

**AN ENQUIRY INTO THE FORMATIVE AND SUMMATIVE
ASSESSMENT PROCEDURES, AND PERCEPTIONS
THEREOF, OF GRADE 10 MATHEMATICS TEACHERS:
A NAMIBIAN CASE STUDY**

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by

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ABSTRACT

The purpose of this study was to gain insight into observed discrepancies between continuous assessment and final examination average marks in Grade 10 Mathematics in the Oshikoto region of Namibia. The study is framed as a case study and is grounded within the interpretive paradigm. A mixed methods approach was applied, eliciting both quantitative as well as qualitative data. The study took place in two phases. In Phase 1, continuous assessment and Grade 10 final examination average marks for 62 Junior Secondary Schools for the period 2008-2010 were gathered and analyzed. Schools were characterized in terms of the relationship between their continuous assessment and final examination average marks for each of the three years. Phase 2, which was informed by Phase 1, took the form of structured interviews with a sample of three Mathematics teachers and three principals along with a focus-group interview of twelve teachers in order to investigate more deeply the perceptions of teachers and principals toward assessment policy and practice. The study shows that Grade 10 assessment practice in Namibian schools is far from ideal. Many teachers are not fully conversant with the various continuous assessment components as outlined by policy, and teachers are not confident about setting appropriate continuous assessment tasks. There is a strong perception that continuous assessment marks can easily be inflated and those teachers who gave high continuous assessment marks to their learners were generally perceived as being either incompetent or dishonest. While continuous assessment was seen as an important component of teaching and learning, it is evident that teachers and principals would welcome greater clarity, along with standardization and moderation, with respect to continuous assessment practice.

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DEDICATION

I dedicate this thesis to my late father Titus Gareth Marongwe who died in 2004. Dad every day I see a revelation of your ambitions and understand what you expected out of your children.

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LIST OF ABBREVIATIONS USED

| | |
|-------|---|
| AFL | Assessment for Learning |
| AIDS | Acquired Immune Deficiency Syndrome |
| CA | Continuous Assessment |
| DNEA | Directorate of National Examinations and Assessment |
| HIV | Human Immunodeficiency Virus |
| JSC | Junior Secondary Certificate |
| LCE | Learner-Centered Education |
| MEC | Ministry of Education and Culture |
| MBESC | Ministry of Basic Education, Sport and Culture |
| MoE | Ministry of Education |
| NAS | National Academy of Sciences |
| NIED | National Institute for Educational Development |
| QAA | Quality Assurance Agency |
| SWOT | Strengths Weaknesses Opportunities and Threats |
| TCE | Teacher-Centered Education |
| TLRP | Teaching and Learning Research Programme |
| ZPD | Zone of Proximal Development |
| SPSS | Statistical Package for Social Sciences |

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CHAPTER ONE

INTRODUCTION OF THE STUDY

1.1 INTRODUCTION

This chapter introduces the research study, an enquiry into the formative and summative assessment procedures, and perceptions thereof, of Grade 10 Mathematics teachers in Namibia. The purpose of this chapter is to provide a brief description of the research landscape, research goals, research design and the research process. The chapter ends with an overview of the structure of the thesis.

1.2 CONTEXT OF THE RESEARCH

After independence in 1990, Namibia embarked on a new educational system that aimed to provide education for all. This reform involved the reorientation of the teaching and learning methods from a teacher-centred to learner-centred approach (Ministry of Education and Culture [MEC], 1993). A change in teaching and learning methods necessitated a shift in the associated learning theories as well, since the two belong to a similar worldview (Ginsburg, 2009).

In terms of assessment, a mutual relationship exists between teaching and learning practices and assessment practices - teaching and learning practices are measured by assessment results, while assessment outcomes may be used to reshape the teaching and learning process. Assessment practices are therefore embodied in the teaching approach. A change from a teacher-centred approach to Learner-Centred Education [LCE] simultaneously changes assessment goals. In brief, Namibia shifted from a historical view of assessment that saw assessment as a tool of oppression to more democratic principles that promote equal access, equity and quality in education (MEC, 1993; Shilongo, 2004). Anderson (1998) describes this transition as a shift from the positivist epistemological view of assessment to the constructivist paradigm.

One of the main principles of LCE is continuous assessment (Kruger, 2004). Namibia now uses two modes of assessment, formative and summative, to obtain a promotional mark for a learner working towards the Junior Secondary Certificate [JSC] at the end of their Grade 10 year. The combination of the two modes of assessment replaced the final examinations that were used prior to independence as sole form of assessment (Ministry of Education [MoE], 2010a). In Mathematics the continuous (formative) assessment mark [CA] and the end-of-year examination (summative assessment) marks are combined in the ratio 7:13 under normal circumstances. This produces each learner's national examination result that is used for promotion to the next grade (MoE, 2006; MoE, 2010a).

The policy and information guide published by the Namibian Ministry of Basic Education, Sport and Culture [MBESC] (1999) explains that when continuous assessment has been conducted as expected, the results should predict the outcome of the end-of-year examinations. Policy documents suggest that this is because "there is an overlap of objectives and competences assessed" (MBESC, 1999, p. 11). Supporting the same view, Passman (2007) argues that formative assessment is created to simply mirror summative assessment. The general assumption put forward by the policy implies that the average results of formative assessment should be a true prediction of the end-of-year examinations which are regulated and standardised by the DNEA. This is seen to be the ideal scenario, although it is contingent on teachers in schools collecting reliable and valid information about learners' performance in the various basic competences (Ministry of Education [MoE], 2010a, p. 10).

Arguing from a different perspective, Farrant (2002) explains why continuous assessment is being increasingly used worldwide as an alternative to terminal examinations. He explains that CA "builds up a picture of the pupils' performance over a prolonged and representative period whereas an examination shows only what he did on one particular day" (p. 146). The argument implies that CA provides more reliable or meaningful information than the end-of-year examinations. Since the two modes of assessment are different, the average percentage marks of the two may not be the same. The ideas put across by different stakeholders, including the Ministry of Education, parents, educators, and researchers suggest that a debatable co-relationship exists between CA and end-of-year examinations in the Namibian context.

The current study was prompted by observed discrepancies in Grade 10 CA and end-of-year examination marks for the 62 Junior Secondary Schools in the Oshikoto region of Namibia over the period 2008-2010. Typically schools fell into one of three groups: (A) those schools whose average CA mark was higher than their average examination mark, (B) those schools with comparable average CA and examination marks, and (C) those schools whose average examination mark was higher than their average CA mark.

The problem being contextualised in this research therefore stems from personal experience as well as that of colleagues teaching Grade 10 Mathematics. There is confusion as to which of the three scenarios is preferable, or even whether a comparison of the two types of assessment, formative and summative, is meaningful. This background motivated an enquiry into the disparities surrounding assessment practices with a hope of finding ways of encouraging teachers to move towards a scenario that promotes fair assessment of the Namibian child (MEC, 1993; Shilongo, 2004).

1.3 RESEARCH GOALS

The purpose of this study was to gain insight into the discrepancies that exist between the average CA marks and the average final examination marks in Grade 10 Mathematics in the Oshikoto region of Namibia. The study seeks to explore the possible reasons for these discrepancies and to develop a deeper understanding of the complex nature of formative and summative assessment within the Namibian educational landscape. In pursuance of this goal, the study is guided by the following research questions:

- What are the characteristics of the analyzed Grade 10 continuous assessment [CA] and end-of-year average marks for the period 2008 to 2010?
- What are the teachers' and principals' perceptions of continuous assessment and the end-of-year examinations as components of summative assessment in Grade 10 Mathematics?
- What is the relationship between the teachers' perceptions and the observed discrepancies from the document analysis?

1.4 RESEACH PROCESS

This study is grounded in the interpretive paradigm. As Cohen, Manion and Morrison (2008, p. 36) remark, “the main aim of an interpretive research is to provide a rich description of a phenomenon and, if possible, develop an explanation for it”. The present study captures the perceptions of teachers and principals with regard to continuous assessment as a component of the Grade 10 promotion mark. The research followed a mixed method approach, with quantitative and qualitative data being combined to produce a rich description of assessment practices within the Namibian context.

A case study methodological approach was used, with the data being collected in two sequential phases. Phase 1 took the form of a document analysis and was focussed on quantitative data. The data gathered and analysed were CA and examination average marks for the years 2008-2010 as obtained from official documents. Phase 2 consisted of two parts. Part 1 involved structured interviews using an interview protocol informed by Phase 1. One school was selected from each of the three groups (A, B and C) from each of which a Grade 10 Mathematics teacher and the principal were interviewed. In Part 2, qualitative data was generated from a focus group interview of twelve purposively selected Grade 10 Mathematics teachers.

1.5 OVERVIEW OF THE THESIS

This section provides a brief overview of the structure of the thesis.

Chapter 1 introduces the research study, an enquiry into the formative and summative assessment procedures, and perceptions thereof, of Grade 10 Mathematics teachers in Namibia. The chapter provides a brief description of the research landscape, research goals, research design and the research process. The chapter ends with an overview of the structure of the thesis.

Chapter 2 provides a contextual backdrop to the study by highlighting the key aspects of assessment in the Namibian context. To begin with, the definition and characteristics of formative and summative assessment from a general perspective are interrogated. Thereafter

assessment in the Namibian context, both before and after independence, is focused on. A review of Junior Secondary School Mathematics assessment in Namibia, in terms of policies, guidelines and regulations is then undertaken. The chapter closes with a review of Mathematics assessment practices in Namibia with regard to opportunities and challenges.

Chapter 3 provides a description of the procedures and methods that were used to gather and analyse data in this research study. The chapter incorporates the research goals, orientation, research design, sampling, data collection methods, analysis, as well as a brief outline of ethical considerations, validity and the limitations of the study.

Chapter 4 deals with the presentation of the data and discusses the findings. The chapter is divided into two sections. Section A involves the presentation and discussion of quantitative data obtained from the document analysis while Section B presents and discusses qualitative data obtained from one-on-one structured interviews and focus group discussions. Section B is in turn made up of two parts. Part 1 describes the teachers', principals' and focus group responses to the interview questions while Part 2 discusses the preset themes as well as a number of emerging themes.

Chapter 5 provides a summary of the findings of the study with specific reference to the original research questions. In order to contextualise these findings, the chapter includes a brief overview of the research process along with the limitations and significance of the study. The chapter concludes with some recommendations for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter provides a contextual backdrop to the study by highlighting the key aspects of assessment in the Namibian context. The first section looks at the definition and characteristics of formative and summative assessment from a general perspective. The second part focuses on assessment in the Namibian context (before and after independence). The third part reviews Junior Secondary School Mathematics assessment in Namibia in terms of policies, guidelines and regulations. The final section is a review of Mathematics assessment practices in Namibia with regard to opportunities and challenges.

2.2 KEY CONCEPTS USED IN ASSESSMENT

2.2.1 Assessment

Assessment can be defined as the “processes of gathering information about how learners are progressing in their learning” (MBESC, 1999, p. 2). The National Academy of Sciences (NAS, 2011) describes assessment as way of measuring what students know and of expressing what students should learn. According to Farrant (2002), assessment is a “process by which the quality of an individual’s work or performance is judged” (p. 146). In schools, assessment of learning is done by the teachers as they observe or test learners periodically (Farrant, 2002, p. 146). From these definitions one can infer that assessment involves the gathering of information that helps to explain how well learners are learning. Black (2008) adds that “all assessment involves the production, by the learner, of evidence that is used to serve the purpose of the assessment” (p. 4). This implies that in assessment there must be evidence of what the learner has done in the period of assessment. In the process, evidence of performance or achievement is gathered, recorded and interpreted for use in the decision making process. Without assessment in teaching it would be difficult to tell whether learning has taken place or not (MBESC, 1999). “At its root, assessment is a communication process that tells students, teachers, parents, and policymakers some things - but not everything - about what students have learned” (National Academy of Sciences [NAS], 2011, p. 3).

The major purpose of assessment in Mathematics education is to “promote, rather than undermine, good education” (Mansell, James & the Assessment Reform Group, 2009, p. 6) where good education can be seen as being characterised by mathematical proficiency in both teaching and learning (Kilpatrick, Swafford & Findell, 2001). Good assessment also provides “a reliable picture on the progress of the learner towards achieving basic competences of the syllabus and towards acquiring life skills” (MoE, 2006, p. 23). The main purposes of assessments can be subdivided into three broad categories (Mansell, et al., 2009):

1. Building a learner’s understanding within day-to-day lessons.
2. Providing information on learners’ achievements to those outside teacher-learner relationship e.g. parents, higher education institutions and employers.
3. To hold individuals (learners, teachers and principals) and institutions to account.

The information provided by assessments (Mansell, et al., 2009) is described by McTighe and Ferrara (as quoted in MBESC, 1999) as being helpful to:

- 1) Diagnose learners’ strength and needs, 2) Provide feedback on teaching and learning, 3) Provide basis for instructional replacement, 4) inform and guide instruction, 5) communicate learning expectations, 6) motivate and focus learner attention and effort, 7) provide a basis for learner evaluation, 8) gauge programme effectiveness. (p. 5)

Expressing similar ideas, the Quality Assurance Agency for Higher Education [QAA], (2006) explains that assessment provides a means by which students are graded, passed or failed. It provides evidence on whether one should proceed to the next level or not. It also provides essential feedback to the learners; this improves their performance as well as evaluates the effectiveness of teaching (Quinn & Hughes, 2007). The points raised above indicate that assessment has the potential to benefit, 1) teachers, as they are able to identify weaknesses and strengths of both the learners and their teaching practice and hence make appropriate modifications, 2) learners, as they receive essential feedback that scaffolds the learning process, 3) parents, as they receive information about the performance of their children which enables them to provide the relevant support, and 4) government, support services and other interested stakeholders since they can make informed decisions using outcomes of school assessments.

Assessment can be described as “inherently a process of professional judgment” (McMillan, 2000, p. 1). It is therefore imperative not to underestimate the consequences of making a

wrong or poor judgment in assessing learners. As Wiggins (quoted in McMillan, 2000, p. 3) contends, “Assessment affects the student’s effort”. It can either motivate or demoralize learners to do the subject. In order to enhance confidence in the stakeholders and protect those who are judged there is a need for reliability and validity of the results. Reliability involves consistency of results (Mansell, et al., 2009, p. 24). Validity ensures that the content assessed is in the syllabus (MBESC, 1999). It is noted that when conducted well, “classroom assessment has the potential not only to measure and report learning but also to promote it” (McTighe & O’Connor, 2005, p. 11). Good assessment also needs to be fair and ethical. It thrives on four views of fairness: absence of bias, equitable treatment, equality in outcomes and opportunity. It also incorporates the use of multiple methods such as tests, projects, investigations and topic tasks (McMillan, 2000). In addition, Quinn and Hughes (2007, p. 271) add that a good assessment ought to differentiate between those who answer questions correctly from those who cannot. To sum up, assessments need to be planned properly so that they are able to serve the intended purpose.

There are a number of dimensions to the process of assessment in Mathematics education. Assessment can be internally or externally administered, formal or informal, and formative or summative. Further, dimensions are based on the type of questions asked. Internal assessment is used by teachers to monitor and evaluate student progress and to make instructional decisions (Kilpatrick, et al., 2001). External assessment is administered by an external agent or organisation, e.g. researchers monitoring a particular programme where the information gathered is of national interest and may not necessarily be useful in teaching and learning in the classroom. In the context of this study attention is focussed on formative and summative assessment as contextualised in the Namibian education system. It is also imperative to note that “formative” and “summative” are not simply labels of different types or forms of assessment, but the terms also imply how such assessments are used (Mansell, et al., 2009).

2.2.2 Formative assessment

Formative assessment can be described as “assessment for the purpose of instruction” (Heritage, as quoted in Ginsburg, 2009, p. 110). Noonan and Duncan (2005) refer to formative assessment as the “feedback provided by the teachers during the formation stage of learning to check on student learning outcomes” (p. 10). Quinn and Hughes (2007) add that formative assessment “provides feedback of the progress that a student is making so that modification can be made to teaching if necessary” (p. 268). Popham (as quoted in Good, 2011) defines formative assessment as:

a planned process in which assessment-elicited evidence of student’s status is used by teachers to adjust their ongoing instructional procedures or by students to adjust their current learning tactics. (p. 2)

The development brief *Toward Education for All* (Ministry of Education and Culture, [MEC], 1993, p. 123-125) explains that assessment has a formative role when:

- It promotes good study habits among the learners.
- It helps the learners to apply the knowledge in problem solving.
- It improves teaching and learning.
- It builds a positive and realistic self image among the learners.

In the Namibian education system, Continuous Assessment (CA) (formative assessment) was brought in by the transition from teacher-centred education (TCE) to learner-centred education (LCE). The parallels of this transition are “from instructivism to constructivism, from behaviourist to cognitive approaches, from representation to generation” (Cohen, Manion & Morrison, 2004, p. 169). Continuous assessment is a principle of learner-centred education (Kruger, 2004). Supporting the same point of view, Cohen, et al., (2004) reiterate that “formative assessment is closely linked to principles of constructivism” (p. 329). Karger (as cited in Ginsburg, 2009, p. 109) explains that “cognitive development theory is essential because assessment is only as ‘valid’ as the ideas on which it is based”. This implies that assessment practices and learning theories should share a similar world view; the two may complement each other in achieving basic competences of a syllabus. According to the Ministry of Education and Culture (MEC, 1993, p. 60), Learner-Centred Education (LCE) lies in the social constructivist paradigm, which means:

- Learning should begin with the prior knowledge of the learners derived from the environment in and around the school. An assessment of prior knowledge is required in every lesson.
- Learning should fulfil the curiosity of the learners and this must be sustained through meaningful tasks.
- The point of view raised by the learners should be appreciated.
- The learning process needs to be treated as a holistic process done co-operatively.
- Learners and teachers need to work as partners.

The relationship between formative assessment and LCE is anchored by theoretical links to contemporary learning theories of constructivism, i.e. cognitive constructivism and social constructivism (Cohen, et al., 2004; Shepard, 2005). In the constructivist perspective learners actively construct their own knowledge by acting on the world. The theoretical link of formative assessment is more strongly connected to the social constructivism of Vygotsky rather than the cognitive constructivism of Piaget. Piaget's theory of cognitive development argues that learners must construct their own knowledge as individuals through experience. In social constructivism learners are believed to acquire knowledge through social relationships with peers, teachers, and adults. Learning can be seen as part of a collective activity in which new knowledge is mediated (Murray, 2009, p. 2).

Formative assessment is one of the tools that can be used by the teacher to mediate and scaffold learning as he or she works on the Zone of Proximal Development [ZPD] of a child. The ZPD can be defined as a "hypothetical, dynamic region in which learning and development takes place" (Berk & Winsler, 1995, p. 2). In other words it is the gap between what learners can do alone and what they can do with the assistance of an adult or a more capable peer. Scaffolding refers to the temporary support that the teacher or more capable peer provides to a learner during problem solving. The link between formative assessment and social constructivism was clarified by Shepard (2005) as he drew similarities between formative assessment and scaffolding. Shepard (2005) argues that both formative assessment and scaffolding elicit prior knowledge and use it to construct new knowledge, provide effective feedback, teach for the transfer of knowledge, and teach self-assessment. Scaffolding and formative assessment therefore play the same role, they are both "strategies teachers use to move learning forward in the zone of proximal development" (Shepard, 2005,

p. 113). In summary, formative assessment is embedded in LCE which is theoretically underpinned by a social constructivist view of learning.

Formative assessment is also called the assessment for learning [AFL] approach (Black, 2008). Continuous assessment “is essentially a form of formative assessment” (Hamukonda, 2007, p. 10). MBESC (1999) views continuous assessment [CA] as a formal part of formative assessment. This view is supported by McTighe and O’Connor (2005) who argue that formative assessment includes formal and informal methods. Baker and Stites (quoted in Alausa, 1999) say, “continuous assessment should involve formal assessment” (p. 7). A critical analysis of literature reveals inadequate clarity as to whether formative assessment is synonymous with CA or whether CA is a type of formative assessment, or rather whether they complement each other. The National Curriculum for Basic Education (MoE, 2010b) states that there are two modes of assessment used in Namibian schools, “formative continuous assessment and summative assessment” (p. 28). In this case the two words ‘formative’ and ‘continuous’ are combined. Further review shows that formative and CA have significant similarities, “they occur concurrently with instruction ... teaching to improve learning” (McTighe & O’Connor, 2005, p. 12). Shepard (2005) elucidates that “formative assessments use insights about learners’ current understanding to alter the course of instruction, and thus support development of greater competence” (p. 67). MBESC (1999) claims that CA is meant to “improve learning and to help shape and direct the teaching-learning process” (p. 8). Kilpatrick, et al. (2001) also adds that “formal sources of assessment help improve quality of instruction” (p. 350). Synthesizing the research literature reveals that continuous assessment and formative assessments serve the same purpose. In terms of this research, continuous assessment (CA) and formative assessment refer to a single procedure that consists of regular, informal and formal assessments made during the school year meant to improve learning and help direct the teaching and learning process (MBESC, 1999, p. 8). The results of research conducted by Noonan and Duncan (2005) in an exploration of the nature and frequency of high school teachers’ use of peer- and self-assessment showed that these two types of assessment are also types of formative assessment. Formative assessment is therefore an assessment strategy that evolved to address the needs of the learners by providing feedback to both the teacher and the learners. The approach also serves as a diagnosis for the teacher. Consolidating the ideas of different scholars, the Ministry of Education Namibia [MoE] (2005, item 6.11a) reiterates that assessment has a formative role for learners if and when:

- It motivates them to extend their knowledge and skills, and establish sound values,
- It promotes health habits of study,
- helps the learners to solve problems intelligently by using what they have learned,
- The teacher uses the information to improve teaching methods and learning material.

In order to achieve a formative role, the assessment content should be more than simple objective tests that require right or wrong evaluations. Questions that require various degrees of understanding should be included in the assessment activities (Good, 2011). Figure 2.1 shows the main components of a formative assessment system. This is a system where formative assessment is enhanced by content, context and strategies. The teacher needs to skilfully align the three components in order to promote meaningful formative assessment.

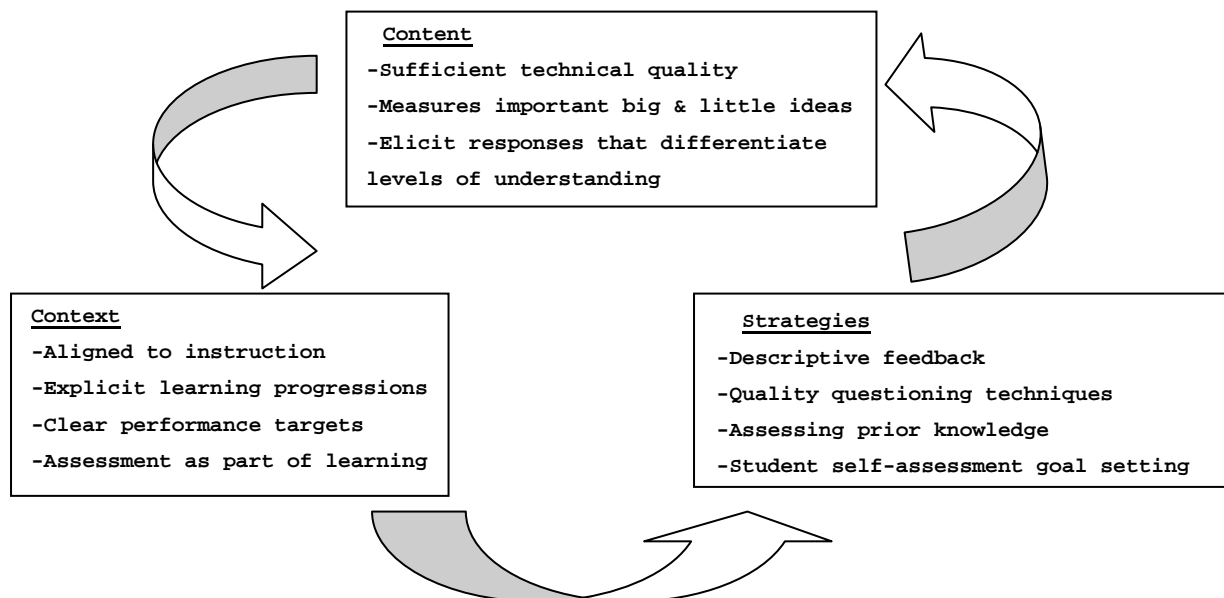


Figure 2.1 Components of the formative assessment process (Good, 2011)

The components of the formative assessment process are very demanding and may cause substantial changes in classroom practice and pedagogy as the teacher negotiates a platform for effective formative assessment. According to Ginsburg (2009) “we may think of formative assessment as a special case of teaching” (p. 126). In a research conducted by the Teaching and Learning Research Programme [TLRP] from 2001 to 2005, it was found that “the ‘spirit’ of assessment for learning was hard to achieve” (Mansell, et al. 2009, p. 20). This suggests that teachers need support in the form of workshops to boost their assessment literacy so that they are able to conduct formative assessment effectively. Unless teachers

conduct meaningful and effective formative assessment, CA marks compiled by schools are unlikely to be either reliable or valid.

2.2.3 Summative assessment

According to McTighe and O'Connor (2005, p. 11), "summative assessment summarizes what students have learned at the conclusion of an instructional segment". This includes tests, performance tasks and examinations. The score or results are often expressed as symbols or percentages. The MBESC (1999) stresses that any assessment made at the end of the year that includes cumulative progress is summative. It "takes place at the end of the course or unit to see if the student has achieved the objectives of the programme and is usually done as a formal test covering content of the course" (Quinn & Hughes, 2007, p. 268). The purpose of summative assessment is to review, to make an overall judgment in order to give strategic advice about the next stage of learning (Black, 2008). The score used to determine whether a learner can proceed to the next stage is called a promotional mark. Depending on the assessment policy of the country or examination board, a promotional mark sometimes comes from the final examinations only (summative score) or it can be a combination of formative marks (CA) and summative marks in a given ratio.

Summative assessment contrasts with formative assessment mainly in timing and purpose. The two are in tension with one another as summative assessment views learning from a behaviourist perspective while formative assessment views learning from the constructivist paradigm (Cohen, et al., 2004). Mansell, et al. (2009, p. 9) outlined some characteristic differences that help to understand summative assessment as follows:

- Summative comes at the end of episodes, whereas formative is built on the learning process;
- Summative aims to assess knowledge and understanding at a given point, whereas formative aims to develop it;
- Summative is static and one way (usually the teacher or examiner judges the pupil) whereas formative is on-going and dynamic (feedback can be both to the teacher and the pupil);

- Summative follows a set of pre-defined questions, whereas the formative follows the flow of spontaneous dialogue and interaction, where one action builds on (is contingent upon) an earlier one.

The characteristics of summative assessment vary according to the way the results are used. Sometimes the results are used by the teachers and administrators within the school, or outside the school by the parents, regional offices or any other interested stakeholders. At other times they are set and marked outside the school (Mansell, et al., 2009). In all cases it is imperative that reliability and validity is maintained to authenticate the outcomes.

2.2.4 Formal versus informal assessment

Formative assessment has two general categories: formal and informal. Formal assessments usually have numerical data which support the conclusions made. This data is usually gathered from exercises that assess specific competences in the syllabus (MBESC, 1999, p. 7). Data generated from activities such as written tests, projects, investigations, topic tasks, quizzes, and portfolios is usually recorded, statistically analysed and graded. Formal assessments can be designed to be more valid and reliable, unlike informal assessments.

Informal assessments are not usually data driven but are rather content and performance driven. “They are not necessarily carefully planned, but they are meant to provide you with information that is critical for you to know at that moment” (MBESC, 1999. p. 7). They are normally conducted while the learners carry on with their normal classroom activities during the term. Informal assessment techniques include questioning a learner, observing a learner’s work, feedback, debriefing verbal critique or listening to a learner making a presentation. According to the MBESC (1999), informal assessments are in all school phases and all lessons because they strengthen teaching and learning.

2.3 EDUCATIONAL ASSESSMENT IN NAMIBIA

2.3.1 Educational assessment before independence

Namibia is a former colony of Germany and South Africa. During the era of German colonialism formal education was introduced by the European missionaries who had the objectives of spreading the gospel (Shilongo, 2004). The Germans later took advantage of the setup to perpetuate racial segregation. During this period, education and educational assessments were essential tools to segregate the indigenous people so that they became unskilled second class citizens who could only provide cheap labour. South Africa's colonialism came into effect in 1914. This intensified racial segregation. Educational aims, according to Bowles and Gintis (cited in Shilongo, 2004, p. 19), were to:

- Reproduce the privileges of the ruling class.
- Reproduce the skills and attitudes required for maintaining a colonial society.
- Serve as an instrument of oppression.

In order to institute effective apartheid principles, educational priorities were offered according to race. Unequal distribution of resources was carried out to maintain social stratification in the communities. During this era assessments in schools were mainly in the form of examinations which had a bottleneck system that allowed only a few indigenous people to be promoted. The number of marginalised people supposed to pass the examinations was known before the papers were written. Shilongo (2004, p. 21) explains that “examinations were used as a supplementary tool to the Apartheid policy in order to strengthen and sustain the disparity between races and ethnic groups”. In the period prior to independence examinations were administered in three different departments: Bantu, Coloured and White. This examination structure reinforced segregation in education because the three groups wrote different examinations.

Examinations used before independence were also characterized by high failure rate of the indigenous black learners. According to Bethel (as cited in MEC, 1993):

This emphasis on failure is endemic throughout the education system with students expecting to fail, teachers expecting them to fail, and examiners setting papers to ensure that large numbers do fail. (p. 124)

Assessment during this era was designed to ensure that black children remained segregated with no opportunities to enter secondary school. Assessment was a tool to pursue social inequality. The apartheid regime was aware that education opens opportunities for better social status through employment; those denied the privileges of good education are permanently placed into low social classes of society.

To sum up, prior to independence, “schools served as agents of colonial government and examinations were deliberately utilized to facilitate this process” (Shilongo, 2004, p. 29). It is also worth noting that during this era “examinations were generally regarded as the sole measure of success for individuals and programmes” (MEC, 1993, p. 123). The assessment was norm-referenced; it compared learners’ performance or attainment to the ‘norm’ average or for any group of similar learners (Hamukonda, 2007). In other words the norms [accepted standards] to be followed were spelled out to those doing the evaluation and they were not negotiable (Mellish, Brink & Patton, 1988). Normative-referenced assessments were designed to select a very small group of the elite. Those with low marks and even those with high marks who were not selected to proceed were referred to as failures (MEC, 1993). The majority of failures during this time were from the indigenous black community, the white minority being regarded as elite.

2.3.2 Educational assessment after independence

After independence in 1990, Namibia realized a need to change assessment practices in order to meet the new educational philosophy that aimed to provide education for all citizens. “As we make a transition from educating the elite to education for all we also make another shift, from the teacher-centred to learner-centred education” (MEC, 1993, p. 10). Anderson (1998) describes this transition as a shift from the positivist epistemological view of teaching and learning to the constructivist paradigm. The re-conceptualization of how learning takes place calls for a shift from traditional assessment to alternative assessment practices that cater for the educational goals of a diverse student population (Anderson, 1998; Ginsburg, 2009).

As outlined in the development brief, *Toward Education for All* (MEC, 1993), the major goals of the educational reform are access, equity, quality and democracy in education.

- **Access:** aims to ensure that education is accessible to all Namibian children by expanding the capacity of schools and classrooms. It also aims to eliminate all barriers that prevent children from going to school such as segregation due to race, ethnic background, and colour or gender disparity.
- **Equity:** is a commitment to provide access to schooling and its benefits. This is to be achieved by reducing inequalities in order to create sameness.
- **Quality:** refers to the commitment to make sure schools are good schools through the provision of quality teacher training, assessment practices, school management and physical facilities.
- **Democracy:** the goal of democracy is to ensure broad participation in decision making and clear accountability where teachers are not seen as masters but creators and managers of learning environments. (MEC, 1993, pp. 32-34)

As controlled by the national goals, the reform process facilitated the use of two modes of assessment in Namibia, formative assessment and summative assessment. The formative mode was meant to motivate learners to extend their knowledge and skills to establish sound values, while the summative mode was to evaluate progress by means of examinations at the end of the year (Kruger, 2004; MoE, 2009). The main purpose of assessment in this reform was to “develop a reliable picture of each individual learner’s progress and level of achievement in relation to Basic competencies as specified in the subject syllabuses” (Kruger, 2004, p. 13).

As part of this reform, the Ministry also changed assessment types and approaches from the norm-referenced to the new criterion-based assessment at all levels (MEC, 1993). Criterion-referenced assessment “compares learner’s performance or attainment to a set of standards for any given subject or learning area rather than to other individuals” (Wilmot, as cited in Hamukonda, 2007, p. 16). According to Mellish, et al. (1988) criterion-referenced evaluations are useful in formative assessment because learners can be given the criteria upon which they will be tested. Any deviations can be pointed out as feedback. The learners are therefore awarded letter grades that reflect the level of performance in relation to Basic Competencies. This implies that “each letter must have a descriptor for what the learner must

demonstrate in order to be awarded a grade” (MoE, 2009, p. 32). According to the National Curriculum for Basic Education, which was implemented as from 2010, in Lower and Upper Primary phases the grades are symbols from A to E. In Junior Secondary phase, the symbols A to G are used. A scale of A to G is used in the Senior Secondary Ordinary level, while the numerical levels 1 to 4 are used for the Higher Level. Ungraded (U) is also used at all levels. Taking an example of Junior Secondary phase the following grade descriptors are used:

Table 2.1 Assessment grade descriptors for JSC. (Ministry of Education, 2006, p. 2)

| GRADES | % INTERVALS | GRADE DESCRIPTIONS |
|--------|-------------|--|
| A | 80-100 | Achieved basic competences exceptionally well; learner is outstanding in all areas of competency. |
| B | 70-79 | Achieved basic competences well; learner is highly proficient in most areas of competency. |
| C | 60-69 | Achieved basic competencies well; learner is above average in class. |
| D | 50-59 | Achieved basic competences satisfactorily; learner is average in class. |
| E | 40-49 | Achieved sufficient number of basic competences to exceed the minimum competency level. |
| F | 30-39 | Achieved minimum number of basic competences to be considered competent. |
| G | 20-29 | Achieved minimum number of basic competences worthy of a grade; Learners need compensatory teaching. |
| U | 0-19 | Ungraded |

2.3.3 Mathematics assessment at Junior Secondary phase (JSC)

In order to ensure that all the learners are assessed progressively during their time at school, the Ministry of Education divided assessment practices into phases. Assessment can be carried out at the Lower Primary phase (Grade 1-4), Upper Primary phase (Grade 5-7), Junior Secondary phase (Grade 8-10) and the Senior Secondary phase (Grade 11-12).

In the Junior Secondary phase assessment consists of informal and formal continuous assessment. Grades 8 and 9 take internal end-of-year examinations in each subject, while Grade 10 takes external examinations at the end of Grade 10. In Grade 8-10 continuous assessment for content-based subjects such as Mathematics counts 35% of the final grade, while the examination takes up 65% of the final grade or promotional mark (MoE, 2005;

MoE, 2006; MoE, 2010b). In other words, the learners' national examination results for Mathematics are made up of continuous assessment (CA) plus an examination mark in the ratio 7:13 (MoE, 2009) as outlined in Table 2.2. According to the Grade 8-10 Mathematics syllabus (MoE, 2006) learners entering for Mathematics examinations will write paper 1 & 2 only, while those entering for Additional Mathematics will write papers 1, 2 & 3. Papers 1 & 2 are the same for all learners. All examinations are graded on a seven-point scale of grades A-G.

Table 2.2 Grade 10 summative and formative components. (MoE, 2006, p. 26)

| | | DESCRIPTION | | MARKS/WEIGHT |
|-----------------------------------|---------|--|--------------|--------------------------|
| EXAMINATION | Paper 1 | Short questions | 1 hour | 45 |
| | Paper 2 | Structured questions | 2 hours | 85 |
| | | | | Total Exam: 130 |
| CONTINUOUS ASSESSMENT (CA) | | Investigations, projects, topic tasks, topic assessments and end-of-term tests | | $(250 \div 25) \times 7$ |
| | | | Total CA: 70 | |

Assessment practice in Grade 10 (JSC) is controlled and regulated by the Directorate of National Examinations and Assessments (DNEA) which is a department in the Ministry of Education. Formative assessment, commonly known as continuous assessment (CA), takes place at both informal and formal levels. The formal part of continuous assessment consists of 15 structured assessments: 5 written topic tests, 4 practical investigations, 1 project and 5 topic tasks. In addition to this, the new assessment guide of 2010 incorporates first and second term tests [see Table 2.3 and Appendix A] (MoE, 2006, p. 23; MoE, 2010b, p. 104). Teachers are however encouraged to give more of these assessments.

Table 2.3 Assessment mark allocations. (MoE, 2006, p. 26)

| GRADES 8, 9 & 10 | | | | | | |
|-----------------------------|-----------------------------------|---------------------|-----------------------------------|---------------------|-----------------------------------|---------------------|
| | TERM 1 | | TERM 2 | | TERM 3 | |
| COMPONENTS | Number & Marks | Total CA | Number & Marks | Total CA | Number & Marks | Total CA |
| Investigations | 2 × 15 | 30 | 1 × 15 | 15 | 1 × 15 | 15 |
| Projects | | | 1 × 15 | 15 | | |
| Topic Tasks | 2 × 10 | 20 | 2 × 10 | 20 | 1 × 10 | 10 |
| Topic Tests | 2 × 25 | 50 | 2 × 25 | 50 | 1 × 25 | 25 |
| Term Marks | | 100 | | 100 | | 50 |

A brief description of each assessment component is given below:

Investigations assess the ability to think and reason independently and to reflect critically on one's own thinking. In this phase investigations into number patterns and their application to everyday problems and generalisations are appropriate.

Topic Tasks are activities that most teachers already use in their day-to-day teaching. These are recorded and assessed activities that could introduce a topic or be used during teaching a topic or revision of a topic. They may well include assessment on competencies like locating information, conducting surveys and analysing information or presenting information.

Projects are longer assignments than topic tasks and give learners an opportunity to complete an investigation into one of the theme topics outlined in the syllabus. This type of investigation will enable the learner to pursue a topic in greater depth and in more lively and creative ways than possible with short discrete topic tasks or investigations. Projects assess the ability to solve problems and apply mathematical processes to everyday life, and the ability to present the problem, the process and the findings according to certain standards. One compulsory project per year must address cross-curricular HIV and AIDS, population or environmental issues. The use of rubrics is appropriate for the assessment of investigations and projects (MoE, 2006, p. 26).

Written Tests of the length of one classroom period are specifically set by the teacher to assess the learners' achievement in relation to content and competencies specified in the syllabus and should consist of short questions as well as more structured questions.

End of Term Tests are comprehensive tests of the whole term's work. No homework should be assigned during the time of writing end of term tests (MoE, 2010a, p. 182).

According to the above assessment policy the Grade 10 teachers in schools are expected to conduct formal and informal assessments in their respective schools. They are expected to compile valid and reliable structured formal assessment in order to provide CA marks for learners by combining marks from tasks, tests, investigations and projects in a given ratio. The DNEA is responsible for external examinations. They set question papers, regulate and administer external (JSC) examinations. They are also responsible for moderating the CA marks and the examination results in the ratio 7:13 in order to determine the final promotion mark that appears on the learners Junior Secondary School Certificate at the end of the Grade 10 academic year. According to DNEA workshop notes of 2009 there is evidence that CA average marks and exam average marks correlate well in some schools but in the majority of the schools CA average marks are significantly higher than the examination average marks (Mutuku, 2009). Since examinations are uniform in all schools throughout the country, this may suggest some inconsistencies in the quality of continuous assessment carried out in some schools.

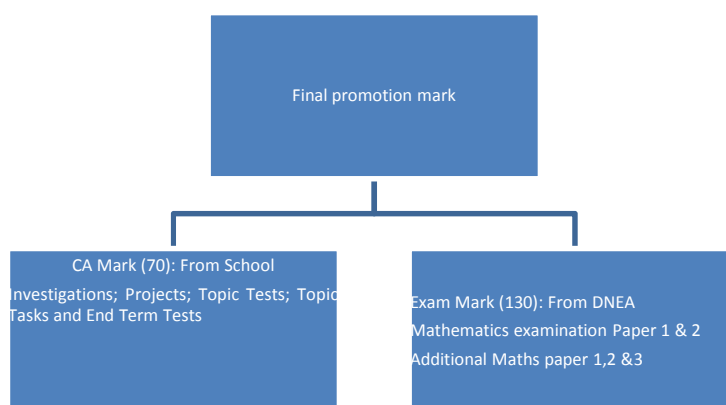


Figure 2.2 Grade 10 Mathematics assessment tools

2.4 CONTINUOUS ASSESSMENT: OPPORTUNITIES AND CHALLENGES

Much of the evidence available shows that the arena where assessments are carried out is not neutral. It is no longer only a judgement of learners but also a measure of the performance of teachers, schools and the nation's education system as a whole (Mansell, et al., 2009). Like any other education system, Namibia's education system is not immune to the consequences of assessment practices. A SWOT analysis of the new learner-centred assessment procedures has opportunities as well as challenges. The discussion below explores the opportunities and challenges that are based on the analysis of different components of assessment practices in the Namibian education system.

2.4.1 Opportunities

Arguing from a Namibian context, Alausa (1999, p. 7) believes that continuous assessment results, gathered over a long period, are more accurate when compared to final examination because they reach the teacher early enough to enable the modification of instruction. This implies that unlike the end-of-year examinations, which are written in a short space of time, the use of continuous assessment gives a more accurate judgment of the learner's performance over a longer period of observation. Furthermore, it helps to re-modify the teaching and learning process, thereby encouraging more teacher participation. McTighe and O'Connor (2005) reiterate that the continuous feedback from formative assessment improves teaching and learning. Kilpatrick, et al., (2001) believe that assessment enhances Mathematics proficiency by helping teachers "to adjust their teaching and identify students who need additional help" (p. 44). Assessment from this point of view creates opportunities for students to learn because improved assessment can lead to improved instruction (NAS, 2011). MEC (1993), contributing to this debate, believes assessments also inform parents and learners about progress. It should be regarded as an "unparalleled tool for communicating the goals and substance of mathematics education reform to various stakeholders" (NAS, 2011, p. 12). Assessments are also used for promotion purposes, to motivate learners and to foster good study habits. The document *Continuous Assessment Manual* compiled by the DNEA states that "an advantage of CA is that it enables diagnostic assessment to take place within the context of the everyday classroom situation" (MBESC, 2000, p. 2). This implies that the development of skills and knowledge identified within the basic competences of the syllabus

is enhanced. It also helps administrators to understand the learners' level of understanding, as well as to identify the teachers' successes and weaknesses in teaching their subject. This ability to judge learners' performance accurately is also part of a teacher's professional growth that helps in predicting expected grades.

Assessment practices that are compliant with the objectives of learner-centred education also create a platform of achieving Namibian national goals of providing education for all. As an example, continuous assessment improves fairness of assessments. In addition, more assessment opportunities and methods are used which creates a variety of chances for learners to demonstrate their mastery of the learning objectives (MBESC, 1999, p. 10).

2.4.2 Challenges

In the school, assessment involves judgements and decision-making processes that go beyond the re-orientation of the teaching and learning process. Decisions that enable one to proceed to the next grade, course or employment opportunity are made. The consequences of placing learners in the wrong grades cannot be underestimated. The process of assessing learners needs to be conducted with caution in order to avoid hurting the learners or the parents. The ability to make valid, reliable, free and fair judgement of learner performance is one of the challenges in Namibian schools.

Lack of assessment literacy among teachers is another challenge, and the development of assessment literacy amongst teachers is an important consideration in terms of reducing their dependency on formal testing and examinations. Reinforcing the importance of assessment literacy, Alausa (1999) acknowledges that Namibian teachers lack skills to set and administer tests that are reliable and valid. Literature reveals that the new assessment practices pose a challenge to the majority of Namibian teachers when it comes to implementation. The setting and keeping of records on the continuous assessment forms provided by the Ministry of Education remains a challenge even though a number of workshops have been conducted since the inception of the process. Furthermore, there is a strong perception that continuous assessment creates more work for both teachers and learners. Also, due to lack of competency and pressure of work, "most of the teachers reverted to old testing habits or simply allocated 'ghost' marks instead of recording marks from written activities" (Kruger, 2004, p. 16). Over the years the DNEA has monitored continuous assessment marks handed in from schools and

acknowledges that CA is “understood and well administered in some schools but not understood and poorly administered in others” (Mutuku, 2009, p. 1).

A close analysis of policy documents that have been published so far shows that lack of consistency in the use of terms like formative assessment, summative assessment and continuous assessment creates confusion. It is not clear in the Namibian context whether ‘formative assessment’, ‘continuous assessment’ and ‘summative assessment’ represent *three* different types of assessment (MoE, 2006, p. 23) or whether there are only *two* modes of assessment in the country, ‘formative continuous assessment’ and ‘summative assessment’ (MoE, 2010a, p. 31). From this background it is not clear whether formative assessment and CA are synonymous. The unanswered question is whether CA is a formal part of formative assessment or not. Pondering over the confusion, Hamukonda (2007, p. 16) says that “continuous assessment can be either formative or summative or both”. Furthermore, there are inconsistencies in the use of the terms ‘promotional mark’, ‘final mark’ and ‘summative mark’ in terms of which one to use on the certificate of the learner at the end of Grade 10. According to the *Policy and Information Guide: Towards Improving Continuous Assessment in Schools* “in grade 5-10 the summative assessment is made up of both the sum of formal continuous assessments and the end-of-year examination combined to specified percentages” (MBESC, 1999, p. 42). The JSC Mathematics syllabus published in 2006 states that “where there is an end-of-year test or examination the summative assessment will consist of both the continuous assessment and the final assessment” (MoE, 2006, p. 24). Assessment record sheets for Grade 8 & 9 (see Appendix A) show that CA Mark + Exam = Promotional mark (MoE, 2010b, p. 185). This shows confusion as to which one is a summative assessment mark. Is it the examination mark only or CA plus examination mark? Is the promotional mark and final mark referring to the same thing? Is the promotional mark also summative? It is likely that the irregular use of terminology may affect the implementation of the assessment process.

In addition it is also not clearly defined where to draw the line between formal and informal continuous assessment. A quote from a policy document reads: “Assessment includes informal and formal continuous assessment over a period of time during classroom activities and formal final assessment” (MoE, 2006, p. 23). Furthermore the language used in most of the policy documents is not easy to read and understand by ordinary teachers without the

guidance of regular workshops. Policy makers need to review official documentation in order to regulate the use of terminology in order to minimise confusion.

2.5 CONCLUSION

To sum up the arguments put forward by different authors, scholars and researchers, it is evident that assessment practices are not neutral spaces. The implementation of assessment involves many stakeholders. Glaser and Silver (cited in Kilpatrick, et al., 2001) suggest that “integration of assessment and learning as an interacting system has been too little explored” (p. 40). Very little literature about research in assessment practices, implementation and administration has been published in Namibia. There is a need for research evidence to answer some of the questions raised by the classroom practitioners, education administrators and the public over the shortfalls of the education system. This study therefore attempts to fill the gap in the literature as well as provide evidence-based insight by evaluating Grade 10 Mathematics assessment (formative and summative) procedures by investigating the perceptions of teachers and principals in the Oshikoto Region.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter provides a description of the procedures and methods that were used to gather and analyse data in this research study. The chapter incorporates the research goals, orientation, research design, sampling, data collection methods, analysis, as well as a brief outline of ethical considerations, validity and the limitations of the study.

3.2 RESEARCH GOALS

The prime focus of this study was to gain insight into the discrepancies that exist between continuous assessment average marks and the final examination average marks in Grade 10 Mathematics in the Oshikoto region of Namibia. To achieve this goal the research responds to the following questions:

- What are the characteristics of the analyzed Grade 10 continuous assessment [CA] and end-of-year average marks for the period 2008 to 2010?
- What are the teachers' and principals' perceptions of continuous assessment and the end-of-year examinations as components of summative assessment in Grade 10 Mathematics?
- What is the relationship between the teachers' perceptions and the observed discrepancies from the document analysis?

3.3 RESEARCH ORIENTATION

This study is grounded in an interpretive paradigm. According to Alvermann and Mallozzi (2010), interpretivism denotes “an approach of social life with an assumption that meaning of human action is inherent in action” (p. 12). As such, the paradigm enables one to develop a deeper understanding of human action. Cohen, Manion and Morrison (2008) add that the “the main aim of an interpretive research is to provide a rich description of the phenomenon and,

if possible, to develop some explanation for it” (p. 36). Miles and Huberman (1994) expound the role of the researcher in an interpretive paradigm as follows:

The researcher attempts to capture data on the perceptions of local actors “from inside” through the process of deep attentiveness, of empathetic understanding, and suspending or “bracketing” preconceptions about the topics under discussion. (p. 6)

The interpretive paradigm therefore allows the researcher to use human perceptions, behaviours and attitudes to configure how observable outcomes were generated, thus making meaning out of practice.

3.4 RESEARCH DESIGN

A good research design equips the researcher with procedures necessary to respond to the research questions, providing the “glue” that holds the research elements together (Maree, 2010). The main aim of this study was to gain insight into educators’ assessment practices and perceptions thereof against a backdrop of information gathered from records of assessment. To achieve these objectives a mixed methods design was used in which both quantitative as well as qualitative data was collected and analysed within an interpretive paradigm. A mixed method approach “combines quantitative and qualitative strategies within one study, collects both numeric (numbers) and text (word) data in a sequence” (Creswell, 2003, p. 262).

Qualitative and quantitative approaches may be defined and distinguished on the basis of the type of data gathered (Bazeley, 2004, p. 2). Qualitative data is characterised by open-ended information such as words (text) gathered from the interview of research participants, while quantitative data includes closed-ended information (numeric data) gathered from performance instruments such as national examinations (Creswell, 2006, p. 6). The qualitative approach places more emphasis on meanings of experiences in order to develop an understanding, while the quantitative approach provides a set of descriptive statistical analyses carried out with the numeric data.

The design of the study is divided into two broad phases that were carried out sequentially. The first phase focused on the collection and analysis of quantitative data from various

official documents obtained from the DNEA, while the second phase involved the collection and analysis of qualitative data gathered from structured interviews of participants and focus group discussions.

The mixed method approach was found suitable because mixing of datasets “provides a better understanding of the problem than if either data set had been used alone” (Creswell, 2006, p. 7). The use of mixed methods can also be seen as a form of triangulation (Bezeley, 2004, p. 4), thereby adding to both the validity and reliability of the results.

3.5 CASE STUDY METHODOLOGY

A research method can be described as a technique of data collection (Creswell, 2006, p. 4). A case study method was adopted for this study. According to Stake (2006, p. 134), a case study “is not a methodological choice but a choice of what is to be studied”. In the qualitative part of this study the case under scrutiny was three purposefully selected JSC schools in the Oshikoto region of Namibia, the unit of analysis being the perceptions (pertaining to assessment practice) of the Grade 10 mathematics teachers as well as the principals of these three schools.

Flyvbjerg (2006, p. 220) defines a case study as a “detailed examination of a single example”. Bromley (as quoted in Best and Kahn, 2009) notes:

A ‘case’ is not only about a ‘person’ but also about a ‘kind of a person.’ A case is an exemplar of, perhaps even a prototype for, a category of individuals. (p. 259)

In this study it was not possible to collect qualitative data from the entire population of 62 JSC schools in the Oshikoto region. However, based on the quantitative data collected in Phase 1 it was possible to purposively select three schools for Phase 2 of the study. A case study approach was also chosen as a research method for this study because it poses an advantage of producing context-dependent data that can be used as a foundation for learning instead of simply providing proof of the existence of a problem (Flyvbjerg, 2006). The theme of this research is to gain a more nuanced understanding of assessment practices within the Namibian context rather than simply an identification of problems. It is against this background that the collective case study methodology was adopted to assist in generating

descriptive information that could help to shed light on the causes of a phenomenon (Brink, 2007, p.110).

3.6 DATA COLLECTION

The data for this study was collected in two phases. Phase 1 focused on quantitative data and involved document analysis. Phase 2 focussed on qualitative data and is split into two parts: Part 1 involved structured interviews while Part 2 centred on focus group discussions. The three different methods of data collection were used to enhance validity and reliability of the study through the process of triangulation. Triangulation may be defined as “the use of two or more methods of data collection in the study of some aspect of human behaviour” (Cohen, et al., 2008, p.140).

Phase 1: Quantitative data (document analysis)

Documents consist of “public and private records that a researcher obtains about a site or participants” (Creswell, 2003, p. 230). Documents may provide original (primary) data or processed (secondary) data that may be quantitative in nature (Brink, 2007). Two sources of primary data were used to gather the numerical data for this part of the study: (i) Grade 10 CA average marks (expressed as percentages) compiled by the respective Grade 10 mathematics teachers, and (ii) end-of-year examination results (Paper 1 and Paper 2 expressed as percentages) provided by the Directorate of National Examinations and Assessment [DNEA] as part of the Mathematics JSC results for 2008, 2009 and 2010. Document analysis was used in this study to foreground the research questions by providing a detailed contextual background. The document analysis was also used as a backdrop to formulating meaningful and probing interview questions. Document analysis was also used because it is unobtrusive in the sense that the data collection process does not interfere with the research participants, and it can be checked for reliability (Ary, Jacobs, Razavieh & Sorensen, 2006).

Phase 2: Qualitative data

Part 1 - Semi-structured interviews

Interviews involve the asking of questions that elicit information about attitudes and opinions, perspectives, and meanings that help produce rich descriptive data (Trochim, 2010). One-on-one semi-structured interviews were carried out with each of the school principals and Grade 10 Mathematics teachers from the selected schools using a carefully designed interview schedule (see Appendix B and C). According to Van der Mescht (2011), semi-structured interviews are the most useful in qualitative research because they are a combination of structured and unstructured interviews. Both closed and open-ended questions are asked in a semi-structured interview. This kind of interview provided the researcher with an opportunity to probe and search for further clarification of perceptions (Van der Mescht, 2011). The interviews were audio taped and subsequently transcribed for analysis.

Part 2 - Focus group discussions

“Focus groups are used to collect a shared understanding of several individuals” (Creswell, 2003, p. 226). In this study, one focus group of twelve Grade 10 Mathematics teachers purposively selected from the Oshikoto region were brought together for a discussion that followed the interview schedule in Appendix B (Interview schedule for teachers). The focus group was used to corroborate and augment evidence gathered from the individual interviews by providing a collective rather than an individual view. In this study the focus group interview enabled triangulation of data sources. The focus group discussion was audio taped and subsequently transcribed.

3.7 SAMPLING

The study took place in the Oshikoto region of Namibia. The study involved the 62 JSC schools within this region. Figure 3.1 shows the physical location of the Oshikoto region in Namibia. The research sample and sites are described with reference to the two phases of the data collection process.

Phase 2

Part 1

In Phase 2 it was found not to be feasible to collect data from all 62 schools. A sample of three schools was purposively selected from the original population of 62 schools. A sample can be described as a part or fraction of a whole selected by researchers to participate in a research study (Brink, 2007, p. 124). The participants in this part of the study (Grade 10 teachers and principals) were drawn from the original population of 62 schools. Leedy and Ormrod (2010, p. 206) explain that in purposive sampling “people or participants are chosen for a purpose”. The outcome of the document analysis (Phase 1) was used to put schools into three groups - A, B or C - according to the observed trend of differences between their CA and examination average marks. The groups are briefly described as follows:

Group A consisted of schools that had shown a significant trend of obtaining high average marks in CA when compared to the average examination mark.

Group B consisted of schools with almost the same average marks when the examination marks were compared to the CA marks.

Group C consisted of those schools with significantly higher final examination marks when compared to the CA marks.

Three schools, one from each group (A, B and C), were selected. One Grade 10 Mathematics teacher and the respective school principal were interviewed from each chosen school. The three schools were purposively chosen according to the following criteria:

- Location of the school.
- Willingness of the teacher and principal to supply information voluntarily.

Part 2

Twelve Grade 10 mathematics teachers took part in a focus-group discussion. These twelve teachers were drawn from the Oshigambo educational circuit of the Oshikoto region and represented all three of the groups (A, B and C) previously described. The Oshigambo circuit was chosen for convenience factors relating to its proximity to the venue where the discussions were held.

3.8 DATA ANALYSIS

Data analysis entails categorising, ordering, manipulating, summarising, accounting for as well as the explanation of gathered data (Brink, 2007). In a mixed research design two different data sets are obtained. The analysis of data in this study followed two distinctive phases that are based on the type of tools used and the data obtained. Creswell (2006, p. 7) elucidates that “it is not enough simply to collect and analyse quantitative and qualitative data; they need to be ‘mixed’ in some way so that together they form a more complete picture of the problem than they do when standing alone”.

Phase 1: Analysis of data obtained from documents

The data collected from the document analysis is quantitative in nature and was analysed using the Statistical Package for Social Sciences [SPSS version 19]. The software was used to produce comparative bar graphs of average CA and examination marks. Descriptive statistics were then used to further analyse this data. In this analysis the researcher looked for trends, major characteristics and emerging relationships between the CA and the end-of-year examination marks.

Phase 2

The data collected from the individual interviews and focus-group discussion was transcribed and analysed in terms of emerging themes through the process of multiple readings and engagement. These emerging themes were gradually refined over time. In this study the data collection and analysis processes were carried out simultaneously, permitting themes to gradually emerge over time.

3.9 ETHICAL CONSIDERATIONS

Research that involves human beings may cause pain, physical or emotional injury or psychological stress to the participants (Cohen & Manion, 2000). As such, research participants have a right to be protected. In the context of social science research “the principle of voluntary participation requires that people must not be coerced into participating” (Trochim, 2010, p. 15). In this study all the participants were informed about the purpose of the study, their rights, and any potential risks involved in participating in the study. All the participants interviewed went through a process of voluntary informed consent, with an understanding that they were free to withdraw from the study at any point without explanation. The principle of anonymity was applied throughout the study and no names of either schools or participants are mentioned in this report. Permission to access documents was given by the director of the Oshikoto region as well as the Director of National Examinations and Assessment (see Template A). Permission to enter schools for interviewing teachers and principals was granted by the Regional Director of the Oshikoto region (see Template B). The participants of the focus group interview were officially invited to the venue, and the process was carried out with authorisation from the appropriate mathematics education officer. All research sites were treated with due respect.

3.10 VALIDITY

Validity is concerned with accuracy, the trustfulness or trustworthiness of a research report (Brink, 2007; Golafshani, 2003). It relates to how an inquirer persuades “his or her audiences...that the research findings of an inquiry are worth paying attention to” (Lincoln & Guba, 1985, p. 290). In this study, validity was enhanced by the use of different sources of data (document analysis, face-to-face interviews and focus group discussions) thereby providing a form of triangulation that “strengthens [the] study by combining methods” (Patton, 2002, p. 247). The use of mixed methods combined the benefits of both qualitative and quantitative approaches of research, thereby providing the study with greater validity (Bazeley, 2004, p. 9).

3.11 CONCLUSION

This study is oriented within an interpretive paradigm, and incorporated both quantitative as well as qualitative data. This mixed methods design was structured within a case study methodology where the quantitative results were used to inform the interview questions upon which the qualitative data was generated. The next chapter presents and discusses the results.

CHAPTER FOUR

RESULTS, ANALYSIS AND DISCUSSION

4.1 INTRODUCTION

The purpose of this chapter is to present the data and discuss the findings of the study. The chapter is divided into two sections. Section A involves the presentation and discussion of quantitative data obtained from the document analysis while Section B presents and discusses qualitative data emanating from one-on-one structured interviews and focus group discussions. Section B is in turn made up of two parts. Part 1 describes the teachers', principals' and focus group responses to the interview questions while Part 2 provides a more in-depth engagement with preset as well as emerging themes.

4.2 SECTION A

4.2.1 Categories of schools

This section is a presentation and discussion of data obtained from the document analysis, the documents being lists of Grade 10 average CA and examination results for the years 2008, 2009 and 2010 for 62 JSC schools in the Oshikoto region. An analysis of the results for the 62 schools produced three major trends of association that were observed between CA and examination average marks.

The quantitative raw data of the results for all 62 schools was used to create comparative bar graphs of CA average and examination marks for each school for the years 2008, 2009 and 2010. The graphs were used to classify schools into three major groups: A, B and C.

- Group A consists of schools that have shown a significant trend of obtaining high average marks in CA when compared to the average examination marks.
- Group B consists of schools with almost the same average marks when the examination marks are compared to the CA marks. (The CA and examination marks needed to differ by less than 5% for a school to be classified as Group B).

- Group C consists of those schools with a significantly higher final examination mark when compared to the CA marks.

Figures 4.1 – 4.3 show examples of schools fitting into each of the three categories. In the analysis that follows, schools are categorised as being in Group A, Group B or Group C for *each* of the three years under investigation. Figures 4.1 – 4.3 specifically show examples of schools that have shown the same trend over all three years (2008-2010).

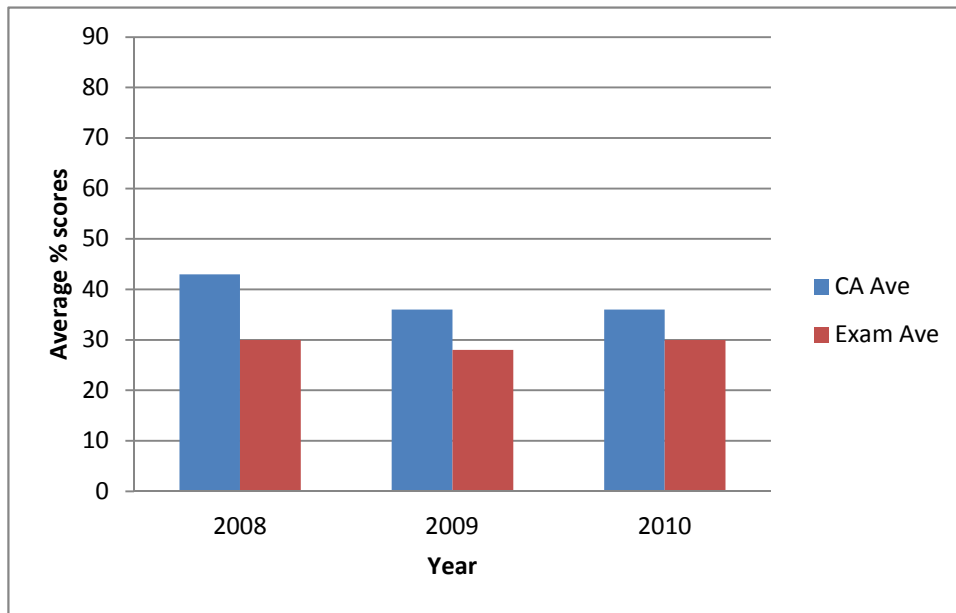


Figure 4.1 Group A – Average CA mark greater than final examination mark

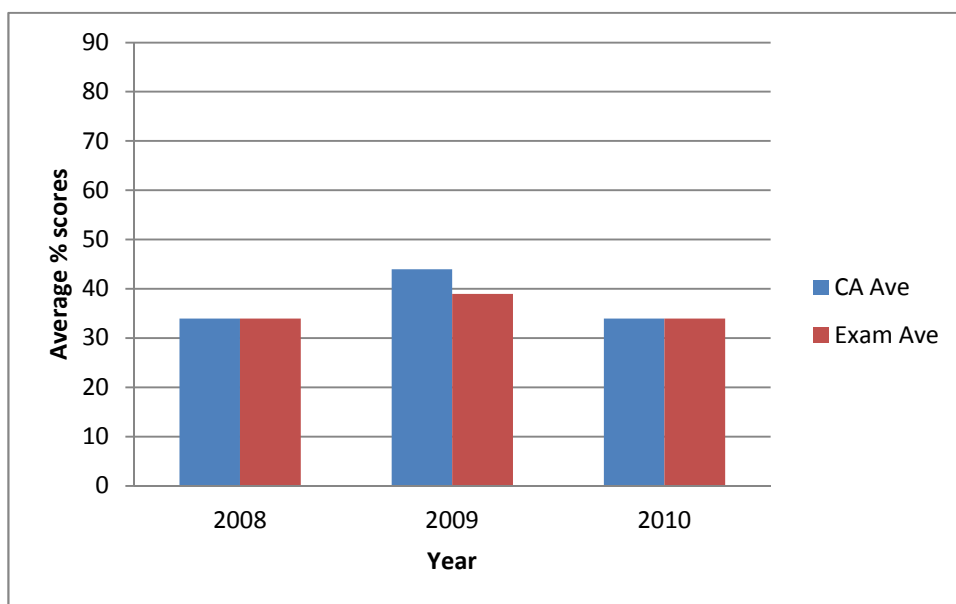


Figure 4.2 Group B – Average CA mark in line with final examination mark

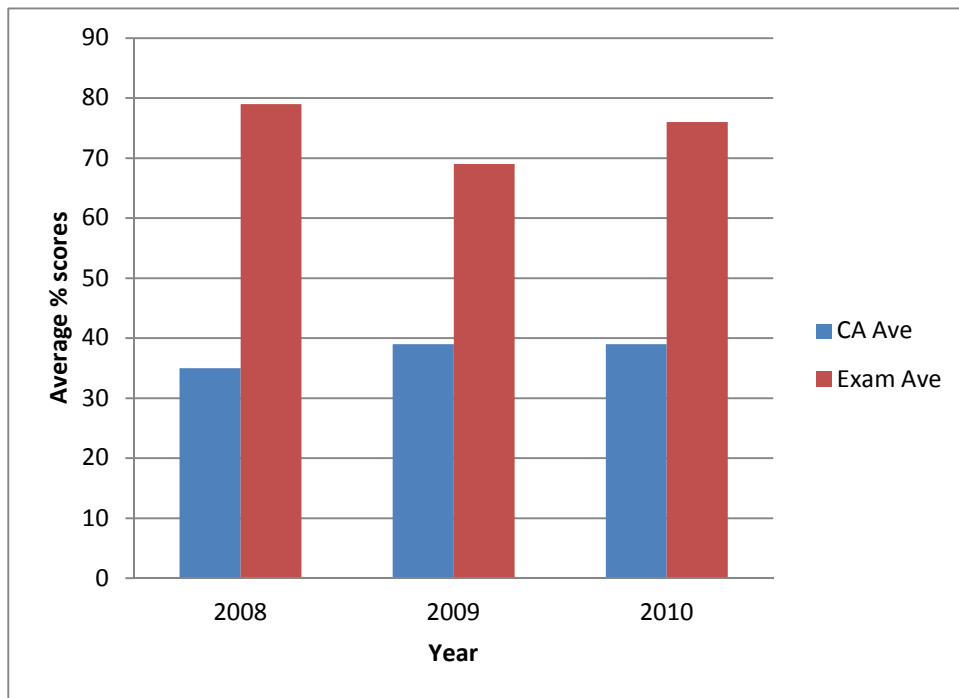


Figure 4.3 Group C – Average CA mark lower than final examination mark

Following the classification described above, each of the 62 schools was placed into a category A, B or C for each of the three years¹.

4.2.2 Distribution of group characteristics over three years

The distribution of the group characteristics over the years 2008 to 2010 is shown in Figure 4.4.

In 2008 only 4 schools (6%) fell into Group A² while 15 schools (24%) fell into Group B³. By contrast, 43 schools, by far the majority (69%), obtained an examination average mark that was higher than the CA average mark [Group C].

¹ It is important to note at this stage that the interview questions used (for teachers, principals and the focus group) were created with reference to the observed relationships of these three groups.

²Group A schools obtained higher average CA marks when compared to examination average marks.

³Group B schools scored comparable marks for average CA and examination scores.

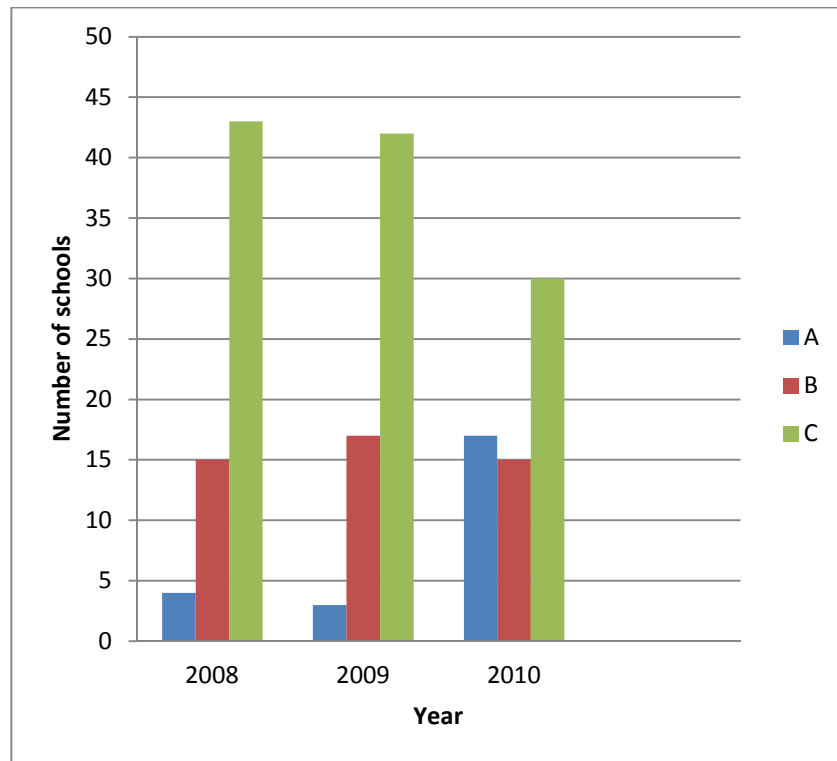


Figure 4.4 Distribution of group characteristics over three years

In 2009 Group A declined from four schools to three schools (4%) while Group B schools increased from 15 to 17 (27%). Group C schools decreased by one, from 43 to 42. While there was a small increase in the number of schools obtaining almost the same CA and examination average marks, the dominance of Group C schools showed only a marginal decrease in 2009.

Year 2010 had significant changes in the distribution of schools according to group characteristics. Schools in Group A increased sharply from three to 17, i.e. from 4% of the total in 2009 to 17% in 2010. The number of schools in Group B decreased from 17 to 15, while Group C schools dropped significantly from 42 schools in 2009 to 30 in 2010 (i.e. from 64% to 48%).

In general, the overview of the distribution of schools into the three groups shows that the number of schools in Group A was almost the same for 2008 and 2009, while there was a sharp increase in 2010. The number of Group B schools remained almost the same for the three years. The number of schools in Group C, the dominant group, declined over the three

years from 68% in 2008 to 48% in 2010. In general, although there are some fluctuations in the percentages of schools falling into the different categories, it can be observed (Figure 4.4) that Group C characteristics were dominant in the three years under study.

4.2.3 Correlation between CA and examination averages for 2008–2010

The purpose of this section is to explore the relationship between CA average marks and examination average marks for the 62 schools in each of the three years (2008-2010). Scatter plots of CA average mark versus examination average mark were plotted for all schools for each of the three years (Figures 4.5(a) – 4.5(c)). Correlation coefficients were calculated based on a linear regression model.

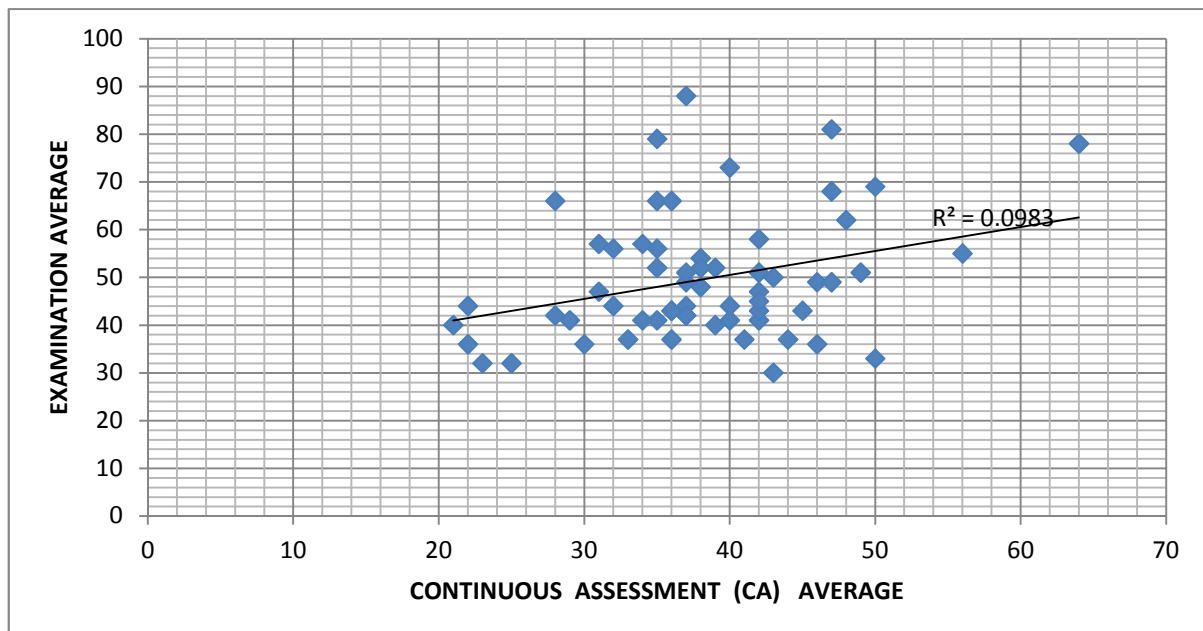


Figure 4.5(a) Scatter plot for 2008 CA and examination average marks

In 2008, 87% of the schools scored an average examination mark that was higher than their average CA mark ($\text{Exam} > \text{CA}$), while 13% of the schools scored an examination average mark that was lower than their CA average mark ($\text{CA} > \text{Exam}$). No school had examination marks exactly equal to CA ($\text{CA} = \text{Exam}$) (Figure 4.5(a)). Nonetheless, despite these general trends there was only a weak correlation between CA and examination average marks ($r = 0.31$). For a given CA mark, Figure 4.5(a) shows a range of corresponding examination marks. By way of example, while five schools scored an average CA mark of 35%, their

corresponding average examination marks ranged from 41% to 79% (specifically, 41%, 52%, 56%, 66% and 79% respectively). Similar scenarios can be seen from Figure 4.5(a).

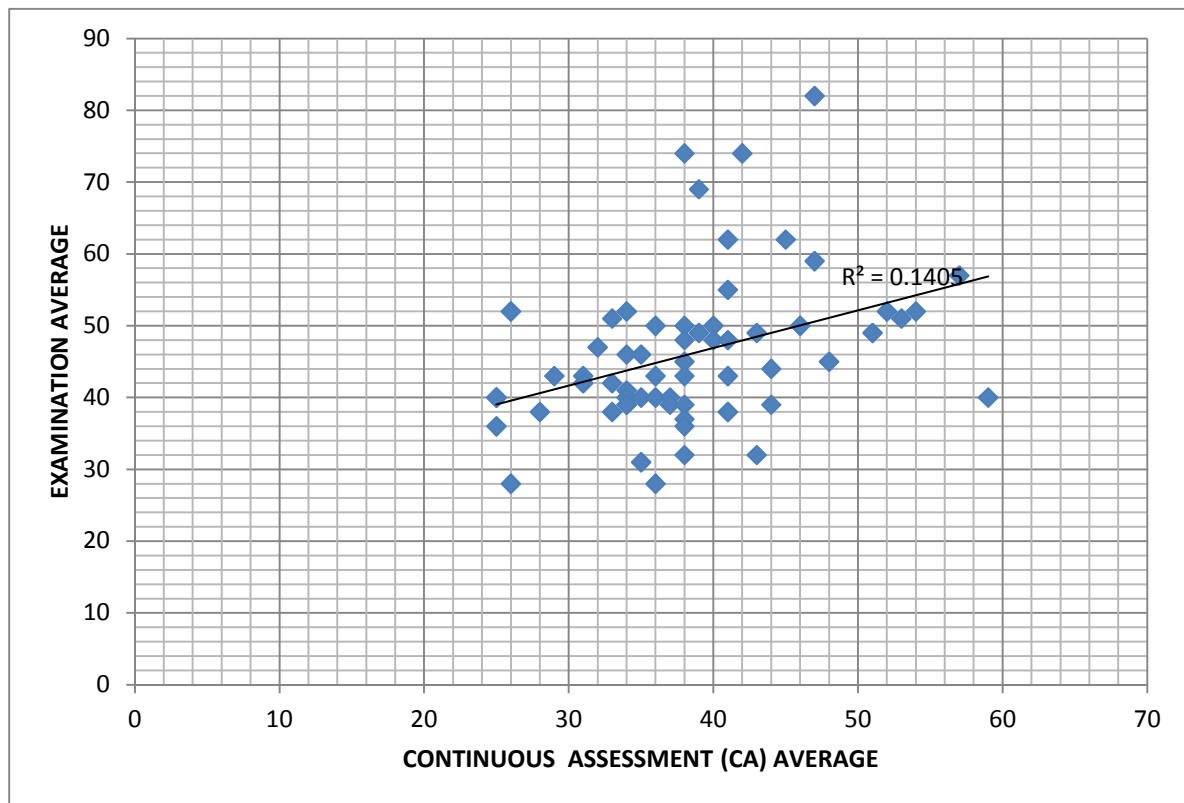


Figure 4.5(b) Scatter plot for 2009 CA and examination average marks

In 2009, 74% of the schools scored an average examination mark that was higher than their average CA mark (Exam > CA), while 21% of the schools scored an examination average mark that was lower than their CA average mark (Exam < CA) (Figure 4.5(b)). 5% (three schools) had identical average CA and examination marks (CA = Exam). As with 2008, there was only a weak correlation between CA and examination average marks ($r=0.37$). In similar vein to 2008, for a given CA mark, Figure 4.5(b) also shows a range of corresponding examination marks. By way of example, while nine schools scored an average CA mark of 38%, their corresponding average examination marks ranged from 32% to 74%. Similar scenarios can be seen from Figure 4.5(b).

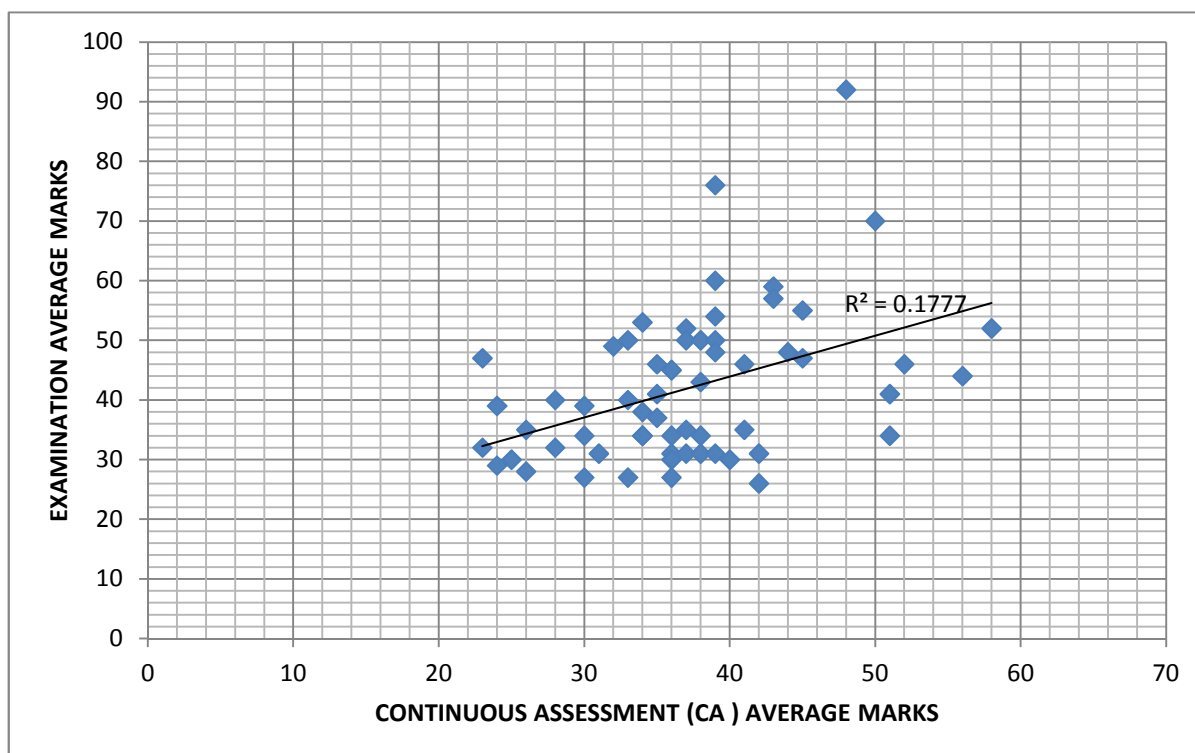


Figure 4.5(c) Scatter plot for 2010 CA and examination average marks

In 2010, 60% of the schools scored an average examination mark that was higher than their average CA mark ($\text{Exam} > \text{CA}$), while 33% of the schools scored an examination average mark that was lower than their CA average mark ($\text{CA} > \text{Exam}$) (Figure 4.5(c)). 7% of the schools had identical average CA and examination marks. As with 2008 and 2009 there was only a weak correlation between CA and examination average marks ($r=0.42$). A comparison of the three years (2008 – 2010) shows a gradual decrease in the number of schools producing examination averages greater than CA averages, although this needs to be seen against a gradual decrease of overall examination averages from 50% in 2008 to 46% in 2009 and 42% in 2010. Overall, CA average marks remained comparatively consistent during this interval (69%, 70% and 68% in 2008, 2009 and 2010 respectively). A comparison of correlation coefficients over the three years shows a weak correlation gradually strengthening, from 0.31 in 2008 to 0.37 in 2009 and finally 0.42 in 2010.

4.3 SECTION B

4.3.1 Part 1 – Description of the responses

This section is made up of an analysis of responses obtained from one-on-one interviews as well as the focus group discussion. Responses of the teachers, principals and focus group were recorded and transcribed. The responses of individuals to each question were collated in order to identify consistencies and differences (Taylor-Powell & Renner, 2003). The codes 1, 2 and 3 are used to distinguish the three principals and the three teachers (e.g. Teacher 1 and Principal 2); other codes (such as 4, 5, 6 and 7) refer to other teachers who were part of the focus group. The results obtained from the focus group discussions have been incorporated into the summary that comes at the end of each question. Each summary briefly highlights and discusses the consistencies and differences apparent in the responses to each question.

Question 1: What do you understand by the term continuous assessment [CA]?

Responses:

Teacher 1: Teacher 1 described CA as a process whereby learners' work is "*indicated and recorded*" so that teachers can identify those learners who get low marks. Once these learners have been identified the teacher can then plan, go back (i.e. revise necessary sections) and help them to improve.

Teacher 2: This teacher described CA as a way of assessing learners regularly to get a sense of their level of understanding or mastery of a particular topic and thereby give learners appropriate feedback on their level of understanding.

Teacher 3: Teacher 3 explained that CA is the testing of learners to see if they have understood what one has taught them in the lesson. It is a way of creating a CA component for Grade 10 final assessments.

Principal 1: Principal 1 described CA as a set of marks learners accumulate during the year which are added to the examination. He explained that CA indicates whether or not learners

understand what they've been taught and as such can be used to direct teaching and classroom methodology. *"It is a kind of reflection on what the learners know and what they do not know in order to help the teacher to carry out some remedial activities"*.

Principal 2: This principal described CA as a way of assessing learners on a continuous basis. CA can take the form of a test given weekly or monthly, a process that goes on until the final examinations.

Principal 3: This principal described CA as something carried out to see if the learners are doing their homework, to see whether they are learning throughout the year instead of only concentrating on the examinations.

Summary of the responses:

Over 70% of the respondents regarded CA as a way of assessing the understanding of the learners with a motive to going back and assisting learners to improve. The teacher can use the results to modify teaching and learning methods. 30% of the respondents regarded CA simply as a means of assessing the understanding of the learners or as a way of checking to see if the learners are doing their homework, with no further action, remedial or otherwise, intended as a follow-up to the assessment.

Question 2: Which activities do you give your Grade 10 learners as part of continuous assessment? *(This question was only applicable to teachers)*

Responses:

Teacher 1: Investigations, projects, topic tests and examinations.

Teacher 2: Tests, tasks, projects and assignments.

Teacher 3: Homework, class work, tests, assignments, projects and investigations.

Summary of the responses:

The majority of the teachers identified tasks, tests, projects and investigations as the major assessment tools for Grade 10 Mathematics CA. A description of what takes place in each activity was provided by most of the teachers, although some teachers admitted to lacking confidence on how to set a standardised test, topic task, project or investigation. Not all the respondents regarded examinations as a component of CA. Homework, class work and assignments were also included on the list of CA activities by a few respondents. Debate that took place in the focus group interviews indicated that not all respondents had read or understood the assessment policies.

Question 3: Do you think it is necessary to carry out continuous assessment?

Responses:

Teacher 1: “*Yes*”, because learners perform well in CA. Lower marks are obtained in the examination.

Teacher 2: CA is necessary because “*it helps you as a teacher to see the level of your learners*” with regard to their mastering of the subject.

Teacher 3: It helps to see if the learners understand things, and also to see if the methods used by the teacher were effective. Learners benefit from the CA process by learning how to present their work and how to answer certain questions.

Principal 1: The principal explained that CA helps the learners to perform better. He was of the opinion that when the CA marks are higher the learner has a better possibility of getting a good result (i.e. in the overall promotion mark).

Principal 2: This principal was in favour of carrying out CA as he saw it as a useful diagnostic tool that can be used to tell if effective learning has taken place. It helps to identify learners’ problems before the examinations. “*Once the teacher assesses the learners he/she discovers areas where the learners are lacking and with such information he/she will be able to plan his lessons accordingly with regards to shortcomings observed.*”

Principal 3: The principal echoed that CA helps us know the performance of the learners before the final written examination and as such allows us to discover learners' problems or weak areas.

Summary of the responses:

The perspective of the first respondent is that CA should simply be carried out to help the learners score higher marks than they are likely to obtain in the examinations. The other respondents agreed that CA is used to evaluate the level of understanding of the learners, but described both the teachers and learners as beneficiaries of CA. Generally all the teachers concurred that CA is a necessary part of Grade 10 mathematics assessment.

Question 4: Grade 10 learners write final examinations from the DNEA at the end of the year. From your own point of view can you explain the difference between CA and these final examinations?

Responses:

Teacher 1: Some learners perform much better in CA than in the examination. This is because examinations are externally set, are of a good standard and are well prepared whereas CA activities are set by the teachers are often of poor quality.

Teacher 2: The teacher explained that CA is "*set by me*" and the same things are tested in both CA as well as the examination. The teacher also expressed his concerns about the way CA is often carried out which makes it easy for learners to cheat. This is very different to the final examinations where it is almost impossible to cheat.

Teacher 3: CA is based on a particular topic being taught at that moment, and learners may well be allowed to refer to textbooks and other resources when answering CA tasks. Examinations on the other hand cover the whole syllabus and learners have nobody to contact or to ask questions.

Principal 1: The principal explained that there is a big difference between CA and the year-end examinations. CA contributes 35% while examinations contribute 65% to the final grade

of the learner, partially, in this principal's view, because "*CA marks are not considered as valid*" and that the teachers who set CA tasks are sometimes not to be trusted.

Principal 2: The year-end examination is based on what was covered throughout the whole year, while the CA focuses on smaller modules of work.

Principal 3: CA yields higher marks than the final examinations due to the fact that "*teachers might give even simple tasks to the learners or they fabricate marks*". By contrast, the examination process is monitored far more strictly with many learners consequently scoring very low marks.

Summary of the responses:

The responses to the question indicate, in the view of the respondents, that there are both similarities and differences between CA and the final examinations. The teachers and the principals identified a set of distinctive differences based on their own understanding of CA and examinations. One respondent felt that they both evaluated the same competencies as indicated in the syllabus. However, for other respondents the content of the two modes of assessment was highlighted as being critically different, with CA being based on small, focused topics while the examination covers the entire syllabus. All respondents agreed that it was easier to score higher marks on CA tasks as a result of non-standardised setting, monitoring and marking of assessment tasks that had the potential to lead to mark manipulation, cheating and fabrication. By contrast, the respondents described the examination process as being a far more monitored and standardised process.

Question 5: Graph A⁴ shows a certain school that had CA average marks always higher than the final examinations average marks for the years 2008, 2009 and 2010. What do you think are the possible causes of this situation?

Responses:

⁴ Refer to Figure 4.1.

Teacher 1: The teacher was of the opinion that high CA marks and low examination marks occurred when the learners have failed to meet the basic competencies stipulated in the national syllabus. The learners were not adequately prepared for the examination and so possibly panicked during the examination. The other reason she gave as a possible cause were the teachers who sometimes “*just give marks*” during the CA process, giving simple and poor activities which do not contribute to knowledge building for the final examination.

Teacher 2: This teacher was of the opinion that the discrepancy between the high CA marks and low examination marks could have been the result of poor learner supervision when CA was carried out. She claimed that learners cheat and copy each other during CA, something they are not able to do in the final examination. Additionally, sometimes only a few topics are tested in a single CA task with the result that learners fail to perform in the examination which covers a whole range of topics in a single paper.

Teacher 3: This teacher ascribed the difference to teachers giving very easy CA activities which do not meet the standards of the examination. Another possible reason for the discrepancy was cited as being the potential for learners to copy each other during CA.

Principal 1: The principal suggested the reason for the difference was because CA marks are raised from only a few activities and the quality of these activities is designed to allow the learners to score high marks. Sometimes the learners copy each other and get extra support and assistance when doing CA activities. This support is not there during examinations.

Principal 2: This principal also agreed that the CA activities are sometimes not sufficiently challenging, and they often do not reach the standards of the examination. There is also poor preparation of the learners for examinations. Learners who are usually given high marks in CA tend to be complacent when it comes to preparing for the examination. The principal also cited a general lack of understanding amongst teachers of how CA works. The principal was of the opinion that this problem is caused by the DNEA who do not explain to teachers how the DNEA moderates and adjusts CA marks when they merge them with the examination results to arrive at a final grade for each learner.

Principal 3: The principal suggested that CA marks had been being worked out from easy tasks, thereby resulting in the discrepancy between CA marks and examination marks. This principal also highlighted the relative ease with which CA marks could be fabricated.

Summary of the responses:

All respondents believed that the teachers are responsible for the differences between CA average marks and examination average marks, with teachers being blamed for:

- Setting easy and substandard CA activities which do not help learners with developing the basic competencies that are asked in the year-end examinations.
- Not supervising CA activities, thereby allowing learners to cheat and copy from each other, resulting in unrealistic CA marks.
- Fabricating marks without even carrying out CA activities.
- Not understanding the purpose of CA, and consequently not knowing how to set and carry out appropriate and meaningful CA activities.

Question 6: Graph B⁵ shows a certain school that had CA average marks almost equal to the final examination average marks for the years 2008, 2009 and 2010. What does this mean to you as a Grade 10 Mathematics teacher?

Responses:

Teacher 1: This teacher believed that this scenario occurs when the teacher provides learners with high-quality CA tasks set at a standard similar to the final examination, with competencies being assessed in CA matching those of the examination.

Teacher 2: This teacher believed the scenario meant the teacher assessed the learners with tasks based on the competencies of the syllabus so that by the final examination the learners would be familiar with the types of questions asked.

⁵ Refer to Figure 4.2.

Teacher 3: Teacher 3 explained that this scenario occurs when the same questions, or at least the same *types* of questions, are asked in both the examination and the CA tasks.

Principal 1: This principal suggested the similarity between CA marks and examination marks was indicative of a hard-working teacher who has given all CA activities needed, a teacher who “*assess the learners and helps them to score equally in the exam*”.

Principal 2: This principal was also of the opinion that the consistency of the marks was a result of teachers giving high quality activities similar to the examinations. He suggested that such teachers interpret the syllabus well and are able to set and mark CA activities of a high standard. He explained that this gives confidence to the learners since they know that whatever they do in CA prepares them directly for the examination.

Principal 3: This principal described the scenario as being indicative of a good school that gives quality education by aiming to balance their “*teaching and learning process in terms of CA and examination marks*”.

Summary of the responses:

There was a general consensus among all the respondents that when CA and examination average marks are balanced the school and the teacher are doing well, and there has been no unfair allocation of marks. As one member of the focus group remarked, “*this is what the DNEA wants and expects from the teachers*”. Teachers who achieve this balance between CA and examination marks are perceived as knowing their learners very well, and are seen as being transparent and honest.

Question 7: Graph C⁶ shows a certain school that had very high final examination average marks when compared to CA average marks for the years 2008, 2009 and 2010. What do you think are the possible causes of this situation?

Responses:

⁶ Refer to Figure 4.3.

Teacher 1: This teacher was of the opinion that such a situation could possibly have been caused by CA activities being more difficult than the examination.

Teacher 2: Teacher 2 believed that the higher examination marks could have been the result of CA activities being marked very strictly and the CA process being used to teach and guide the learners in preparing for the examination so that learners would find the examination questions familiar and would be able to avoid making mistakes that would have already been addressed and corrected during the CA process.

Teacher 3: This teacher was of the opinion that the higher examination marks could have been the product of a strict teaching process which exposed learners to challenging mathematics which would allow them to find the examination easy by comparison. This teacher was of the opinion that the low marks learners scored in CA would motivate them to work hard for the examinations.

Principal 1: The principal proposed that the scenario could have arisen by teachers being strict in terms of awarding CA marks as a way of forcing the learners to do better in the examination. He said, *“If the learners know that they have done very well in CA mark, it may cause them to be a bit lazy or too relaxed that ‘ah! I have enough CA marks’. But if they know their CA marks are low [they are] forced to work very hard in order to score very high marks in the exam”*. The principal was also of the opinion that these are the learners who receive high motivation from their teachers, principal and parents.

Principal 2: The principal explained that this situation may be caused by teachers who are very strict in the marking of CA activities and who give the learners challenging questions in CA. The principal also suggested that these teachers would likely have gone an extra mile to provide additional knowledge to the learners above and beyond the basic competencies contained in the syllabus.

Principal 3: The principal was of the opinion that such a scenario indicated that the teachers didn't have a positive attitude because they were supposed to balance CA average marks to the examination average. He suggested that such teachers are too strict in terms of CA which *“might create a negative attitude among the learners because you are penalising them too much”*. However, in his closing remark he said that *“as a principal, it is better that we have to*

be strict so that our learners can aim high than to give more CA marks and lower examination marks”.

Summary of the responses:

In summary, about 87% of the respondents argued that this scenario is caused by strict teachers who provide challenging CA activities. They believed that this is the best practice if the aim is to get learners to pass at the end of the year, since low CA marks encourage them to work hard in preparing for the examination. However, 13% of the respondent described the practice of being strict with CA marks as, in the words of one respondent, “*cheating the learners, this is not fair*”. There was a feeling that some of the learners could have done better in the final grade if their CA mark had been higher. There was also a feeling among some participants that low CA marks demotivate learners instead of encouraging them to work harder.

Question 8: Which graph or status (A, B or C) do you think is the most ideal? Give reasons.

Responses:

Teacher 1: Graph C. The teacher believed that when learners are exposed to difficult material during the course of the year they will find the examination easy.

Teacher 2: Graph C. This teacher explained that, “*When you are teaching the learner, it is like you are training a soldier for war, so you do not need to feel pity; otherwise at the end the child will suffer. It is better to teach them to stand on their own towards the end of the year*”

Teacher 3: Graph C. This teacher argued that the learners should be prepared to perform when they are tested at the national level. Learners must be able to answer examination questions because there is no room for copying.

Principal 1: Graph C. The scenario creates highly ethical, motivated and independent learners who are not simply pushed up by CA marks.

Principal 2: Graph C. The principal justified his choice by stating that strictness has a positive impact.

Principal 3: Graph B. The principal justified his choice by saying that in an ideal situation, learners should have a thorough understanding of the relationship between CA and examination marks, an understanding that would allow them to appreciate the purpose and benefits of CA and encourage them to take their studies seriously.

Summary of the responses:

83% of the respondents believed that it was better for schools to obtain lower CA marks when compared to examination average marks since learners needed to be challenged. The emphasis of the respondents was more on the examination marks rather than the CA marks. As one respondent expressed it, *“CA marks must not be used to influence the exam mark. In a case where the exam mark is too low the CA must be used as a basis for re-marking”*. The respondents who chose graph B all argued that teachers need to be fair and give the learners what they deserve all the time. One respondent explained that CA and examinations are based on the same competencies and a learner who performs well in CA will also perform in the examination. Furthermore, she said we should not be strict on Mathematics CA since it is now a promotional subject.

Question 9: What is your opinion or perception towards the use of CA and examinations as assessment tools in our Grade 10 Mathematics curriculum?

Responses:

Teacher 1: The teacher was of the opinion that CA should continue to be used as it is, *“because if there are no CA marks the majority of the learners will not get anything”*.

Teacher 2: The teacher said the government must phase out CA as a component of the final promotional mark. In the teaching and learning process CA should still be used, but it should not be a component used to determine the final grade of the learner because it can easily be manipulated.

Teacher 3: This teacher believed that while CA is an important tool for practice it should not be used for promotional purposes.

Principal 1: The principal said that both CA and examinations should be used as assessment tools but the ratio of the CA mark and examinations in the final promotional mark should be 50:50 instead of the current 35:65. He further commented that CA carried out by the teachers needs to be appreciated and that the DNEA should trust and respect teachers as examiners for the purposes of CA.

Principal 2: The principal had no objection towards the use of CA. He highlighted that principals simply need to put emphasis on the standards of setting CA activities. CA simply needs to be monitored.

Principal 3: This principal said he had a positive view of CA. He explained that CA helps the learners to understand, and in the event that a learner encounters a problem on the day of the examination, the CA marks help to boost the promotional mark.

Summary of the responses:

All the respondents recognised the importance of CA in the teaching and learning process. The use of CA as a means of raising promotional marks was highly contested. About 40% of the participants thought it should not be a component of the promotional mark in Grade 10 and that the present system used in Grade 12 should be applied to Grade 10 as well. Another 40% of the participants accepted the use of CA but felt it should be better moderated and should be conducted far more systematically. The emphasis on the use of CA should start in Grade 8 and 9.

Question 10: Principals can influence the quality of CA marks. Can you comment on this statement? (This question was relevant to teachers only)

Responses:

Teacher 1: This teacher was of the opinion that principals can influence the quality of CA by supervising, monitoring and visiting the teachers in their lessons, and checking the learners' work.

Teacher 2: The teacher explained that there are situations where a principal would come to you and say "*Your CA marks are too low you must make them high*". Sometimes they provide a list of learners who must be given extra easy tasks to raise their CA marks.

Teacher 3: The principal ensures that the teachers are giving quality work to the learners.

Summary of the responses:

Putting together all the responses of individual teachers (including those who took part in the focus group discussion) there is an indication that principals can have either a positive or negative impact on the quality of CA marks. There is an indication that the majority of principals are not pleased with low CA marks and have previously asked teachers to do something to improve the marks. Two thirds of the teachers said their principals suggest ethical means of improving CA marks. The other third simply put pressure on teachers to make the CA marks higher, without specifying an appropriate procedure to do this.

Question 11: Are there any other comments you would like to make?

Teacher 1: Giving her own opinion, Teacher 1 felt that CA should always be a part of the teaching and learning process. She felt that it would be better to do away with the examinations rather than CA, or as a compromise to use CA and examination marks in a ratio of 50:50 to compile promotional marks.

Teacher 2: Expressing her own opinion, Teacher 2 urged the Government to do away with CA and to run assessment in Grade 10 just like it is carried out in Grade 12, where the promotional mark is based purely on the final examination without any CA component.

Teacher 3: This teacher said he prefers a situation where only the examinations are used as promotional marks.

Principal 1: The principal was of the opinion that CA and examination marks should be combined in a 50:50 ratio with so-called “*adjustments*” being done away with.

Principal 2: The principal said that from the discussion he learnt that “*CA is a tool that guides us on how much is being learnt and for me, without CA, teaching and learning would not be of quality*”. “*We do not only teach learners to pass the exam, but we teach them skills to use in life beyond the school*”.

Principal 3: This principal remarked that there was a need for principals and teachers to understand CA policies. Incorrect implementation of CA yields incorrect or inappropriate results, and this is where the problem lies. Commitment is required.

Summary of the responses:

It was generally agreed that CA is an essential element of teaching and learning. The inclusion of CA in calculating promotional marks was debatable. One third of the participants felt that CA should not form part of the promotional mark; another third felt it should form part of the promotional mark but improvements were needed to the CA implementation process. Another third felt that things should be left as they are. In the words of one of the participants: “*Whether we like CA or not, we cannot teach without CA. It is a need*”.

In brief it can be noted that the use of CA and examinations had a mixed set of opinions. The majority of respondents were not happy with the status quo and advocated for either an improvement of the CA implementation process or alternatively a complete removal of CA as a component of promotional marks. Discrepancies between CA marks and examination marks are regarded as irregularities, and the lack of uniform moderation of CA implementation across Namibia was seen by many participants as being problematic. As such they argued that it is unfair to use CA marks as part of the promotional requirements.

4.3.2 Part 2 – Discussion of preset themes

This section focuses on particular themes or issues that were purposefully investigated through the posing of specific questions in the interviews and focus group discussions. These themes were directly pertinent to the research questions and in part were drawn from major topics identified in the research literature. Table 4.2 provides a summary of the responses (from interviews as well as the focus group discussion) to these preset themes.

Table 4.2 Summary of responses to preset themes.

| | |
|---|--|
| Reasons for carrying out CA. | <ul style="list-style-type: none"> • CA helps learners perform well. • Helps with seeing the level of mastery of the learners. • Helps to evaluate the teaching methods used. • Helps the learners to practice answering questions. • Serves as a diagnostic tool. Problems are identified and addressed before the examination. |
| Possible reasons behind a Group A scenario – i.e. CA marks higher than examination marks. | <ul style="list-style-type: none"> • Failure of learners to meet examination competencies. • Inadequate examination preparation. • Awarding of marks from inappropriate or poorly set tasks. • Learners copying each other or consulting other resources when carrying out CA activities. • Teachers using easy CA activities that are below examination standards. • Poor knowledge of assessment practices. • Fabrication of marks (marks not supported by evidence). |
| Possible reasons behind a Group B scenario – i.e. CA marks on par with examination marks. | <ul style="list-style-type: none"> • Teachers giving quality CA activities that match the standards of the examination. • Teachers carrying out CA tasks that follow the basic competencies set out in the syllabus. • Alignment of CA question style and/or content with the examination. • CA activities are relevant. • Correct interpretation of the syllabus, fair marking and good quality CA activities. • The teaching and learning process is balanced. |

| | |
|--|---|
| Possible reasons behind a Group C scenario – i.e. CA marks lower than examination marks. | <ul style="list-style-type: none"> • Teachers giving more difficult CA activities when compared to examination questions. • Teachers marking strictly but using CA effectively to prepare learners for the examination. • Strict teachers who expose learners to tough conditions as a means of motivation. • Teachers giving challenging questions that stretch their learners beyond the basic competencies of the syllabus. |
| Suggestions regarding assessment practices in Grade 10. | <ul style="list-style-type: none"> • CA and examinations should remain as they are since one cannot rely on examinations only. • CA should be phased out as part of the promotional mark and should only be used for the purposes of teaching and learning. • CA and examination marks should be combined in a 50:50 ratio. • The quality of CA practices needs to be monitored and improved. • The DNEA should set standardised CA activities for all schools. • CA should only be used when a learner has a legitimate problem with the examination. • Doing away with CA will encourage teachers to teach without assessing the learners. |

According to the MEC (1993, p. 123), assessment becomes formative if it improves the teaching and learning process. A review of the responses of teachers and principals reveals that all participants supported the idea of acquiring evidence of learners' knowledge for the purpose of using it to improve the learning and teaching process. This resonates with the definition of formative assessment as being "a planned process in which assessment elicited evidence of student's status is used by the teachers to adjust their own ongoing instructional procedures or by students to adjust their current learning tactics" (Popham, as quoted in Good, 2011, p. 2). Respondents gave answers that closely amalgamate to a working definition of CA that is in line with reviewed literature. It can therefore be concluded that in general teachers and principals seem to have a sound understanding of the purposes of CA. With this in mind, responses to each of the preset themes are now discussed in more detail.

(a) Is it necessary to carry out CA?

The purposes of CA are such that it is not possible for one to teach effectively without using CA. As Kruger (2004) remarks, CA is an important principle of learner-centred education, and it is important to recall that learner-centred education represents the philosophical backdrop to the Namibian education system. The objectives of learner-centred education are more likely to be achieved when teachers use CA in the process of teaching and learning. The responses of the participants revealed a unanimous agreement of the relevance of CA as an important component of teaching and learning.

(b) What are the possible causes of CA marks being higher than examination marks?

The background to this theme originates from the document analysis carried out in the first phase of data collection. Examination records of 2008, 2009 and 2010 JSC results revealed that some schools consistently obtained CA mark averages that were higher than their examination average marks.

A critical analysis of participants' responses revealed a number of troubling perceptions harboured by teachers and principals. There was a feeling that CA marks being higher than examination marks was a result of incompetent teachers who were challenged by the published assessment policies and procedures and who did not understand the purpose of CA or how to carry out meaningful CA.

The awarding of high CA marks that are not justified by the evidence of written work produces invalid and unreliable scores that can potentially have serious consequences in terms of placing learners in incorrect grades. Mansell, et al. (2009) describe this process as the misclassification of learners, a practice that can have serious consequences for a learner's academic growth at school. This has the potential to lead to scenarios where learners who usually score high grades at school will fail national examinations. According to Kruger (2004) this scenario is caused by teachers who lack assessment literacy. Such teachers lack the skills required to administer valid and reliable CA activities that solicit the levels of competences expected in the examinations (Alausa, 1999). In some instances teachers simply do not have the necessary skills to mark learners' work fairly or constructively. In extreme

cases the pressure to produce high CA marks, coupled with time constraints, leads to teachers fabricating marks or supplying “ghost marks” for assessments that were never carried out.

(c) What are the possible causes for CA marks being in line with examination marks?

Almost all participants expressed appreciation and praise for the teacher who strives to balance CA marks and examination marks. The majority of the teachers and principals viewed this scenario as being closest to the ideal and associated it with teachers being able to give good quality CA activities that incorporated the competencies as outlined in the syllabus.

This scenario is also supported by the Ministry of Education in its assessment policy (MBESC, 1999). The Ministry argues that if CA tasks and examinations are based on the same syllabus and the same competencies then the average of the two should be the same since the two complement one another. Failure to meet these standards thus implies an unfair assessment of the learners during CA, and large discrepancies between CA and examination marks acted as an indication of irregularities that prompted the DNEA to moderate CA marks⁷.

(d) What are the possible causes of examination marks being higher than CA marks?

All of the respondents agreed that this scenario is a result of teachers who are competent and very strict, and who use low CA marks as a means of motivation. The majority of the participants (83%) appreciated this tendency as they regarded examinations as being more important than CA. Teacher 7 in the focus group discussion argued that if CA was really as important as the examination, “*why does the DNEA add or deduct marks in their process of moderation?*”. 16% of the respondents felt that exposing learners to unnecessary levels of stress and hardship was unfair, and considered it an indication of the lack of a positive attitude among teachers. Teacher 4 in the focus group discussion argued that some of the learners with high marks in the examination could have obtained better promotional scores if their CA mark had been higher.

⁷ As argued by one of the DNEA officials at a workshop held at Heroes Private School in Ondangwa in 2011.

The ministerial policies do not support the scenario of CA marks being lower than the examination marks. However, it is interesting to note that most of the schools known for good performance in Grade 10 Mathematics in the region under study fall into this category. The facts and arguments raised from the interview results, document analysis and literature do not subscribe significant evidence to explain why it would be bad to expose learners to difficult CA activities. On the contrary, there is evidence that learners who are regularly challenged during CA in most cases find examinations easier and hence score better marks.

4.3.3 Part 2 – Discussion of emerging themes

In the process of analysing data focussing on the open-ended questions, other themes or categories of interest gradually emerged. This part of the analysis discusses key ideas related to these emerging themes. This iterative process of engagement created an important stepping-stone towards providing answers to each of the research questions.

The most prominent themes that emerged after coding of the data are (i) the importance of feedback, (ii) the components of CA, and (iii) the manipulation of CA marks. While each of these themes is discussed individually, it is recognised that they are interconnected and interrelated.

(a) Feedback

Feedback can be given orally or in writing. Marks, ticks, short comments and other more structured approaches of giving feedback are an integral part of the CA process. CA “provides feedback of the progress that the student is making ... so that modification can be made to teaching if necessary” (Quinn & Hughes, 2007, p. 268). Mansell, et al., (2009) highlight the differences between CA and examinations in terms of how the results are used. Examination results are generally used as a summative measure of learners’ understanding at predetermined points. By contrast, CA aims to nurture understanding by analysing results in terms of a feedback process. In general, examinations results are used to judge learners for the purposes of deciding, for example, who can proceed to the next grade, whereas CA uses results to improve the teaching and learning process.

Feedback helps to break the cycle of repeated failure, providing clarity on what learners need to do in order to improve (Weeden, 2008). Positive feedback is characterised by mathematical proficiency in both teaching and learning (Kilpatrick, et al., 2001) and enhances the goals of assessment by being an inherent component of CA/formative assessment (Noonan & Duncan, 2005, p. 10). Evidence of the learners' status helps teachers to modify teaching procedures and learners to adjust their learning techniques (Good, 2011). In the context of the social constructivist learning theories that underlie LCE used in Namibia, feedback also plays an important role in facilitating the scaffolding⁸ process in the course of mediating learning. Feedback helps to locate the position of learners in the ZPD⁹ and as such is an important part of the diagnostic process. Once the ZPD has been identified, the teacher is then able to apply suitable strategies to advance a learner's understanding or ability. In learner-centred education effective use of feedback has the potential to improve the quality of lessons as well as to motivate learners (MoE, 2005). Other beneficiaries of feedback are not only the learners themselves but also parents/guardians and educational planners. Parents/guardians require feedback in order to provide relevant support to their children/wards, while governments and educational stakeholders require meaningful feedback to make informed decisions in their planning. Additionally, Alausa (1999, p. 7) elaborates that unlike examinations, which are written in the space of a few hours, continuous assessment results are gathered from a range of activities over much longer periods of time and as such may provide a deeper and more accurate assessment of learners' ability.

In situations where feedback has not been released to the concerned parties, or where the feedback is incorrect or has not been delivered in a constructive way that encourages learning from mistakes, it may give rise to negative effects. This can be described as negative feedback, and it affects the learners in a negative way even to the extent of learners becoming demoralised to do the subject (McMillan, 2000, p. 3). In addition, when teachers make use of incorrect feedback this may lead to a mismatch between learning content and the cognitive level of the learners. There are thus far-reaching consequences of incorrect feedback, and as such, feedback should be based on reliable and valid assessments that are fair and ethical (McMillan, 2000). Since the mode or style of delivering feedback has the potential to create

⁸ Scaffolding refers to the temporary support that a teacher or more capable peer provides to a learner during problem solving.

⁹ ZPD (Zone of Proximal Development) is a "hypothetical, dynamic region in which learning and development takes place" (Berk & Winsler, 1995, p. 2).

feelings of negativity, learners should be educated to view feedback as a supportive and meaningful way of fixing their mistakes rather than as a platform for condemnation. Giving learners assessment activities without marking them, or not assessing them authentically, can similarly create feelings of negativity.

(b) The components of CA

According to the MoE (2006, p. 26) CA can be carried out in either formal or informal ways. Formal assessments have numerical data that support the conclusions made (MBESC, 1999, p. 7). According to assessment policy the formal part of Grade 10 CA has a minimum of 15 structured assessments: five written topic tests, four practical investigations, one project and five topic tasks. In addition there are larger tests carried out at the end of term. According to the assessment policy, subject teachers are expected to set reliable and valid assessment components, supervise the CA process, assess the activities, and give authentic marks. This suggests that without uniform moderation the CA activities given by different mathematics teachers are different in quality and quantity. However, the CA components given to the learners should be the same across the country, covering similar competencies to those stated in the syllabus (MoE, 2006). It is of paramount importance that mathematics teachers understand the type and style of activities they are expected to give their learners in order to accumulate meaningful CA marks as required by the assessment policy.

The results of this study highlight the fact that many teachers are not sufficiently familiar with the CA components as required by policy. None of the respondents managed to state all five correct CA components. 33% gave only four correct components while 66% gave only three. It would thus seem that teachers are not fully aware of the formal activities that they are supposed to prepare and provide to learners in order to generate CA marks. Teacher 3 stated that CA marks are compiled from homework and class work, while Teacher 2 mentioned assignments. These responses are vague and create doubt as to how some learners are being assessed during CA.

CA and end-of-year examinations should complement each other, and when valid and reliable instruments are used it is expected that learners' CA marks should correlate with their examination marks (Mutuku, 2009, p. 3). As observed in the results of 2008, 2009, and

2010¹⁰, the relationship between average CA marks and average examination marks varies substantially from school to school. Since national examinations are already standardised, there is a need for greater support and monitoring of the CA process in many schools.

(c) The manipulation of CA in schools

Repeated engagement with the interview data revealed another important emergent theme, namely the manipulation of CA procedures and/or marks by teachers, learners and principals. It was revealed that the quality, reliability and validity of CA results are sometimes compromised in the following ways:

- Teachers sometimes give marks without providing evidence of learners' written work.
- Teachers sometimes give CA tasks that are far too simple or otherwise sub-standard and which do not contribute to the type of knowledge required in the examination.
- At times teachers do not supervise the learners when they are writing CA activities, leading to learners cheating and copying from one another.
- Principals on occasion, dissatisfied with the quality of CA marks, put pressure on their teachers to manipulate the CA marks by either providing learners with easy assessment activities that will boost their CA marks or simply by the fabrication of marks.

Juxtaposed with the above is the process of the DNEA moderating CA marks. While some teachers and principals understand this as a necessary process, the practice of moderating CA marks does not please all teachers and principals. In the words of one principal, the DNEA moderating CA marks is akin to them saying they "*do not respect us; they don't trust us*".

It is unavoidable that the teachers who set and mark CA activities, and who compile and compute CA marks, will also have the opportunity to manipulate the results. However, as noted from the various interviews and discussions, these teachers are working under pressure from the DNEA as well as the school principals. The DNEA¹¹, from its assessment policies, expects teachers to produce CA marks for their learners that closely correlate with their

¹⁰ Refer to Figures 4.5(a), 4.5(b) and 4.5(c).

¹¹ Refer to the policy and information guide (MBESC, 1999).

examination marks. However, teachers complain that the DNEA does not educate them on how to achieve this status. In addition, principals sometimes reject the low quality of CA marks produced by learners at their schools, asking teachers “*to do something*” (Teacher 2) about it. Under pressure from different sides, teachers sometimes succumb to manipulating CA marks upward to the expected standard.

4.4 CONCLUSION

The discussion of the quantitative data obtained from the document analysis paved the way to structuring a meaningful engagement with teachers’ and principals’ perceptions surrounding the continuous assessment component of year-end examinations, both in terms of preset themes as well as emergent themes. The final chapter consolidates these findings in relation to the original research questions.

CHAPTER FIVE

FINDINGS AND CONCLUSION

5.1 INTRODUCTION

The purpose of this final chapter is to provide a summary of the findings of the study with specific reference to the original research questions. In order to contextualise these findings the chapter includes a brief overview of the research process along with the limitations and significance of the study. Recommendations for further research are also suggested.

5.2 REVIEW OF THE OBJECTIVES

The purpose of this study was to gain insight into the discrepancies that exist between the average CA marks and the average final examination marks in Grade 10 Mathematics in the Oshikoto region of Namibia. The study aimed to explore the possible reasons for these discrepancies and to develop a deeper appreciation for the complex nature of formative and summative assessment within the Namibian educational landscape. In pursuance of this goal, the study was guided by the following research questions:

- What are the characteristics of the analyzed Grade 10 continuous assessment [CA] and end-of-year average marks for the period 2008 to 2010?
- What are the teachers' and principals' perceptions of continuous assessment and the end-of-year examinations as components of summative assessment in Grade 10 Mathematics?
- What is the relationship between the teachers' perceptions and the observed discrepancies from the document analysis?

5.3 OVERVIEW OF THE CONTEXT

The context of this study lies in the assessment practices adopted by Namibia during the educational reform after independence. Before independence, examinations were used as the sole assessment tool. As part of the educational reform after independence, the country

introduced continuous assessment as part of the learner assessment process with the aim of improving fairness, equity and democracy. CA was also used as an aid to facilitate a shift from teacher-centred approaches to learner-centred education in schools (Kruger, 2004). The introduction of CA as formative assessment did not eliminate the use of end-of-year examinations as a summative assessment method, and currently both CA and examinations are used in Grade 10 Mathematics assessment. CA contributes 35% of the final grade while examinations contribute 65% of the final grade or promotional mark (MoE, 2005; MoE, 2006; MoE, 2010a). CA is made up of marks gathered by teachers from investigations, projects, topic tasks, topic assessments and end-of-term tests. Examinations at the end of Grade 10 are set by the DNEA and are made up of a combination of short answer questions in Paper 1 and structured (long) questions in Paper 2.

Despite its potential opportunities, the introduction of the new assessment procedure was not without its challenges. This study focused on one of the challenges by exploring the possible causes of the disparities that are observed between CA and examination mark averages.

5.4 OVERVIEW OF THE RESEARCH PROCESS

This study is grounded in the interpretive paradigm. As Cohen, et al. (2008, p. 36) reiterate, “The main aim of an interpretive research is to provide a rich description of a phenomenon and, if possible, develop an explanation for it”. The present study captures the perceptions of teachers and principals with regard to continuous assessment as a component of the Grade 10 promotional mark. The research followed a mixed method, with quantitative and qualitative data being combined to produce a nuanced description of assessment practices within the Namibian context.

A case study methodological approach was used, with the data being collected in two sequential phases. Phase 1 took the form of a document analysis and focussed on quantitative data. Phase 2, which was informed by Phase 1, involved structured interviews as well as focus group discussions, providing rich qualitative data.

5.5 FINDINGS OF THE STUDY

The findings of this study are summarised here in response to the three guiding research questions.

What are the characteristics of Grade 10 CA and end-of-year average marks for the period 2008-2010?

The following characteristics provide a summary of the quantitative data derived from the document analysis (Grade 10 average CA and examination results for the years 2008, 2009 and 2010 for 62 JSC schools in the Oshikoto region).

(a) Schools can be classified into one of three categories: Group A schools are characterised by a high average CA mark compared to the average examination mark ($CA > \text{examination}$); Group B schools where the two marks are in line with each other ($CA \approx \text{examination}$); and Group C schools where the average examination mark is markedly higher than the average CA mark ($CA < \text{examination}$).

(b) The characteristic of obtaining an examination average higher than a CA average (Group C) was dominant in 2008 with almost 70% of the schools falling into this category. This dominance however gradually declined to 68% and 48% in 2009 and 2010 respectively. The number of schools falling into Group B remained reasonably constant over the three years (between 24% and 27%). As a result, the decrease in schools falling into Group C was mirrored by an increase in the number of Group A schools, increasing from 6% in 2008 to 27% in 2010.

(c) Very weak correlation coefficients (r) were observed between CA and examination averages using a linear regression model. Although the correlation coefficient strengthened slightly from 0.31 in 2008, 0.37 in 2009 to 0.42 in 2010, the correlation nonetheless is still classified as being weak. In view of this we can conclude that, at present, average CA marks are a poor indicator of average examination marks in Grade 10 assessment in Namibia.

What are the teachers' and principals' perceptions of continuous assessment and the end-of-year examinations as components of summative assessment in Grade 10 Mathematics?

(a) Continuous assessment (CA)

Approximately 70% of the teachers and principals perceived continuous assessment as a means of checking learners' work in order to find ways of helping them to improve, for example by modifying teaching and learning methods. Although CA has potential benefits to both the teacher and the learner (MEC, 1993, pp. 123-125), 30% of the teachers and principals perceived CA as a means of assessing the understanding of learners without necessarily using the results to alter instructional methods. There is thus evidence to suggest that some teachers don't fully appreciate the purpose or potential value of CA in spite of the fact that all respondents agreed that they cannot teach effectively without the use of CA.

(b) Assessment components for Grade 10 Mathematics

The JSC syllabus used in Grade 10 states clearly that as part of formal continuous assessment should be included 15 structured assessments: 5 written tests, 4 practical investigations, 1 project and 5 topic tasks. The results of this study highlight the fact that many teachers are not sufficiently familiar with the CA components as required by the assessment policy are thus not fully aware of the formal tasks that they are supposed to prepare and provide to learners in order to generate CA marks. There is also evidence to suggest that some teachers lack confidence in setting certain types of CA activities.

(c) Differences between CA and final examinations

In general, most respondents seemed to be reasonably aware of the similarities and differences that exist between CA and the final examinations. However, there was a strong perception amongst both teachers and principals that CA marks can easily be inflated through the setting of easy or substandard tasks, cheating on the part of the learners, and manipulation of marks on the part of teachers or principals. Interestingly, there was a general perception that those teachers who gave their learners high CA marks in comparison to the examination marks were either incompetent or dishonest. By contrast, teachers who achieve a balance between CA and examination marks are believed to know their learners very well, and are

seen as being fair, transparent and honest. Those teachers who produce CA marks that are significantly lower than the examination marks were generally perceived to be strict and who provided good quality but challenging CA tasks, although some respondents felt that such a scenario was unfair on the learners. On choosing the most ideal scenario, 83% of the respondents believed it was better for schools to obtain lower CA marks when compared to examination average marks since learners need to be challenged. Furthermore, there was a general perception that examination marks are more reliable than CA marks since, unlike CA, examinations are standardised and well regulated.

(d) Perceptions on the use of CA and examinations in Grade 10

In general, most teachers and principals regard CA as an important component of teaching and learning, with all respondents agreeing that they cannot teach effectively without the use of CA. However, differences emerged as regards to opinions in the way CA marks should be used as components of promotional marks. 10% of the respondents suggested that the two components (CA mark and examination mark) should be combined in the ratio 50:50 as opposed to the current ratio of 35:65. Two fifths of the respondents suggested that CA should not form part of the promotional mark in Grade 10. A further two fifths of the respondents were of the opinion that if CA is to be used as part of the promotional mark then CA activities need to be moderated and standardised by the DNEA. Uniform activities with clear marking schemes should be given to schools, with the process beginning already in Grade 8 and 9.

What is the relationship between the teachers' perceptions and the observed discrepancies from the document analysis?

The results of this study suggest that teachers and principals have strong perceptions that CA marks can influence the final promotional mark in a number of ways. CA marks represent 35% of the promotional mark, and high CA marks can thus positively influence overall pass rates. The *process* of CA is also seen as important in terms of the final promotional mark since CA activities have the potential to prepare learners for the final examinations which form 65% of the promotional mark. However, a comparison of CA and examination marks over the years 2008, 2009 and 2010 shows a weak correlation between these two components of the promotional mark. As such, average CA marks are a poor indicator of average

examination marks in Grade 10. To combat the use of unrealistic CA marks the DNEA usually adjusts CA marks received from schools. When CA marks are above the examination average of the school, marks are deducted from the CA component to balance the two marks. When the examination average is higher than the CA scores, marks are added to the CA component to balance the two.

There is a general perception that teachers who are competent in continuous assessment produce CA average marks that are similar to the examination average. These teachers were described as mentors who can set CA content that is similar in standard to the examination. DNEA officials in their workshops have also advocated for teachers to strive for CA marks that are in line with examination marks. However, the document analysis for the years 2008, 2009 and 2010 shows that only a quarter of the schools managed to achieve this balance. This raises two interesting questions. What processes need to be put in place to ensure that schools are able to achieve this balance between CA and examination marks? More fundamentally, is this balance between CA and examination marks necessarily the best relationship to strive for?

5.6 LIMITATIONS

Despite their potential for richly textured data, case studies nonetheless have their limitations. The findings of this case study are not generalisable due to the small number of participants involved in the research. However, findings could be increasingly refined through further research en route to a broader understanding of the research question.

Another limitation of the study relates to possible apprehension on the part of the participants. During the time of the data collection process, Ministry officials announced that there was a team of supervisors moving around schools verifying CA marks against work done by learners. Although all participants who took part in the study did so voluntarily, the timing of the Ministry's inspection was unfortunate. Even with the appropriate documentation in hand, and anonymity assured, it was nonetheless difficult to convince some prospective participants that I was simply conducting independent research on Grade 10 assessment. Those who agreed to participate voluntarily might possibly have felt more at ease if the timing of the data collection had been different, but the reaction of some of the

prospective participants nonetheless highlights the sensitive nature of the issue being researched.

5.7 SIGNIFICANCE

This study contributes ultimately towards the attainment of mathematical proficiency amongst Namibian learners by highlighting the need for better assessment literacy of Mathematics teachers in Namibia. The main purpose of the study was to gain insight into the perceptions of teachers and principals with regard to the role of CA in Grade 10 Mathematics assessment. It is hoped that through this research a meaningful dialogue can be opened up between teachers/principals and the Ministry of Education in the interests of a mutually beneficial Grade 10 assessment processes.

5.8 RECOMMENDATIONS

Based on the results of this study, the following recommendations are made with a view to improving Grade 10 assessment practice in Namibia:

- Assessment literacy needs to be improved across the country.
- The CA process needs some level of standardisation as well as support within schools.
- The quality and uniformity of CA activities could be improved through a process of moderation.
- The clarity and transparency of CA adjustments needs to be improved, particularly when it comes to the combining of CA and examination marks to produce the promotional mark.
- The summative role of CA in Grade 10 should be regulated in order to avoid undermining the formative role of CA.

5.9 RECOMMENDATIONS FOR FURTHER RESEARCH

During the course of the research process a number of additional questions arose. These are presented here as possible avenues for future research.

- This study focused on the 3-year period from 2008 to 2010. It would be interesting to extend this study to a 10-year period to investigate the relationship between CA and examination marks over a longer time span.
- Since the DNEA advocates for teachers to strive for CA marks that are in line with examination marks, a more in-depth study of those schools achieving this status could shed more light on possible means of achieving this.
- This study has focused on teachers and principals. It would be interesting to investigate how JSC learners perceive the way they are assessed in Mathematics.
- Research could also be carried out to test the quality of the CA activities given by the teachers in different schools. Assessment criteria could be developed and used to assess whether CA activities produced by teachers are of an appropriate standard.
- Although little correlation was found between average CA and examination marks for a given school, it would be worthwhile investigating whether there was a correlation between these two marks for individual learners *within* a given school.

5.10 CONCLUDING COMMENTS

Within a school context, issues of assessment inescapably involve the judgement of learners. When poor or inappropriate assessments lead to poor judgements being made, it is ultimately the learner who suffers. Assessment thus bears with it an important and unavoidable moral or ethical dimension. This study has shown that Grade 10 assessment practice in Namibian schools is far from ideal. Ministerial assessment policy needs to be supported with workshops in order for policy to be implemented meaningfully and uniformly across the country. Finally, in the words of Kilpatrick, et al. (2001, p. 13), “Mathematics assessments need to enable and not just gauge the development of proficiency”. It is hoped that this study goes some way to reminding all concerned that assessment, in the final analysis, should be embraced as an integral part of the strive towards proficiency.

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Appendix A: Grade 10 Continuous Assessment record sheets

11.9. Continuous Assessment Sheets for Mathematics

CONTINUOUS ASSESSMENT SHEET FOR MATHEMATICS (GRADE 8-10) AND ADDITIONAL MATHEMATICS (GRADES 9 & 10).

School: _____ Circuit: _____

| TERM 1 | Topic Tests | | | Topic Tasks | | | Investigations | | | Final Marks | |
|---------------------------------|-------------|--------|-----------|-------------|--------|-----------|-----------------|-----------------|-----------|-----------------------------|---------|
| GRADE: _____ YEAR: _____ | Test 1 | Test 2 | Total (A) | Task 1 | Task 2 | Total (B) | Investigation 1 | Investigation 2 | Total (C) | T ₁ Mark = A+B+C | Grading |
| <i>Maximum marks</i> | 25 | 25 | 50 | 10 | 10 | 20 | 15 | 15 | 30 | 100 | |
| Name of Learners | | | | | | | | | | | |
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| 35. | | | | | | | | | | | |

Subject Teacher: _____

Date: _____

Subject Head: _____

Date: _____

Principal: _____

Date: _____

**CONTINUOUS ASSESSMENT SHEET FOR MATHEMATICS (GRADE 8-10) AND
ADDITIONAL MATHEMATICS (GRADES 9 & 10).**

School: _____ Circuit: _____

| TERM 2 | Topic Tests | | | Topic Tasks | | | Investigations and Projects | | Final Marks | | |
|-----------------------------|-------------|--------|---------|-------------|--------|---------|-----------------------------|---------|-------------|-----------------------------|---------|
| | Test 1 | Test 2 | Total A | Task 1 | Task 2 | Total B | Investigation | Project | Total C | T ₂ Mark = A+B+C | Grading |
| GRADE: _____ YEAR: _____ | | | | | | | | | | | |
| <i>Maximum marks</i> | 25 | 25 | 50 | 10 | 10 | 20 | 15 | 15 | 30 | 100 | |
| Name of Learners | | | | | | | | | | | |
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Subject Teacher: _____

Date: _____

Subject Head: _____

Date: _____

Principal: _____

Date: _____

**GRADES 8 - 10 MATHEMATICS CONTINUOUS ASSESSMENT SHEET FOR
TERM 3 ONLY**

School: _____ Circuit: _____

| TERM 3 GRADE: _____ YEAR: _____ | Topic Test (A) | Topic Task (B) | Practical Inv. (C) | T_3 Mark = (A+B+C) | T_1 Mark | T_2 Mark | $T_{1,2,3}$ Marks = ($T_1+T_2+T_3$) | $CA = (T_{1,2,3} \text{ Marks} \div 25) \times 7$ | Paper 1 | Paper 2 | Exam = $P_1 + P_2$ | $P. \text{ Mark} = (CA + \text{Exam}) \div 2$ | Grading |
|---|----------------|----------------|--------------------|----------------------|------------|------------|---------------------------------------|---|---------|---------|--------------------|---|---------|
| | 25 | 10 | 15 | 50 | 100 | 100 | 250 | 70 | 45 | 85 | 130 | 100 | |
| Name of Learners | | | | | | | | | | | | | |
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| 33. | | | | | | | | | | | | | |
| 34. | | | | | | | | | | | | | |
| 35. | | | | | | | | | | | | | |

Subject Teacher: _____

Date: _____

Subject Head: _____

Date: _____

Principal: _____

Date: _____

Appendix B: Interview schedule for teachers

Interview Schedule for Grade 10 Mathematics Teachers

{(a) Explain purpose of the study (b) Explain what will be done with the data (c) Highlight how long the interview will take (d) Pledge confidentiality}

SWITCH ON THE RECORDER

INTERVIEW QUESTIONS:

(Use the blank spaces to fill in some interview notes)

1. Can you briefly describe your duties as a grade 10 Mathematics teacher at your school?

2. One of the main duties of a teacher is to assess the learners. What do you understand by the term continuous assessment [CA]?

3. Which activities do you give your grade 10 learners as part of continuous assessment?

4. Do you think it is necessary to carry out continuous assessment?

5. Grade 10 learners write final examinations from the DNEA at the end of the year. From your point view can you explain the difference between CA and these final examinations?

6. Graph A shows a certain school that had CA average marks always higher than the final examination average marks for the years 2008, 2009 and 2010.
What do you think are the possible causes of this situation?

7. Graph B shows a certain school that had CA average marks almost equal to the final examination average marks for the years 2008, 2009 and 2010.
What does this mean to you as a Grade 10 Mathematics teacher?

8. Graph C shows a certain school that had very high final examination average marks when compared to CA average marks for the years 2008, 2009 and 2010.

What do you think are the possible causes of this situation?

9. Which graph (A, B or C) do you think is the most ideal for a school? Give reasons. How can a teacher achieve this ideal situation?

10. What is your opinion or perception towards the use of CA and examinations as assessment tools in our grade 10 Mathematics curriculum?

11. Principals can influence the quality of CA marks. Can you comment on this statement?

12. Do you use CA marks to predict the final grades of your grade 10 learners? [From your experience, what connections have you observed between the CA and final grade 10 results]

13. Are there any other comments that you would like to make?

END..... [Stop recorder]...Thank the participant and reassure confidentiality.

Appendix C: Interview schedule for principals

Interview Schedule for School Principals

Theme: Perceptions towards continuous assessment and end of year examinations in grade 10 Mathematics

[Describe here the project, telling the interviewee about (a) purpose of the study, (b) individuals and sources of data being collected (c) What will be done by the data being collected to protect the interviewee, and (d) how long will the interview take.][Turn the recorder and test]

INTERVIEW QUESTIONS:

(Use the blank spaces to fill in some interview notes)

1. Can you briefly describe your role in the teaching of Mathematics at your school?
2. One of the main duties of a Mathematics teacher is to assess the learners. What do you understand by the term continuous assessment [CA]?
3. Do you think it is necessary to carry out continuous assessment?
4. How do you supervise your teachers to ensure they carry out continuous assessment?
5. Grade 10 learners write final examinations from the DNEA at the end of the year. From your point view can you explain the difference between CA and these final examinations?
6. Graph A shows a certain school that had CA average marks always higher than the final examination average marks for the years 2008, 2009 and 2010. What do you think are the possible causes of this situation?
7. Graph B shows a certain school that had CA average marks almost equal to the final examination average marks for the years 2008, 2009 and 2010. What does this mean to you as a school principal?

8. Graph C shows a certain school that had very high final examination average marks when compared to CA average marks for the years 2008, 2009 and 2010.

What do you think are the possible causes of this situation?

9. Which graph A, B or C do you think is the most ideal for a school? Give reasons. How can one achieve this ideal situation?

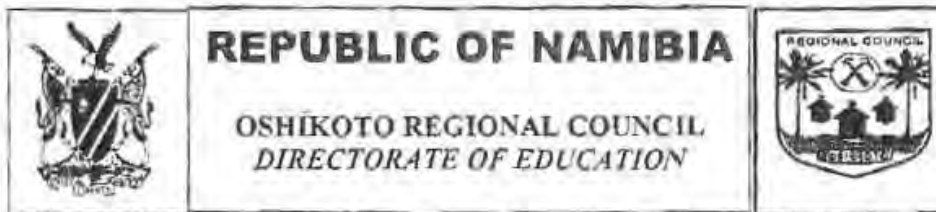
10. Do you use CA marks to predict the final grades of learners in grade 10? [From your experience what connections have you observed between the CA and final grade 10 results?]

11. What is your opinion or perception towards the use of CA and examinations as assessment tools in our grade 10 Mathematics curriculum?

12. Are there any other comments that you would like to make?

END..... [Stop recorder]....Thank the participant and reassure confidentiality.

Template A: Permission to use documents



Tel (065) 281901
Fax (065) 240315

Private Bag 2028
Ondangwa
22 July 2011

Enq : Mr Lamek T. Kafidi
Ref : 3/4


To: Heroes Private School
Private Bag 2024
Ondangwa

Dear Mr Marongwe

PERMISSION TO USE JSC MATHEMATICS STATISTICAL DATA IN MASTER OF MATHEMATICS EDUCATION RESEARCH STUDY.

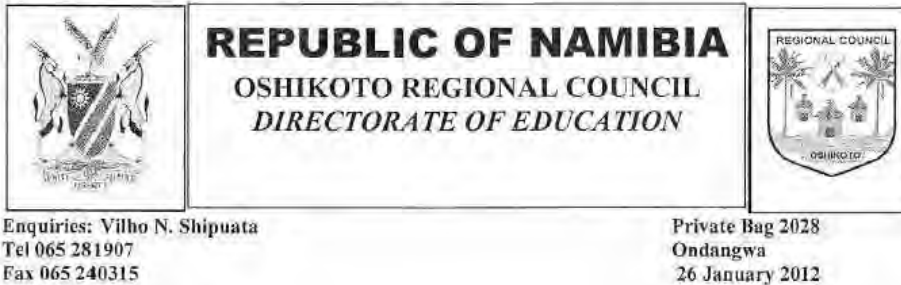
1. We hereby acknowledge receipt of your request to use the data of Heroes private school for your research.
2. We do not have any objection to your request. However, since Heroes is a private school, we advise that further permission be sought from the school management.
3. We trust that you would get the necessary support to complete your study, which would in many ways benefit the teaching of Mathematics in general.

Yours faithfully


.....
MR LAMEK T. KAFIDI
DIRECTOR OF EDUCATION
OSHIKOTO REGIONAL COUNCIL



Template B: Permission to carry out research in the Oshikoto region



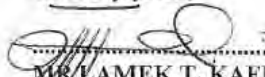
To: Mr Anesu Desmond Marongwe
Heroes Private School
Private Bag 2024
Ondangwa
Tel 065 240869
Fax 065 240451
Cell : 0812148901

Dear Mr Marongwe

RE: REQUEST FOR PERMISSION TO CONDUCT AND ACADEMIC RESEARCH AT SIX SCHOOLS IN OSHIKOTO REGION

1. The above-mentioned subject refers.
2. This communiqué serves to inform you that permission is hereby duly granted for you to conduct an academic research at the following schools as requested, [REDACTED] at [REDACTED] your own convenient time and on condition that:
 - (a) You are expected to make an appointment in time with the Principals of the proposed schools to be visited.
 - (b) The research should be conducted in such a way that it will not interfere with the teaching and learning programme.
 - (c) Any interview to be conducted with the staff members should be on voluntary basis and with the consent of the respondent.
 - (d) The confidentiality will be respected at all times and will be maintained by the researcher.
3. Thanking you most sincerely for selecting our schools for the purpose of your study and we hope that the outcome of your research will be of great benefit to our region and the entire education sector.

Sincerely yours,


MR LAMEK T. KAFIDI
DIRECTOR OF EDUCATION
OSHIKOTO REGIONAL COUNCIL

