that is, whether the research adopts the positivist or interpretivist approaches. The theoretical perspective on the other hand is informed by the researcher's epistemological stance. Crotty (1998) summarizes the relationship between different aspects of research diagrammatically as shown in Figure 4.1.
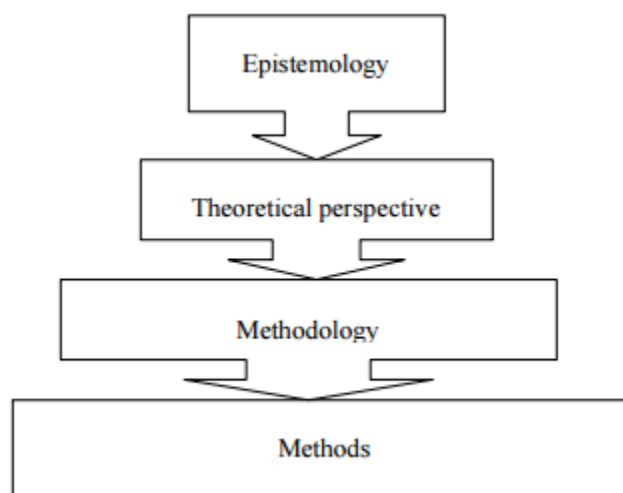
Figure 4.1: Relationship between Different Aspects of Research (Crotty, 1998: 3)

4.3   RESEARCH PARADIGMS

In any research, the theoretical perspective is "*the theoretical stance informing the methodology and thus providing a context for the process and also grounding its logic and criteria*" (Crotty, 2003: 7). There are three theoretical perspectives which the researcher can adopt when carrying out the study. These are the positivist, the interpretive, and the critical realism. According to Eslami (2013), the positivist perspective aims at discovering real phenomena through a closed system. While the interpretivist perspective aims at finding real phenomena that is complex and open to different interpretations. In critical paradigm, the researcher is aiming at combining some standpoints of both positivism and interpretivism.   The theoretical stance adopted in the research is the critical realism which mixes the two paradigms in a

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single research project (Teddlie & Tashakkori, 2003). In the next sections each of the paradigms is discussed.

4.3.1 Positivism Paradigm

According Easterby-Smith *et al.* (2008), the key idea of positivism is that the social world exists externally, and that its properties should be measured through objective method, rather than being inferred subjectively through sensation, reflection and intuition. They further demonstrate that in positivist paradigm, knowledge is seen as value-free and neutral and it is attained by the objective observation of reality, which is out there. On the other hand, McGregor and Murnane (2010), point out that within the positivist research paradigm, it is assumed as the only way people can be positive that the knowledge is true is seen if it was created using the scientific method. Positivist methodology is directed at explaining relationships. Positivists attempt to identify causes which influence outcomes and their aim is to formulate laws, thus yielding a basis for prediction and generalization (Scotland, 2012). Asif (2013) posits that positivist researchers conduct quantitative studies since these are in line with positivist ontological and epistemological views. He further illustrates that the purpose of positivist researchers is to describe social life, to predict and generalize courses of events. The main focus of this research was to find a link between different variables that are related to the implementation of AfL. The next section presents the ontological and epistemological foundations of positivist paradigm.

4.3.1.1 *Ontological and Epistemological Foundations of Positivist Paradigm*

According to Rosa (1998), the ontological foundations of positivism are that of objectivism or realism. He asserts that ontological theory of realism is based on the assumption that "*there exists an external world whose properties are independent of human existence*" (p.18). Thus, objectivism looks at reality as independent, external and objective (Eusafzai, 2014). For Eusafzai (2014), the implication of this view of reality for the role of a researcher is that of an observer and that the researcher and the reality being studied are independent of each other. He further points out that

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realist ontology regards reality as something 'out there' and can only be known by applying scientific methods. Thus, positivists believe that reality is separate from the individual who observes it. They consider the researcher and the phenomena to be researched as two separate, independent entities.

Scotland (2012) demonstrates that the positivist epistemology is one of objectivism. He indicates that positivists go forth into the world impartially, discovering absolute knowledge about an objective reality. Thus, the researcher and the researched are independent entities and the meaning solely resides in objects, not in the conscience of the researcher, and it is the aim of the researcher to obtain this meaning. The objectivist epistemological stance asserts that the researcher can avoid any bias or influence on the research outcome thereby producing results that are true. In summary, positivist epistemology is characterized by observer being independent of what is being observed; value-free and scientific, that is, the choice of subjects and methods are objectively made, not based on beliefs or interests; involves large samples and results are generalized to a large population and uses quantitative methodology.

For Lindsay (2010), both ontological assumptions and epistemological assumptions tend to overlap as "*to talk of the construction of the meaning is to talk of the construction of meaningful reality*" (Crotty, 1998:10). This overlap between the ontological and epistemological foundations is evident from what has been discussed above where both ontological and epistemological foundations of positivism rely on objectivism. Table 4.1 below summarizes the ontological and epistemological foundations of positivism.

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Table 4.1: Comparison between Ontological and Epistemological Foundations	
Ontological Foundations	**Epistemological Foundations**
• Reality is external to the researcher and represented by objects in space. • Reality can be known by applying scientic methods. • Reality can be captured by senses and predicted.	• Researcher is independent of what is researched. • Truth can be attained because knowledge rests on a set of firm, unquestionable and indisputable truths. • Knowledge is objective, value-free and scientific. • Generalization of facts to a wider population.

4.3.1.2   Strengths and Weaknesses of Positivist Research

Positivist approach has a number of advantages and disadvantages. As it has been discussed above, it is objective, reliable and can be generalized to a wide population. According to Eusafzai (2014), positivist approach saves time as a large sample of population can participate in the study within a short time and with limited resources. However, Lin (1998) indicates that though positivist approach allows the researcher to discover the link between two or more phenomena, it does not explain why the link exists. Furthermore, the positivist approach does not provide the researcher with information on the context of the situation where the studied phenomenon occurs.

House (1991) in Eslami (2013) asserts that "*reality consists not only of what we can see but also of the underlying causal entities that are not always directly discernible. Reality, is stratifying*" (p.192). Eslami (2013) recommends that researchers should not limit everything to only what they really experience. On the other hand, Eusafzai (2014) points out that some of the critics of positivism are its dehumanized objectivity. He posits that positivism, when applied to the field of social sciences, treats human beings as any other objects of nature as it expects generalized laws for

human beings in the same ways as natural sciences expect them for other natural objects. He maintains that reality, which is discovered in the world out there, is clouded by the researcher's judgment, beliefs and values which evolve as a result of the interplay between the researcher, the environment, the culture and the context in which he/she grew. Thus, using positivist paradigm in social science may not provide the rich information arising from the context in which the participants are.

The above-mentioned ontological and epistemological foundations of positivism have an impact on the choice of methodologies and methods used. Hence the next section discusses the methodologies used by positivists.

4.3.1.3   *Quantitative Approach as a Methodology Used by Positivists*

According to Crotty (1998), methodology is a strategy or plan of action that links methods to outcomes. It governs the choice and use of methods in any particular study. Hence positivists employ quantitative research approaches. Mukherji and Albon (2010) point out that positivist methodology relies on the collection of empirical data, facts or information that has been derived by quantitative methods. They further indicate that quantitative methodology aims to measure, quantify or find the extent of a phenomenon. Creswell (2008:46) indicates that *"quantitative research is an educational research in which the researcher decides what to study; asks specific, narrow questions; collects quantifiable data from participants; analyses these numbers using statistics and conducts the inquiry in an unbiased, objective manner".* This definition illustrates that quantitative research involves the collection of data or information that can be quantified and subjected to the statistical methods. Research adopting the quantitative approach is said to be mostly numerical and is designed to ensure objectivity, generalizability and reliability (Eslami, 2013).

Creswell (2003) differentiates the methods from the methodology by demonstrating that methods are techniques and procedures that are used in collecting data. On the other hand in collecting quantitative data, both experimental and non-experimental forms are used. Positivists' researchers tend to collect their data through

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experimentation, intervention, surveys, questionnaires, structured observation with predetermined schedule and content analysis (Asif, 2013). There are a number of strengths and weaknesses of quantitative approach. These are discussed in the section below.

4.3.1.4 Strengths and Weaknesses of Quantitative Approach

Quantitative research has been found to have numerous strengths in social science research. Johnson and Onwuegbuzie (2004) have identified some of the strengths of quantitative research as testing and validating already constructed theories about how phenomena occur; generalizing research findings when the data are based on random samples of sufficient size or generalizing a research finding when it has been replicated on many different populations and subpopulations; useful for obtaining data that allow quantitative predictions to be made; using data collection methods that are relatively quick (survey and, telephone interviews); providing precise, quantitative, numerical data; the research results are relatively independent of the researcher and are useful for studying large numbers of people. Similarly, Choy, (2014) illustrates that quantitative research can be administered and evaluated quickly and the responses can be tabulated within a short timeframe. He also points out that numerical data obtained through this approach can facilitate comparisons between organizations or groups, as well as allowing determination of the extent of agreement or disagreement between respondents.

However, quantitative methods have also been found to have some limitations. Johnson and Onwuegbuzie (2004) have identified the following limitations; the researcher may miss out on phenomena occurring because of the focus on theory or hypothesis testing rather than on theory or hypothesis generation and the knowledge produced may be too abstract and general for direct application to specific local situations, contexts, and individuals. Quantitative approach is also criticized for depending heavily on structured questionnaires with pre-determined items which restrict the respondents to express themselves freely. Quantitative approach is further criticized for reducing important characteristics of participants to numbers

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which cannot be adequately understood without reference to the local context in which the participants live (Choy, 2014).

In conducting the present study, the researcher wanted to get teachers' deeper understandings of AfL, their assessment practices and the concerns they experience in implementing AfL. For the researcher to accomplish these she needed to interact with teachers participating in the study at their respective schools and this could not be addressed using positivist approach. Therefore, the next section introduces interpretivist paradigm which recognises the importance of studying the participants in the context in which they live.

4.3.2 Interpretivist Paradigm

Burrell and Morgan (2005) illustrate that interpretive paradigm is informed by a concern to understand the world as it is, to understand the fundamental nature of social world at the level of subjective experience. They point out that interpretive paradigm "*seeks explanation within the realm of individual consciousness and subjective, within the frame of reference of the participant as opposed to the observer of action*" (p. 28).   Schwandt (1994) in Crotty (1998) illustrates that interpretivism is;

> *conceived in reaction to the effort to develop a natural science of the social… Its foil was largely logical empiricist's methodology and bid to apply that framework to human enquiry. …the interpretivist approach to the contrary, looks for culturally derived and historically situated interpretations of the social life-world* (p.67).

Likewise, Asif (2013) reveals that interpretive paradigm came as a reaction to positivism. He points out that the proponents of this paradigm criticized positivism for applying natural sciences on human beings. Eusafzai (2014) argues that the underlying idea in interpretivist paradigm is that social world and natural world are fundamentally different from each other as social world deals with human beings

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who cannot be studied and dealt with in terms of simple cause and effect relations. He further illustrates that perception of reality by human beings is always influenced by their values and conscience. He thus advises that the implication of this perspective for researchers is to study individual understandings, the meanings that individuals develop, form and attach to the world around them, and then look deeply inside these understandings and meanings. The next section discusses both ontological and epistemological foundations of the interpretivist paradigm.

4.3.2.1 *Ontological and Epistemological Foundations of Interpretivist Paradigm*

Interpretivism is based on a relativist ontology that believes in multiple complex realities which do not exist independently but which are socially constructed (Elshafie, 2013). Crotty (2009) in Eslami (2013) demonstrates that "*what is said to be the way things are really just the sense we make of them*" (p.192). Eslami (2013) illustrates that an individual may interpret the same phenomenon differently. Thus, interpretivists believe that the reality is not a fact out there needed to be found, but it is constructed in peoples' mind. According to Eusafzai (2014), relativism means that reality varies from individual to individual, meaning that reality is subjective. He posits that an individual's perception of reality is influenced by individual's conscience which is the sum total of social, cultural, ideological and environmental influences. In the same manner, Scotland (2012) articulates that relativism is the view that reality is subjective and differs from person to person. He demonstrates that realities are mediated by our senses and without consciousness the world is meaningless. Thus, the interpretivist ontology is based on the notion that reality is individually constructed; hence there are as many realities as the individuals-multiple realities.

As for epistemological foundations of interpretivism, Elshafie (2013) points out that it is 'subjective' as the meaning is the product of interaction between the subject and the object. Scotland (2012) also illustrates that interpretive epistemology is one of subjectivism which is based on real world phenomena. He shows that the world does not exist independently of researcher's knowledge of it and that meaning is not

discovered, but it is constructed though the interaction between consciousness and the world. For Eslami (2013), interpretivist epistemology views all knowledge and all meaningful reality as being contingent upon human practices and as being constructed in and out of interaction between human beings and their world. Eslami (2013) points out that the aim of interpretive research is to understand the complex realities through the eyes of the social actors where Richards (2003) in Eslami (2013) defines actors as:

> *…individuals with biographies, acting in particular circumstances at particular times and constructing meanings from events and interactions. An understanding of this develops interpretively as research proceeds, so the relationship between the researcher and the object of investigation is of fundamental importance* (p.38).

Thus, in interpretive epistemology, different people may construct meaning in different ways but truth is a consensus formed by co-constructors. Hence, knowledge has the feature of being culturally derived and historically situated (Scotland, 2012). The Table 4.2 below summarizes the ontological and epistemological assumptions of the interpretivist paradigm.

Table 4.2: A summary of the ontological and epistemological assumptions of the interpretivist paradigm	
Ontological Foundations	**Epistemological Foundations**
• Reality is constructed on the basis of individual interpretation, it is not a fact.. • Reality is seen as subjective. • There are multiple perspective on one phenomena. • Events are distinctive and cannot be generalised to a larger population.	• Knowledge is gained through personal experience. • Meaning is not discovered but is constructed though the interaction between consciousness and the world truths. • Aim is to understand the complex realities through the eyes of the social actors. • Truth is a consensus formed by co-constructors.

Interpretivist paradigm has been criticized for its being subjective and unscientific. Knowledge produced may not be generalized to other people or other settings, that is, findings are unique to the relatively few people included in the research study (Asif, 2013). Despite the criticisms levelled against interpretivist paradigm, it still has a number of benefits. The next section looks into the strengths and weaknesses of interpretivist paradigm.

4.3.2.2 *Strengths and Weaknesses of Interpretive Research*

One of the main advantages of interpretivist approach is that it allows for deeper understanding of the individual perspective (Eusafzai, 2014). However, it is criticized for being subjective and unscientific which makes this approach to lack reliability, generalizable laws and applicability of the findings to a wider context (*ibid*). According to (Eusafzai, 2014), *"the most important criticism of the interpretivist approach, has been that the approach is predominantly focused on the study of individual perceptions and meaning building, and does not account for historical, social, institutional and environmental influences on individual experiences"*(p.182)*.

Though interpretivist paradigm has been criticised for being unscientific, numerous studies in social science still use this paradigm as it offers an understanding of complex realities of the actors. Adopting interpretivist view compels researchers to select appropriate methodologies that would provide them with rich data that would help them in understanding these realities. The next section deliberates on the methodologies that are employed by interpretivists.

4.3.2.3 Qualitative Approach as a Methodology used by Interpretivists

According to Scotland (2012), interpretive methodology is directed towards understanding phenomenon from an individual's perspective, investigating interaction among individuals as well as their personal, historical and cultural experiences. In the same way, Holloway and Wheeler (2002) point out that interpretivist methodology centres on the way in which human beings make sense of their subjective reality and attach meaning to it. They illustrate that social scientists

approach people not as individual entities who exist in a vacuum but explore their world within the whole of their life context. For Eusafzai (2014), the role of the researcher in interpretive approach is to understand, explain and demystify social reality through the eyes of different participants and this requires the methodology which allows the researcher's involvement with the participants in their natural environment. He suggests that the methodology appropriate for interpretive research is qualitative methodology.

Creswell (2008) demonstrates that *"qualitative research is the one in which the researcher relies on the views of participants, asks broad, general questions; collects data consisting largely of words or text from participants; describes and analyses these words for themes; and conducts the inquiry in a subjective, biased manner"* (p. 46). On the other hand, Patton (1985) in Merriam (1998) explains that:

> *Qualitative research is an effort to understand situations in their uniqueness as part of a particular context and the interactions there. This understanding is an end in itself, so that it is not attempting to predict what may happen in the future necessarily, but to understand the nature of that setting - what it means for participants to be in that setting, what their lives are like, what is going on for them, what their meanings are, what the world looks like in that particular setting - and in the analysis to be able to communicate that faithfully to others who are interested in that setting…the analysis strives for depth of understanding* (p.6).

For Broom and Willis (2007), qualitative methodologies seek to establish an understanding of people's lives, experiences and the subjective meanings that could explain the process of decision making and action. Interpretivist researchers use various qualitative methods to collect data. These methods include open-ended interviews, focus groups, open-ended questionnaires and observations. According to Eusafzai (2014), the data collected are mostly verbal, and interpreted subjectively through identifying different themes and categories within the data.

Like any other research methodologies, qualitative approach has its own strengths and weaknesses. These are elaborately discussed in the section to follow.

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4.3.2.4   Strengths and Weaknesses of Qualitative Approach

There are numerous benefits provided by qualitative approach in social science research. Johnson and Onwuegbuzie (2004) have presented the strengths of qualitative research as providing understanding and description of people's personal experiences of phenomena; studying a limited number of cases in depth; providing and describing in rich detail, phenomena as they are situated and embedded in local contexts - thus, allowing the researcher to have a thorough understanding of participants experiences ; qualitative researchers are responsive to changes that occur during the conduct of a study (especially during extended fieldwork) and may shift the focus of their studies as and when necessary and qualitative data in the words and categories of participants lend themselves to exploring how and why phenomena occur. Likewise, Coates (2004) demonstrates that in qualitative research, data are collected from people in their own environment, taking into account their own social and cultural situation as there is no attempt to change the research situation or control it.

Though qualitative research has a number of strengths, it also has some weaknesses. Johnson and Onwuegbuzie (2004: 20) point out the following as the weakness of qualitative method; "*knowledge produced may not be generalized to other people or other settings (i.e., findings may be unique to the relatively few people included in the research study); it is difficult to make quantitative predictions; it generally takes more time to collect the data and analyse it and the results are more easily influenced by the researcher's personal biases and idiosyncrasies*" (p.20). Likewise, Choy (2014) indicates that in qualitative research, the data collection process is time-consuming. He also points out that qualitative research is generally open-ended and this may lead to important issues being overlooked.

Thus, in qualitative research, there are several drawbacks that may have negative predicaments on the data generated. The above discussion illustrates that there is no single paradigm that can address the research questions holistically. Hence the next section justifies the rational for mixing both paradigms.

4.3.3 Rationale for Choosing Both Positivist and Interpretivist Paradigms

The current study was positioned within the positivist paradigm in that the researcher wanted to establish teachers' understanding of AfL and their assessment practices before embarking on AfL training. The researcher was detached from the whole process of data collection as she did not want to influence the participants in any possible way. Thus, this was done in order to minimise potential research bias and contamination of data. Hence questionnaires were used to collect data on teachers' assessment practices and their understanding of AfL before training. Harris and Brown (2010) illustrate that questionnaire is an objective tool that can be used to produce generalisable results.

The adoption of interpretivist approach in this study indicates that the researcher acknowledges the importance of interpreting the constructions and meanings which teachers ascribe to their understanding, assessment practices and their concerns in implementing AfL in their classes. To obtain this information, the researcher had to interact with teachers in their natural settings to obtain deeper meanings behind their actions. From the above discussion (**Section 4.3.2**), interpretivists are concerned with understanding the meanings which people give to objects, social settings, events and the behaviours of others, and how these understandings in turn define their settings. Thus, interpretivist adopt qualitative data narrative and data collection methods such as interviews and observation which served to answer the research questions How do primary mathematics teachers understand and implement assessment for learning after training? and how do contextual challenges influence teachers in implementing AfL practices? Thus, this approach has enabled the researcher to answer how questions rather than giving a brief view about the phenomenon studied. The combination of both positivist and interpretivist paradigms has led to critical research paradigm.

4.3.4 Critical Realism

According to Asif (2013), critical realists attempt to combine some standpoints of positivism and interpretivism. Eusafzai (2014) points out that the ontological position of critical realism is similar to that of positivist approach while its epistemological stance is that of interpretivist approach. Similarly, Asif (2013) illustrates that social sciences can use the same methods as natural science regarding causal explanations (as in positivism) and moves away from them by adopting an interpretive understanding as critical realists not only tend to understand but also explain the social world. By combining the standpoints of positivism and interpretivism, critical realism tries to overcome the limitations of each of these approaches.

For McEvoy and Richards (2006), critical realists acknowledge the fact that the real world operates as a multi-dimensional open system, instead of following a set order, effects arise due to the interaction between social structures, mechanism and human agency. They further point out that causal mechanisms have the potential to make an impact, but the actualisation of the mechanism is dependent upon the variable conditions in which the mechanism operates. Critical realists recognize the role played by interpretivist methodologies which focus on discourse, human perception and motivation because the human reasons can serve as causal explanations (*ibid*).

According to McEvoy and Richards (2006) critical realists illustrate that the choice of methods should be dictated by the nature of the research problem where in many cases they suggest that the most effective approach is to use a combination of quantitative and qualitative methods. For critical realists, the strength of quantitative methods is that they may be used to develop reliable descriptions and provide accurate comparisons while that of the qualitative methods can help to illuminate complex concepts and relationships that are unlikely to be captured by predetermined response categories or standardized quantitative measures (*ibid*). The critical realists use the mixed methods approach for complementing the strengths and weaknesses of both quantitative and qualitative approaches.

4.3.4.1   Mixed Method Research Approach

This study is situated within the tradition of the mixed methods approach as it has adopted both quantitative and qualitative approaches. Creswell (2014) illustrates that mixed methods research is an approach of inquiry involving collecting both quantitative and qualitative data. The core assumption here is that the combination of quantitative and qualitative approaches provides a more complete understanding of a research problem than either approach alone. In addition, Creswell and Plano (2007) define mixed methods research by blending its methods and methodological orientation by saying that:

> *as a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis and the mixture of qualitative and quantitative approaches in many phases of the research process. As a method, it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone* (p. 5).

In his earlier definition, Creswell (2003) demonstrates that "*mixed methods approach is one in which the researcher tends to base knowledge claims on pragmatic grounds*" (p.18). For Creswell (2003), mixed methods approach employs strategies of inquiry that involve collecting data simultaneously or sequentially to best understand research problems. Elaborating on this point, Creswell, Clark, Gutmann and Hanson (2003) show that mixed methods approach involves collection or analysis of both quantitative and qualitative data in a single study in which data are collected concurrently or sequentially and involves the integration of the data at one or more stages in the process of research. In essence, researchers collect or analyze not only numerical data, which is customary for quantitative research, but also narrative data, which is the norm for qualitative research in order to address the research questions defined for a particular study (Williams, 2007).

Tashakkori and Teddlie (2010) call mixed methods approach the 'third methodological movement' as it is gaining a lot of popularity from researchers. They point out that mixed methods have:

… gone through a relatively rapid growth spurt…it has acquired a formal methodology that did not exist before and is subscribed to by an emerging community of practitioners and methodologists across the disciplines. In the process of developing a distinct identity, as compared with other major research communities of researchers in the social and human sciences, mixed methods has been adopted as the de facto third alternative, or third methodological movement' (pp. 803-804).

There are a number of reasons why mixed methods approach is gaining popularity among researchers. Palinkas, Horwitz, Green, Wisdom, Duan and Hoagwood (2015) elucidate that the popularity of mixed methods approaches among researchers is triggered by the realisation that the challenges of implementing innovative practices and interventions are so complex that a single methodological approach is often insufficient. Since the present study is about implementation of an innovation, the use of mixed methods approach is therefore appropriate.

Likewise, Johnson and Onwuegbuzie (2004) illustrate that in mixed methods approach, words, pictures, and narrative can be used to add meaning to numbers which would otherwise be meaningless without the narration. He further points out that numbers can also be used to add precision to words, pictures, and narrative. They further indicate that in mixed methods approach, the researcher can generate and test a grounded theory and can answer broader and more complete range of research questions as he/she is not confined to a single approach. In addition, they point out that in mixed methods approach, the researcher can use the strengths of one method to overcome the weaknesses of another method and this can provide stronger evidence for a conclusion through convergence and corroboration of findings. In using the mixed methods approach, one can add insights and understanding that might be missed when only one method is used. Thus, the use of both quantitative and qualitative methods in one study can increase the generalizability of the results and produce more complete knowledge necessary to inform theory and practice (*ibid*).

However, Johnson and Onwuegbuzie (2004) demonstrate that in using mixed methods approach, it can sometimes be difficult for a researcher to carry out both qualitative and quantitative research, especially if these two approaches are to be used concurrently. They also show that the researcher has to learn about multiple methods and approaches and understand how to mix them appropriately. Mixed methods approach is considered more expensive to conduct and more time consuming. Different research approaches discussed above have an impact on the choice of the research design employed in the research. The section below presents different mixed methods research designs which can be adopted in research. It also explains how sequential transformative design was employed in this research.

4.4   RESEARCH DESIGN

A research design is defined as a "*blueprint for conducting a study with maximum control over factors that may interfere with the validity of the findings*" (Burns & Grove, 2003:195). Parahoo (1997) elaborates this definition by indicating that research design is a plan that describes how, when and where are the data to be collected and analyzed. The function of a research design is to ensure that the evidence obtained enables the researchers to answer the research questions as unambiguously as possible (De Vaus, 2001). Thus research design is a plan that provides clear, specific details guiding the researcher.

Creswell and Plano (2007) provide a more comprehensive definition of mixed method design as:

> "*… a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone* (p. 5).

For Lodico, Spaulding and Voegtle (2010), the greatest advantage of mixed methods research design is that it provides an in-depth look at context, processes, interactions and precise measurement of attitudes and outcomes.

According to Creswell *et al*. (2003) there are six types of mixed research designs which build on the four decision criteria: implementation, priority, integration, and theoretical perspective. These designs are sequential explanatory, sequential exploratory design, sequential transformative design, concurrent triangulation design, concurrent nested design and concurrent transformative design.

Sequential explanatory design: This design is characterised by the collection and analysis of quantitative data which is followed by collection and analysis of qualitative data (Creswell *et al*. (2003). In this design the priority is given to quantitative data and the methods are integrated during the interpretation stage of the study. According to Ponce and Pagan-Maldonado (2015), the purpose of this design is to describe the research problem in depth by first using quantitative methods to measure the attributes or properties of the problem and then use qualitative methods to deepen the quantitative findings.

Sequential exploratory design: This design involves collecting and analysing qualitative data first, then collecting and analysing quantitative data (Creswell *et al*. (2003). The priority is given to qualitative data and these two methods are integrated during the interpretation stage of the study. Similarly, Ponce and Pagan-Maldonado (2015) illustrate that the objective of sequential explanatory design is to explore the research problem when very little is known about it. They further point out that this design first uses a qualitative research approach to explore the experience of participants, and with the qualitative findings, the researcher designs a quantitative study to measure the findings of the qualitative phase.

Sequential transformative design: This design involves two phases of data collection. For Harwell (2011), the objective of this approach is to ensure that the views and perspectives of a diverse range of participants are represented. Here

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either of the two methods may be used first and the priority may be given to either qualitative or quantitative methods or both (Harwell, 2011 and Creswell *et al*. (2003). Qualitative and quantitative data are analyzed separately, and the findings are integrated during the interpretation phase (Harwell, 2011).

Concurrent triangulation design: In this design, both types of data are collected and analysed at the same time (Creswell *et al*. (2003). Priority is equal between the methods and the integration occurs during the interpretation stage of the study. However, Creswell *et al*. (2003) illustrate that "*ideally, the priority would be equal between the two methods, but in practical application, the priority may be given to either the quantitative or the qualitative approach*" (p.183). According to Harwell (2011), the purpose of this design is to confirm, cross-validate, or corroborate the findings from a single study. He illustrates that as qualitative and quantitative data are collected concurrently, the weaknesses of one kind of data are ideally offset by strengths of the other.

Concurrent nested design: In this design, both types of data are collected and analysed simultaneously. One of the methods has a priority over the other one and the integration is done at the data analysis stage (Creswell *et al*. 2003). For Harwell (2011), the strengths of this design include the shorter data collection period and the multiple perspectives embedded in the data, whiles its weaknesses include the level of expertise needed to execute the study successfully, especially in mixing the qualitative and quantitative data within the data analysis.

Concurrent transformative design: This design involves collecting two types of data at the same time and may have equal or unequal priority (Creswell *et al*. 2003). Qualitative and quantitative data are typically mixed during the analysis phase. The Strengths of this design include a shorter data collection period, whereas its weaknesses include the difficulties encountered in reconciling conflicting results using qualitative and quantitative data.

This research has adopted the sequential transformative mixed method design in that two phases of data collection were employed. During the first phase, quantitative data were collected using a survey. Survey was conducted to answer the following research questions:

a. What are primary mathematics teachers' assessment practices before training?
b. What are primary mathematics teachers' understandings of AfL before training?

Teachers who wished to participate in the second phase of the research had to indicate on the questionnaire their names and contact details. Among those who showed interest in participating in the present study, eight were purposefully selected. These were teachers who received the training and were later observed and interviewed. The purpose of observation was to see the assessment practices teachers were using in an effort to answer the research question – how do primary mathematics teachers understand and implement AfL after training? The importance of interviewing teachers in this study was to establish their understanding of AfL and also the contextual challenges which influenced their implementation of AfL. The data collected through quantitative and qualitative methods were integrated during the interpretation stage.

A diagram of the procedures for this sequential transformative mixed method design is presented in Figure 4.2.
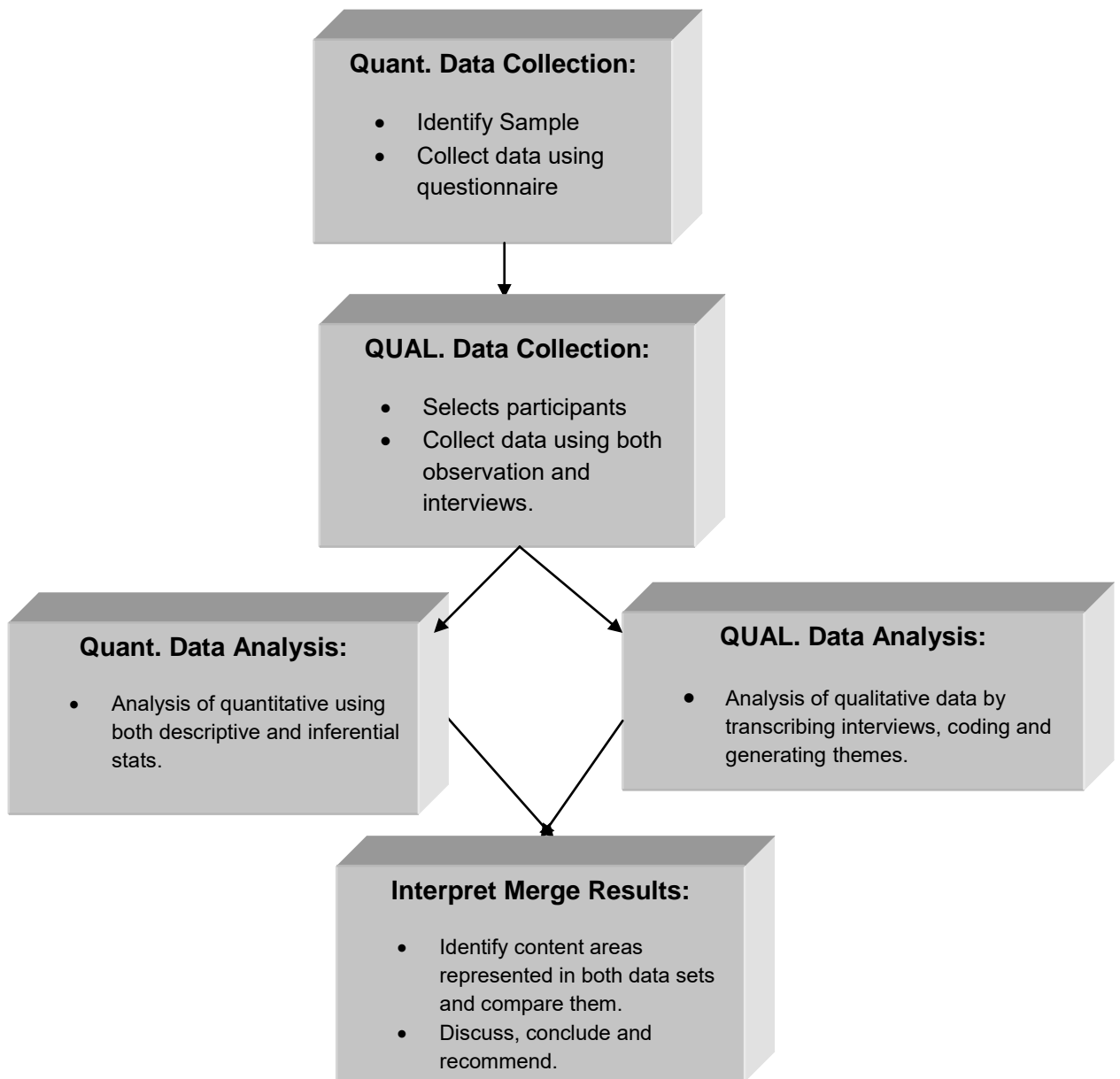
Figure 4.2: A Sequential Transformative Mixed Method Design–Adapted from Creswell et al., 2003:180

In order for the researcher to collect data, it is important to identify the setting where the sample is going to be selected. The setting of this research has been presented below.

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4.5   SETTING OF THE STUDY

The setting of the research was in Maseru Lesotho. The research focused on primary school teachers teaching mathematics in grades 1 – 4. Primary schools in Lesotho which are classified a public and private, where public schools comprise church-owned and government-owned schools. On the other hand private schools consist of individually owned schools and community owned schools. Majority of primary schools in Maseru are owned by churches. Education in the public primary schools in Lesotho is free and this results in an over-crowding in most classrooms at this level. Primary school teachers in Lesotho teach one grade or standard in a given year and they teach all the subjects (which range from 5 to 8 subjects). However, as per the New Integrated Curriculum, grades 1 to 4 concentrate only on three learning areas, namely numeracy, literacy and integration of these learning areas. It is in these grades where teachers are supposed to use AfL when assessing their learners as per CAP (MoET, 2009).

All the eight teachers who participated in the study were females. Their profile is indicated in Table 4.3.

Table 4.3: Participants Profile			
Participant	Age Range	Qualifications	Teaching Experience Range
1	30 – 40	Diploma	5 – 10
2	30 – 40	Diploma	5 – 10
3	30 – 40	BEd (Hons)	5 – 10
4	30 – 40	Diploma	5 – 10
5	60 – 70	PTC	30 – 40
6	60 – 70	PTC	30 – 40
7	60 – 70	PTC	30 – 40
8	30 – 40	Diploma	10 – 15

All eight teachers were from four church schools in Maseru. Two schools were situated in the city centre, the third school was about six kilometres from the city centre and the fourth was about twelve kilometres from the city centre. Three

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schools were along the main tarred road while the fourth one was about three kilometres from the tarred road. In terms of facilities available in the school, all the schools had similar resources as all public and government schools are resourced by the government. The two primary schools in the city centre had a population of more than one thousand each, while the other two had a population of less than a thousand.

The next section discusses the sample and sampling techniques used in this research.

4.6   SAMPLE AND SAMPLING TECHNIQUE

The target population for the study consisted of grades 1 to 4 primary school teachers in Maseru. The study comprised two samples. The first sample on which a questionnaire was administered consisted of 250 grades 1- 4 primary school teachers who were selected from 20 public schools which were randomly selected from 105 public schools in Maseru. The age, qualification and teaching experience of these teachers were not considered. The only determining factor was the level at which these teachers were teaching, that is, grades 1 to 4 because the new forms of assessment was mainly practiced at these levels.

The second sample comprised eight grades 1 to 4 primary teachers from four primary schools in Maseru which were purposefully selected as they were knowledgeable and experienced about AfL issues. These teachers were part of those who completed the questionnaire in the first phase. On the questionnaire, teachers who were interested to take part in the research were requested to supply their personal details for ease of communication with the researcher. This was done in order to ascertain that teachers were willing and available to participate in the study. Palinkas *et al.* (2015) demonstrate that purposive sampling is a technique used in qualitative research for identification and selection of information-rich cases for the most effective use of limited resources. They further point out that purposive

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sampling involves identification and selection of individuals or group of individuals that are knowledgeable and experienced with a phenomenon of interest.

Since almost all teachers who completed the questionnaire provided their details, the researcher decided to purposively choose four schools in which teachers had shown interest to participate in the study. In each school, two teachers were selected and the researcher provided the school principals with a list of selected teachers who were to be trained. This was done so that these teachers could be released to attend the assessment for learning workshop on the said date. The reason for involving two teachers per school was that these teachers were expected to work together and help each other when they get back to their respective schools. Furthermore, only two teachers per school were selected to participate in the study for the most effective use of limited resources. Once the sample was selected, training workshops for the selected sample were done. The next section elaborates on how the workshops were carried out.

4.7   OUTLINE OF ASSESSMENT FOR LEARNING WORKSHOPS

The aim of the training that was conducted in this research was to assist teachers to deepen their understanding of assessment for learning by clarifying some concepts associated with it. The training was held in two stages where in the first stage all teachers who participated in the second phase of the research were given a one day workshop. The second stage of the training was school-based where teachers in their respective schools where training continued. The section below elaborates on how these training workshops were conducted.

4.7.1 Initial Workshop

Assessment for learning workshop for primary mathematics teachers was held in Maseru on Thursday, the 17th October, 2013 from 0800 to 1700. All the eight

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teachers from four primary schools attended this workshop. The day started with registration of teachers from 0800 to 0830. Teachers were given files containing lined paper, a pen, pencil, rubber, ruler and copies of Integrated Primary Curriculum for Grades 1, 2, 3 and 4. The workshop commenced at 0830 with a prayer by one of the participants. After the prayer, the researcher who organized the workshop introduced herself and the resource person who accompanied her. The resource person was a mathematics lecturer from one of the teacher training institutions in Lesotho, who teaches curriculum studies in mathematics, involved in the development of the new integrated curriculum and also took part in the writing of Assessment Packages for grades 1 to 4.

The researcher then asked teachers to introduce themselves in turns, indicating who they were, the schools they came from and the grades they taught. Thereafter, the researcher made welcome remarks indicating the aim of the workshop as to capacitate teachers with assessment for learning strategies. Then the researcher requested teachers to write down their expectations about the workshop in as far as assessment for learning is concerned. Teachers were then asked to read their expectations and the researcher wrote these expectations on the flip chart and then grouped similar expectations together. The expectations were grouped into: interpretation of the new integrated primary curriculum, definition and development of success criteria, attributes of peer and self-assessment and use of performance statements in assessing learners. The researcher showed that all the expectations were mentioned with an exception of interpretation of the new integrated primary curriculum, which would be addressed under the following objectives of the workshop as presented on the PowerPoint as teachers should be able to:

- Develop success criteria for a mathematics concept;
- Apply peer and self-assessment in the teaching of mathematics;
- Define what constitutes descriptive and effective feedback;

The interpretation of the new integrated primary curriculum which was not part of the issues to be discussed in the workshop had to be given a slot in the program as most teachers seemed to have a challenge in interpreting it. Fortunately, this was not

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a problem because the resource person was involved in the development of the curriculum and knew a lot about it. This activity lasted for an hour as indicated on the programme in Appendix E.

After introduction and welcome remarks, forty five minutes was spent on interpretation of the new integrated primary curriculum. The Resource person indicated that unlike in the old curriculum, the new integrated primary curriculum comprises different learning areas, namely, Linguistic and Literacy; Numerical and Mathematical; Personal, Spiritual and Social; Scientific and Technological; and Creativity and Entrepreneurial. However, the resource person indicated that the syllabi for grades 1 to 4 focus only on Sesotho window, English window, Numeracy window and the integrated aspect of the curriculum. The resource person further indicated that in lesson planning, teachers should start with the integrated part and then move on to windows to show how the content from the windows relates to the integrated part. Examples were given which elaborated relationship between different windows and how they could be integrated. The next thirty minutes were assigned for working tea break in which teachers were given an opportunity to ask questions and comment on the presentation.

In the next one and half hour session, the resource person made a PowerPoint presentation on assessment for learning. The main focus of the presentation was on what assessment for learning is, how it differs from assessment of learning, strategies used in assessment for learning, the importance and challenges of using assessment for learning strategies in the teaching-learning situation. An elaboration of assessment for learning strategies was made. These strategies were sharing the learning intentions and the criteria for success with the learners at the beginning of the lesson, use of quality questions based on the criteria for success, providing timely feedback based on the criteria for success and the use of peer and self-assessments. Elaborating on these strategies, the resource person indicated that in sharing the learning intentions, learners would have a clear notion of what they are expected to know, understand or be able to do by the end of lesson. Sharing criteria for success with learners was considered as an important aspect of assessment for

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learning because it is through these statements that learners recognize if they have been successful in their learning or not. Success criteria summarize the main teaching points or processes and spell out the steps required to achieve the learning intentions.

The use of good quality questions based on the criteria for success was also emphasised by the resource person who pointed out that good question elicit learners understanding or misunderstanding of a concept. Use of good questions also assists the teacher to establish if learners followed the steps as outlined in the criteria for success. It was elaborated that through answers learners give, the teacher is able to give feedback and provide necessary support or remedy for the problem on time. The resource person indicated that the abolishment of ticks and crosses in assessing learners' work is meant to encourage teachers to provide descriptive feedback that would inform learners about their strengths and weaknesses. Teachers were referred to page 4 of grades 1- 3 of the syllabus where these strategies are well articulated.

When talking about peer and self-assessments, the resource person strongly urged teachers to use these strategies in their teaching. The reason why teachers were urged to use these strategies was that classes especially at lower primary level are crowded and it is not possible for a teacher to attend to each and every learner in the class. It was emphasised that for learners to be able to self-assess (where learners check their own work against the criteria for success) and be assessed by others (in their groups, learners check each other's work against the criteria for success); they have to understand the criteria for success and should also have an idea of how good work looks like. Use of indicators was also encouraged as the resource person indicated that indicators would help the teacher to identify learners who need some assistance.

After the presentation, teachers were given thirty minutes to ask questions, seek clarification and comment on the presentation. It was during this session that most

questions were asked and it was also evident that most teachers were not aware of the information contained in their syllabi and other documents in their possession. Questions asked by the teachers showed that they were not at all in the light of what they were supposed to be doing. For example, grades 1 to 3 syllabi clearly stipulate that "*teachers should share learning outcomes and success criteria with learners, so that learners know what they are learning and the standards they are aiming for*" (p.4). Yet, teachers in the discussion indicated that they were not aware of this and had never done this in their classes. One teacher asked "*what is this success criterion, can you elaborate more on it*?" The researcher answered this question by indicating that the next session was about development of success criteria.

After detailed and fruitful discussion, thirty minutes were spent on the development of criteria for success on "rounding off 3-digit number to the nearest hundred". In this activity the resource person, the researcher and the teachers worked through the steps that would guide the learners to round off a 3-digit number to the nearest 100. In doing this activity, teachers were asked to state the knowledge that they expect learners should have in order to successfully do this activity (where learners 'are' in terms of their knowledge). Next, teachers were asked to state the learning intention for this activity (where learners are going). Then the group outlined step by step, the procedure that learners would follow in order to get to the answer. Finally the criteria for success on rounding off 3-digit number to the nearest hundred were as follows:

- *Write the place value of each digit in the number above each digit.*
- *Look at the digit occupying the place value "tens"- if it is 5 or more, round the number up and if it is 4 or less round it down*
- *When rounding up, increase the hundreds digit by one and when rounding down keep the hundreds digit the same*
- *In the positions of "tens" and "units", write zeros as place holders*
- *Check that the answer has the same number of digits as the one you started with*

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After this activity, teachers were given one hour lunch break and were requested to reflect on the activity they had just done while having their meals. After lunch, two groups of teachers were formed comprising of one teacher from each school. Each group was given a chance to choose a numeracy concept from grades 1 to 4 syllabi and develop success criteria for it. In the development of the success criteria, teachers were requested to state the prior knowledge that the learners should have and the learning intention for the concept chosen. The researcher and the resource person moved around to assist the groups in the development of the success criteria. This activity lasted for one hour fifteen minutes, after which groups were given one hour to present their work to the rest of the group.

After group presentations, the researcher asked the teachers whether they were now confident to implement AfL as stipulated in the assessment policy and also confident to share with their colleagues what they have learnt in the workshop. All the teachers indicated that they were not competent enough to talk about development of success criteria and requested that the researcher followed up the workshop with school-based training where the rest of their colleagues would be able to attend as they also had similar problems. However, it was finally agreed that the purpose of the follow-up workshops in the schools would be to assist them in the implementation of AfL in their classes and also to support them. It was agreed that follow-up workshops would be done a week after initial training where the researcher in collaboration with teachers who participated in the workshop would work together to prepare a lesson which teachers would teach afterwards. Though the purpose was to assist teachers who attended the initial workshop, they were given the liberty to invite other teachers to see the process as it unfolded. Teachers were then given evaluation forms to complete (see Appendix F). The researcher then closed the workshop by thanking all present and for making the workshop a success. One of the teachers on behalf of other teachers thanked the facilitators and indicated that they hoped that this was just the beginning as the workshop was an eye-opener for all of them. She further indicated that this kind of workshop was what they had been longing for. The workshop was closed with a prayer at 1700.

4.7.2 Follow-Up Workshops

The follow-up workshop at the first school was on the 25th October, 2013. The workshop started at 0900 and was attended by twelve teachers. This workshop was officially opened by the school principal who pointed out that the workshop was very important and came at the right time when teachers were facing challenges regarding the implementation of assessment for learning. She concluded by indicating that she hoped that at the end of the workshop, teachers especially those who did not attend the initial workshop would have gathered enough knowledge and skills regarding this new mode of assessment. The researcher and the teachers who attended the initial workshop facilitated in preparing the lesson. First, the team agreed on the concept to be taught (**dividing a 3-digit number by one-digit number using long method**) from grade 3 syllabus. Objectives for the lesson were stated (i.e where learners are going). Then the team brainstormed on the pre-knowledge learners should possess for them to be able to do this activity (i.e where learners are in terms of their knowledge). The researcher together with the two teachers, who attended the initial training, guided the rest of the teachers in developing the success criteria for "dividing a 3-digit number by one-digit number using a long method". This step clearly defined how the lesson objectives would be achieved (i.e how to get there). The researcher highlighted the importance of success criteria in peer and self assessment. She also emphasised that in AfL, it was important to ask good questions that required high order thinking skills (how and why). The importance of using indicators was also encouraged as it is through use of indicators that the teacher would be able to see learners' progress. Due to time constraints, the team agreed that the prepared lesson would be taught the following day by all teachers teaching similar grades in that school. The workshop lasted for three hours. In her closing remarks, the school principal thanked the researcher and the teachers who attended the workshop for the work well done.

In the second school, the workshop was conducted on the 29th October, 2013 and lasted for four hours. Fortunately the topic selected was similar to that of the first school except that the concept was now selected from grade 4. Hence the program for the workshop was the same as that of the first school. In fact the program followed was the same for all schools except in one school where the concept

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chosen was on "rounding off 4-digit number to the thousand" from grade 4 syllabus. When these workshops were completed, the researcher then started collecting data using a variety of data collection techniques which are elaborated in the next section.

4.8   DATA COLLECTION TECHNIQUES

Since the study adopted mixed methods design, both quantitative and qualitative data were collected. Questionnaires were used to collect quantitative data while participant observation and interviews were used to collect qualitative data.

4.8.1 Questionnaire

A questionnaire is one of the most frequently used methods of data collection in educational research. Mangal and Mangal (2013) define a questionnaire as *"a data collection tool available in the shape of a form containing a set of appropriate questions meant for collecting necessary data from the subjects of the study by getting it filled in by the subjects themselves"* (p.337). They point out that a questionnaire is used when factual information is desired. The set of questions contained on the questionnaire are written in advance of their administration by the researcher. These questions can either be closed or open. Brian (2002) points out that closed questions are those that require fixed responses where the respondent just chooses from a list of responses. On the other side they describe open questions as those that give the respondent an opportunity to write down their views. In other words closed questions give quantitative data while open questions give qualitative data. Harris and Brown (2010) point out that, questionnaires are viewed as a more objective tool that can produce generalisable results and are usually adopted where the field of investigation is large and the respondents are widely spread over a region.

Questionnaire as a research tool has a number of advantages to the researcher. Mangal and Mangal (2013) indicate that the following are advantages of a questionnaire:

- It is helpful in collecting factual information as well as opinion of the respondents regarding the issues raised in the research study in an appropriate way.

- It can work as an economic research tool for collecting information from a large number of respondents available in a group at a particular location.

- In the administration of a questionnaire on a personal basis, the researcher can have a face-to-face interaction with the respondents available at a particular location.

- Questionnaire as a tool of data collection provides greater opportunity to the respondents for providing information in their own ways by enjoying full freedom of doing so.

- A respondent may freely express his opinion or furnish any information without revealing his identity to the researcher.

- Questionnaires, sent through mail or handed over personally for being returned afterwards, carry a special advantage to the respondents as the respondents can complete them according to their convenience and availability of time.

- Written questionnaires enjoy greater possibility of reducing the researcher's biasness on account of the uniformity lying in the question presentation (p.352-353).

In the same manner, Gratton and Jones (2010) illustrate that a questionnaire allows a researcher to collect data from a geographically dispersed sample group at a much low cost. In addition, they indicate that the researcher is not needed to be present when a questionnaire is completed and this leads to reduction of bias into the result, especially where the questionnaire is well designed. Elaborating on the issue of anonymity, Gratton and Jones (2010) posit that filling the questionnaire in the absence of the researcher who might be interested in certain sensitive issues may increase the validity of responses.

Despite having a number of advantages, questionnaire as a data collection tool still has some weaknesses and limitations. One of the weaknesses of a questionnaire is that it can only be adopted where respondents are literate. In fact Mangal and

Mangal (2013) show that the "*task of responding to the items of questionnaire needs a lot from the respondents in terms of proper grasping or understanding the meaning inherent in the questions*" (p.353) This therefore indicates that a questionnaire may not work well with a number of people such as illiterate, ignorant about the language used in the questionnaire, poor in reading and writing skills. It can provide the answers to the questions what, where and how, but it is not easy to find responses on the why. The main emphasis here is on fact finding (ibid).

As it has already been mentioned above, this study adopted a quantitative approach in which a questionnaire was used (Appendix B). This questionnaire was adapted from the previous research on teachers' assessment practices which was carried out by LCE and CGDE (2008-2009). The use of a questionnaire helped the researcher to answer the research questions on teachers' assessment practices before training and their understandings of AfL before training. The questionnaire consisted of two sections. Section A: **Teachers General Background Information:** this section had five items which addressed teachers' age, their highest qualification, teaching experience, grades they were currently teaching and the number of learners in each class. This section provided the researcher with data on the subjects of the research, which could have an impact on their assessment practices. Section B: **Information about Teacher's Assessment Practices:** in this section, Likert scale, with different number of alternatives depending on the type of question asked was used. The section consisted of five questions. Question one had seven items addressing teacher's assessment methods. In answering this question, a five-point Likert scale was considered to be the most appropriate scale. Assessment methods were provided and the respondents were to indicate the frequency of using each method. Options given ranged from always, often, sometimes seldom, as well as never. Question two had six items on reasons for the choice of assessment method used. In this question, respondents had to indicate whether they strongly agree, agree, neutral, disagree or strongly disagree with the reason provided. Question three had fourteen items on teachers' AfL practices. Respondents were requested to rate themselves using rarely, often and always. Question four was investigating whether teachers had guidelines on assessing learners or not and if they had how often they used them. The last question was an open-ended question which established teachers' understanding of AfL. Respondents were asked to write down

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what they understood by assessment for learning. Another tool that was used to collect data was an observation schedule. The next section discusses different forms of observation used in research.

4.8.2 Observation

According to Sparkes and Smith (2014) *"observation is the rigorous act of perceiving the workings of people, culture and society through one's senses and then documenting these in field notes or recording them through technological means"* (pp.100-101) For Baker (2006), observation involves the systematic recording of observable phenomena or behavior in a natural setting. Sparkes and Smith (2014) point out that observation enables the researcher to "*examine peoples' lives in situations and life as it happens in 'real time'"* (p.100). They also highlight that observational methods allow the researcher to record the 'mundane', taken-for-granted, and typical features of everyday life that the participants might not feel were worth commenting on. Thus, observation as a method of collecting data does not only provide information on what people say they do, but also on what they actually do in their own setting. For Sparkes and Smith (2014), some of the reasons for using observation in qualitative studies are that they provide the researcher with a contextual understanding of people's actions, interactions and emotions, and data collected through observation can be a route to 'knowing people' rather than 'knowing about them'.

On the other hand Waltz, Strickland and Lenz (2010) illustrate that observation provides *"a variety and depth and breadth of information to research that is difficult to obtain with other data collection methods"* (p.277). They further ascertain that this method can be quite flexible as it allows an observer to get right inside the situation in a manner that can give real information which cannot be readily obtained by other methods.

While observations can enhance information obtained considerably, Waltz *et al.* (2010) demonstrate that data obtained through observation are amenable to bias

and distortion as errors by observer and insufficient skills in observing can threaten the quality of data. Gerrish and Lacey (2010) show that any form of interruption during a period of observation is likely to result in an incomplete data collection which can result in abandoning such piece of an observation. They also argue that during observation, the underlying meanings ascribing certain behaviours remain inaccessible.

Observation methods can be divided into four different roles the researcher can play depending on the level of contact she/he has with those being studied. According to Baker (2006) the four roles the researcher can assume are complete observation (non-participant observer), observer as participant, participant as observer and complete participation.

4.8.2.1 *Complete observation (non-participant observer)*

Baker (2006) indicates that in complete observation, the researcher has no level of involvement with participants. In this role, the researcher is present on the scene but does not participate or interact with participants to any great extent, that is, her/his role is to listen and observe. On the other hand, Sparkes and Smith (2014) illustrate that in complete observation; the researcher adopts a 'fly on the wall' approach and does not actively participate in the field but instead observes what happens and how things happen.

According to Baker (2006), one advantage of this role is that the researcher can remain completely detached from the group. However, he points out that detachment can also be a major disadvantage because it could prevent the researcher from hearing entire conversations or grasping the full significance of an information exchange and thus, cannot ask participants any questions related to what they have said.

4.8.2.2 Observer as participant

This role, as described by Sparkes and Smith (2014), involves the researcher being only marginally involved in the situation. Baker (2006) illustrates that the researcher assuming this role involves more observation than participation. Sparkes and Smith (2014) show that the advantage of assuming this role is that it opens the possibilities for the researcher to ask questions, to be accepted as a colleague, but not called upon as a member of the group under the study. However, this role is seen as a source of frustration to the researcher who cannot play a real role of being an observer in that setting (*ibid*).

4.8.2.3 Participant as observer

In this role, the researcher becomes more involved with the participants' central activities but still does not fully commit to "*members' values and goals*" (Baker, 2006). For Baker (2006), it is during this period of observation that the researcher may develop relationships with the participants. William and Pearce (2006) reiterate that where the researcher takes the role of a participant as observer then he/she has the opportunity to put her/himself "in the shoes" of the participants and use introspection as a tool. The advantage of this role is the ease with which the researcher–participant relationship can be forged or extended such that the observer can move freely around the setting to observe more sites in more detail and depth (Sparkes & Smith, 2014). However, this relationship can also be viewed as problematic in that, the researcher may "over identify" with the participant such that she/he loses objectivity, and "go native," thus jeopardizing her/his role as a researcher/observer (Baker, 2006).

4.8.2.4 Complete participation

According to Sparkes and Smith (2014), in complete participation, the researcher becomes part of the setting and takes participant's role, that is, the researcher does not participate in the lives of the participants in order to observe them, but rather observes while participating fully in their lives. For Baker (2006), researchers act as members, not researchers, so that they do not unnaturally alter the flow of the interaction. The disadvantage of this type of observation is that the researcher may

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feel that "*he has violated his observer role, that it is almost impossible to report his findings*" (*ibid*: 177).

In this research participant observation was adopted. This tool was particularly adopted in this research because it had the greatest potential of revealing all the aspects of assessment for learning practices which teachers enacted in their classrooms and it was also used to show teachers' understanding of AfL. Furthermore, observation was used in this study to provide the researcher with an understanding of the classroom setting in which the participants implement AfL. Observation protocol (Appendix C) was used to make the observation more focused. It was also used to look into the planning of the lesson planning and its presentation, especially on assessment for learning strategies such as the types of questions asked, feedback provided and teacher-learner or learner-learner interaction. After classroom observations were conducted, individual teacher interviews were done. The next section discusses different types of interviews and the one that was used in this research.

4.8.3 Interview

Interview is another data collection method that was used in this research. Sparkes and Smith (2014) define interview as a "*conversation with a purpose in which the interviewer aims to obtain the perspectives, feeling and perceptions from the participants in the research*" (p.83). For Marks and Yardley (2004), the use of interviews in a research is aimed at discovering the 'interviewee's own framework of meanings' and the researcher's work is to try as much as possible to avoid imposing her/his own views. There are different types of interviews depending on the need and design of the study and these are structured, semi-structured and unstructured interviews. The next section briefly discusses each of these types of interviews.

4.8.3.1   Structured Interview

The structured interview uses a structured schedule in which the interviewer asks predetermined questions which are short and clearly worded. The questions asked

are closed and have fixed choice answers (Marks & Yardley, 2004). In addition, Salmon *et al*. (2010) demonstrate that in a structured interview, the interview content in terms of questions and their order is pre-determined and is adhered to quite rigidly, that is, no scope for discussion outside of the pre-defined area of the study is usually permitted. Structured interviews are said to be useful especially where limited time is available for data collection purposes because they focus data collection significantly (ibid). However, structured interviews are criticized for not allowing the researcher to explore the responses provided by the respondents further and also for limiting the types of responses given.   The section below discusses another type of interviews which is namely, the semi-structured.

4.8.3.2   *Semi-structured Interview*

On the other hand, in a semi-structured interview, part of the questions asked and their order is pre-determined, though a degree of flexibility is added. According to Sparkes and Smith (2014), in semi-structured interview, the researcher uses a pre-planned interview guide to direct the interaction and relies predominantly on open-ended questions. They point out that this kind of interview gives greater freedom to participants than the structured interview and it has the potential for allowing the participants a certain degree of flexibility to express their opinions, ideas, feelings and attitudes. For Sparkes and Smith (2014), semi-structured interview allows participants to reveal much more about the meanings they attach to their experiences thereby providing the interviewer with deep knowledge about them.

However, this type of interview is criticized for providing data that is less reliable as it is difficult to compare the responses between the respondents (Walsh & Wigens, 2003). Compared with the structured interview, semi-structured interview takes a longer time to complete and even to transcribe. Klenke (2008) illustrates that the semi-structured interview lacks validity, it is not reliable, it is time consuming, expensive and difficult to analyze. Apart from semi-structured interviews, there is yet another type of interview which is referred to as unstructured. This type of interview is discussed in the section below.

4.8.3.3 *Unstructured Interview*

According to Sparkes and Smith (2014), unstructured interview is the one that begins with a broad, open-ended question within the topic area. They point out that in unstructured interview, the interviewer has a broad range of topics to cover, however, ideas or issues raised by the participants as these ideas and issues unfold in their story are followed up. For Klenke (2008), unstructured interview is designed to elicit an authentic account of the interviewees' subjective experiences. He further indicates that unstructured interviews aim at digging deep beneath the surface in order to obtain the true meanings that the interviewees assign to their experiences of their attitudes and behaviours.

Klenke (2008: 126) illustrates that the advantages of unstructured interviews are that more complex issues can be probed, answers can be clarified and a more relaxed atmosphere may contribute to the elicitation of more in-depth as well as sensitive information. However, he points out that this kind of interview results in different types of information collected from different participants who are asked different questions thereby limiting the comparability of responses. In the same manner, Sparkes and Smith (2014) assert that the data collected from unstructured interview is more difficult to analyse and to compare across cases and time consuming.

Semi-structured interview was adopted in this research to collect information from primary teachers teaching the new Integrated Curriculum at grades 1 to 4. This tool was used to solicit teachers' understandings, beliefs, views about AfL, how they use it and why, that is, the purpose for the use of AfL. The interview schedule (Appendix D) used consisted of open-ended questions about teachers' perceptions of AfL and their assessment practices.

Once an appropriate data collection technique was selected, the procedure on how data was to be collected was determined. This procedure is outlined in the next section below.

4.8.4 Procedure for Data Collection

The data in this research was collected in two phases. In the first phase, 20 schools which were randomly selected from 105 public schools in Maseru urban participated in the study. Data in this phase was collected using a questionnaire. Prior to administration of the questionnaires, a letter to the school principals requesting permission to carry the study and also indicating what the study was all about and the purpose for carrying out such study was sent. The questionnaire was administered to 250 primary teachers who taught grades 1 to 4. These questionnaires were hand delivered and were later collected from the respondents. Out of 250 questionnaires distributed, 177 questionnaires were returned out of which six were spoilt as they were incomplete and in some cases, where one option had to be marked, more than one response was provided. On the questionnaires, teachers who wished to participate in the second phase of the study had been asked to write down their particulars so that they could be contacted. Data collected was then analyzed using Statistical Package for Social Science version 24.

In the second phase of data collection, eight teachers from four schools which were purposefully selected were trained on issues pertaining to assessment for learning. The training was conducted in two stages. The first stage involved a one day workshop which started at 0800 and finished at 1700. The workshop was meant to equip teachers with knowledge and skills pertaining to assessment for learning. The second workshop was school-based and it was intended to provide more information to the teachers who attended the first workshop and other teachers in the school who taught grades 1 to 4 and might wish to join their counterparts. Two months after the second workshop, teachers who participated in the study were observed teaching the lesson they prepared on their own. However, no data was collected at this stage as this was meant to give teachers confidence in using this new assessment mode. After lesson presentation, the researcher and the teacher concerned discussed what transpired during the lesson and suggestions were made as to how the lesson could be improved.

In the second school visit which took place a month after the first observation, the data was collected using observation protocol (Appendix C). The data was collected from five teachers as the other three had declined. The purpose of classroom observations was to see which assessment for learning strategies teachers had retained after training, their understanding of AfL which would be reflected in their assessment practices and the contextual challenges they experienced during implementation of AfL. This activity lasted for two weeks. Appointment with teachers about convenient time for which they could be interviewed was made. This was done telephonically. Prior to interviews, teachers' consent was sought with regard to the use of audio recording device during interviews. Teachers were interviewed about their experiences of using assessment for learning strategies (Appendix D). The interviews were conducted over a period of two weeks. The interviews conducted helped the researcher to gain in-depth information from teachers, and also to check for clarification of possible responses where necessary. Data collected was now ready for analysis. Hence the next section presents strategies that were used to present and analyse the data in this research.

4.9   DATA PRESENTATION AND ANALYSIS

In research, interpretation and analysis involves searching for understanding by looking at patterns and relations that emerge from the data. According to Creswell (2008) analyzing and interpreting the data involves representing it in tables, figures and pictures to summarize it and explain the conclusions in words in order to provide answers to the research questions. In this study, data collected through the questionnaires had been presented and analysed using both descriptive and inferential statistics. Frequency tables, percentages, means and standard deviations were generated using Statistical Package for Social Science version 24. In the case of inferential statistics, cross tabulations and Chi square tests were used.

Data collected from the interviews and observations were presented and analysed concurrently to show teachers' understanding of AfL, their assessment practices and the contextual challenges encountered during implementation. In analyzing the data, the first step was to transcribe the data that was collected from interviews and

observations. The transcripts were read, highlighting the most important parts which were later cut and sorted out in different groups depending on the common meaning they portrait. The data was thematically analysed. Thematic analysis involves identifying, analysing and reporting emerging pattern within data that provide an organisation of data, followed by an interpretation. Figure 4.2 below shows an example of how the researcher generated the codes from teachers' narratives themes.

GROUP A: Example of Codes

- Through the success criteria learners are able to check their work
- ....due to the map I provide them, learners are able to know where they are going unlike before where I used to give them the formula and let them work with it.
- (Pause)...I now use a variety of strategies to assess my learners
- It has now helped my learners to self assess themselves because of the success criteria
- If learners do not understand, they are able to tell their teachers through the use of indicators.

THEME: Effects of Assessment for Learning on Learners

GROUP B: Example of Codes

- Assessment for learning is an ongoing evaluation. It is done after a lesson or during the lesson or after a unit of learning.
- It is the assessment conducted during teaching-learning process to modify/rectify mistakes to enhance effective learning.
- Assessment for learning is an on-going learning process whereby both teachers and learners are given the chance to make improvements on teaching and learning while it is still going on. Assessment for leaning can be used every time when you want to check whether the learners understand the topic introduced. It can be done daily at the end of the lesson.

THEME: Policy Interpretation

GROUP C: Example of Codes

- There is a shortage of material such as the syllabus... there is also shortage of materials such as charts and markers
- ...we were not given any proper training and orientation about
- With a large class like mine it takes a lot of time to write statements for each learner
- There is a lot of paper work to be done if you want to do it thoroughly
- … requires a lot of time to prepare

THEME: Teachers' Problems Regarding Use of Assessment for Learning

Figure 4.1: Themes Generated in this Research

4.10   RELIABILITY AND VALIDITY OF THE FINDINGS

In research, reliability is considered as a situation where the same instruments used by different researchers produce the same results. Joppe (2000) in Golafshani (2003) defines reliability as:

> *the extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of the study can be reproduced under a similar methodology, then the research instrument is considered to be reliabl*e (p.598).

In this research, the researcher strived to maintain reliability by adapting and modifying data collection instruments that were used in other research studies (LCE & CGDE, 2009 and Khechane & Makara, 2014) on teacher assessment practices and also by trying to record and document data as best as possible.

However, Golafshani (2003) illustrates that though the researcher may be able to prove the research instrument repeatability and internal consistency showing its

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reliability, the instrument itself may not be valid. For Joppe (2000) in Golafshani (2003) validity especially in quantitative research:

> *Determines whether the research truly measures that which it was intended to measure or how truthful the research results are. In other words, does the research instrument allow you to hit "the bull's eye" of your research object? Researchers generally determine validity by asking a series of questions, and will often look for the answers in the research of others* (p.599).

The validity of data in this research was enhanced using triangulation in which the researcher used a sequential transformative research design that enabled her to employ different methods and sources of data collection within the same study. This was done in an attempt to confirm the conclusions the researcher wished to draw from the findings of the research. Joppe (2000) in Golafshani (2003) illustrates that triangulation strengthens study by combining different methods including using both quantitative and qualitative approaches.

In qualitative research, issues of trustworthiness demand attention to credibility, confirmability, dependability and transferability. The issue of credibility establishes whether or not the research findings represent plausible information drawn from the participants' original data and whether it is a correct interpretation of the participants' original view (Anney, 2014). In this research, the issue of credibility was addressed by using various data collection methods which included the questionnaire, interviews and observations.

On the other hand, confirmability in qualitative research is concerned with establishing that data and interpretation of the findings are not researcher's fabrications, but are clearly derived from the data (Anney, 2014). In the present study, the research findings were the result of the experiences and ideas of the respondents rather than the likings of the researcher. In order to enhance confirmability, mixed methods approach in which both quantitative and qualitative strategies were used. There were some similar questions asked in both strategies which addressed the issue of confirmability. For instance, in the questionnaire, teachers were asked to briefly say what they understood by AfL and during the

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interviews, they were again asked to define AfL.   The use of these two strategies was to complement the weakness of each other.

Dependability in qualitative research refers to the stability of the findings over time. In the current study, dependability was addressed through observation of participants and use of individual interviews. Last but not least, transferability in qualitative research refers to the "*degree to which the results of qualitative research can be transferred to other contexts with other respondents*" (Anney, 2014). In this study, transferability was addressed by giving detailed description of participants' views and opinions. However, the intention of the researcher was not to generalize the findings to a larger population other than the sample used. In any research, not only are issues of validity and reliability looked into, but there are also issues of ethical consideration which should be taken care of. The section below illustrates how issues of ethical considerations were addressed in this research.

4.11   ETHICAL CONSIDERATIONS

In educational research, issues of ethical considerations are very important. Cohen, Manion and Morrison (2003) illustrate that there are two important issues to lookout for in ethical considerations namely, the way in which the study has been conducted in relation to the participant, that is, issues such as consent, confidentiality and acknowledgements of all people who contributed in one way or the other in the research.   Before the administration of the questionnaire, the researcher sought the permission from the school principals to allow her to conduct the study in the school. This was verbally communicated to all the principals of the schools in which the questionnaires were administered. The questionnaires with covering letter inviting teachers to participate in the study were given to the principals who were asked to request teachers who were willing to fill the questionnaire. Principals were also asked to collect the questionnaires upon completion. The letter clearly indicated the name of the researcher, purpose of carrying out the study, confidentiality of the information provided, anonymity for those who would take part and the availability of the research report upon request after completion of the study (see Appendix A). According to Drew, Hardman and Hosp (2008), this information to the participants is

very crucial as it provides assurances to the participants that the information provided would be used for the said purpose only. However, teachers who wished to take part in the second phase of the study were requested to indicate on the questionnaire their particulars so that they could be contacted.

All participants who took part in the qualitative part of the study were assured that their identity would be kept confidential. During interview sessions, participants were asked whether they would like to be recorded or not. Some indicated that they did not feel comfortable and therefore were asked to speak slowly so that the researcher could capture the whole information. The interview questions were asked in English and teachers were given the liberty to use either English or Sesotho to answer them. However, all teachers who participated in the study decided to respond in English.

Generally in this study, participation was voluntary almost at every stage of the research study and confidentiality was observed throughout the research. Since participation was voluntary, the researcher agreed with the participants that should they want to discontinue their participation in the research at any time, they were free to do so and indeed three of the participants withdrew. However, there were some limitations which were experienced in carrying out this research. These limitations are presented in the next section.

4.12   LIMITATIONS

Length of the study emerged as a limitation in that teachers were only starting to understand and put the new ideas in practice by the end of the study. The researcher would have loved to work with the teachers for longer time to help them understand but this was not possible due to time constraints. Lack of resources such as finances and equipment also impacted on the choice of the sample of the study. A larger sample would mean more resources and more time invested in the study of this size.   Another limitation for this study was that its results could not be generalized to a wider population except the intended sample because a non-probability sample, namely purposive sample was used to select research participants. However, this was not the intention of the researcher to generalize the findings. The researcher was just interested to see the enactment of the new

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assessment mode and the challenges experienced during implementation phase. Finally, teachers who participated in this study decided to answer the interview questions in English though they were given freedom to answer either in Sesotho or English. This being their second language might have restricted them from giving all the information.

4.13   SUMMARY

In this chapter, a detailed account of philosophical issues in research, that is, ontological, epistemological and methodological approaches were outlined as they formed the basis for selecting methodology that was appropriate for the study. The study adopted mixed methods design in which both quantitative and qualitative techniques were used. Quantitative data was collected using questionnaires while qualitative data was collected using participant observation and interviews.

The intervention provided to teachers and data collection procedures were also discussed. Methods of analyzing both qualitative and quantitative data also formed part of this chapter. Issues of validity and reliability of quantitative data were looked into while trustworthiness which pays attention to credibility, dependability, confirmability, and transferability in qualitative data was also discussed. Ethical consideration and limitations of the study were also addressed in this chapter. The next chapter presents the data collected in study, its analysis and interpretation.

CHAPTER 5

FINDINGS AND INTERPRETATIONS

5.1 INTRODUCTION

The purpose of this research study was to investigate how primary mathematics teachers in Maseru understand and implement assessment for learning in the context of the new integrated primary curriculum. In an attempt to achieve this aim, this chapter starts by presenting the results that were collected through use of questionnaire. These results were analyzed using descriptive statistics, factor analysis tool and inferential statistics. These results are aimed at addressing the following research questions:

    a.   What are teachers' assessment practices before training?

    b.   What are teachers' understandings of AfL before training?

The second part of this chapter presents the results collected through classroom observations and teacher-interviews. These results were coded and later classified into three categories. The three categories which emerged from the results were *teachers' assessment for learning practices*, *teachers' understanding of assessment for learning* and *the challenges*. These results were meant to answer the following research questions:

    a.   What do teachers' classroom practices reflect as an understanding of assessment for learning after training?

    b.   Which contextual tensions exist for teachers in implementing AfL practices?

5.2 PRESENTATION OF QUANTITATIVE DATA

The results presented in this section are those that were collected through use of questionnaire. These results were analyzed using descriptive statistics, factor analysis method and inferential statistic method. Ho (2006) indicated that the major concern of descriptive statistics is to present information in a convenient, usable, and

understandable form. In this study, descriptive statistics were used to describe set of data in terms of totals, percentages, means and standard deviations which were generated using SPSS version 21. On the other hand Factor analysis method was carried out in order to investigate variable relationships and also to reduce the data itself so that it could be easily interpreted and understood. Yong and Pearce (2013: 79) illustrate that "*the broad purpose of factor analysis is to summarize data so that relationships and patterns can be easily interpreted and understood*".

Chi-square tests were also used to determine the significance difference relationship between variables. Ho (2006) pointed out that inferential statistics is not only concerned with describing the obtained data but also addresses the problem of making broader generalizations or inferences from sample data to population. The characteristic of the sample from which data is collected is of utmost importance in research. The next section presents the demographic information of teachers who took part in this research.

5.2.1 Biographical Data

This section presents biographical data of teachers who participated in this study. Data shown in Table 5.1 suggests that almost all the respondents (99.4%) in this study indicated ages, with only 14.5% of them falling in the range of 20-30 years of age. In the category 31-40 years of age, there were 59 respondents and this amounted to 37.1% of all the respondents who completed the questionnaire. The respondents who aged between 41 and 50 years account for 21.4% while those who were 51 years and above were 43 which gives 27%. It is interesting to note that of all the respondents who participated in this study 51.6% of them were 40 years or younger while the remaining 48.4% were above 40 years of age. The results indicate the balance between the younger generation and the more mature respondents.

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Table 5.1: Teachers' Age				
	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
20 - 30 years	23	14.4	14.5	14.5
31 - 40	59	36.9	37.1	51.6
41 - 50	34	21.3	21.4	73.0
51 and above	43	26.9	27.0	100.0
Total	159	99.4	100.0	
Missing	1	0.6		
Total	160	100.0		

A substantive number of respondents (158) which accounts for 98.8% answered this question. Most of the respondents (46.8%) who responded to this question had diplomas, while 25.3% of them had degrees. Only 16.5% of the respondents had other qualifications and 11.4% had teaching certificate. There were only 2 respondents who did not indicate their qualification. Generally, this data reflects that there is a small percentage (27.9%) of the respondents without diplomas and degrees (Ref. to Table 5.2).

Table 5.2: Teacher's Highest Qualification				
	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
PTC	18	11.3	11.4	11.4
DIP	31	19.4	19.6	31.0
DEP	43	26.9	27.2	58.2
BED	40	25.0	25.3	83.5
OTHER	26	16.3	16.5	100.0
Total	158	98.8	100.0	
Missing	2	1.3		
Total	160	100.0		

A good-sized number of respondents (158) responded to this question. Only two respondents did not attempt this question. The majority of the respondents in this sample (45.6%) had teaching experience of 15 years and above, while 23.1% of the respondents had an experience of 6-10 years. Respondents accounting for 16.3% had teaching experience 0-5 years and those with teaching experience between 11 and 15 years were 23 which was equivalent to 14.6% of all the respondents. It is therefore worth noting that 60.2% of the respondents had teaching experience of 11 years and above as shown in Table 5.3. This may indicate that the respondents are experienced in the field of teaching.

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Table 5.3: Teacher's Teaching Experience				
Years of experience	Frequency	Percent	Valid Percent	Cumulative Percent
0 - 5 YEARS	26	16.3	16.5	16.5
6 - 10 YEARS	37	23.1	23.4	39.9
11 - 15 YEARS	23	14.4	14.6	54.4
15 AND ABOVE	72	45.0	45.6	100.0
Total	158	98.8	100.0	
Missing	2	1.3		
Total	160	100.0		

All the respondents (100%) responded to this question. Table 5.4 illustrates that the majority of the respondents (63.1%) were teaching grades 1-4, while the remaining 36.9% were teaching grades 5-7.

Table 5.4: Classes Currently Taught				
	Frequency	Percent	Valid Percent	Cumulative Percent
GRADE 1	22	13.8	13.8	13.8
GRADE 2	26	16.3	16.3	30.0
GRADE 3	31	19.4	19.4	49.4
GRADE 4	22	13.8	13.8	63.1
GRADE 5	17	10.6	10.6	73.8
GRADE 6	19	11.9	11.9	85.6
GRADE 7	23	14.4	14.4	100.0
Total	160	100.0	100.0	

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Almost all the respondents (99.4%) answered this question. Respondents who had a class size of between 21 and 40 learners accounted for 30.6%, while 23.1% of all the respondents had 41 – 60 learners per class. In addition, quite a number of respondents (23.8%) had a class size between 61 and 80 learners. There were 22 (13.8%) respondents who had a class size of more than 100 learners. The least number of respondents (13) which is 8.1% had between 81 and 100 learners per class. This data shows that 45.7% of the respondents had 61 and more learners in their classes (see Table 5.5).

Table 5.5: Number of Learners Per Class				
	Frequency	Percent	Valid Percent	Cumulative Percent
21 - 40	49	30.6	30.6	30.6
41 - 60	37	23.1	23.1	53.8
61 - 80	38	23.8	23.8	77.5
81 - 100	13	8.1	8.1	85.6
101 and above	22	13.8	13.8	99.4
Missing	1	.6	.6	100.0
Total	160	100.0	100.0	

Generally, the table above shows that the teacher-pupil ratio in the Lesotho primary schools is high.

5.2.2 Descriptive Data

Descriptive statistics were used in this research to compare the percentages, means and standard deviation of different factors. Descriptive statistics involve identifying the characteristics of an observed phenomena or exploring possible correlations among two or more phenomena. In the section below, assessment methods used by teachers who took part in this research and their frequency of use are presented.

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5.2.2.1 Assessment Methods

Teachers who responded to the questionnaire illustrated that they use different methods to assess their learners in the teaching of mathematics. The methods used included observation, oral and written work, homework, worksheets, performance tasks, peer and self-assessments as shown in Table 5.6

Table 5.6: Assessment Strategies							
Assessment Methods	Total	Never	Seldom	Often	Always	Mean	Std. Dev.
Observation	153	2 (1.3%)	14 (9.2%)	46 (30.1%)	91 59.5%	3.48	0.717
Oral exercise	158	1 (0.6%)	12 7.6%	56 35.4%	89 56.3%	3.47	0.665
Written tests	153	0 0	18 11.8%	76 49.7%	59 38.6%	3.27	0.659
Homework	156	4 2.6%	26 16.7%	83 53.2%	43 27.6%	3.06	0.738
Worksheets	145	36 24.8%	61 42.1%	27 18.6%	21 14.5%	2.23	0.984
Peer and self	154	22 14.3%	49 31.8%	48 31.2%	35 21.9%	2.62	0.991
Performance tasks	149	14 9.4%	35 23.5%	59 39.6%	41 27.5%	2.85	0.933

Observation

There were 153 respondents who answered this question. Table 5.6 shows that two respondents who constituted 1.3% of the respondents indicated that they never used observation as an assessment method, while 9.2% of the respondents showed that they seldom used observation. On the other hand, 30.1% of the respondents illustrated that they often use observation in assessing their learners. The majority of the respondents (59.5%) reported that they always used observation to assess their learners. The mean of 3.48 which is between 3 (often) and 4 (always) indicates that most respondents who responded to this question do use observation often to assess their learners. This is supported by the standard deviation of 0.717 which shows that the respondents are clustered around the mean. Only 2 respondents did

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not answer this question. Teachers also indicated that they also used oral work when assessing their learners. The results on the use of this method are presented below.

Oral Exercise

An overwhelming majority of the respondents (98.8%) responded to this question. Only 0.6% of the respondents indicated that they never used oral exercise to assess their learners, whereas 7.6% of the respondents displayed that they seldomly used this method. Of interest to this question is the response of 35.4% and 56.3% of the respondents who showed that they often and always use oral exercise respectively. This gives an overall percentage of 91.7% of the respondents for those who use this method. The mean for this question is 3.47 with the standard deviation of 0.665. In essence, this indicates that the respondents do agree that they often use oral exercises in assessing their learners (Refer to Table 5.6). The next section shows the findings on teachers' use of written work.

Written Exercise

A substantial number of respondents (95.6%) attempted this question. All the respondents indicated that they do use written exercise; however, they differ in degree of its usage. 11.8% of the respondents illustrated that they seldom use written exercise, 49.7% of the respondents showed that they often use this method while 38.6% of the respondents indicated that they always use this method. The mean of 3.27 clearly shows that respondents do use this method quite often. The standard deviation of 0.659 clarifies that the responses given for this questions were grouped around the mean (see Table 5.6). Homework is one of the strategies used by teachers in assessing learners. Teachers who participated in this research also indicated that they do use this strategy in assessment. Data on use of homework has been presented in the next section.

Homework

Table 5.6 illustrates that the majority of the respondents (97.5%) replied to this question. Interestingly, only 96% of the respondents use homework in assessing their learners. However, this method is used at varied degree. 16.7% use this method seldom, 53.2% often use the method, while 27.6% always use this method. Only 2.6% of the respondents do not use homework in assessing their learners. The mean for this question is 3.06 with an overall standard deviation of 0.738 shows that respondents do use homework as a method of assessing their learners even though their responses were scattered widely. The use of worksheets in the teaching and learning of mathematics is very important. Through the use of worksheets, teachers could assess the extent in which their learners have understood a concept to be developed. The next section presents data on the use of worksheet by teachers participating in this study.

Worksheets

A considerable number of respondents (90.6%) responded to this question. The responses shown in Table 5.6 indicate that the majority of the respondents (66.9%) never or seldom use the worksheets. Only a small percentage of the respondents (33.1%) indicated that they use the worksheets, of this. 18.6% use this method often and 14.5% reporting that they always use it. The mean for this question is 2.23 which shows that respondents seldom use worksheets as a method of assessing learners. The standard deviation for the question is 0.984, which indicates that the responses are scattered. The use of peer and self-assessments is very important in AfL as learners are able to reflect upon their own learning. The section below presents results on the use of these methods.

Peer and Self

Table 5.6 shows that a significant number of respondents (96.3%) answered this question. 14.3% of the respondents indicated that they never use peer and self-assessment in their teaching. A sizeable number of respondents (31.8%) showed

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that they seldom use peer and self-assessment. Respondents who indicated that they use this method often account for 31.2%, while those who always use it constitute 21.9%. The mean for this question is 2.62 with a standard deviation of 0.991. This shows that the respondents do use this method though the responses spread around the mean. The next section shows the data collected on the use of performance tasks.

Performance Tasks

A good-sized number of respondents (93.1%) attempted this question. Table 5.6 illustrates that only 9.4% of the respondents displayed that they never use performance task to assess their learners. On the other hand, majority of the respondents (90.6%) demonstrated that they use this method though to a varying degrees. 23.5% of the respondents pointed out that they seldom use this method while 39.6% of the respondents showed that they often use this method. 27.5% of the respondents indicated that they always use performance tasks to assess their learners. The mean for this question is 2.85 with the standard deviation of 0.933. This indicates that the respondents do use this method in assessing learners, however, their responses are scattered around the mean. Teachers who participated in this research showed a variety of methods they used in assessing learners in mathematics. It was important for the researchers to establish reasons for the choice of assessment method used.

5.2.2.2   Reasons for Choice of Assessment Methods

Teachers participating in this study gave different reasons for choosing certain assessment methods in the teaching of mathematics. Some of the reasons for using certain assessment methods are said to be easy to prepare and mark, they are appropriate for assessing mathematics, they are not time consuming, they do not know other methods and they teach too many learners. The results are shown in Table 5.7.

Table 5.7: Reasons for Choice of Assessment Methods								
	Total	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Dev
Easy to mark	147	10 (6.8%)	11 (7.5%)	31 (21.1%)	55 (37.4%)	40 (27.2%)	3.71	1.148
Easy to prepare	146	6 (4.1%)	12 (8.2%)	34 (23.3%)	68 (46.6%)	26 (17.8%)	3.66	1.00
Appropriate for assessing maths	147	5 (3.4%)	10 (6.8%)	28 (19.0%)	45 (30.6%)	59 (41.1%)	3.97	1.085
Not time consuming	139	13 (9.4%)	21 (15.1%)	31 (22.3%)	46 (33.1%)	28 (20.1%)	3.40	1.231
Do not know other methods	139	68 (48.9%)	36 (25.9%)	20 (14.4%)	12 (8.6%)	3 (2.2%)	1.89	1.081
I teach too many learners	146	26 (17.8%)	24 (16.4%)	22 (15.1%)	31 (21.2%)	43 (29.5%)	3.28	1.484

Easy to Mark

Table 5.7 suggests that 37.4% of the respondents who responded to this item on the questionnaire agreed that they used certain assessment methods because they were easy to mark. In addition, 27.2% of the respondents indicated that they strongly agreed that they chose assessment method on the basis of ease of marking. It is interesting to note that 21.1% of the respondents were neutral when it comes to this question. The remaining 14.3% represent the respondents who either disagreed or strongly disagreed that they used assessment method on the basis of how easy it was to mark. Out of 160 respondents, 13 did not answer this question and this gives a response rate of 91.9% which is quite a good number.

The mean for this question is 3.71 which lies between 3 and 4, and indicates that the respondents strongly agree that they choose assessment methods that enable them

to mark easily. However, an overall standard deviation of .148, shows that the responses were scattered over a wide range. The next section shows the results for choosing an assessment method on the basis of how easy is it to prepare it. The results for this option are displayed below.

Easy to Prepare

A sizeable number of respondents (91.3%) attempted this question, leaving 8.75% for those who did not attempt it. Table 5.9 shows that an overwhelming number of respondents (68) with a valid percentage of 46.6 replied that they agreed to the fact that they chose an assessment method that was easy to prepare, and 26 respondents (17.8%) also indicated that they strongly agreed. These two responses (strongly agree and disagree) gave a total percentage of 64.4 which is quite high. There were 34 (23.3%) respondents who were neutral about this question, 12 (8.2%) respondents who disagreed and 6 (4.1%) respondents who strongly disagreed that they chose an assessment method on the basis of how easy it was to prepare.

The average for this question is 3.66 with the standard deviation of 1.00. This value of 3.66 lies between 3 (agree) and 4 (strongly agree) which shows that the respondents strongly agreed that they chose assessment methods that were easy to mark. Nonetheless, the standard deviation of 1.00 reflects that participants' responses were widely scattered. The choice of assessment method used also depends on whether it is appropriate for assessing mathematical content or not. The results of this option are outlined below.

Are Methods of Assessment used Appropriate for Assessing Mathematics

Table 5.7 shows that out of 160 respondents, 147 answered this question. This gives a response rate of 91.9%, which is quite reasonable. Of the participants, 3.4% indicated that they strongly disagreed that they chose assessment methods that were appropriate for assessing mathematics, 6.8% disagreed that they used assessment methods that were appropriate for assessing mathematics while 19.0%

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remained neutral about this issue. A substantial number of the respondents (30.6%) agreed that they used assessment methods that were appropriate for assessing mathematics which the majority of respondents (41.1%) strongly agreed with this item. Both options agree and strongly agree, giving the cumulative percentage of 71.7.

The mean for this question is 3.97 which is very close to 4 (strongly agree). This indicates that on average, the respondents strongly agree that when assessing their learners, they use assessment methods that are appropriate for mathematics. On the other hand the standard deviation of 1.085 shows that the responses were more dispersed. Sometimes the choice of assessment method used depends on whether it takes a long time to administer or not. The results of choosing assessment method on the basis of not taking a lot of time are presented in the section below.

Not Time Consuming

A considerable number of respondents (86.9%) responded to this item. It is obvious from the Table 5.7 that about 50% of the respondents chose assessment methods that were not time consuming. This is because 46 (33.1%) teachers agreed and 28 (20.1%) also strongly agreed and both making a representative cumulative percentage of 53.2. With regard to the two responses strongly disagree and disagree, there were 13 and 21 respondents respectively who chose these options. However, 31 teachers with a valid percentage of 22.3% answered neutral.

The average for this item is 3.40 with standard deviation of 1.231. The mean of 3.40 is in between 3 (agree) and 4 (strongly agree) which indicates that the respondents generally agree that they use assessment methods that are not time consuming. However, the standard deviation of 1.231 reflects that the responses were spread out widely. The possibility that some teachers use one assessment method over the other one is that they do not know about other methods which exist. In the section below, the results of this are outlined.

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Do *Not Know Other Methods*

Data shows that 139 respondents ticked the statement 'do not know other methods'. This gives a response rate of 86.9%. A large number of respondents (48.9%) replied that they strongly disagreed and 25.9% also indicated they disagreed with the fact that they did not know other methods of assessment. These two responses give a total of 74.8%. For the remaining 25.2 %(35), 14.4% of the respondents were neutral, 8.6% agreed and 2.2% strongly agreed they did not know other methods (see Table 5.9).

The mean for this statement is 1.89 which is closer to option 2(disagree). This indicates that the respondents generally disagree that they choose certain assessment methods because they do not know other methods. On the other hand, the standard deviation of 1.081 shows that the responses varied greatly. Sometimes the choice of assessment method used may be influenced by the number of learners in the class. The results of this option are outlined below.

I teach too many Learners

Out of 160 respondents, 146 replied to the item "*I teach too many learners*". This gives a response rate of 91.3%. In response to this item, the majority of the respondents (29.5%) stated that they strongly agreed with this statement. With regard to the response 'agree', 31(21.2%) of the respondents chose this item to show that they also conceived that a number of learners in their classes have an impact on the choice of the assessment method used. The cumulative percentage for these two options is 50.7%. A substantial number of respondents (21.2%) remained neutral about this item. The remaining 34.2% of the respondents indicated that the size of the class did not influence the choice of assessment method they used. Specifically, of this 34.2%, those who strongly disagreed with the above item accounted for 17.8% while 16.4% showed that they disagreed with this (Refer to Table 5.7).

The mean for this item is 3.28 and this is very close to 'agree' option. This indicates that on average the respondents agree that too many learners in class impact on the choice of assessment method used. The standard deviation of 1.484 indicates that the responses were widely spread out. During the process of teaching and learning, there are various assessment practices teachers perform. These practices together with their frequency of occurrences are outlined in the section below.

5.2.2.3 Classroom Assessment Practices

In this study, it was important to establish teachers' assessment practices before training to see if what they were doing was in line with assessment for learning practices. Table 5.8 below shows some of the practices (together with their frequency of use) which teachers said they used.

Table 5.8: Teachers' Assessment Practices						
Classroom assessment practices	**Total**	**Rarely**	**Often**	**Always**	**Mean**	**Std. Dev.**
At the beginning of the lesson, I clearly explain to my learners what I am going to teach (Learning Outcome**).**	159	11 (6.9%)	20 (12.6%)	128 (80.5%)	2.74	0.579
At the beginning of the lesson, I share success- criteria with my learners.	154	35 (22.7%)	74 (48.1%)	45 (29.2%)	2.06	0.720
I communicate with my learners indicators they should use to indicate their progress.	154	30 (19.5%)	62 (40.3%)	62 (40.3%)	2.21	0.747
In mathematics lessons, I ask learners to work in pairs or groups.	158	19 (12.0%)	77 (48.7%)	62 (39.2%)	2.27	0.661
During lessons I intervene at timely intervals to ensure learners remain focused.	158	11 (7.0%)	37 (23.4%)	110 (69.6%)	2.63	0.613
I discuss with my learners about what they have done well and what they need to do to improve.	160	6 (3.8%)	42 (26.3%)	112 (70.0%)	2.66	0.548
I use variety of means to gather learners' understanding of mathematics.	160	4 (2.5%)	35 (21.9%)	121 (75.6%)	2.73	0.498
I write comments on learners' work which explains what they have done well and what they need to do to improve.	157	38 (24.2%)	64 (40.8%)	55 (35.0%)	2.11	0.764
In my mathematics lesson, I ask learners to mark/comment on their work and progress.	157	89 (56.7%)	45 (28.7%)	23 (14.6%)	1.58	0.735
I ask learners to mark or comment on their class-mate's work.	156	101 (64.7%)	37 (23.7%)	18 (11.5%)	1.47	0.695
I provide guidelines (criteria) to help my learners mark their own or class-mate's work.	153	94 (61.4%)	37 (24.2%)	22 (14.4%)	1.53	0.735
I use assessment guidelines in assessing mathematics.	108	3 (2.8%)	51 (47.2%)	54 (50.0%)	2.47	0.555

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At the beginning of the lesson, I clearly explain to my learners what I am going to teach

The data about this statement reveal that 159 respondents out of 160 reacted to the statement. This accounts for 99.4% response rate which is very high. Table 5.8 illustrates that an overwhelming number of respondents (80.5%) indicated that at the beginning of the lesson, they always explained to learners what they were going to teach about. There were 20 (12.6%) respondents who also indicated that they often did that at the beginning their lessons. Only 6.9% of the respondents stated they rarely did that in their lessons.

The mean for this statement is 2.74 and lies closer to 3 than to 2. This highlights that the majority of the respondents "always" tell learners what they are going to teach. The standard deviation of 0.579 represents a data set where responses are very close to the mean. Apart from sharing learning intentions with the learners at the beginning of the lesson, it is also crucial for the teachers to communicate the success criteria to the learners at the beginning of the lesson so that they could know how to achieve the lesson intentions. The section below presents the findings on whether teachers communicate the success criteria to the learners or not.

At the beginning of the lesson, I share success- criteria with my learners

Out of 160 respondents who participated in this study, 154 ticked the statement "*at the beginning of the lesson, I share success- criteria with my learners*". Table 5.8 shows that of this, the majority of the respondents (48.1%) stated that they "often" shared success criteria with their learners at the beginning of the lesson. Of the remaining percent, 29.2% illustrated that they always did that and 22.7% showed that they "rarely" did that.

The mean for this item is 2.06 which is very close to option 2(often). This demonstrates that at the beginning of the lesson, the respondents often share success criteria with learners. The standard deviation of 0.720 indicates that the

responses are narrowly scattered around the mean. In order for the learners to self-assess themselves, they should know different ways they can use to communicate their level of understanding to the teacher. Mostly learners use indicators to indicate their level of understanding to the teacher. However, learners cannot just use indicators if they are not taught by the teacher how to use. In the next section, the findings on whether teachers do communicate these indicators to their learners are outlined.

I communicate with my learners indicators they should use to indicate their progress.

There were 154 respondents out of 160 who responded to the statement "*I communicate with my learners, indicators they should use to indicate their progress".* This amounts to 96.3% response rate for this statement. It is noteworthy that the number of respondents who indicated that they "often" communicated indicators to be used is exactly equal to the number of those who "always" did that. Each of these options accounted for 40.3% giving a cumulative percentage of 80.6. The remaining 19.4% of the respondents pointed out that they "rarely" communicated indicators learners should use to show their progress (see Table 5.8).

The mean for this statement is 2.21 and this is very close to option 2(often), hence, it indicates that on average, respondents do often communicate indicators to be used by learners. However, the standard deviation of 0.747 shows that the responses are more spread out from the mean. In situations where learners have shown their level of understanding using indicators, teachers can make use of other learners to those with difficulties. In order for the learners to help each other, they should be engaged or instructed by the teacher to do so. The section below presents the finding on whether teachers encourage their learners to work collaborately or not.

In mathematics lessons, I ask learners to work in pairs or groups

A good number of the respondents (98.8%) replied to the statement "*In mathematics lessons, I ask learners to work in pairs or groups*". The responses to this statement indicate that the majority of the respondents "often" used groups or pairs in the teaching of mathematics while 39.2% "always" used this strategy in mathematics teaching. Table 5.8 shows that only a small number of respondents (12.0%), demonstrated that they rarely used this strategy in their teaching.

The mean for this statement is 2.27 with the standard deviation of 0.661. The mean of 2.27 lies between 2(often) and 3(always), which indicates that during mathematics lessons teachers "often" use cooperative learning. The standard deviation showed that teachers' responses were a bit more spread out from the mean. Teachers timely intervention during teaching and learning process is very important as it helps learners to remain focussed for the rest of the lesson. The results of teacher intervention during teaching and learning process are presented below.

During lessons I intervene at timely intervals to ensure learners remain focused

The majority of the respondents (98.8%) replied to the item "*During lessons I intervene at timely intervals to ensure learners remain focused*". Quite a number of respondents (69.9%) indicated that during the lesson, they "always" intervened at timely intervals to ensure that learners remain focused while 23.4% of the respondents also highlighted that they "often" intervened during the lesson. It is noteworthy that a small percentage of the respondents (7%) "rarely" intervened during the lesson to ensure that learners remain focused (Refer to Table 5.8).

This item has the mean of 2.63 which is closer to option 3 (always) and the standard deviation of 0.613 indicated that responses were narrowly spread out from the mean. Hence these results illustrate that on average, the respondents do intervene timely in the lessons to ensure that learners remain focused. It is also important for teachers

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to discuss with their learners where they have done well and where they need to improve. The next section reports the findings on whether teachers do discuss with learners about what they have done well and also where they need to improve.

I discuss with my learners about what they have done well and what they need to do to improve

All the respondents answered this item with the majority (70%) of them indicating that they "always" discussed with learners about what learners had done well and what they needed to do to improve. Table 5.8 illustrates that a considerable number of respondents (26.3%) also indicated that they "often" discussed with their learners what they had done well and what to improve. Both these options (always and often) gave the total percentage of 96.3 of the respondents. Only a small percentage (3.8) of the respondents demonstrated that they did not discuss with their learners what they had done well and what to improve.

The mean for this item is 2.66 with a small standard deviation of 0.548. These results indicate that all in all, respondents do talk with their learners what they have done well and where they should improve. In addition, this standard deviation indicates that their responses were centred more closely to the mean. In order for teachers to check for learners' understanding of mathematics, they need to use a variety of methods to gather this information. The results on whether teachers do use variety of methods to gather learners' understanding have been shown below.

I use variety of means to gather learners' understanding of mathematics

All the respondents replied to this item, giving a response rate of 100%. Responses to this item indicated that 121 respondents who accounted for 75.6% illustrated that they "always" used a variety of means to gather learners' understanding of mathematics. Similarly, 21.9% of the respondents also demonstrated that they "often" used variety of mean to gather learners understanding. On the other hand,

only a small percentage of the respondents (2.5) showed that they "rarely" used a variety of means to gather learners' understanding (see Table 5.8).

The mean for this item is 2.73 which lies between 2 (often) and 3 (always), but very close to 3. This reflects that the majority of the respondents always use a variety of means to gather learners' understanding. The standard deviation of 0.498 also indicated that the responses were centred more closely to the mean score, thus the range was small. Different methods that are used to gather learners' understanding should clearly explain what learners have done well and what they need to do to improve. In the next section, the results on whether teachers do write elaborative comments on learners' work are presented below.

I write comments on learners' work which explains what they have done well and what they need to do to improve

A large number of respondents (98.1%) answered this statement. The responses to this question indicated that the highest number of respondents (40.8%) indicated that they "often" wrote comments on learners work. This was followed by 35.0% of the respondents who showed that they always write the comments on learners' work. Table 5.8 shows that 24.2% pointed out that they "rarely" wrote comments on learners' work.

The mean of 2.11 with standard deviation of 0.764 illustrated that though the mean indicated the respondents "often" write comments on learners' work, the responses were widely spread around the mean. In assessment for learning, not only teachers can mark or comment on learners' work. Learners could also be tasked with the responsibility to mark or comment on their work. The results on whether teachers who participated in this research do allow their learners to mark or comment on their work are outlined below.

In my mathematics lesson, I ask learners to mark/comment on their work and Progress

The majority of the respondents (98.1%) answered this item. Responses showed that 56.7% of the respondents illustrated that they "rarely" ask learners to mark or comment on their work and progress while 28.7% indicated they "often" did that. Table 5.10 illustrates that only 14.6% of the respondents pointed out they "always" asked learners to mark or comment on their work and progress.

The mean of 1.58 demonstrated that respondents "rarely" ask their learners to mark or comment on their work and progress. This is because 1.58 lies between 1 and 2 (rarely) and is closer to 2. On the other hand, the standard deviation (0.735) showed that the responses were widely scattered around the mean. If learners are able to mark or comment on their own work, they can also be able to mark or comment on their peers' work as the criteria for doing so are the same. In the section below, the findings on whether learners are encouraged to mark or comment on their peers' work are displayed.

I ask learners to mark or comment on their class-mate's work

A very good number of respondents (97.5%) replied to this statement. Table 5.8 displays that of 97.5%, a substantive number of respondents (64.7%) indicated that they "rarely" asked their learners to mark or comment on their class-mate's work. In addition, 23.7% of the respondents pointed out that they "often" asked their learners to mark or comment on their class-mate's work while a small percentage of the respondents (11.5%) illustrated that they "always" asked their learners to mark or comment on their class-mate's work.

The mean of 1.47 lies between 1 and 2(rarely) and indicated that on average, the respondents do not ask their learners to mark or comment on their class-mate's work. The standard deviation of 0.695 showed that the responses were narrowly scattered around the mean.   For learners to be able to mark or comment on their

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work or their peers' work, they need to be provided with guidelines to do so. The next section shows the results on whether teachers do provide guidelines to learners for marking.

I provide guidelines (criteria) to help my learners mark their own or class-mate's work

Table 5.8 showed that 97.5% of the respondents answered this item. The responses clearly indicated that more than 60% of the respondents "rarely" provided guidelines (criteria) to help learners mark their own or class-mate's work. Of the remaining percentage, 24.2% demonstrated that they "often" provided guidelines for marking while 14.4% illustrated that they "always" provided the marking guidelines.

The mean of 1.53 indicated that the respondents rarely provide the marking criteria. However, the standard deviation of 0.735 showed that the responses had more variance, thus widely spread out from the mean score. The section below further presents the results on whether teachers provide learners with guidelines on how to assess mathematics.

Guidelines on assessing learners in mathematics

Results from Table 5.8 illustrate that 78.8% of the respondents indicated that guidelines on how they should assess learners were available while 21.2% said there were no guidelines available. The standard deviation of 0.410 demonstrated that the respondents' answers lied around the mean of 1.21.

I use assessment guidelines in assessing mathematics

On the question of whether teachers participating in this study use assessment guidelines in assessing mathematics or not, out of 108 teachers who responded to the question, three teachers (2.8%) pointed out that they rarely used them, 51

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(47.2%) indicated that they often used them while 54 (50%) said they always used them. The mean of 2.47 which lies between 2 – often and 3 – always indicated that teachers do use assessment guidelines when assessing their learners. The standard deviation of 0.555 showed that teachers' responses clustered around the mean (See Table 5.8). In the next section, factor analysis results are presented.

5.2.3 Summary of Descriptive Findings

The above findings showed that most primary teachers who participated in this study were between 30 years old with quite a good number of teachers being more than 50 years old (27%). Amongst these teachers, a small percentage (11%) had primary teachers certificate while the rest had diplomas and above. This is a clear indication that all teachers who took part in the study were well qualified to teach in the primary schools. A big number (45%) of these teachers had more than 15 or more years of teaching experience. A good number of teachers (46%) had more than 60 learners in their classes with 14% accounting for 100 and above learners in their classes. This shows that a good number of teachers who participated in the study had big classes.

The above data also revealed that assessment strategies such as worksheets, peer and self assessments and performance tasks were minimally used by teachers. The mostly used assessment strategies were observation, group work, oral work, written tests and homework. However, these strategies which are mostly favoured by teachers do not provide learners with much needed written descriptive feedback. Though tests and homework are some of the mostly used strategies, they do not provide learners with immediate feedback which can assist them in attending to their weaknesses on time. It should be noted that timely and descriptive feedback are the most important aspects of AfL. The data above also showed that some of the reasons surrounding teachers' choice of assessment methods included the number of learners they have, the concept to be taught, the method that would allow them to easily mark the learners' work and also save their time.

The data presented above further indicated that most of the teachers share the learning outcomes with their learners at the beginning of the lesson. However, a small percentage of teachers (29%) showed that they always share success criteria with their learners at the beginning of their lessons. This shows that even though learners may know the learning outcome, but they do not have an idea of how such learning outcomes would be achieved. The data also revealed that the majority of teachers (81%) communicated indicators which learners should use to show their progress. In addition, teachers indicated that they use variety of means to gather learners' understanding of the concept being taught. Nevertheless, majority of teachers showed that they do not write performance statements about learners' work indicating what they have done well and what they need to do to improve. They also pointed out that they do not normally ask learners to neither comment about their work nor allow peers to comment on others work. This is understandable as the majority of teachers (61%) had shown that they did not provide learners with the criteria for marking their own work or that of their peers. However, quite a good number of teachers (50%) showed that they use assessment guidelines in assessing their learners that is, looking at the process rather than the product. In the next section, factor analysis results are presented.

5.2.4 Factor Analysis

Bartholomew, Knott & Moustaki in Yong & Pearce (2013) describes factor analysis as a notion operating on measurable and observable variables that can be reduced to fewer latent variables sharing a common variance and are unobservable. Yong and Pearce (2013) further indicate that the purpose of factor analysis is to summarize data so that relationships and patterns can easily be interpreted and understood. Factor analysis can also provide a means of explaining variation among relatively many original variables using relatively few newly created variables that is, the factors (DeVellies, 2012). In essence, factor analysis reduces the number of variables by grouping variables with similar characteristics together in order to produce a smaller number of factors from a large number of variables. Once a large number of factors have been reduced to a smaller number, factors are then extracted. The section below outlines the procedure for extraction of these factors.

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5.2.4.1 Factor Extraction

In this study, factor analysis extracted 29 linear factors of the variables that estimated the "latent variables" or constructs that the instrument was measuring. Since these factors were many, it was important for the researcher to decide how many components to retain. Yong and Pearce (2013) demonstrate that extracting too many factors may present undesirable error variance and extracting too few factors might also leave out valuable common variance. They also point out that one criterion that can be used to determine the number of factors to retain is *Kaiser's criterion* which is referred to as "rule of thumb". This rule stipulates that only factors with eigenvalue of more than one should be retained (ibid). That is, drop any factor that accounts for eigenvalue less than one. Another device for deciding on the number of factors to retain is the scree test (DeVellies, 2012). The scree test involves examining the graph of the eigenvalues against all the factors and looking for natural bent or break point in the data where the curve flattens out (ibid). The number of data points above the 'break' is usually the number of factors to retain (Costello & Osborne, 2005). Hence, this study employed both criteria for determining the number of factors to be retained.

Table 5.9 shows all the factors (29) extractable from the analysis along with their eigenvalues, variance percentage for each factor, and the cumulative variance of the factor. There were twelve factors with eigenvalues greater than one (3.319, 2.872, 2.365, 2.275, 1.967, 1.608, 1.487, 1.383, 1.304, 1.140, 1.035, 1.019) and these factors accounted for 75.1 cumulative percentage. All the remaining factors were not significant. However, the corresponding scree plot suggested only five factors rather than twelve factors.

Table 5.9: Total Variance Explained								
	Initial Eigenvalues			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.319	11.445	11.445	3.319	11.445	11.445	2.659	9.169	9.169
2	2.872	9.902	21.347	2.872	9.902	21.347	2.225	7.673	16.842
3	2.365	8.155	29.502	2.365	8.155	29.502	2.044	7.047	23.889
4	2.275	7.846	37.349	2.275	7.846	37.349	1.975	6.809	30.698
5	1.967	6.784	44.133	1.967	6.784	44.133	1.954	6.738	37.436
6	1.608	5.544	49.676	1.608	5.544	49.676	1.820	6.275	43.711
7	1.487	5.128	54.804	1.487	5.128	54.804	1.783	6.147	49.858
8	1.383	4.767	59.571	1.383	4.767	59.571	1.623	5.597	55.455
9	1.304	4.498	64.069	1.304	4.498	64.069	1.497	5.161	60.616
10	1.140	3.931	68.001	1.140	3.931	68.001	1.476	5.090	65.705
11	1.035	3.570	71.571	1.035	3.570	71.571	1.365	4.706	70.411
12	1.019	3.513	75.084	1.019	3.513	75.084	1.355	4.673	75.084
13	.961	3.313	78.397						
14	.784	2.704	81.101						
15	.730	2.518	83.618						
16	.678	2.339	85.958						
17	.606	2.088	88.046						
18	.560	1.933	89.979						
19	.494	1.703	91.682						
20	.398	1.372	93.054						
21	.381	1.315	94.369						
22	.336	1.159	95.528						

Extraction Method: Principal Component Analysis.

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According to Costello and Osborne (2005), data points above the 'break' on the scree plot usually gives the number of factors to retain. The graph in Figure 5.7 flattened from the sixth factor which implies that all the remaining factors from 6 are not going to be retained.
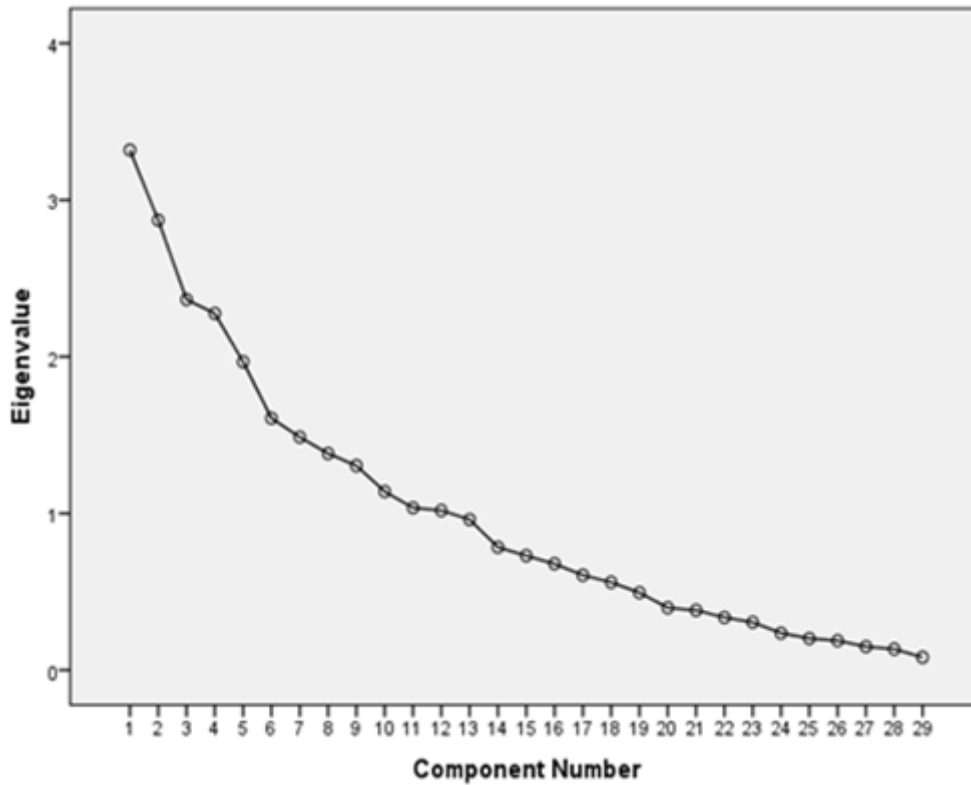
Figure 5.1: Scree Graph

In selecting five factors which were identified by the scree plot, rotated matrix was used. Five factors with related items and had loadings greater than 0.6, were identified as shown in Table 5.10.

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ITEMS	FACTOR				
	1	2	3	4	5
I ask students to mark or comment on their class-mate's work.	.846				
I provide guidelines (criteria) to help my students mark their own or class-mate's work.	.840				
In my mathematics lesson, i ask students to mark/comment on their work and progress.	.604				
How often do you use assessment techniques indicated?		.768			
Observations		.712			
Appropriate for assessing mathematics		.613			
I ask questions that require students to explain and justify their responses			.706		
I use variety of means to gather students' understanding of mathematics.			.664		
During lessons I intervene at timely intervals to ensure students remain focused.			.653		
Easy to prepare				.811	
Easy to mark				.793	
At the beginning of the lesson, I clearly explain to my students what I am going to teach (Learning Outcome).					.792
At the beginning of the lesson, I share success criteria with my students.					.725

Table 5.10: Rotated Component Matrix

Rotated matrix above shows five factors with related items having loadings greater than 0.6. The items loading each of these factors were used to generate labels for each of the five factors. These factors are discussed in the section below.

5.2.4.2   Extracted Factors

From the five factors that were extracted from the rotated matrix, there were three items that were loaded onto Factor 1. The items loaded onto this factor were "I ask students to mark or comment on their class-mate's work"; "I provide guidelines (criteria) to help my students mark their own or class-mate's work" and, "I ask students to mark/comment on their work and progress". All these items were related to the role learners take during classroom assessment. This factor was therefore named "peer and self-assessments".

The second factor was loaded with three items which were related to assessment techniques teachers' use, their frequency and their appropriateness for assessing mathematics. These items were "observations", "how often do you use assessment techniques indicated?" and "appropriate for assessing mathematics". This factor was labeled, "Assessment Techniques".

There were three items loaded on the third factor. These items were "I ask questions that require students to explain and justify their responses", "I use a variety of means to gather students' understanding of mathematics" and "during lessons I intervene at timely intervals to ensure students remain focused". The three items relate to different methods in which a teacher collects information from learners about their learning. This factor is therefore labelled "strategies for collecting information about learners' learning".

Items loaded onto the fourth factor were two and they were related to the reasons for choosing a particular assessment strategy. These items were "easy to prepare" and "easy to mark". This factor was named "reasons for choosing assessment technique".

Items for factor 5 were two and these items were "at the beginning of the lesson, I clearly explain to my students what I am going to teach (Learning Outcome)" and "at the beginning of the lesson, I share success criteria with my students". This factor

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was labelled "teachers' assessment practices" as they outline what teachers do especially at the beginning of the lesson. Inferential statistics was used to determine the relationships between different variables. Only variables which showed the significance difference at 5% level are displayed in the section below.

5.2.5 Inferential Statistics

The Chi-Square test was also run to test whether there was any significant difference between teachers' demographic details and the assessment methods used. The test was also used to determine if there was any significant difference between assessment methods used and reasons for using such methods. The results shown below are only those which are significant. However it is worth mentioning that in this study, teachers' qualifications did not show any significant difference on assessment strategies used.

Table 5.11(b) below shows that at a 0.05 significance level, the age of the teacher was significantly different from the type of questions the teacher asked as $p = 0.026$. The cross tabulation Table 5.11(a) shows that teachers who were over 30 years old normally asked questions which require learners to explain.

Table 5.11(a): Age * I ask questions that require students to explain and justify their responses					
Age		I ask questions that require students to explain and justify their responses.			**Total**
		Rarely	**Often**	**Always**	
20 - 30 years	Count	6	11	6	23
	% within Age	26.1%	47.8%	26.1%	100.0%
	% of Total	3.8%	7.0%	3.8%	14.6%
31 - 40	Count	7	15	37	59
	% within Age	11.9%	25.4%	62.7%	100.0%
	% of Total	4.5%	9.6%	23.6%	37.6%
41 - 50	Count	1	13	19	33
	% within Age	3.0%	39.4%	57.6%	100.0%
	% of Total	.6%	8.3%	12.1%	21.0%
51 and above	Count	8	16	18	42
	% within Age	19.0%	38.1%	42.9%	100.0%
	% of Total	5.1%	10.2%	11.5%	26.8%
Total	Count	22	55	80	157
	% within Age	14.0%	35.0%	51.0%	100.0%
	% of Total	14.0%	35.0%	51.0%	100.0%

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Table 5.11(b): Chi-Square Tests			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	14.325[a]	6	0.026
Likelihood Ratio	15.681	6	0.016
Linear-by-Linear Association	0.124	1	0.725
N of Valid Cases	157		
a. 2 cells (16.7%) have expected count less than 5. The minimum expected count is 3.22.			

Table 5.12(a) illustrates that the majority of teachers who did not know about the availability of assessment guidelines were between 30 and 50 years old while those less than 30 and more than 50 knew about assessment guidelines. Table 5.12(b) shows that there is significance difference between the teacher's age and teacher's knowledge about availability of assessment guidelines (p = 0.007).

<table>
<thead>
<tr>
<th colspan="5">Table 5.12(a): Age * Are there guidelines on assessing learners in mathematics?</th>
</tr>
<tr>
<th rowspan="2">Age</th>
<th></th>
<th colspan="2">Are there guidelines on assessing learners in mathematics?</th>
<th rowspan="2">Total</th>
</tr>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td rowspan="3">20 - 30 years</td>
<td>Count</td>
<td>19</td>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td>% within Age</td>
<td>86.4%</td>
<td>13.6%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% of Total</td>
<td>12.7%</td>
<td>2.0%</td>
<td>14.7%</td>
</tr>
<tr>
<td rowspan="3">31 - 40</td>
<td>Count</td>
<td>43</td>
<td>12</td>
<td>55</td>
</tr>
<tr>
<td>% within Age</td>
<td>78.2%</td>
<td>21.8%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% of Total</td>
<td>28.7%</td>
<td>8.0%</td>
<td>36.7%</td>
</tr>
<tr>
<td rowspan="3">41 - 50</td>
<td>Count</td>
<td>18</td>
<td>13</td>
<td>31</td>
</tr>
<tr>
<td>% within Age</td>
<td>58.1%</td>
<td>41.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% of Total</td>
<td>12.0%</td>
<td>8.7%</td>
<td>20.7%</td>
</tr>
<tr>
<td rowspan="3">51 and above</td>
<td>Count</td>
<td>38</td>
<td>4</td>
<td>42</td>
</tr>
<tr>
<td>% within Age</td>
<td>90.5%</td>
<td>9.5%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% of Total</td>
<td>25.3%</td>
<td>2.7%</td>
<td>28.0%</td>
</tr>
<tr>
<td rowspan="3">Total</td>
<td>Count</td>
<td>118</td>
<td>32</td>
<td>150</td>
</tr>
<tr>
<td>% within Age</td>
<td>78.7%</td>
<td>21.3%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% of Total</td>
<td>78.7%</td>
<td>21.3%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 5.12(b) Chi-Square Tests			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	12.115^a	3	0.007
Likelihood Ratio	11.688	3	0.009
Linear-by-Linear Association	0.123	1	0.726
N of Valid Cases	150		
a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 4.69.			

In Table 5.13 (b), the chi square test is significant at 5% critical value implying that the teaching experience is a significant variable influencing the teachers' use of peer and self-assessments. Table 5.13(a) shows that teachers with teaching experience of less than 5 years seldomly use these assessment strategies. Thus, teachers with more teaching experience tended to use this strategy more than those with less experience.

Table 5. 13(a): Teaching Experience * Peer or self						
		Peer or self				Total
		NEVER	SELDOM	OFTEN	ALWAYS	
0 - 5 years	Count	8	10	5	1	24
	% within Teaching Experience	33.3%	41.7%	20.8%	4.2%	100.0%
	% of Total	5.3%	6.6%	3.3%	0.7%	15.8%
6 - 10 years	Count	8	7	10	11	36
	% within Teaching Experience	22.2%	19.4%	27.8%	30.6%	100.0%
	% of Total	5.3%	4.6%	6.6%	7.2%	23.7%
11 - 15 years	Count	0	7	11	5	23
	% within Teaching Experience	0.0%	30.4%	47.8%	21.7%	100.0%
	% of Total	0.0%	4.6%	7.2%	3.3%	15.1%
15 and above	Count	6	25	22	16	69
	% within Teaching Experience	8.7%	36.2%	31.9%	23.2%	100.0%
	% of Total	3.9%	16.4%	14.5%	10.5%	45.4%
Total	Count	22	49	48	33	152
	% within Teaching Experience	14.5%	32.2%	31.6%	21.7%	100.0%
	% of Total	14.5%	32.2%	31.6%	21.7%	100.0%

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Table 5.13(b): Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	39.144^a	12	0.000
Likelihood Ratio	37.876	12	0.000
Linear-by-Linear Association	5.571	1	0.018
N of Valid Cases	153		

a. 11 cells (55.0%) have expected count less than 5. The minimum expected count is 0.16.

As it is shown in Table 5.14(b), significant difference was observed between average number of learners in the class and the use of homework strategy by teachers as Asymp. Sig. is 0.038 which is less than 0.05. Table 5.14(a) shows that 29% of teachers who taught classes with 61 to 80 learners seldom use home-work strategy.

Table 5.14(a): Average number of learners in class* Home work						
Avarage number of students in class.		**Home work**				**Total**
		NEVER	**SELDOM**	**OFTEN**	**ALWAYS**	
21 - 40	Count	0	9	26	11	46
	% within Average number of students in class.	0.0%	19.6%	56.5%	23.9%	100.0%
	% of Total	0.0%	5.8%	16.7%	7.1%	29.5%
41 - 60	Count	0	6	23	7	36
	% within Average number of students in class.	0.0%	16.7%	63.9%	19.4%	100.0%
	% of Total	0.0%	3.8%	14.7%	4.5%	23.1%
61 - 80	Count	4	7	18	9	38
	% within Average number of students in class.	10.5%	18.4%	47.4%	23.7%	100.0%
	% of Total	2.6%	4.5%	11.5%	5.8%	24.4%
81 - 100	Count	0	2	7	4	13
	% within Average number of students in class.	0.0%	15.4%	53.8%	30.8%	100.0%
	% of Total	0.0%	1.3%	4.5%	2.6%	8.3%
101 and above	Count	0	2	9	12	23
	% within Average number of students in class.	0.0%	8.7%	39.1%	52.2%	100.0%
	% of Total	0.0%	1.3%	5.8%	7.7%	14.7%
Total	Count	4	26	83	43	156
	% within Average number of students in class.	2.6%	16.7%	53.2%	27.6%	100.0%
	% of Total	2.6%	16.7%	53.2%	27.6%	100.0%

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Table 5.14(b): Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.974[a]	12	0.038
Likelihood Ratio	20.131	12	0.065
Linear-by-Linear Association	2.743	1	0.098
N of Valid Cases	156		
a. 8 cells (40.0%) have expected count less than 5. The minimum expected count is .33.			

Significance level for average number of learners in class and use of worksheet was below 0.05 as p = 0.002 (Ref. Table 5.15(b)). As shown in Table 5.15 (a), teachers who taught classes with 21- 40 learners seem to be the ones who use worksheets more than others.

Table 5.15(a): Average number of learners in class* Worksheets						
Average number of students in class.		**Worksheets**				**Total**
		NEVER	**SELDOM**	**OFTEN**	**ALWAYS**	
21 - 40	Count	8	19	15	5	47
	% within Average number of students in class.	17.0%	40.4%	31.9%	10.6%	100.0%
	% of Total	5.5%	13.1%	10.3%	3.4%	32.4%
41 - 60	Count	4	18	4	6	32
	% within Average number of students in class.	12.5%	56.3%	12.5%	18.8%	100.0%
	% of Total	2.8%	12.4%	2.8%	4.1%	22.1%
61 - 80	Count	12	13	2	6	33
	% within Average number of students in class.	36.4%	39.4%	6.1%	18.2%	100.0%
	% of Total	8.3%	9.0%	1.4%	4.1%	22.8%
81 - 100	Count	9	1	2	1	13
	% within Average number of students in class.	69.2%	7.7%	15.4%	7.7%	100.0%
	% of Total	6.2%	.7%	1.4%	.7%	9.0%
101 and above	Count	3	10	4	3	20
	% within Average number of students in class.	15.0%	50.0%	20.0%	15.0%	100.0%
	% of Total	2.1%	6.9%	2.8%	2.1%	13.8%
Total	Count	36	61	27	21	145
	% within Average number of students in class.	24.8%	42.1%	18.6%	14.5%	100.0%
	% of Total	24.8%	42.1%	18.6%	14.5%	100.0%

Table 5.15(b)Chi-Square Tests			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	31.155^{a}	12	0.002
Likelihood Ratio	30.338	12	0.002
Linear-by-Linear Association	1.553	1	0.213
N of Valid Cases	145		
a. 8 cells (40.0%) have expected count less than 5. The minimum expected count is 1.88.			

Table 5.16 shows that majority of teachers (67%) who participated in this study used performance task when assessing their learners. Chi square test in Table 5.16(b) shows that there was significance difference between a number of learners in the class and the use of performance tasks by the teachers. The value of p = 0.004 which is less than 0.05.

Table 5.16(a): Average number of learners in class * Performance Tasks						
Average number of students in class.		**Performance tasks**				**Total**
		NEVER	**SELDOM**	**OFTEN**	**ALWAYS**	
21 - 40	Count	5	12	20	9	46
	% within Average number of students in class.	10.9%	26.1%	43.5%	19.6%	100.0%
	% of Total	3.4%	8.1%	13.4%	6.0%	30.9%
41 - 60	Count	2	9	13	9	33
	% within Average number of students in class.	6.1%	27.3%	39.4%	27.3%	100.0%
	% of Total	1.3%	6.0%	8.7%	6.0%	22.1%
61 - 80	Count	2	5	14	14	35
	% within Average number of students in class.	5.7%	14.3%	40.0%	40.0%	100.0%
	% of Total	1.3%	3.4%	9.4%	9.4%	23.5%
81 - 100	Count	5	1	1	5	12
	% within Average number of students in class.	41.7%	8.3%	8.3%	41.7%	100.0%
	% of Total	3.4%	0.7%	0.7%	3.4%	8.1%
101 and above	Count	0	8	11	4	23
	% within Average number of students in class.	0.0%	34.8%	47.8%	17.4%	100.0%
	% of Total	0.0%	5.4%	7.4%	2.7%	15.4%
Total	Count	14	35	59	41	149
	% within Average number of students in class.	9.4%	23.5%	39.6%	27.5%	100.0%
	% of Total	9.4%	23.5%	39.6%	27.5%	100.0%

Table 5.16(b): Chi-Square Tests			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	28.783[a]	12	0.004
Likelihood Ratio	26.627	12	0.009
Linear-by-Linear Association	.147	1	0.701
N of Valid Cases	149		
a. 8 cells (40.0%) have expected count less than 5. The minimum expected count is 1.13.			

The cross tabulation Table 5.17(a), shows that teachers teaching more than 60 learners in the class agreed that they chose an assessment method on the basis of how easy it is to prepare. The chi square test shows significance relationship between class size and the choice of assessment method used. This is shown by the value of p = 0.016 which is less than 0.05 level (Ref. Table 5.17(b)).

Table 5.17(a): Average number of learners in class * Easy to prepare							
		Easy to prepare					
Average number of students in class.		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
21 - 40	Count	0	4	9	23	8	44
	% within Average number of students in class.	0.0%	9.1%	20.5%	52.3%	18.2%	100.0%
	% of Total	0.0%	2.7%	6.2%	15.8%	5.5%	30.1%
41 - 60	Count	5	3	7	14	5	34
	% within Average number of students in class.	14.7%	8.8%	20.6%	41.2%	14.7%	100.0%
	% of Total	3.4%	2.1%	4.8%	9.6%	3.4%	23.3%
61 - 80	Count	1	0	8	19	6	34
	% within Average number of students in class.	2.9%	0.0%	23.5%	55.9%	17.6%	100.0%
	% of Total	.7%	0.0%	5.5%	13.0%	4.1%	23.3%
81 - 100	Count	0	0	4	3	5	12
	% within Average number of students in class.	0.0%	0.0%	33.3%	25.0%	41.7%	100.0%
	% of Total	0.0%	0.0%	2.7%	2.1%	3.4%	8.2%
101 and above	Count	0	5	6	9	2	22
	% within Average number of students in class.	0.0%	22.7%	27.3%	40.9%	9.1%	100.0%
	% of Total	0.0%	3.4%	4.1%	6.2%	1.4%	15.1%
Total	Count	6	12	34	68	26	146
	% within Average number of students in class.	4.1%	8.2%	23.3%	46.6%	17.8%	100.0%
	% of Total	4.1%	8.2%	23.3%	46.6%	17.8%	100.0%

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Table 5.17(b): Chi-Square Tests			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	30.472[a]	16	0.016
Likelihood Ratio	31.187	16	0.013
Linear-by-Linear Association	0.264	1	0.607
N of Valid Cases	146		

a. 13 cells (52.0%) have expected count less than 5. The minimum expected count is 0.49.

The evidence from the cross tabulation Table 5.18(b), shows that 35.1% of teachers whose classes have more than 60 learners rarely write performance statements on learners' work. Only 28.4% of teachers who teach more than 60 learners in a class always write performance statements on learners' work. At $p = 0.05$ level, the chi square test (Table 5.18(b)) for number of learners in a class and writing of performance statements shows significance relationship where $p = 0.027$.

Table 5.18(a): Average number of learners in class * I write performance statements					
		I write performance statements			Total
		Rarely	Often	Always	
21 – 40	Count	7	20	20	47
	% within Average number of students in class.	14.9%	42.6%	42.6%	100.0%
	% of Total	4.5%	12.7%	12.7%	29.9%
41 – 60	Count	5	17	14	36
	% within Average number of students in class.	13.9%	47.2%	38.9%	100.0%
	% of Total	3.2%	10.8%	8.9%	22.9%
61 – 80	Count	13	17	8	38
	% within Average number of students in class.	34.2%	44.7%	21.1%	100.0%
	% of Total	8.3%	10.8%	5.1%	24.2%
81 - 100	Count	2	6	5	13
	% within Average number of students in class.	15.4%	46.2%	38.5%	100.0%
	% of Total	1.3%	3.8%	3.2%	8.3%
101 and above	Count	11	4	8	23
	% within Average number of students in class.	47.8%	17.4%	34.8%	100.0%
	% of Total	7.0%	2.5%	5.1%	14.6%
Total	Count	38	64	55	157
	% within Average number of students in class.	24.2%	40.8%	35.0%	100.0%
	% of Total	24.2%	40.8%	35.0%	100.0%

Table 5.18(b): Chi-Square Tests			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	17.361[a]	8	0.027
Likelihood Ratio	17.747	8	0.023
Linear-by-Linear Association	5.296	1	0.021
N of Valid Cases	157		

a. 2 cells (13.3%) have expected count less than 5. The minimum expected count is 3.15.

The cross tabulation Table 5.19(a) shows that 64.7% of teachers who participated in this study rarely allow their learners to mark or comment on their peers work. The table also shows that this practice happens regardless of the size of the class being taught. Only 11.5% of teachers who took part in the study illustrated that they always allow their learners to engage in peer assessment. This was also evident from Table 5.19(b) which shows significance association between numbers of learners in a class and use of peer assessment. At p =0.05 level, the significance difference level between class size and use of peer assessment is p = 0.010.

Table 5.19(a): Average number of learners in class * I ask learners to mark or comment on their peers' work					
		I ask students to mark or comment on their class-mate's work.			Total
Average number of students in class.		**Rarely**	**Often**	**Always**	**Total**
21 - 40	Count	35	4	9	48
	% within Average number of students in class.	72.9%	8.3%	18.8%	100.0%
	% of Total	22.4%	2.6%	5.8%	30.8%
41 - 60	Count	21	12	3	36
	% within Average number of students in class.	58.3%	33.3%	8.3%	100.0%
	% of Total	13.5%	7.7%	1.9%	23.1%
61 - 80	Count	20	13	4	37
	% within Average number of students in class.	54.1%	35.1%	10.8%	100.0%
	% of Total	12.8%	8.3%	2.6%	23.7%
81 - 100	Count	11	0	2	13
	% within Average number of students in class.	84.6%	0.0%	15.4%	100.0%
	% of Total	7.1%	0.0%	1.3%	8.3%
101 and above	Count	14	8	0	22
	% within Average number of students in class.	63.6%	36.4%	0.0%	100.0%
	% of Total	9.0%	5.1%	0.0%	14.1%
Total	Count	101	37	18	156
	% within Average number of students in class.	64.7%	23.7%	11.5%	100.0%
	% of Total	64.7%	23.7%	11.5%	100.0%

Table 5.19(b): Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.173[a]	8	0.010
Likelihood Ratio	26.402	8	0.001
Linear-by-Linear Association	.337	1	0.562
N of Valid Cases	156		

a. 5 cells (33.3%) have expected count less than 5. The minimum expected count is 1.50.

5.2.6 Summary of Inferential Findings

Chi-square tests presented above showed the general patterns of relationships that were significant at $p < 5$ though there were small differences that occurred within the groups themselves. Generally, young teachers seemed to ask questions that did not require learners to justify their responses, whereas mature teachers asked questions that required justification (Table 5.11 (a)). With regard to availability of guidelines on assessing learners in mathematics, teachers of different ages seemed to know about availability of assessment guidelines though a small number of teachers aged 41 – 50 showed that they did not know about the availability of such guidelines. This is surprising because one would think that teachers of this age range would be aware of such documents. Data showed that teachers who had six or more years of teaching experience were the ones using peer and self assessment more than the less experienced. The cross tabulations (Table 5.14(a) - 5.16(a)) generally showed that the number of learners in the class did not influence teacher's use of homework and performance tasks. Teachers with fewer numbers of learners in their classes seemed to use these assessment strategies in the same way as those with large classes. Similarly, the number of learners in the class did not have any impact on the use of worksheet as teachers regardless of the size of their classes did not use worksheets. In addition, teachers seemed to use assessment tasks that were easy to prepare regardless of the number of learners in their classes. The general pattern that was observed between the number of learners in the class and the use of performance statements was that, teachers who had less than 60 learners in their

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class seemed to be the ones using performance statements more. However, use of peer and self assessment was not influenced by the number of learners in the class as a large number of teachers regardless of the number of learners in their classes rarely used peer and self assessments. The next section presents the interpretation of the quantitative findings.

5.3   INTERPRETATION OF STATISTICAL FINDINGS

The data that was collected through the use of the questionnaires was meant to determine teachers' assessment for learning skills used in their classes prior to AfL training that was provided to some of the teachers who participated in this study. Generally, the findings revealed that teachers' demographic data did not have much impact on teachers' assessment for learning practices except for the age of teachers which had an influence on the type of questions they asked. The results showed that most teachers aged below 30 years did not require their learners to justify their answers. This suggests that young teachers with five or less years of teaching experience might not have necessary skills and experience for asking questions which may require learners to justify their answers. These results are corroborated by the results from the study conducted by Matovu and Zubairi (2014) who illustrated that teachers' teaching experience had influence on teachers' assessment practices (cf.2.2.3.1). Furthermore, the results of this study revealed that teachers' teaching experience also influenced teachers' use of peer and self assessment in classrooms. Otherwise, other demographic details of teachers did not affect their use assessment for learning practices.

The results of this study showed that teachers mostly used observation, group work, oral, written, tests and homework when assessing their learners and they justified the use of these practices as being easy to mark and that they also save time. The results further revealed that teachers when using these "traditional" assessment methods did not provide learners with descriptive feedback. Douglas (2008) emphasizes that using these traditional methods is not enough; if the information is not used by the teacher early enough to make changes in the teaching and learning

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process (cf. 2.3.2). The study revealed that assessment techniques used by teachers were also influenced by the number of learners in the class. The findings of the study also demonstrated that class size seemed to influence the use of performance statements as teachers with less than 60 learners in classes were the ones who were writing performance tasks more than teachers with more than 60 learners in a class. This is not surprising as Raman and Yamat (2014) have stated that it becomes difficult for teachers who have too many learners in their class to get to know each and every learner's strengths and weaknesses (cf. 2.6.3). However, the results of this study revealed worksheets, performance tasks and peer and self assessments were minimally used by the teachers regardless of the number of learners in the class. The findings also showed that teachers were not using these assessment techniques which are learner-centred because they indicated that the choice of the assessment techniques they used were influenced by class size, ease of marking and assessment techniques which would save their time. As indicated in chapter 2, Deluca *et al.* (2012) pointed out that shortage of time is frequently mentioned in research on changing teachers' assessment practices in which teachers believe that traditional forms of assessment are more time efficient.

In addition, findings of this study revealed that most teachers shared learning outcomes and communicated indictors to the learners. However, the study showed that few teachers shared success criteria with their learners. The importance of sharing learning outcomes was raised by Wilson (2014) who indicated that when learners understand what the learning intention is, they are more able to take control of their own learning. Having analysed and interpreted the quantitative results, it is important to look at the qualitative results so that a complete picture of the study could be established, hence, the next section presents the qualitative findings.

5.4   PRESENTATION OF QUALITATIVE DATA

The results that this section presents are based on the analysis of classroom observations, semi-structured interviews and open-ended questions from the questionnaire. These results were collected from five female teachers who came from four different schools as the other three discontinued their participation in the

study. The four schools from which the study was carried out had similar teaching resources as they are provided by the Lesotho government.

School A: This school is situated in the city centre. The school has an enrolment of 1472. This is a well developed school as it has electricity and a telephone line. Two teachers from this school participated in this study. For the purpose of reporting, these teachers were named teacher 1 and teacher 2. Teacher 1 was between 31 – 40 years of age and had diploma in education primary with teaching experience ranging from 10 to 15 years. Teacher 1 was teaching grade 1 which had 74 learners. Teacher 2 was also between 31 – 40 years of age and had diploma in education primary with teaching experience ranging from 10 to 15 years. She was teaching grade 3 which had 68 learners.

School B: The school is also located in the city centre. It has the total population of 1391 learners. This school is also well developed as it has electricity and a telephone line. Only one teacher from this school participated in the study as the other one declined. This teacher was referred to as Teacher 3. The teacher was between 60 – 70 years of age and had Primary Teacher's Certificate (PTC) with teaching experience of 30 – 40 years. She was teaching grade 1 which had 76 learners.

School C: The school is situated within the radius of six km from the city centre. This school had 893 learners. The school had electricity but no telephone line. Originally two teachers from this school participated in the training workshops but later, the other teacher withdrew her participation in this research. The remaining teacher was referred to as Teacher 4. The teacher was between 41 – 50 years of age and had Bachelor in Education (honours) with teaching experience of 10 – 15 years. At the time of the study, she was teaching grade 4 which had 42 learners.

School D: This school is located within the radius of 12km from the city centre. It had a total population of 904 learners. The school had electricity but no telephone

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line. Two teachers from this school originally participated in the training workshops but later, the other teacher felt sick hence, she terminated her participation in the study. The remaining teacher was referred to as Teacher 5. This teacher was aged between 60 – 70 years. She had 30 – 40 years teaching experience and was teaching grade 4 which had 56 learners.

The results collected through classroom observations and interviews mostly addressed the research questions on 'how do primary mathematics teachers understand and implement assessment for learning after training; and how contextual challenges influence teachers in implementing assessment for learning practices?' The information collected was classified into three different themes. The three themes which emerged from the data were 'effects of assessment for learning on learners; Policy Interpretation; and teachers' problems regarding use of assessment for learning'. Though these themes were given as separate, there was a significant overlap between them. It should also be noted that though the information collected was categorized into three major themes, teachers who participated in this study contributed different amounts of information towards the three themes. Details about these themes are given below.

5.4.1 Effects of Assessment for Learning on Learners

This section reports on teachers' assessment practices which seemed to promote learner participation in their own assessment. These assessment practices were visible during classroom observations and were also mentioned by teachers during interviews. Some of the assessments for learning practices which teachers mentioned during interviews and were observed are discussed below.

Assessment for learning practices that influence learners' participation

During classroom observations, all teachers communicated learning intentions to the learners at the beginning of the lesson. On the issue of sharing success criteria with learners, all teachers talked at length about the importance of writing and sharing

success criteria with learners. Elaborating on the importance of success criteria, teacher 1 from school A pointed out that "*the use of success criteria helps learners to check their work and make my work easier*" she further indicated that "*through success criteria learners are able to do the work on their own by just following the steps. They enjoy doing mathematics.*" It is evident from the above quotation that this teacher made use of success criteria which is one of the important components of assessment for learning. This practice seemed to be beneficial to the teacher and the learners as the teacher illustrated that use of success criteria resulted in learners enjoying doing mathematics.

The issue of importance of success criteria in promoting learner-participation was also raised by teacher 3 from school B who reiterated that "*I provide them with steps which guide them towards reaching the learning goal. Learners know that they have to follow all the steps in the order given in order to reach the answer. The map guides learners*".

Teacher 3 also found the use of success criteria to be useful in encouraging learner-participation. The similar comment was also received from teacher 4 from school C who illustrated that:

> *I write the success criteria on the board, read them with the learners, let them follow them step by step, the steps in the success criteria make the learning path to be very clear – success criteria avoids the situations where it is like learners are trapped into getting the answer wrong.*

Lesson observations revealed that all teachers who participated wrote and shared the success criteria with learners except teacher 3 from school B who later indicated that she could not write the success criteria for her grade1 learners as they were not able to read properly. Figure 5.2 below shows a sample of success criteria written and shared with learners in teacher 2 classroom.
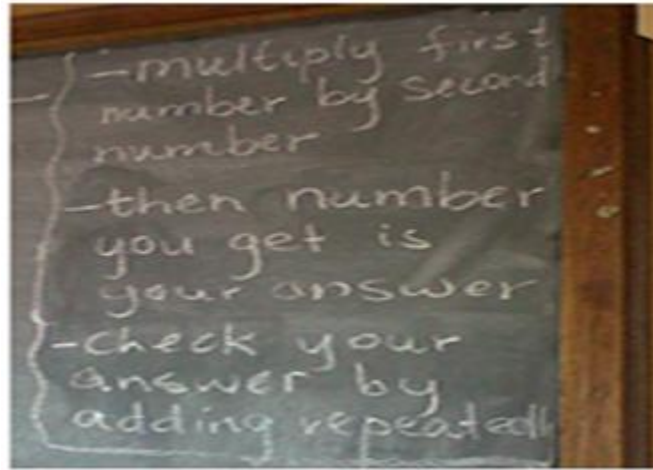
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Figure 5.2: Example of Success Criteria

Though all teachers who participated in this study seemed to realise the importance and benefits of sharing success criteria with learners before training, all of them did not know what success criteria are and how to develop them. They indicated that they had seen this concept in the syllabus but did not know what it was.

The importance of self and peer assessments was also raised by teachers during interviews. They indicated that if success criteria were clearly communicated to the learners, they were able to check their work and those of their peers against the criteria provided. In showing the importance of self and peer assessment, teacher 5 from school D demonstrated that:

> *my learners are now able to self-assess themselves because of the success criteria, they now know that when they have missed a certain stage, their answers are going to be wrong, they are already assessing themselves, so even before they get to me as a teacher they already assess themselves when they are standing waiting to be marked, they check to see if they have followed all the steps, if they see that they have missed something they go back and write what they have missed*

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During lesson observation of teacher 1, learners were seen to read through the success criteria and were able to help each other as they were seated in groups. One learner was standing in a queue to be marked, he turned and read the success criteria and said "acerrrrrrr" meaning that he had identified his mistake on his work and went back to his desk to do some correction on his work. On the same token, teacher 4 from school C also alluded that "*learners were able to assess each other in their groups*".

On the issue of the use of indicators, learners were observed using thumbs up and thumbs down during teaching and learning process to show their level of understanding. As a result of this, teachers were able to respond to learners' concerns timeously. In teacher 3 classroom, grade one learners used indicators to reveal their level of understanding. One learner who had thumbs down had a facial expression which showed that he was not happy. During interviews teacher 2 said "*learners are now able to check their own work through use of success criteria, and where they do not understand they are able to tell me through use of indicators*".

One of the attributes of assessment for learning is provision of regular and timely feedback to learners. It is through provision of feedback that learners are able to know their strengths and weaknesses, and take remedial steps where necessary on time. Teacher 1 also acknowledged the importance of providing regular and timely feedback to the learners. She indicated that:

> *…when I teach I have to keep on assessing my learners, I have to assess my learners regularly, learners are being assessed on small content covered and this is done regularly, it's like you give them hmmmm…… assessing learners regularly helps them understand what has been taught unlike what we used to do in the past when we taught them a lot of content and then assess it at the end of the lesson.*

The fact that this teacher recognised the importance of regular feedback showed that teachers were now beginning to embrace the importance of assessment for learning

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as opposed to assessment of learning. Teacher 5 was also of the same view that regular feedback was important as she said "*as I teach, I always provide my learners with feedback which helps them to see where they are in terms of their learning….it also helps me to emphases important points in the lesson*".

Provision of timely feedback was also observed during teaching and learning process. The feedback was provided either orally or by using symbols. As teachers were checking learners' work, they explained why some of the answers given by learners were wrong and asked them to do the correction. This was done throughout the observed lessons.

The New Integrated Primary Curriculum in Lesotho discourages the use of ticks and crosses as they are regarded as meaningless because they do not indicate what the learner is able to do or unable to do. The curriculum instead prescribes the use of performance statements which show the level of performance for each learner. These statements indicate what the learner can do and cannot do. Coupled with these statements, teachers are supposed to use symbols. For example $\triangle$ means that a learner has fully achieved the required level of learning. On the other hand the symbol $<$ indicates that the learner knows a lot though there are some aspects which the learner does not know. The symbol $—$ indicates that the learner knows very little about the concept. This is the learner who needs more attention from the teacher in the form of remedial lessons. Commenting about this new form of assessing learners, teacher 2 showed that "*I now call learners and discuss their performance with them unlike before when I used to just put ticks and crosses without any explanation*".

The comments made by teacher 2 illustrate that teachers are now beginning to adjust their assessment practices to include assessment for learning practices which are learner-centred. The importance of performance statements in assessing learners was also raised by teacher 4 who said that "*the statements when used with*

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symbols help me to know exactly who and where the learner needs help. I now know learners in my class who need my help and these are the ones that I normally target at".

During lesson observations, all participants used observation, oral, written and homework. Worksheets and performance tasks were not used.

Although the above mentioned practices illustrated that teachers had now begun to use assessment for learning practices which encouraged learners to take part in their own assessment, they were some assessment practices which they still had to improve on. The second theme that emerged was policy interpretation. Findings relating to this theme are discussed below.

5.4.2 Policy Interpretation

In order for teachers to use assessment for learning more effectively and efficiently they have to understand what it is, what their role is and which strategies they have to use in implementing it. In this study, it was important to establish what teachers know about the assessment for learning policy which they were already implementing in their classrooms. Teachers who participated in the study showed differing knowledge about their understanding of assessment for learning. Furthermore, teachers showed different conceptions about assessment for learning before and after training. The same teacher would not define assessment for learning in the same manner before and after training. This shows that professional development training that was provided had some impact on teachers' understanding of assessment for learning. Before training teacher 1 defined assessment for learning as "*an ongoing evaluation. It is done after a lesson or during the lesson or after a unit of learning*". The same teacher during interviews which were carried out after training said "a*ssessment for learning is when the teacher asks the learners questions when the lesson is going on to see if they understand. I use it to check if learners are still concentrating*".

Even though in the first definition teacher 1 had mentioned one aspect of

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assessment for learning as ongoing, the teacher showed some confusion about what assessment for learning is. However, after training her understanding of her assessment for learning seemed to have improved.

Generally the definitions provided by teachers before training showed lack of understanding of assessment for learning. However, teachers' conception of assessment for learning seemed to have improved after training. This is also seen in teacher 4 who prior to training defined assessment for learning as "*Assessment for learning is a quiz to test the understanding of the learner within a short period of time. It is done daily at the end of the lesson or weekly after the end of each topic covered*". After training, the definition given by same teacher had changed as she now said:

> *Assessment for learning is an on-going learning process whereby both teachers and learners are given the chance to make improvements on teaching and learning while it is still going on. Assessment for leaning can be used every time when you want to check whether the learners understand the topic introduced. It can be done daily at the end of the lesson.*

The results of this study also revealed that some teachers had some knowledge of assessment for learning even before training was provided. Prior to AfL training teacher 4 defined AfL as "*the assessment conducted during teaching-learning process to modify/rectify mistakes to enhance effective learning*". After training this teacher defined AfL differently as:

> *the kind of assessment that is carried out throughout learning as the learner progresses towards the outcome. It provides a teacher with information on which group of learners need remedial activities, additional support and it also provides feedback. Mostly I use assessment for learning to make sure that the learners are still focused during learning. This helps me to know things I will have to repeat or emphasize during remedial classes. So I use it daily.*

The above results on teachers' conception of assessment for learning showed that some teachers had little understanding of what assessment for learning entailed. Some of these teachers informally indicated that they attended a three-day workshop on assessment for learning which was organised by MoET at the beginning of the implementation of assessment for learning in 2012. Unfortunately the training provided by the MoET only catered for the school principals and one teacher per school. Hence it is not surprising that most teachers do not have a full conception of what assessment for learning is. During interviews, respondents raised a number of problems that they experienced as they implement AfL in their classes. These are elaborately discussed in the next section.

5.4.3 Teachers' Problems Regarding Use of Assessment for Learning

Though assessment for learning had been found to have numerous benefits, teachers who participated in this study had some concerns regarding use of AfL in their classrooms. These concerns can be classified into self, task and impact. As defined by Hall and Hord (1987), self-concerns are those that affect teachers directly during implementation of an innovation, task concerns are related the actual implementation of an innovation in the classroom, while impact concerns are those that focus on learners' learning. The section below presents self concerns raised by the respondents.

5.4.3.1 Self Concerns

When teachers are normally introduced to a new practice, they become focused on how the new practice is going to affect them. In this study, the concerns raised by teachers were support and training, and clarity of the policy.

When implementing a new practice, training plays an important role as it introduces teachers to the new practice that they are expected to implement. It is through training that teachers are provided with knowledge and skills necessary for proper implementation of the new practice. The teachers' lack of clear understanding of AfL

shows that not much training was provided prior to implementation of AfL to prepare teachers for effective implementation. Hence, it is not surprising that teachers raised concerns about need for training. Teacher 3 from school B said "*Hei! This new curriculum, we were not given any proper training and orientation about it and now we have to use it and this new method of assessment, this is too much for us old teachers.* This teacher shows a frustration in implementing AfL as did not receive any training which would enable her to acquire knowledge and skills that would allow her to interpret the policy and also to know her roles when implementing AfL. Similar views were expressed by teacher 5 from school D who exclaimed that "*we old teachers need more training and support on these new techniques".* This concern on the need for training had been raised by teachers who were more than 60 years of age.

The implementation of any new practice requires support for implementers especially after they have undergone training so that they can be assisted in implementing what they have learned in the training. Normally teachers have problems of transferring what they have learned from workshops to their classrooms. It is therefore imperative that they be given assistance during implementation phase. In this study the need for support in implementing AfL is evidenced by what teacher 2 said "*this approach is new and we do not have anybody helping us. Even when the inspectors are here, they do not assist us instead they tell us to help one another*". This quotation reveals that primary teachers in Lesotho receive minimal support in their endeavour to implement AfL. This calls for a serious support if implementation of AfL is to be a reality.

It is practically impossible for teachers to implement any policy, if it is not clear to them as they would not be in a position to know what the policy is all about nor their roles in its implementation. In this study teachers expressed their concern about their lack of knowledge concerning AfL. This is evidenced in what teacher 4 said "*I am already struggling with this curriculum, and it is even worse with assessment because I do not know what to do. When I ask other teachers, they also don't know, even the principal does not know and the Ministry also does not give us any support.*

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Lack of clarity of the policy was also evidenced by the definitions of AfL provided by some teachers prior to AfL training as indicated in section 5.3.2 where teachers gave varying definitions of AfL some of which were not close to what the definition of AfL is. Teachers did not only have self concerns, they also had task concerns which are presented below.

5.4.3.2 Task Concerns

In actual implementation of a new practice, there are many classroom factors which may impact on the implementation of the practice. Some of the factors which may affect the implementation of AfL in Lesotho primary schools are teacher-pupil ratio which increased dramatically due to implementation of free primary education policy; assessment for learning is one mode of assessment which is resource intensive, hence, provision of resources in schools can also be a major concern for the least developed country like Lesotho; assessment for learning involves writing performance statements for each and every learner in the class and this requires a lot of time and also increases the work load of the teacher especially in large classes such as the ones in Lesotho.

The average class size of teachers who participated in this study was about 60 learners which is considerably high especially when considering the amount of work involved in using AfL. Teachers who participated in the study raised large class size as a concern. This was evidenced in what teacher 1 who had 74 learners in the class said: "*with a large class like mine it takes a lot of time to write statements for each learner*". Similar concerns were also raised by teacher 3 from a different school who had 76 learners in the class. She exclaimed "... *for example in large classes we take a week or more to write performance statements for every learner when we administer formal assessment*". From the evidence given by these two teachers, it is clear that administering assessment for learning in large classes is demanding. Teacher 3 was complaining about writing performance statements for every learner when administering formal tests and yet, they were expected to write these statements whenever assessing. During classroom observations, all classes observed were overcrowded and teachers took a long time to provide symbolic

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feedback to learners which would be worse if teachers were to write performance statements for each learner.

In implementing assessment for learning, there are various resources that are required for effective implementation. Some of the materials used in Lesotho in administering assessment for learning are forms for writing performance standards and booklets for formal assessment tasks. All these resources are provided for by the government and in most cases they are not delivered in time while in some situations they are not even distributed to schools. The issue of lack of resources was also raised by teachers who participated in the study. Teacher 4 indicated that "*there is a shortage of material such as the syllabus, only one copy per grade is available in this school and all of us teaching the same grade have to refer to it. Also there is shortage of materials such as charts and markers though the new curriculum requires use of them".* The implication of this quotation raises a very serious concern as teachers without syllabus would not know what to teach and how to teach it. The quotation further suggests that teachers in the absence of the syllabus are free to do whatever they like. The sentiments were shared by teacher 3 who said that "*We are not provided with assessment guidelines and assessment tasks for learners in some grades and yet we are expected to use them*. The issue of lack of resources was also evidenced by the researcher during classroom observations as some of the teachers showed her some of the activities they could not perform due to lack of resources. Furthermore, some of the teachers confessed that only copies of the syllabus they had were the ones they got from the training workshop.

Given that daily teacher's schedules are already packed with high demands of the present integrated primary curriculum, introduction of assessment for learning with its demands has increased their workload tremendously.   In addition, for teachers to cope with assessment for learning demands, they need extra time to do so. With the increased load in a normal working day, it becomes practically impossible for teachers to meet all these demands. The issues of workload and time were also raised by teachers who participated in this study. Teacher 2 noted that 'there *is a lot of paper work to be done if you want to do it thoroughly'*. This teacher shows that her workload has increased which implies that to do the work thoroughly, she needs

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extra time. Teacher 5 was also of the same view that AfL has increased their workload and requires more time to administer it. She pointed out, *"Hei'! Now we have to write performance statements for every learner in every learning area. You spent more time on paper work than the actual teaching".* This evidence is a clear indication that teachers were spending more time on completing assessment tasks than on actual teaching. During classroom observations, lessons that were supposed to last for 30 minutes for grades 1 to 3 and 40 minutes for grade 4s, took one hour or more in some cases. Hence if the above-mentioned teachers concerns are not addressed in time, they may hinder the implementation of assessment for learning in schools resulting in teachers reverting back to their old assessment practices. The next section briefly discusses the concerns relating to the impact of an innovation.

5.4.3.3 Impact Concerns

When a new practice is introduced in the schools, it is normal for teachers to worry about the impact of an innovation on their learners. Guskey (2002) illustrates that if teachers see changes in their learners learning, they are also likely to change their beliefs, attitudes and practices about the new practice. This suggests that teachers' adoption of new practices is influenced by the impact the new practice has on learners. Teachers who participated in this study did not raise concerns regarding the impact of AfL on their learners.

5.4.4 Summary of qualitative findings

The findings on teachers' conception of assessment for learning before training were unclear and somehow confusing. Their definition showed that they had an idea of assessment for learning as they indicated that it was on-going, however, they also defined it using assessment of learning attributes, such as being carried out at the end of the lesson, week or topic. However, teachers' conception of assessment for learning changed after training. Teachers' definition of assessment for learning had now improved as it had included a number of AfL aspects such as on-going, providing immediate feedback which helps learners to improve their performance which give teachers a chance to reflect upon their teaching.

The results showed that after training teachers were using assessment for learning practices such as communicating learning outcomes, sharing success criteria, providing varied and timely feedback, engaging learners in self and peer assessments, using symbolic and oral feedback.

The findings revealed that there were numerous concerns that teachers have about implementation of assessment for learning in their classrooms. Some of the challenges which emerged in this study were lack of teaching and learning materials such as the syllabus, assessment tasks booklets, and forms for filling performance statements for individual learners. Lack of training and support were also identified as some of the challenges that emerged. In assessment for learning teachers have to write performance statements for each and every learner during the teaching and learning process, in the case of Lesotho where teacher-pupil ratio is high teachers complained that AfL has increased their workload. They further illustrated that they spend more time filling performance statements than actual teaching.

5.5   INTERPRETATION OF QUALITATIVE FINDINGS

Generally, the qualitative results of this study showed that prior to AfL training, teachers had confused meanings of what assessment for learning was. This suggests that if teachers do not have a clear understanding of the policy they are likely to implement it ineffectively. Fullan (2007) has warned that lack of clarity; of the policy being implemented represent a major problem at the implementation stage, as this can cause great anxiety and frustration to teachers who are trying to implement it. Where teachers are not clear about the policy they are implementing they may demonstrate what Fullan (2001) refers to as 'false clarity' (cf. 2.6.1). Evidence from research showed that assessment for learning has been subjected to great deal of abuse and misinterpretation by teachers (cf. 2.6.1). The importance of clarity of the policy to the implementers is succinctly summarized by Fullan (2001) when he indicates that if reforms are to be successful, individuals implementing it must find meaning concerning what should change as well as how to go about it.

However, teachers' conceptions of assessment for learning seemed to have improved after training. This illustrates the importance of training in implementing a new practice. As has been indicated in the literature, teachers should be provided with professional development programme that will help them develop an understanding of how to collect, analyse and interpret evidence of learners' learning, how to make strategic adjustments, and how to provide feedback that supports learning (Wylie & Lyon, 2012; Hargreaves, 2004). The importance of training in introducing a new practice has been well articulated by Fullan's model of educational change, Guskey's model of teacher change and Clarke and Hollingsworth's model of teacher change (cf. 3.2.1 and 3.2.2)

Furthermore, the qualitative results showed that teachers were communicating learning outcomes, sharing success criteria, providing learners with timely feedback which was done orally or symbolically. The results also revealed that learners were using indicators and engaged in peer and self assessments. These results illustrate the importance of AfL in promoting learners' participation in their own assessment. As illustrated in section 2.5, these attributes are underpinned by constructivist view of learning in which the learner is expected to take an active role in their own assessment (McManus, 2008).

The findings of this study revealed that when implementing assessment for learning, teachers met some challenges. These challenges were inadequate time to carry out assessment for learning practices, high teacher-pupil ratio which makes it impossible for teachers to carry out some AfL practices effectively, increased teacher workload, lack of resources and support during implementation. Lack of resources has been identified by Fullan (2001) as one of the factors which make educational change difficult to implement. These concerns raised by teachers are clearly articulated in the CBAM model where it illustrates that during the implementation of a new practice, teachers normally have self-related and managerial concerns (cf. 3.2.3.1). According to Cetinkaya (2012), managerial concerns are characterized by class sizes, time pressures, and the lack of instructional materials.

5.6 MERGING QUANTITATIVE AND QUALITATIVE FINDINGS

Quantitative findings revealed that teachers were using assessment strategies such as observation, group work, oral assessment, homework and written tests more, while strategies as worksheets, peer and self assessments and performance tasks were minimally used and were not even providing learners with criteria for marking their work and that of their peers (cf. 5.2.2.1 & cf. 5.2.2.3). However, qualitative results showed that teachers after training employed peer and self assessment strategies in their classes though peer assessment was done informally by the learners as they were not provided with the scoring rubrics (cf. 5.4.1).

Qualitative results corroborated with quantitative results in that all teachers regardless of their age, experience and qualification did not use performance tasks and worksheets in the teaching of mathematics (cf. 5.2.2.1 & 5.4.1). Furthermore, both quantitative and qualitative findings showed teachers did not write performance statement when assessing learners (cf. 5.2.2.3 & 5.4.1). Findings from qualitative data revealed that teachers were not using performance standards when assessing their learners as these needed a lot of time to do given the huge number of learners they have in their classes and these also increased their workload (cf. 5.4.3.2). Similarly quantitative results showed that teachers' choice of assessment strategy largely depended on the number of learners they had, the ease of preparing and marking the given assessment task (cf. 5.2.2.2). These strategies which were mostly favoured by teachers did not allow teachers to provide learners with descriptive feedback which indicate the performance level of the learner. Though teachers revealed that they do not provide learners with descriptive feedback, it should be noted that descriptive feedback is one of the important attributes of AfL. During lesson observations, teachers were seen providing learners with symbolic and oral feedback which did not assist learners to address some of their weaknesses as these strategies used did not guide them and some were still struggling even after they were given the feedback (cf. 5.4.1). Though teachers illustrated that they did not write performance statement because of large classes they teach, even those with fewer number of learners still did not write performance statements.

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Both quantitative and qualitative results showed that strategies such as communicating indicators to the learners, use of varied assessment strategies and sharing learning outcomes with their learners at the beginning of the lesson were used by teachers (cf. 5.2.2.3 & 5.4.1). However, quantitative result illustrated that a small percentage of teachers shared the success criteria with their learners at the beginning of their lessons (cf. 5.2.2.3). These results were substantiated by what teachers said at the beginning of AfL training where they indicated that they did not know what success criteria were though they had seen it in their integrated curriculum document (cf. 4.7.1). However, after training, teachers indicated that they write and share success criteria with their learners and they were also observed doing these in their classes (cf. 5.4.1).

5.6   SUMMARY

This chapter presented the results of both quantitative and qualitative data. The chapter further summarised both sets of data after which the findings were interpreted and merged to find the similarities and differences between these two sets of data. The similarities that established were that teachers were mostly using assessment techniques such as observation, homework, written tests, oral work and group work. These assessment strategies do not allow teachers to provide descriptive feedback even where descriptive feedback could be provided, that would be done too late for any correctional measure to be made. There were some AfL practices which teachers only used after training. This illustrates the importance of training in implementing assessment for learning. The importance of training has also been evidenced by a drastic change in teachers' conception of AfL which was evident in the definitions they provided. The results also illustrated a number of concerns which teachers had as they implemented AfL in their classes. These concerns were classified into self, managerial and impact concerns. The self concerns that were noted in this study were policy interpretation, provision of training and support. The managerial concerns that were eminent included resources, class size, time and workloads. In this study, teachers did not raise any impact concerns. The next chapter provides the summaries of all the chapters in the study, the conclusions drawn and the recommendations made.

CHAPTER 6

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1   INTRODUCTION

Assessment is at the heart of teaching and learning process. It assists teachers to know how their learners' are progressing and the difficulties they encounter with their learning so that appropriate measures can be put in place to meet learnersneeds (Black & Wiliam, 1998). Internationally, assessment is changing to meet the demands of changing nature of teaching and learning.

This research was set to investigate primary mathematics teachers' assessment practices and their understanding of AfL in the context of the new integrated primary curriculum. This chapter presents the summary of chapters in this study, conclusions reached from the findings and recommendations thereof.

6.2   SUMMARY OF CHAPTERS

Chapter 1 presented the historical and current educational systems in Lesotho (cf. 1.1.1, 1.1.2). This chapter also outlined the statement of the problem which illustrated that there had been some attempts in Lesotho education system to implement CASS in the early 1980s and this attempt failed due to lack of clarity of the concepts among teachers (Sebatane, 1985 in Raselimo & Mahao, 2015). With the introduction of AfL the question is what measures have been put in place to address some of the challenges that led to the failure CASS (cf. 1.2). The chapter further stated the objectives and the significance of the study (cf. 1.4, 1.5). The conceptual framework on assessment and the methodology employed by the study were briefly discussed (cf. 1.6; 1.7). Finally the limitations of the study and definitions of terms were also presented.

Chapter 2 reviewed issues pertaining to assessment in general; characteristics of educational assessment, purposes of assessment, and factors influencing teachers' assessment practices (cf. 2.2; 2.2.1; 2.2.2; 2.2.3). The chapter also discussed

different forms of assessment in particular summative which is currently referred to as assessment of learning and formative which is known as assessment for learning, and the tensions that exist between these two forms of assessment (cf. 2.3; 2.3.1; 2.3.2; 2.3.3). Since the study was mainly on implementation of AfL policy, assessment for learning formed the major component of the literature review chapter. Theories which underpinned assessment for learning and the role played by teachers in assessment for learning also formed part of this chapter (cf. 2.4; 2.5). It was important to consider some of the factors which might influence teachers in implementing assessment for learning. This chapter revealed some of these factors being clarity of assessment for learning policy, availability of resources, and provision of training and support. In this study clarity was defined as a clear understanding of goals and means of what needs to be changed (Fullan, 2007). The issue of clarity of the policy was very important in this study as the first attempt of implementing CASS failed due to lack of clarity. Factors which hindered the implementation of AfL were also presented (cf. 2.7). These factors included among others lack of clarity, lack of resources, large class size, increased workload and time constraints. Looking at the situation of Lesotho where teacher-pupil ratio is high because of the introduction of free primary education, it is likely that the implementation of AfL might not be as effective as expected.

Chapter 3 discussed the theories which underpinned this study. It first outlined the process of change which teachers have to undergo in order to transform their current practices. Fullan's definition of change process and his three stage model of educational change had been presented. These stages were outlined as initiation, implementation, and institutionalisation (cf. 3.2). The chapter also discussed two models of teacher change, Guskey's model of teacher change and Clarke and Hollingsworth's model of teacher change. Though Guskey's model is linear and that Clarke and Hollingsworth is cyclic, the two models basically have the same components. Both models emphasised the importance of professional development programmes in changing teachers' classroom practices (cf. 3.2.2). Though these models are crucial in outlining the process of teacher change, but they do not explain the concerns teachers have during implementation process.

Hence the chapter discussed the concerns based adoption model which conceptualises change as a developmental process of attitudes and behaviours for individuals attempting to put change into practice (Hall & Loucks, 1977). This is comprised of stages of concern, level of use of innovation and innovation configuration (cf. 3.2.3.1; 3.2.3.2; 3.2.3.3). As stated earlier, professional development programmes are important components in effecting change. For effective implementation of change, teachers have to undergo training which will equip them with necessary knowledge and skills for the implementation process (cf. 3.3).

Chapter 4 elaborated on the methodology and research design adopted in this study. First, philosophical issues and research paradigms were discussed (cf. 4.2). Research paradigms that were presented in this chapter were positivist, interpretivist and critical realism. The study adopted critical realism stance which aims at combining both positivist and interpretivist paradigms (cf. 4.3). The chapter also outlined the justification for using mixed methods design as triangulation, where one approach is used to complement the weaknesses of the other approach. As stated in this chapter, another reason for using mixed methods approach was that the researcher wanted to establish teachers' assessment practices from their own point of view without being influenced. However, it was also important to find deeper meanings behind what they said; hence the use of quantitative and qualitative approaches (cf.4.4).

In this chapter, the setting of the study was outlined paying attention to the characteristics of the schools from which teachers who participated in this study came from. The sample and sampling techniques of the participants were discussed (cf. 4.5, 4.6). The sampling techniques that were used in the study were random sampling for quantitative approach and purposive sampling for qualitative approach. Palinkas *et al.* (2015) demonstrated that purposive sampling is a technique used in qualitative research for identification and selection of information-rich cases for the most effective use of limited resources.

The sample for quantitative approach consisted of 250 grade one to four teachers in Maseru while the sample for qualitative approach comprised of eight teachers who participated in the survey and also took part in the training workshops. Out of these eight teachers, three terminated their participation in the study for different reasons (cf. 4.6).

Chapter 4 also provided an overview of AfL training workshops for eight teachers who initially participated in the study. The first training workshop in which teachers were training on issues relating to AfL took the whole day and was followed-up with school-based workshop where teachers were assisted in implementing AfL in their classes (cf. 4.7). The chapter further presented techniques that were used for collecting data. Questionnaire was used for collecting quantitative data while observations and interviews were used to gather qualitative data (cf. 4.8). For data presentation and analysis, frequency tables, percentages, means, standard deviations and Chi-square tests were used for quantitative data while themes generated from common codes that emerged from teachers' narratives were used for qualitative data. Creswell (2008) illustrated that thematic analysis involves identifying, analysing and reporting emerging patterns within data that provides organisation of data and interpretation. Finally the chapter addressed the issues of reliability and validity of the findings of the study. Ethical considerations and limitations of the study also formed part of this chapter (cf. 4.10; 4.11; 4.12).

Chapter 5 started by presenting raw data and was followed by its interpretation. The chapter first presented the quantitative data collected through the use of questionnaire and this was followed by interpretation of these findings. Second qualitative data were presented and this was followed by their interpretation. Lastly, the results from both quantitative and qualitative data were merged looking at the similarities and differences that emerged (cf. 5.2; 5.3).

In Chapter 6 the summary of chapters in this study, conclusions reached and recommendation made were discussed. The chapter presents two models which

emerged from the study. The first model developed was on how to improve primary teachers' implementation of AfL in mathematics and the second was about the process of teacher change for effective implementation of the assessment for learning policy.

6.3   CONCLUSIONS

This section provides conclusions by revisiting the research questions and providing answers to them based on the research findings. The general aim of this research was to investigate primary mathematics teachers' assessment practices and their understanding of AfL in the context of the new integrated primary curriculum. To achieve this aim four research questions were answered. The conclusions reached for each research question are presented in the next section.

6.3.1 What are Primary Mathematics Teachers' Assessment Practices Before AfL Training?

In addressing this research question, a survey consisting of 250 primary teachers from Maseru was conducted. This was done in order to establish if teachers' assessment practices were in line with what has been prescribed by the curriculum and assessment policy before they could be provided with the training on AfL practices. Questioning is one important strategy of assessment for learning as it identifies gaps in learners knowledge and understanding. As mentioned earlier, Johnston-Wilder (2005) illustrated that by asking learners questions that require them to identify, justify or demonstrate what they know, the teacher can identify gaps and misconceptions learners have. The results of this study revealed that teachers aged below 30 years did not ask questions that require learners to justify their response (cf. 5.2.5) The results also revealed that teachers were mostly using observation, group-work, oral work, written test and homework in assessing their learners (cf. 5.2.2.1). Furthermore the findings showed that teachers used worksheets, performance tasks, self and peer assessments minimally (cf. 5.2.2.1 & 5.4.1).

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It is important to note at this juncture that these AfL techniques which are minimally used are the ones that make AfL unique from other forms of assessment and these are the very same techniques that make AfL learner-centred. The findings illustrated that teachers' choice of assessment technique was based on ease of preparing and marking, the number of learners in the class and time available (cf. 5.2.2.2).

In addition, the results of the study demonstrated that most teachers shared learning outcomes and communicated indicators which learners use to show their level of understanding while few teachers showed that they wrote and shared success criteria with their learners at the beginning of the lessons (cf. 5.4.1). It should be noted that without clear success criteria, learners would not be able to reach the learning outcomes. Success criteria are the details of the learning outcomes. They break down the learning outcomes into smaller parts guiding learners as to what they need to do to meet the outcome and helping them to see where they need to improve (cf.2.3.4.2).

Generally these results illustrated that prior to AfL training, teachers were using assessment techniques that were easy to prepare, easy to mark and which were more teacher-centred than learner-centred.

6.3.2 What are Primary Mathematics Teachers' Understandings of AfL Before Training?

For teachers to effectively implement assessment for learning practices, they needed to have a clear conception of what AfL was. Hence it was important for this study to establish if teachers understood what the concept is all about. In chapter two, Stiggins *et al.* (2007) demonstrated that assessment for learning happens while learning is still underway to diagnose learners' needs, plan next steps in instruction, and provide learners with feedback they can use to improve the quality of their work. Teachers who participated in this study showed some confusion about what AfL is. In the teachers' definitions of AfL, both attributes of assessment for learning and

assessment of learning were mentioned (cf. 5.4.2). For example, Teacher 1 defined AfL as "*an ongoing evaluation. It is done after a lesson or during the lesson or after a unit of learning*" while Teacher 4 defined it as "*a quiz to test the understanding of the learner within a short period of time. It is done daily, at the end of the lesson or weekly after the end of each topic covered*".

Looking at the two definitions, one sees a lot of confusion among teachers about what AfL is. The first teacher had correctly indicated that AfL is on-going, but at the same time she illustrated that it is done after a lesson or after a unit of learning. The two views mentioned are contrasting as one is an attribute of AfL while the other one is the attribute of assessment of learning. The second teacher was totally confused as she defined AfL as a quiz which is an assessment technique. Generally, teachers prior to AfL training did not have a clear understanding of what it is. This in a way would hinder their ability to utilize assessment for learning practices in their classes. As indicated in Chapter 3, Fullan (1991) believed that the key to successful implementation of any change is the clear, coherent and common meaning for all individuals involved.

6.3.3 How do Primary Mathematics Teachers Understand and Implement AfL After Training

As mentioned earlier, prior to AfL training teachers seemed to have confusion regarding what AfL is and their assessment practices also revealed that teachers were still inclined to teacher-centred assessment practices. However, after training; teachers' understanding of AfL and their assessment practices seemed to have improved drastically. For example, teacher 4 after training defined assessment for learning as "*an on-going learning process whereby both teachers and learners are given the chance to make improvements on teaching and learning while it is still going on. Assessment for learning can be used every time when you want to check whether the learners understand the topic introduced*…." When comparing the two definitions given prior and after AfL training, one sees a dramatic change in teachers' understanding of AfL. Unlike before, the teacher now knows that AfL is not an

assessment technique but rather a process which is ongoing, involving both teachers and learners, which gives both teachers and learners a chance to improve while teaching and learning are still going on.

Similarly, training seemed to have improved teachers' assessment practices in a positive manner. The results gathered through observations and interviews have revealed that teachers had incorporated some of the AfL practices which they minimally used prior to training (cf. 5.6). The findings showed that after training, teachers were able to develop, write and share success criteria with their learners. Teachers also talked at length about the importance of sharing the success criteria with learners. Some of the benefits they indicated were that success criteria help learners to check their work and also to do the work on their own by just following the steps provided in the success criteria. Teachers also indicated that through use of the success criteria, learners are now enjoying doing mathematics (cf. 5.4.1). Heritage (2000) illustrates that learners use success criteria to keep track of how well they are moving towards the learning intension and to make adjustments to their learning whenever necessary. The results also indicated that even after training, teachers continued to communicate learning intensions. With regard to provision of descriptive feedback, teachers did not show any improvement as they continued providing learners with symbolic and oral feedback (cf. 5.4.1). For Black and Wiliam (1998), feedback in assessment for learning should be given regularly in the form of written comments and should also provide information to learners regarding learning objectives. Where feedback is given symbolically or orally, learners do not get an opportunity to follow up on their weaknesses.

During observation, learners were seen correcting their work by following the steps provided by the success criteria even before the teacher could look at it (5.4.1). It should be noted that the more the learners are involved in their own assessment, the more they are likely to understand the subject matter which will in turn improve their learning. The importance of self-assessment has also been illustrated by Frankland (2007) who pointed out that self-assessment helps learners to develop critical reflection and to make critical judgements about their own work. Furthermore, the

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results revealed that teachers did not encourage the use of peer-assessment as they did not even provide learners with guidelines and rubrics which they should use in assessing others (cf. 5.2.2.3 & 5.4.1). In the Lesotho situation where teacher-pupil ratio is high, the use of peer-assessment would alleviate teachers' heavy workloads. Patri (2002) illustrated that if the effectiveness of peer-assessment could be adequately improved, the teachers' workload could be partly reduced.

Generally teachers understanding of assessment for learning had improved after training. Their assessment practices also showed an improvement except for use of peer assessment which was not formalised hence could not be used effectively. Another AfL strategy which teachers seemed not to practice effectively was provision of descriptive feedback. They continued using oral and symbolic feedback which did not assist learners in correcting their mistakes and making adjustments where necessary (cf. 5.4.1).

6.3.4 How do Contextual Challenges Influence Teachers in Implementing AfL Practices

There are different contextual challenges which can impact on teachers' implementation of assessment for learning. These challenges can be classified as teacher-related or work-related. The teacher-related challenges involve worries that teachers can have about the effect of implementation of AfL on themselves while work-related challenges are about what will happen during the actual implementation of AfL. The findings of this study revealed that teachers were worried about their lack of understanding of AfL, lack of training and support during implementation of AfL (cf. 5.4.3.1). Teacher 4 illustrated that they were already struggling with the new integrated curriculum and it was even worse with AfL as they did not know what to do. Teachers lack of clarity of the AfL policy has been evidenced by the results collected through survey where they could not define AfL. On the issue of support Teacher 4 continued to point out that they did not get any support from their fellow teachers as they also indicated that they did not know what to do, or from the MoET personnel (cf. 5.4.3.1). Similar sentiments were shared by Teacher 2 who illustrated

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that this approach was new to them and there was nobody helping them as the inspectors also did not assist them rather they told them to help one another (cf. 5.4.3.1).

The findings of this study showed that teachers were worried about lack of training before and during implementation of AfL. Teacher 3 illustrated that they were not given any proper training and orientation about this new method of assessment (cf. 5.4.3.1). In Chapter 3, Fullan (2001) illustrated that lack of clear conceptualisation of the change makes it difficult for teachers to implement change effectively. On the other hand, Guskey (1986) pointed out that teacher professional learning programmes are a vehicle in bringing change in the classroom practices of teachers.

The findings revealed work-related challenges that affected teachers' effective implementation of AfL as shortage of resources, large class size, heavy workload, and shortage of time (cf. 5.4.3.2). Teachers complained that they did not have enough teaching and learning resources like the syllabus, assessment task booklets and forms for filling learners' performance standards. Teacher 4 indicated that there was shortage of materials such as the syllabus where only one copy was available per grade. She further illustrated that there was shortage of materials such as charts and markers though they expected to use them. Though teaching and learning materials are provided for by the MoET, in most cases they are never enough and are also delivered late to schools (cf. 5.4.3.2).

Since the introduction of FPE in the Lesotho primary schools, the enrolment in the primary schools increased tremendously thereby making implementation of AfL very difficult. Teacher 1 confessed that with a large class like hers, it took a lot of time to write performance statements for each learner (cf. 5.4.3.2). The same sentiments were shared by Teacher 3 who indicated that in large classes they took a week or more to write performance statements for every learner when administering formal assessments. This situation in which teachers spend a lot time writing performance statements is an indication that teachers need a lot of time to complete the task. This

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implies that time now becomes a challenge on the part of the teacher. On the issue of time Teacher 5 alluded that they spent more time on paper work than the actual teaching (cf. 5.4.3.2). This implies that teachers are likely to compromise teaching and learning in the name of administering AfL. If teachers complain that they have a lot of paper work to be do, it means that their workload has increased.

Given these work-related challenges faced by teachers in implementing AfL, it implies that implementation of AfL in the Lesotho primary schools might be compromised if these challenges are not address in time. There are two models which emerged from the findings of this study. The two models are elaborately discussed in the next section.

6.4   EMERGENT MODELS

After critical analysis of the results, two models which provide an insight into teachers' assessment practices which appeared as they implement assessment for learning and the one that shows the elements which were necessary for teacher change emerged (Figure 6.1 and Figure 6.2).

6.4.1 Emerged Model of Assessment for learning

The assessment model which emerged from the findings of this study has five elements which came out frequently from teachers' assessment practices. For the teachers who participated in the study, the most important components of assessment for learning are communication of learning intentions, writing and sharing success criteria, use of peer and self assessments guided by indicators, provision of non descriptive immediate feedback and use of varied assessment techniques. All teachers seemed to know that they had to communicate learning intentions to their learners at the beginning of the lesson. Teachers also wrote success criteria on the board and shared it with their learners at the beginning of the lesson and during the lesson. Learners also seemed to understand and use indicators when self assessing themselves. Learners were also using peer and self assessments guided by the success criteria. In assessing their learners, teachers used varied assessment techniques and also provided learners with immediate

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feedback, though it was not descriptive as they were using symbols and oral feedback to show the level of learners' performance.
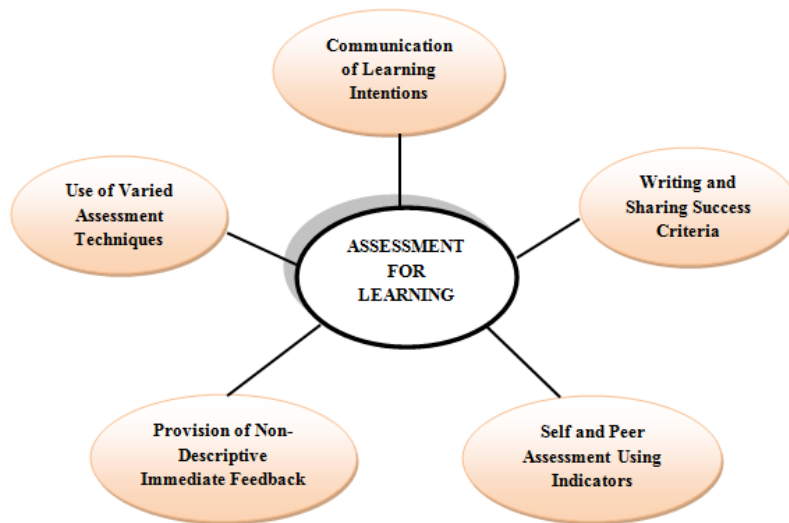
Figure 6.1: Emerged Model of Assessment for Learning

6.4.1.1   Implementation of the Assessment for Learning Model

It is important for mathematics teachers to understand how they can effectively implement the emerged model for assessment for learning in their classes. Hence, a brief description of what teachers can do at each stage of the model has been provided below.

Communication of Learning Intentions

Learning intentions are the key elements of instructional activities as they guide both teaching and learning. The model suggests that in the teaching of mathematics, learning intentions should be written on the board and communicated to the learners at the beginning of the lesson and during the lesson in the language learners understand. The reason for communicating the learning intentions to the learners at the beginning of the lesson is that learners should know right from the beginning the standards they are aiming for. During the lesson, it is also important that the teacher keeps on revisiting the learning intentions to remind the learners of what their target

is. All teachers who took part in this study communicated learning intentions to their learners (cf. 5.4.1). Wilson (2014) illustrated that when learners understand very clearly what the learning intention is, and what is necessary to meet this intention, they are more able to take control of their own learning by self assessing themselves (cf. 5.4.1). Communicating clear learning intentions is not enough, it is also important to elaborate the criteria by which learners' work will be judged.

Sharing Success Criteria

In developing the success criteria, teachers should bear in mind the learning outcome for the lesson and then determine how learners will demonstrate their learning. The teacher should then put the main ideas in logical steps which the learner should follow to attain the learning intention. Once the success criteria have been developed, it should then be shared with the learners at the beginning of the lesson. When sharing the success criteria with learners, teachers should write them on the board in clear specific terms, using the language learners would understand (cf. 2.3.4.2 & 5.4.1). In ensuring that learners understand the success criteria, the teacher should read these criteria with them. It is also important that teachers keep on reminding learners to revisit the success criteria as the learning progresses. Below is an example of the success criteria developed the AfL training workshop (cf. 4.7.1).

Learning Intention: Should be able to round off three-digit numbers to the nearest 100.

Success criteria:

- *Write the place value of each digit in the number above each digit.*
- *Look at the digit occupying the place value "tens"- if it is 5 or more, round the number up and if it is 4 or less round it down.*
- *When rounding up, increase the hundreds digit by one and when rounding down keep the hundreds digit the same.*
- *In the positions of "tens" and "units", write zeros as place holders.*

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- *Check that the answer has the same number of digits as the one you started with.*

When success criteria are clearly understood by learners, they can use them to assess their work and the work of their peers without necessarily indicating the level of performance which might be challenging for young learners.

Self and Peer Assessment Using Indicators

When learners have a clear understanding of what they are suppose to learn, they are able to track their progress towards attainment of the learning intention through the use of success criteria. Hence, the teacher should regularly ask learners to check their progress against the stated success criteria and indicate their level of performance as prescribed by the steps in the success criteria (cf. 2.3.4.2). For learners to use the indicators properly, teachers should train them.

Once learners know how to use indicators, they can now indicate their level of performance and the teacher can help them according to their needs. The teacher can concentrate more on learner with serious challenges and may ask those who are performing well to assist others. In Lesotho situation where teacher-pupil ratio is high, these strategies can assist in reducing teachers' workload.

Provision of Non-Descriptive Immediate Feedback

In Lesotho primary schools where teacher-pupil ratio is high, it is not possible for teachers to provide learners with performance standards in each and every mathematics lesson. However, it is important that when providing immediate symbolic feedback, teachers should also communicate verbally the strengths and weaknesses of learners and what learners should do to improve their learning. Using symbols prescribed by MoET without an indication of learners' strengths and weaknesses, does not help learners to improve (cf. 5.4.1). In providing immediate feedback, teachers can use different strategies.

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Use of Varied Assessment Techniques

In collecting information about learners' learning, different assessment techniques are used depending on the type of information required. For instance, different assessment techniques can be used to measure a variety of aspects of learners' learning, conceptual development, skill acquisition and application. The use of varied assessment techniques will yield a deeper and more meaningful understanding of what learners know and are able to do. Furthermore, the use of various assessment techniques allows teachers to determine the effectiveness of their instructional strategies. Teachers who took part in this study also used varied assessment techniques in assessing their learners (cf. 5.2.2.1 & 5.4.1).

6.4.2 Emergent Model of Teacher Change for Effective Implementation of Assessment for Learning

The main focus of the second emergent model of teacher change has the teacher as the main focus of the model. The model describes four key elements which were found necessary for teacher change. These elements are training, policy interpretation, personal practices and working conditions. The other two elements of this model illustrate the impact of the four elements on the teacher. The first three factors which impacted on teachers were, policy that they had to implement, their existing personal practices and the prevailing working conditions. The fourth factor was provision of school-based training and support.
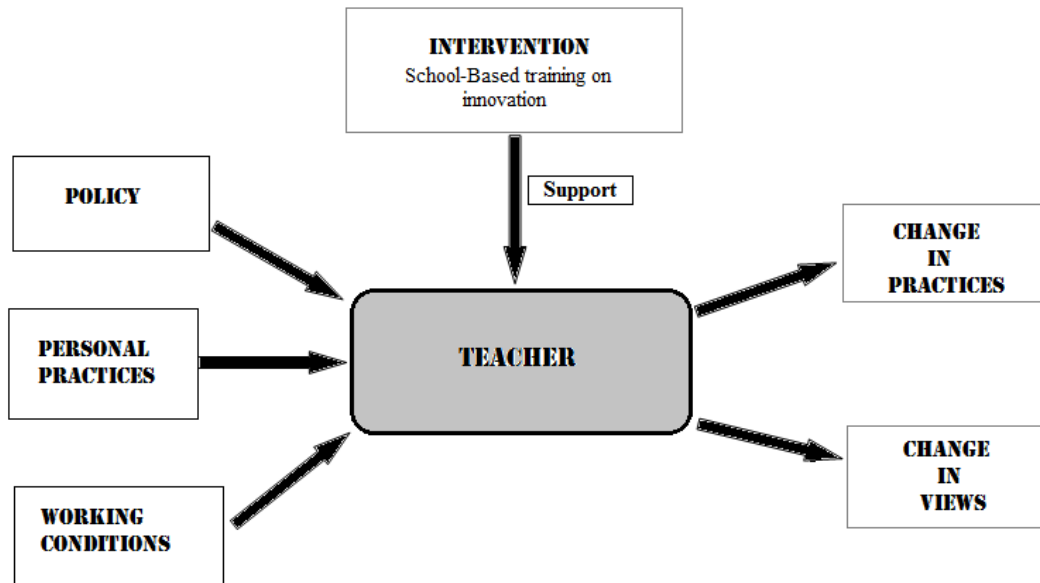
Figure 6.2: Emerged Model of Teacher Change for Effective Implementation of AfL.

Assessment for Learning Policy

The Ministry of Education and Training in Lesotho introduced the curriculum and assessment policy in 2009. This policy advocated for the use of both assessment for learning and summative assessment, with more emphasis on the former. In order for teachers to effectively implement the policy, they needed to thoroughly understand what the policy required. The knowledge and understanding of the policy was important for teachers as it required them to use assessment strategies that were new to them.

Personal Assessment Practices

Prior to introduction of AfL, teachers were already using certain assessment practices. With the introduction of AfL, teachers had to alter some of these assessment practices as AfL came with its demands. Changing ones old practices is not easy and it takes a long time and several cycles of trial and error. Elmore (1996) in Smith et al. (2003) illustrated that change takes a long time to happen because teachers have to feel that there are some compelling reasons for them to change their practices. In order for teachers to understand what AfL was all about, they needed to be provided with in-service training.

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Provision of Intervention

Provision of intervention was of utmost importance because it equipped teachers with knowledge and skills necessary for understanding the policy and also for changing some of their assessment practices. The intervention is more effective when it is school-based as teachers happen to see the implementation of the change in process. The importance of support provided to teachers was for ease of implementation of the policy and sustainability of the practices gained (O'Sullivan, 2002). However, it is important to note that working conditions can impact on the teachers' adoption of AfL.

Working Conditions

There are various working conditions which prevail in Lesotho primary schools. These conditions include lack of teaching and learning resources, large class sizes and heavy teachers' workloads. With the introduction of AfL, the working conditions such as reduced teaching time, lack of preparation time and lack of time for writing performance statement became evident. For effective implementation of AfL, these conditions should be addressed as they may impact negatively on the teachers' assessment practices.   However, the present study could not address these challenges.

6.5   SYNTHESIS

The study was set to establish teachers' perception of assessment for learning, determine teachers' assessment for learning skills used in their classrooms, establish the effects of assessment for learning, training on teachers' assessment practices, finally to determine teachers' experiences when using assessment for leaning in their classes.

The results of this study indicated that teachers' understanding of assessment for learning prior to training was a bit confused as teachers incorporated both aspects of assessment for learning and assessment of learning in one definition.

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Teachers prior to AfL training encompassed varied assessment techniques though most of them were teacher-centred as they did not allow learners to take an active role in assessing their work. In addition, the assessment techniques used did not allow teachers to provide immediate-descriptive feedback which could help learners to attend to their weaknesses in time.

After training, teachers' conception of assessment for learning had improved tremendously as teachers were now able to include most of assessment for learning attributes in their definition. Teachers' assessment practices also seemed to have improved a lot after training as they encompassed use of success criteria, self and peer assessment. However, teachers still had challenges on peer assessment as learners were not provided with rubrics for marking their peers. Furthermore, teachers still had the challenge of providing learners with immediate-descriptive feedback.

The results of this study also revealed that through use of success criteria, peer and self assessments, learners were able to take an active role in their own learning and they showed positive attitude towards learning of mathematics. However, the results indicated that teachers had some challenges in implementing assessment for learning. The challenges raised were need for training, provision of support especially during this crucial time of implementation, reduced teaching time, lack of preparation time, lack of time for writing performance statements, resources, high teacher-pupil ratio and an increased teacher's workload.

From the findings of this study, two models emerged. The first model shows assessment for learning attributes which seemed to emerge from the results. The second model shows elements necessary for teacher change which emerged from the study. In general, teachers who participated in this study showed some deficiencies, but after training, however small as it was, they showed a dramatic change in their understanding of AfL and in their assessment practices.

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6.6   RECOMMENDATIONS

The chapter concludes by recommending that if real changes in teachers' assessment practices are to be achieved, the following recommendations are made.

- Ministry of Education and Training in Lesotho needs to provide teachers with regular in-service training on assessment for learning to equip the already practicing teachers with knowledge and skills. The in-service training should be provided in the already existing clusters where all teachers belonging to a particular cluster can have a chance to attend the training. This will close the existing gap in their knowledge. Hord et al. (1987) illustrated that change cannot succeed without effective in-service training that enable teachers to acquire necessary knowledge and skills for the implementation process. Similarly, Purzer et al. (2014) indicated that teachers are not likely to adopt an innovation or change in their practices unless they are confident of its effective implementation which could be acquired through in-service training.

- Ministry of Education and Training through its professional support structures such as Area Resource Teachers and Inspectors should provide strong support to teachers on all issues relating to AfL and also attend to some problems which emerge. Aiyepeku (1982) in Alade (2008) asserts that inspectors are the only ones that can give the professional help and guidance required in schools. The study carried out by Harvey (1999) revealed that teachers who received support made substantial change in their classroom teaching (O'Sullivan, 2002).

- There needs to be a strong sustainable partnership between Ministry of Education and Training and the teacher training colleges so that the newly proposed changes by the Ministry can be incorporated in the college activities.

- Enough resources need to be provided to schools in time for effective implementation of AfL. Narayan (2014) demonstrated that for an effective implementation of assessment for learning, Ministry of Education should

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provide resources which will enable both teachers and learners to produce quality work.

- Ministry of Education and Training needs to reduce teachers' workload by reducing teacher-pupil ratio and employing more teachers in schools. Fullan (1991) posited that change is resource hungry as it demands additional substitute teachers to ease teachers' workload.

6.7   SUGGESTIONS FOR FURTHER RESEARCH

Even though the present study was carried out on a small sample over a short period of time, it has provided an insight into the implementation of AfL policy. However, it would be desirable to carry out a similar study;

- which includes teachers from different regions in Lesotho over a long period of time so that a clear picture on the implementation of the AfL policy could be obtained;

- which establishes the visibility of using all the strategies of assessment for learning in the Lesotho primary schools at all levels and in all subjects.

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APPENDIX A – CONSENT LETTER

I am a PHD student in the Faculty of Humanities at the Central University of Technology, Welkom Campus. I invite you to participate in a research study entitled *Developing a Model for Assessment in Primary Schools in Maseru, Lesotho*. The purpose of the study is to investigate how primary mathematics teachers in Maseru understand and implement assessment for learning in the context of the new integrated primary curriculum.

Your participation in this research study is completely voluntary and you can withdraw at any time you feel like. If you agree to participate in this study, please respond to the questions as best as you can and your responses will be kept confidential and anonymous. Thank you in advance for your cooperation.

Upon completion of the study, a report will be compiled and made available to you on request.

Your cooperation will be highly appreciated.

NB **The second phase of the study involves training of teachers on assessment for learning. If you would like to participate in this phase of the study, please provide your name and contact number below.**

Name……………………………………………………………………

Contact No…………………………………………

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SECTION A: GENERAL BACKGROUND INFORMATION

Please tick in the appropriate box or supply the answer in the space provided. Please use a tick to indicate:

1. AGE

20– 30 years [   ] 31 – 40 years [   ]   41 – 50 years [   ]   51 years and above [   ]

2. HIGHEST QUALIFICATIONS

PTC [   ]   DIP [   ]   DEP [   ]   BED [   ]   Other, Specify:_____

3. TEACHING EXPERIENCE

0   – 5 Years   6 – 10 years   11 – 15 years   15 years and above

4. Which grade are you currently teaching?

Grade 1 [   ]   Grade 2 [   ]   Grade 3 [   ]   Grade 4 [   ]

5. On average how many learners do you teach? Please fill in the number of learners.

Grade	Number of learners
1	
2	
3	
4	

SECTION B: INFORMATION ABOUT YOUR ASSESSMENT PRACTICES

1. Please indicate by √, the frequency with which you use the following methods of assessment in your class.

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Ass. Method	Always	Often	Sometimes	Seldom	Never
1.1 Observations					
1.2 Oral exercise					
1.3 Written tests					
1.4 Home work					
1.5 Worksheets					
1.6 Peer or self					
1.7 Performance tasks					

Other, please specify and indicate frequency_____

2. Please indicate with a tick the reasons for the choice of your assessment method used frequently

1 = strongly disagree   2 =disagree   3 = neutral   4 = agree   5 = strongly agree

	1	2	3	4	5
2.1 Easy to mark	1	2	3	4	5
2.2 Easy to prepare	1	2	3	4	5
2.3 Appropriate for assessing mathematics	1	2	3	4	5
2.4 Not time consuming	1	2	3	4	5
2.5 Don't know about other methods	1	2	3	4	5
2.6 I teach too many students	1	2	3	4	5

3. How would you rate yourself with regard to the following using the scale below

1= rarely   2 = often   3 = always

	1	2	3
3.1 At the beginning of the lesson, I clearly explain to my learners what I am going to teach (learning outcomes)	1	2	3
3.2 At the beginning of the lesson, I share the success criteria with my learners	1	2	3
3.3 I communicate to my learners, indicators they should use to indicate their progress.	1	2	3
3.4 In my mathematics lessons, I ask learners to work in pairs or groups.	1	2	3
3.5 During the lesson, I intervene at timely intervals to ensure learners remain focused.	1	2	3

3.6 I discuss with my learners about what they have done well and what they need to do to improve.	**1**	**2**	**3**
3.7 I use variety of means to gather learners' understanding of mathematics.	**1**	**2**	**3**
3.8 I ask questions that require learners to explain and justify their responses.	**1**	**2**	**3**
3.9 I write comments on learners' work which explains what they have done well and what they need to do to improve	**1**	**2**	**3**
3.10 In my mathematics lessons, I ask learners to mark/comment on their work and progress.	**1**	**2**	**3**
3.11 I ask learners to mark or comment on their class-mate's work.	**1**	**2**	**3**
3.12 I provide guidelines (criteria) to help my learners mark their own or class-mate's work.	**1**	**2**	**3**
3.13 I give learners time to correct their mistakes.	**1**	**2**	**3**
3.14 At the end of the lesson, I summarize what I have taught in the lesson.	**1**	**2**	**3**

4. Are there guidelines on assessing learners in mathematics?   Yes [   ]   No [   ]

   If yes, how often do you use them?   rarely [   ]   sometimes [   ]   often [   ]   always [   ]

5. Briefly write down what you understand by assessment for learning.

   _____
   _____
   _____
   _____
   _____
   _____

APPENDIX C – CLASSROOM OBSERVATION SCHEDULE

Name of School: _____

Name of Teacher: _____

Topic of the lesson: _____

Length of the lesson observed: Starting time: _____ Finishing time: _____

Date: _____

Lesson Observation	Key indicators	Comments
At the beginning of the Lesson • Are the learning outcomes shared with learners in a way that they can understand? • Are success criteria shared or developed with the learners? • Do the teacher and the learners agreed on the indicators to be used during the lesson to show learners' progress?	• Learners can rephrase and explain the learning outcomes • Success criteria are written on the board/books • Learners discuss success criteria with peers and teachers. • Learners use appropriate indicators to show their level of understanding during the lesson. • Teacher responds appropriately to learners' indicators	
During the Lesson • How the teacher does monitors learners' learning and understanding?	• Teacher uses questions that elicit learners' understanding • Teacher observes peer interactions around the task • Teacher uses variety of means to gather learners' state of knowledge (stickers, cards) • Questioning/answer,	

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• How does the teacher assess learners' work?	observation, marking with symbols, written comments, writing solution on the board	
• Does the feedback make learners aware of the achievements they have made in relation to the learning objectives?	• Teacher provides descriptive feedback to students about areas of improvement and means of achieving improvement	
• Are learners given time to respond to feedback?	• Learners are given time to correct their mistakes.	
• Are pupils involved in self/peer assessment?	• Learners are given opportunities to discuss and assess their work. • Learners regularly discuss success criteria and their work with peers. • Learners are able to help each other and identify next steps.	
• Does the teacher use what he/she finds out from assessment to inform his/her interventions in the midst of learners' learning?	• Teacher intervenes at timely intervals to ensure learners remain focused. • There is evidence that the teacher adjusted his/her instruction based on the assessment information gathered	
• What type of questions does the teacher ask?	• Questions elicit learners' thinking.	

APPENDIX D – INTERVIEW SCHEDULE

1. Did you enjoy participating in this study? Why?

2. Did your participation in the assessment for learning training benefit you in assessing learners in mathematics? If yes, how? If no, why?

3. Can you briefly say what an assessment for learning is?

4. Which aspects of assessment for learning benefitted your learners? Why?

5. Which aspects of assessment for learning disadvantaged your learners? Why?

6. How did the assessment for learning training influenced the way you assess your learners?

7. a) What aspects of assessment for learning did you like most? Why?

   b) What aspects of assessment for learning did you not like? Why?

8. What challenges did you encounter when implementing AfL?

APPENDIX E – TRAINING PROGRAMME

Time	Activity	Facilitator
8:00 – 8: 15	Registration	Researcher
8:15 – 9: 15	Introduction and Welcome Remarks	Researcher
9:15 – 10: 00	Interpretation of the Curriculum	Resource Person
10:00 – 10: 30	Working Tea Break (Discussion and Questions)	Researcher and Resource Person
10:30 – 12.00	Introduction to AfL	Resource Person
12:00 – 12:30	Discussion and Questions	Researcher and Resource Person
12:30 – 1:00	Development of success criteria	Resource Person
1:00 – 2: 00	Lunch	
2:00 – 3:15	Group Work on development of success criteria	Researcher and Resource Person
3:15 – 4:15	Group Reports and Discussions	Researcher
4:15 – 5:00	Way Forward Evaluation of the workshop Closing Remarks	Researcher

APPENDIX F: EVALUATION FORM

ASSESSMENT FOR LEARNING - WORKSHOP EVALUATION FORM

Date: _____

Workshop Location: _____

Presenter(s):_____

Please respond to the following statements by ticking the most appropriate option.

Statements	Strongly disagree	Disagree	Agree	Strongly agree
1. Workshop objectives were clearly stated and met,				
2. The workshop loved to my expectations.				
3. The workshop was well organized.				
4. The information presented was relevant and useful to my job.				
5. The presenter(s) allowed me to work with and learn from my colleagues				
6. The presenter(s) were well prepared				
7. The materials provided were useful and appropriate for the workshop.				
8. The workshop influenced me to reflect on my assessment practices				

9. I will be able to apply what I learnt in this workshop confidently				
10. The presenter(s) provided adequate time for questions and answer them satisfactorily.				
11. The activities in this workshop gave me sufficient practice and feedback				

12. What were the most valuable aspects of this workshop?

_____
_____
_____
_____
_____

13. What were the least valuable aspects of this workshop?

_____
_____
_____
_____
_____

14. What improvements would you recommend in this workshop?

_____
_____
_____
_____
_____

THANK YOU FOR YOUR COOPERATION