

**AN INVESTIGATION INTO ASSESSMENT REFORM IN SOUTH AFRICA WITH  
SPECIAL REFERENCE TO COMMON TASK ASSESSMENT (CTAs)**

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SPECIAL REFERENCE TO COMMON TASK ASSESSMENT (CTAs)**

**By**

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for the Degree of Masters in the Department of Mathematics, Science and  
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## DECLARATION

I, Themba Russel Xulu hereby declare that **“An Investigation into assessment reform in south Africa with special reference to common task assessment (CTAs)”** is my own work both in conception and execution and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references.

Signed by -----

on the ----- day of -----2013

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I would like to acknowledge the following people for playing a great role in different ways in making my study a success.

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- Andy Kunene for his assistance. Ngiyabonga Mtimande.

## **DEDICATION**

I would like to dedicate this study to my sisters Lindiwe, Nonhlanhla, Nelisiwe and my brother Musa and my sons Siyanda and Junior and my grandchildren Luyanda, Sluleko, Nana, Ntokozo, Amahle, Khetha, Owethu, Nqobile, Baya and Thabiso. To my grandchildren, I say the message is that, 'education is the key to better life opportunities'.

## **ABSTRACT**

The purpose of this study was to examine the attitude and perception of grade 9 mathematics teachers to CTA (common task assessment) 2009 as well as their understanding of the role of CTA.

Six secondary schools in Pietermaritzburg area in the province of KwaZulu-Natal were selected as cases for an in-depth qualitative study. Two schools were African schools and the other three were multiracial school and one private school.

Fourteen (14) teachers were interviewed and were observed teaching mathematics. The study utilised participant observation, interviews and relevant documents as source of data collection. The main finding of the study was the frustrations expressed by teachers not clearly understanding what is expected of them and also the lack of official support for meaningful implementation and general lack of teachers understanding of the role of CTAs. Most teachers raised their concerns about the lack of mathematics content in grade 9 mathematics CTAs.

Most teachers raised concerns about CTAs content favouring or geared towards mathematical literacy and leaving out pure mathematics and failing to prepare learners to be competent in mathematics and failing completely to prepare learners for grade 10 pure Mathematics.

## LIST OF ABBREVIATIONS AND ACRONYMS

C.T.A	Common Task Assessment
APU	Assessment of Performance Unit
CASME	Centre for the Advancement of Science and Mathematics Education
CNE	Christian National Education
Ex-DEC	Ex-Department of Education and Culture
Ex-DET	Ex-Department of Education and Training
Ex-HoD	Ex-House of Delegates
Ex-NED	Ex-Natal Education Department
HG	Higher Grade
HoD	Head of Department
HPS	Higher Performing Schools
INSET	In-Service Training of Educators
LPS	Lower Performing Schools
NDoE	National Department of Education
NRC	National Research Council
OBE	Outcomes Based Education
SG	Standard Grade

## TABLE OF CONTENTS

No.	DESCRIPTION	PAGE
	Declaration	(i)
	Abstract	(ii)
	Acknowledgements	(iii)
	Dedication	(iv)
	List of abbreviations and acronyms	(v)

### CHAPTER ONE : MOTIVATION OF THE STUDY

1.1	Introduction	1
1.2	Statement of the problem	4
1.3	Research questions	6
1.4	Aim of the study	7
1.5	Definition of terms	7
1.5.1	Common Task for Assessment (CTAs)	7
1.5.2	Outcomes Based Education (OBE)	7
1.6	Research methodology	7
1.6.1	Research Design	7
1.6.2	Sampling design	7
1.6.3	Research instruments	8
1.6.4	Data analysis	8
1.7	Organisation of the study	9

### CHAPTER TWO : LITERATURE REVIEW



2.1	Introduction	10
2.2	Assessment of Higher-Order Skills	12
2.3	Criteria Evidence and Teachers' Judgements	14
2.4	OBE and Its Implication for Assessment	15
2.5	Traditional Summative Testing versus Assessment in OBE	22
2.6	Section A of the CTA Instrument	24
2.7	Section B of the CTA Instrument	26
2.8	Some Gaps in the Literature	31

### **CHAPTER THREE : RESEARCH METHODOLOGY**

3.1	Introduction	33
3.2	Theoretical Framework	33
3.2.1	Symbolic Interaction	33
3.2.2	The Qualitative Research Approach	35
3.2.3	Ethical Issues	36
3.3.4	Selection of Schools	37
3.3	Data Collection Strategies	39
3.1	Interviews	38
3.2	Research Rate and Completeness	40
3.3	Observations	43
3.4	Presentation and Introduction of Schools and Teachers	44
3.4.1	Presentation of Case Studies	44
3.4.1.1	Case study of school A	44
3.4.1.2	Case study of school B	49
3.4.1.3	Case study of school C	52
3.4.1.4	Case study of school D	55
3.4.1.5	Case study of school E	60
3.4.1.6	Case study of school F	64
3.5	Research Design	69
3.5.1	Validity and Reliability of Qualitative Design	69
3.5.2	Strategies to Enhance Validity	69

3.5.3	Discipline	70
3.5.4	Extensions of Findings	70
3.5.5	Trustworthiness	70
3.6	Research Questions	72

#### **CHAPTER FOUR : DISCUSSION OF FINDINGS**

4.1	Introduction	73
4.2	Discussion	73
4.3	Problems and Challenges Associated with Classroom interaction	73
4.3.1	Group work	74
4.3.2	Questioning for Understanding versus Control	76
4.3.3	Creating an Environment to Support Meaningful Teaching	76
4.3.4	Assessment	77
4.3.5	Interviews	78
4.4	Conclusion	98

#### **CHAPTER FIVE: PRESENTATION OF FINDINGS**

5.1	Introduction	99
5.2	Implication of the findings	99
5.2.1	Policy	99
5.2.2	Implication practice	100
5.2.3	Implication insert	100
5.3	Implementation	100
5.3.1	Continuous Assessment	101
5.3.2	Examination	102
5.3.3	The CTA Instrument	103
5.3.3.1	Conclusions regarding the negative aspects of the CTA Instrument	105
5.3.4	Insufficient preparation time for implementation	106
5.3.5	Poor preparation of educators for implementation	107
5.4	Limitation of Study	108

5.5	Issues for Further Research	109
5.6	Recommendations	111
	BIBLIOGRAPHY	119
	APPENDIXES	

## LIST OF TABLES

Table 3.1	: Number of learners per grade in school A	45
Table 3.2	: Total number of grade 9 learners in school B	50
Table 3.3	: A graph of $y = 2x$ drawn by a learner	51
Table 3.4	: The enrolment for grade 9 for 2009 in school C	53
Table 3.5	: The distribution of grade 9 in 2009 in school D	57
Table 3.6	: Activity done by learners in 2009 in school D	60
Table 3.7	: Grade 9 learners in 2009 in school E	61
Table 3.8	: Grade 9 which formed part of the research in school E	65

# CHAPTER ONE

## MOTIVATION FOR THE STUDY

### 1.1 INTRODUCTION

Assessment is a critical issue in the teaching and learning of mathematics and one that requires careful consideration by teachers and preservice teachers alike. The assessment experiences for many students in the classroom is the one which is based on a behaviourist approach where discrete facts and skills are tested, where grading and ranking are the primary goals (Niss, 1993). Kilpatrick, (1993) maintains that we need to understand how people come to use mathematics in different social settings and how we can create mathematics instructions that help them to use it better, more rewardingly, and more responsibly. According to Kilpatrick, this would require us to understand the crippling vision of mind as a hierarchy, school as a machine, and assessment as engineering. This further requires that multiple sources of assessment involve ways of presenting tasks to learners as well as different ways of probing assessment information so that valid inferences about learners' progress can be made. Tasks can include a variety of formats: written, oral, and practical; can be closed or open-ended; real life or abstract; completed individually or as a group (Swan, 1993). Similarly, CTASs in South Africa tasks cover a range of assessment activities e.g. practical, project, classroom, homework, oral, presentations, paper and pencil tests, etc.

In the last decade, there has been a growing recognition of the value of assessment in improving the quality of education, in particular the use of continuous assessment for improving the teaching and learning process. This has resulted in a significant increase in the number of countries (e.g. South Africa and Tanzania) developing policies and systems for conducting and using continuous assessment. In South Africa, for example, the final Grade 12 examination grade is based on the examination score, which comprises 75% as well as the continuous assessment score of 25%, whereas in Tanzania, the examination and continuous assessment score comprises of 50% of the final grade. According to (Kanjee & Sayed, 2008),

in South Africa, major initiatives to reform assessment and align with curriculum have involved the following:

- 1998- first national assessment policy promulgated
- 2002- Common Tasks of Assessment (CTASs) Grade 9
- 2005- Assessment Exemplars for teachers
- 2006- National database of Language and Mathematics items for teachers in Grades 1 to 6.
- 2006- Change in Grade 10, 11 & 12 School based assessment
- 2007- Early Reading Assessment tools.

Assessment in the National Curriculum Statement is an integral component of teaching and learning in Mathematics (Department of Education, 2003). For this reason, assessment should be part of every lesson and teachers should plan assessment activities to complement learning activities. Assessment cannot, therefore, be neutral with respect to what is taught and learned. It supports teaching and learning by providing both the teacher and the learner with insights of what the learner understands or is ready to learn (Department of Education, 2003). In Mathematics Education, assessment is taken to concern the judging of the mathematical capability, performance and achievement. Assessment thus addresses the outcome of the mathematics teaching and learning at the student level. Assessment is one of the key areas of curriculum delivery in South Africa. Curriculum 2005 advocates a radical change to what is considered “worthwhile” school knowledge, pedagogy and assessment.

In 2001, the Department of Education (DoE) decided to pilot the use of Common Tasks for Assessment (CTASs) in each of the eight learning areas, focussing on the Grade 9 level. The CTASs were developed by teams of learning area experts drawn from the provincial education departments. In 2003, the CTASs were developed and moderated and it was made obligatory for all schools to administer the CTASs in November 2003.

The introduction of CTASs came with many challenges to educators and learners. Some questions and concerns arose as the researcher studied certain areas of the policy and procedures in the National Curriculum Statement (NCS) document and other mathematics documents. Other researchers (e.g. Adler, Pournara, & Graven, 2000) in the field of education have looked into curriculum transformation in South Africa from various viewpoints e.g. educators, learner-performance and curriculum implementation models, but the researcher have decided to look into effectiveness of curriculum transformation using CTASs lenses. Since the researcher was involved in the implementation of CTAS in my school since its inception, the researcher observed that there were gaps such as a lack of understanding as to what would ensure successful transition to the FET phase.

The CTASs provided a number of activities or tasks in which learners are afforded the opportunity to demonstrate a particular ability under both controlled and uncontrolled conditions. These tasks cover a wide range of assessment activities e.g. practicals, project, classroom exercises, homework, oral presentations, and paper and pencil tests. The major aim of CTASs was to strengthen the capacity of the school-based continuous assessment. They were also perceived to be contributing to the credibility and public confidence in the General Education Training Certificate (GETC). The marks from CTASs counted for 25% of the total year mark, whilst the other 75% came from the assessment of work done throughout the year.

The Department of Basic Education announced by means of Circular S1 of 2010 (8 April 2010) that the grade 9 CTASs were to be discontinued and these were replaced by the Annual National Assessment (ANA) for grade 9 in Languages and Mathematics on an annual basis. CTASs were an important development in the teaching and learning of mathematics in South Africa. I believe that it is, therefore, necessary to investigate how the CTASs were implemented and what impact they had with respect to the teaching and learning of mathematics. In particular, this study purports to inquire into the knowledge competency concerning the conceptualisation and designing of CTASs that the mathematics educators have acquired and their capability in implementing them in their mathematics classrooms. I personally participated in the implementation and teaching of CTASs

and whilst this new development was quite exciting the researcher experienced some challenges. This study sought to determine experiences and challenges faced by other educators and how CTASs befitted their learners in general. This study would shed some light on how educators can deal effectively with some challenges that came with the introduction of the CTASs. It would further provide some advice to the DoE of practical steps that could be taken and which could lead to better planning, development, implementation and management of the CTAS process in future.

## **1.2 STATEMENT OF THE PROBLEM**

Globally, education systems are currently undergoing transformational changes. In recent years, assessment has attracted increased attention from the international mathematics education community. The assessment literature of the past two decades has been dominated by two themes; assessment as a catalyst for educational reform (or improvement); the second more recent theme is assessment for accountability (or quality assurance). During the last couple of decades, the field of mathematics education has developed considerably in the area of ideals and goals, and theory and practices, whereas assessment concepts and practices have also considerably developed.

New developments have not, however, been matched in parallel development in assessment. (Kanjee & Sayed, 2008) maintain that assessment was the most neglected aspect of the new government's efforts to transform the apartheid based education system, even though assessment formed the basis of the National Qualifications Framework (NQF) and Outcomes-Based Education that underpinned the new education system. So, tensions exist between state of mathematics education and current practices. A gap has widened between contemporary mathematics teaching and traditional assessment practices. In South Africa, this change is evidenced by an Outcome Based Education (O.B.E) approach, introduced after the birth of the country's democracy on 27 April 1994. The revised National Curriculum Statement (2002) aligns the school curriculum with the Assessment Policy published in Government Gazette No. 19640 of 1998. This document suggests that assessment in South African schools "should provide indications of

learner achievement in the most effective and efficient manner, and ensure that learners integrate and apply knowledge and skills. Assessment should also help students to make judgements about their own performance, set goals for progress and provoke further learning”(Department of Education, 2003: 18).

Mason (1999:137) argues that O.B.E is, furthermore, intended to redress the legacy of apartheid by promoting the development of skills to prepare all learners for participating in the local democracy as well as in the increasingly competitive global economy. It is emphasised in the National Curriculum Statement (NCS) that assessment is an integral part of teaching and learning. As such, assessment is made to be part of every lesson and teachers are required to plan assessment activities to complement learning activities.

The curriculum change meant that assessment is not limited to sit-down examination and tests as it has been done in the past, where there were half yearly examinations in June and a big examination at the end of the year in November and December. The government policy on continuous assessment has been developed for that effect, and the main concern and emphasis is on formative type of assessment. According to Combrink (2003:51) this new assessment should focus mainly on empowering the learner. (Nakaburg & Sieborger, 1999:288) describe continuous assessment simply as a continuous updating of assessment, the one that forms on continuous basis. It is used by various stake holders, namely, learner, teacher, parent, place of work, educational authorities and institutions of high learning such as universities and technikons.

Assessment standards describe the minimum level, depth and breadth of what is learnt. However, assessment changes from grade to grade, while learning outcome stays the same from grade to grade. The assessment standards also contribute to the qualification, and in the case of grade 9, this means the general education and training certificate.

This study focuses on mathematics grade 9 continuous assessment, and in particular, the Common Task Assessment (CTASs).The Common Task for Assessment (CTAS) is an external assessment tool intended to sample learner



performance against the assessment standards of the learning outcomes (Department of Education, 2003). The CTASs, in all learning areas, should consist of both performance-based tasks and pen and paper tasks. The performance-based tasks could include projects, orals, and pen-and paper activities and so on. All learners in all schools are assessed through the CTAS in all the learning areas, including mathematics. The CTASs is context-based and the teacher is expected to explain the criteria for assessment to all learners before the commencement of each activity. Masehela, (2008: 3) notes that the CTASs have to a large extent crystallised policy debates about the role and purpose of formative assessment, and indeed the balance must be struck, or tensions between what weighting should CTAS mark and Continuous Assessment mark contribute.

CTASs have been receiving scrutiny since their conceptualisation and later their implementation from different quarters. For example, Masehela (2008) makes synthesis of the evaluative information of CTASs and then draws practical operational conclusions that can advise the DoE on better planning, development, implementation and management. Poiah (2003: 13) is optimistic about the role of the CTASs and he mentions that, “The introduction of the CTASs at the GETC level has contributed significantly to alerting policy and educators of the challenges that confront assessment at this level. It is, therefore, anticipated that over the next few years considerable progress would be made towards installing a GETC that is credible and has public currency.” This study, therefore, seeks to determine what these challenges were and what benefit’s did educators derive from using the CTASs.

### **1.3 RESEARCH QUESTIONS**

This study attempted to find answers to the following research questions:

1. Did mathematics educators perceive CTASs as helpful in assisting learners to be competent in their mathematics learning at GET band?
2. Did educators teaching at GET level have common understanding about the role and the aims of the CTASs in their mathematics teaching?

This study further investigated the extent to which educators were involved in the conceptualisation and design of as well as the challenges they encountered in the implementation of CTASs.

#### **1.4 AIMS OF THE STUDY**

1.4.1 To determine whether mathematics teachers perceived the CTASs as helpful in assisting the learners to be competent in mathematics learning.

1.4.2 To determine whether teachers understood the role of CTASs in their mathematics teaching.

#### **1.5 DEFINITION OF OPERATIONAL TERMINOLOGY**

The researcher acknowledges the importance of providing the operational definition of terminology as used in the context of this study.

##### **1.5.1 Common Task for Assessment (CTASs)**

The Common Task for Assessment is an external assessment tool intended to sample learner performance against the assessment standards of the learning outcomes. CTASs cover a range of assessment activities e.g. practical, project, classroom, homework, oral, presentations, paper and pencil tests, etc.

##### **1.5.2 Outcomes Based Education (OBE)**

OBE means clearly focusing and organising everything in an educational system around what is essential for all students to be able to do successfully at the end of their learning experience.

#### **1.6 RESEARCH METHODOLOGY**

##### **1.6.1 Research Design**

Methodology refers to the methods or techniques that would be used to collect and analyse data. A qualitative research method is deemed appropriate, as the aim was to obtain insight into educators' thinking about the role of CTASs in mathematics learning at GET band. Qualitative research is inherently a multimethod in focus. Two methods were used to collect data: observation of mathematics educators teaching

grade 9 and who were involved in using CTASs and in-depth semi-structured interviews. All interviews were audio taped and transcribed and qualitative methods were used to analyse the views of teachers. Educators would be asked questions about the general performance of learners in mathematics prior to and during the implementation of CTASs. Educators' views were sought on information about the extent of educator's involvement in the conceptualisation of CTASs and their general understanding of the aim of CTASs.

### **1.6.2 Sampling design**

Ten teachers from two contrasting socio-economic status schools, an ex-model C school and an ex-DET school were observed and interviewed in-depth. Two teachers were selected from the ex-model C and eight teachers were from the ex-DET schools. All the educators were selected on the basis that they are qualified to teach mathematics and had at least three years of involvement in handling the CTASs. Attempts were made to involve equal number of men and women educators.

### **1.6.3 Research instruments**

The research instruments which were used comprised of two types of research tools to collect data namely, interview schedule and observation sheets. Interview schedule with structured open-ended questions were administered to the participants for the purpose of soliciting qualitative data. Observation sheets were used for the validation and verification purposes on whether educators can demonstrate knowledge competency of Common Tasks Assessment.

### **1.6.4 Data analysis**

Qualitative methods were used to analyse and present the data. Data analysis procedures will start immediately after the instruments have been collected from participants. Following the interviews of ten educators, the transcript was studied and attempt was made to make sense of the data. The researcher then placed the data into categories that provides descriptive information about the context from which the units of meaning were derived. Findings would be interpreted in the

light of the research questions. Data collected using observation schedule would be analysed along similar lines as interview schedule.

## **1.7 ORGANISATION OF THE STUDY**

### **Chapter One:**

This chapter consists of the motivation of the study, critical questions, and definition of terms and plan of the whole study.

### **Chapter Two:**

The chapter discusses the relevant literature review. A theoretical background is provided in the chapter.

### **Chapter Three:**

The chapter discusses details the research design and methodology of the study. This includes the procedure for data collection, selection of subjects, a plan for organising and analysis of data.

### **Chapter Four:**

A detailed analysis and interpretation of data is discussed in this chapter.

### **Chapter Five:**

The main focus of the chapter is the presentation of the main findings of the study.

### **Chapter Six:**

The final chapter focuses on the summary, conclusions and recommendations of the study.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

Psychometrics has for a very long time dominated assessment in such a way that assessment was limited to testing and examination. Testing was mainly to assess memorisation of factual knowledge (Gipps, Lawrez and Helgesons in Gobel, 1994).

For the purpose of this discussion assessment will therefore be considered.

As occurring whenever one person, in some kind of interaction, direct or indirect, with another, is conscious of obtaining and interpreting information about the knowledge and understanding or abilities and activities of that other person. To some extent or other, it is an attempt to know that person (Rowntree, 1987:4).

According to the definition it is clear that assessment is very broad, it is not limited to what learners know, and it includes abilities and attitude. Rowntree (ibid) does not only view assessment as the measurement tool, but it should involve testing and other methods of assessment such as discussions, interviews, oral projects and observation.

In this chapter literature review will be discussed on the integration of teaching and classroom assessment. Developments in the first world countries, United Kingdom (UK), United States of America (USA) have contributed to assessment ideas in the third world and developing countries such as South Africa. Classroom assessment is particularly good for both teachers and learners as a feedback strategy that provides teachers with data on teaching effectiveness and learner's comprehension. This type of assessment plays an important part as it involves students in active mental processing of new information and makes them aware of themselves as learners.

Classroom assessment according to (Angelo & Cross, 1993) is an educational innovation that unites efforts to improve both teaching and learning. Assessment is very broad and serving a number of different purposes and some of those purposes including promotion, rating, diagnosing, guidance and certification.

In the past, assessment had a short term focus. Assessment tasks emphasised content and factual recall “often entailed learning in parrot fashion” (Cockburn, 1995:5). The top learner that was regarded the best was the one who could memorise and reproduce the educator’s marking memorandum. Very little emphasis was placed on critical thinking skills or on valuing the personal inputs of the learner. In those days there was no paradigm shift which was strongly characterised by paper and pencil test that promoted the recall of textbook based knowledge. The major percentage of marks awarded to a learner was always based on written examination (Cockburn *et al.*, 1997:5). There was a strong need for change.

The feeling of integrating teaching and assessment was gaining momentum and questions began to be asked about purpose and results of end of period of summative assessment. The new policy on assessment was promoting more emphasis on monitoring progress and supporting teaching and learning (Gipps 1994; National Research Council, 1996; Department of Education 1996; Malcom, 1994a). One way which is the only option was to integrate learning and teaching.

Assessment should be an on-going process and not something that only comes at the end of teaching process. We assess the learner’s competences which are learner’s inner abilities to do things irrespective of the context (Lubisi, 1999). The fact that these are inner abilities means that they cannot be observed, therefore, competence cannot be directly assessed but can be inferred from learner’s performance (Lubisi, 1999 and Malcom, 1999).

Many educational scholars argue that assessment should not take place in a very formal situation. They further argue that this has negative consequences in making inferences about the learner’s competence. First world countries such as Australia, UK, USA excluding South Africa argue very strongly that learners should be assessed doing activities which are closely related to real life situations, this assessment should be authentic (National Research Council, 1996; Department of Education, 1996). Authentic assessment is concerned with the assessment of those learning outcomes which value what people do in real life authentic human activities (Lubisi 1999:57; National Research Council, 1996).

There are strong beliefs that authentic assessment originated in the USA, there was a deep attempt of moving away from standardised multiple choice questions (Gipps, 1994). In South Africa the present assessment practice is often referred to as a holistic outcomes based assessment. A holistic approach means that different role players and environment issues are taken into consideration. An inclusive approach also means that the different learning environments and persons are taken into consideration for example sexes, disabilities, cultures and religions. Holistic outcomes based assessment is holistic in a number of ways, namely:

- a. Learners should be assessed in multiple integration outcomes located in a variety of knowledge, skills and values.
- b. Teachers are expected to use a variety of modes media and techniques for assessment.
- c. Focus must be on the whole and not parts of the learner's performance (Lubisi, 1999).

There seem to be no difference between holistic outcomes based assessment and authentic assessment. Holistic outcomes based assessment puts more emphasis on integration whole, whereas authentic assessment emphasise real life activities, but both of them stress assessments of learners performing in order to make some inferences on their competence, hence the notion performing assessment.

Performing assessment can take many different forms including: presenting an oral argument, assembling a portfolio, writing an extended essay, planning and conducting an investigation (Doran, Lawrez & Helgeson in Gabel, 1994).

The form of assessment must be appropriate for the learning outcomes being measured. (Bray, 1987) calls this "fitness for purpose", that is, assessment must be fit for the purpose it serves. This, she argues, means that an assessor should make a right choice of modes (form), media and assessment instruments.

## **2.2 ASSESSMENT OF HIGHER-ORDER SKILLS**

The main principle informing South African outcomes based education (OBE) is the creation of creative thinking. Both process and the content of OBE are emphasised in

the description of the outcomes that must be reached at the end of the process. In the Revised National Curriculum Statement (RNCS), learning outcomes and assessment standards were designed from the critical and developmental outcomes. These two are found as outcomes that result from the constitution which are found in the South African Qualifications Authority Act (1995). Hence, the learning programme should promote learners' ability to think logically and analytically as well as holistically and laterally'' (Department of Education, 1996:14). This brings about strong challenges to assessment as it is expected to reflect or show these goal (Doran, Lawrez & Helgeson, 1994; Gipps, 1994) considerable expectations and challenges increases more than ever before since the researchers are gradually accepting that assessment drives the curriculum.

Bellis, (1998) warns about two types of decisions to be made such as “what does successful learning look like”, and “what content should be learned”. However, such decisions precede how such learning opportunities may be delivered. Therefore, it is not incorrect to affirm that assessment drives the curriculum (Bellis, 1998). It is easy to assess and assist learners while they are busy with the investigation or an activity. Again, in giving feedback and also making judgment about the competence of the learners, the emphasis should not be about the right or wrong answer but the extent to which a learner performed close to perfection. In that case, it is important to use a scoring rubric which describes different levels of achievement.

It is important to know the level of achievement and scoring rubric makes it and much clearer and it is much helpful if accompanied by a short description which says a learner obtained a particular level. However, some types of assessment have constraints. Malcom, (1999) argues that assessment as inference is always “tentative in its claim”. Ruiz-Primo & Shavelson, (1996) concur with this idea and they argue that it needs an expert to make an appropriate judgment.

Lubisi, (1999) finds problems also with the way teachers make final decisions about the competence of the learner. He then poses the following question:

To what extent does a student's performance indicate competence in a particular domain? To what extent does a student's poor performance indicate a lack of competence? (Lubisi, 1999).



All that Lubisi (1999) is uncomfortable about and his main real concern is about the validity of the performance assessment. Lubisi (ibid) further warns teachers to be extra cautious not to readily infer competence from performance. (Wood, 1987) uses the notion of false positive and false negative. It is possible to make an error of judgment by awarding competence where there is no competence or judging a learner to have no competence there is competence, an error of judgment.

### **2.3 CRITERIA EVIDENCE AND TEACHERS' JUDGEMENTS**

This method of using criteria is not new. It dates back as early as 1960s after the publication of Robert Glaser's seminal paper on criterion referenced assessment (Glaser 1963). He was concerned about the type of measurement or criteria that teachers used to assess learners and make conclusion about their findings. He further states that it was not enough to only consider students' achievement relate to predetermined norms. He made a suggestion that students achievement be also "measured" against set criteria or standards. Glaser was not the only person who was concerned with this criterion referencing norm. The criterion referencing norm was also practiced in the United States of America (USA) since the turn of the 20<sup>th</sup> century in the form competence based industrial and teacher education (Tuxworth, 1989).

Natal Education Department in their syllabus dating back to 1915 also used the criterion referencing (Harley 1989:323-324).

Teachers also have their own criteria often unstated, which may or may not be related to the official criteria (Lubisi (1999)).

When the South African school curriculum was reformed, the new approach was claimed to be Outcome Based Education (OBE) (Department of Education, 1997:29). This paradigm shift brought with it many suggestions for changes to assessment practice.

## 2.4 OBE AND its IMPLICATION FOR ASSESSMENT

(Killen, 2002) argued that high quality assessment practices are fundamentally not different from high quality assessment practices in any other approach to education. This claim was supported by (Spady, 1994) in his four defining principles of OBE. These principles are:

- Clarity of focus
- Designing down
- High expectation
- Expanded opportunity for learning

The explanation that Spady gave for clarity of focus was that all assessment tasks must be clearly and explicitly linked to well-defined outcomes. These links, he claimed, are essential if the assessment is to produce evidence from which valid inferences can be made about the learner's achievements. This then means that learners are not assessed on things that they have not been helped to learn.

The designing down principle claims that it is based on the idea that each component of learning is included in a curriculum because it has identified as contributing directly to learners' achievement of short-term outcomes that contributes to more complex outcomes that would lead to the exit outcomes of the programme. This implies that if this principle is used for assessment, it needs that teachers should be able to describe the purpose of each assessment task in term of the way that that it provides information about the learners' current understanding, also the readiness information of the learner to determine his or her readiness to proceed to the next step in learning. Generally each assessment task should inform the teacher about readiness of learners to proceed to more complex learning.

Spady's (ibid) high expectation is based on the idea that given appropriate opportunities, all learners can achieve high standards. This poses a lot of expectations from the teacher regardless of his or her situation at his or her school.

(Luke, Lingard & Ladwig, 1998) state that teachers' expectations and their teaching practices influence learner's achievement.

Spady mentions that assessment task must be in lined with the following:

- Assessment task must be challenging. There are no routines
- Assessment must provide scope for learners to demonstrate deep levels of understanding and high levels of achievement
- It must be possible to discriminate between low and high levels of achievement
- Excellence in student achievement must be recognized and rewarded

Spady's Expanded Opportunity implies that all learners can succeed if they are given adequate opportunity and time. Learners who do not achieve high levels of understanding at their first attempt must be provided with further opportunities to learn and demonstrate their learning. There are many limitations in regard to Spady's principle of expanded opportunity given the time that learners spent in school.

For example, this study on Grade 9 CTASs would indicate that CTASs only arrive at all schools during the third term, and that there are specified times given for each task in the first part of CTASs, and this sounds rather impossible. This expanded opportunity principle is also impossible to implement even in the case of grade 12.

Historically the South African teacher, by and large, has been subjected to strong top down education initiatives. Curriculum development preceded by the Research Development Dissemination Adoption (RDDA) method and experts generally developed resource materials in isolation of end users and classroom realities. Curriculum is the product someone else's thought knowledge, experience and imagination and becomes something developed out there. The teacher takes the package and hands it to the learners. Everyone is a consumer, everyone deficient and dependant.

So as such the curriculum is the mechanism which controls the daily activities of both pupils and teachers in South Africa only a select group is responsible for the curriculum (King and Van Den Berg, 1991). Thus input by teachers, pupils and parents are limited.

In the next chapter I would consider the interviewing of Grade 9 mathematics teachers. I hope after that interview it will be much clearer how they contribute in the development of assessment which is the focus of my research.

In the section which follows, the focus on literature review about CTASs. The following topics impact greatly on the topic of my study:

- Outcomes Based Education (OBE)
- C 2005
- National Assessment Policy
- School Act

### ***Outcomes Based Education***

Outcome Based Education (OBE) concerns a shift from teacher inputs (what teachers do) to learner outcomes (what learners know and can do). According (Spady & Marshall, 1991: 67), OBE is formed on three premises:

- All students can learn and succeed but not on the same day in the same way. Success breeds success.
- Schools control the condition of success.

OBE focuses on the learner and virtually guarantees every learner and education; OBE focuses on what a student can demonstrate given a particular set of outcomes. These outcomes can be achieved through the use of any content which gives the impression that content does not matter. (Jansen, 1997) argues that knowledge, skills and values are not achieved by learners in a vacuum and should be linked to relevant and appropriate content. (Boxien & Soudien, 1997) argues that OBE is not a neutral text, but indeed political. They state that in South Africa OBE serves to assimilate the previously disadvantaged into a world system; silencing rival epistemologies of the modern world and more subversively, rival epistemologies of knowing the world.

OBE has its corners to knowledge, skills and values. It focuses on clearly defined outcomes that learners are expected to attain in order to be competent when they finish schooling. (RSA, DoE, 1997h: 1) Outcomes Based Education puts more emphasis on

the following:

- Acquired skills for life.
- Cognitive and communication process that is basic for all learning areas (Spady, 1993: 1-5).

The National Education Policy Act (No. 27 of 1996) made provision for the education of the following curriculum design elements to support an Outcomes-Based Education:

- Critical outcomes
- Specific outcomes
- Assessment criterion
- Performance indicators
- Range statements
- Learning programmes (RSA, DoE, 1997h:2)

In the following paragraphs the researcher shall discuss the above concepts:

### ***Critical outcomes***

Critical outcomes underpin learning on all levels of education and reside in the constitution of South Africa 108 of 1996 (RSA, 1996). Learners are expected to demonstrate the following:

- Identify and solve problems through critical thinking.
- Collect, Organise, analyse and critically evaluate information.
- Sensible towards cultural issues and entrepreneurial skills.
- Communicate effectively using language skills in oral and written work, using visual, mathematical form.
- Use Science and Technology effectively and critically, assuming responsibility for the environment and health of others.
- Team working, work effectively with others as members of a team, group, organisation or community.
  - Be responsible citizen with career opportunities (Department of Education. 1997 h: 14-15).

From these learners are expected to strive towards the realisation of the above mentioned critical outcomes, whether it is grade one learner or a university or technikon university student. There are five developmental outcomes and seven critical outcomes (Department of Education, 1997h: 14; Hartzenburg, 2000: 66).

### ***Specific Outcomes***

Specific outcomes are smaller and are, as the name specify, specific to each learning area. In the new draft national curriculum statement there are now called learning outcomes rather than specific outcomes. What learners can do at the end of a learning experience. Learning outcome is a description of what learners should be able to demonstrate at the end of the general education and training bans.

### ***Assessment criteria***

An assessment criterion describes the level on which learners must show their attainment of the specific outcomes and ways depth and width to demonstrate this attainment. Assessment criteria are grade specific and show how conceptual progression in a learning area will take place. An assessment criterion embodies the necessary knowledge, skills and values to reach the learning outcomes.

### ***Range statements***

Range statements prescribe the level of complexity, slope, height and depth of an achievement. They give the details of skills, knowledge, values and attitudes that learners have to acquire. The main aim is for the learner to attain an acceptable level of achievement. Also the content, processes and learning contexts for the learner to engage with (Hartzenburg, 2000:72).

### ***Performance indicators***

They describe what specific things look for when judging the learner's performance developing assessment criteria. They are measures through which educators plan and assess learners' progress towards the achievement of the specific outcome. Performance indicators provide details of the learning content, context and processes in which learners should engage (Department of Education, 1997h, 18-19).

### ***Learning programmes***

Learning programmes are structured and systematic groups of activities that promote the attainment of learning outcomes and assessment standard for the phase. Learning programmes specify the range of learning and assessment activities per phase.

Learning programmes also contain work schedules that make provision for the rate and order of these activities for year, as well as examples of lessons plans that can be implemented during any given period. The fundamental principles and values of the revised national curriculum statement also underlie the learning programmes.

They must also ensure that all learning outcomes and assessment standards are covered effectively and that the allocated time and emphasis are allocated to learning area. They include critical outcomes, specific outcomes, assessment criteria, range statements, performance indicators (Department of Education, 1997: 17).

In Grade 9 there are eight learning programmes which comprise the core knowledge, skills and competencies of the learning areas (Department of Education, 1997:26).The National Education Policy (No.27 of 1996) made provision for the development of the following curriculum design elements to support an outcome based approach:

- Critical outcomes
- Specific outcomes
- Range statements
- Assessment criteria

C2005 provides framework for both provinces and schools to develop learning programmes for teaching and learning without prescribing what schools should do. According to the national curriculum statement there are eight learning areas. The learning areas as set out in this revised national curriculum statements are:

- Languages
- Mathematics
- Natural Sciences
- Technology

- Social Sciences
- Arts and Culture
- Life Orientation
- Economic and Management Sciences

The worst apartheid curriculum after 1994 which was introduced after liberation became known as curriculum 2005. This curriculum which was implemented in January 1998 plans to change education in South Africa:

- Makes lifelong learning possible for all South Africans
- Creates a culture of human rights multiculturalism
- Integrated education and training
- Is based on outcomes
- Provide learners with knowledge and talents necessary outside works
- Promise to train thinking and competent citizens for the future.

Curriculum 2005 was an attainment to provide an outcome based framework for school education in South Africa and it is relevant to the CTAS instrument. It is the main vehicle for implementing the new curriculum in South African school. It also embraces the principles and values of human rights such as non-discrimination and equality which are enriched in the Constitution of the Republic of South Africa 108 of 1996 [1996, Section, 9(1)-(4)]. Curriculum 2005 placed a strong emphasis on continuous assessment that was usually defined as “the assessment of the whole learner on an on-going basis over a period of time where cumulative judgments of the learner’s abilities in specific areas are made in order to facilitate further positive learning” (Le Grange & Reddy, 1988-11).

All aspects of learning and teaching are in cooperated in curriculum 2005 as well as all the Grade 9 learning programmes (Department of Education. 1997: 16). Mathematical literacy (Department of Education, 1997:8-10). In the next section discussion and analysis of traditional summative testing and Outcome-Based Assessment will be made.



## 2.5 TRADITIONAL SUMMATIVE TESTING VERSUS ASSESSMENT IN OBE

Prior to the introduction of OBE, learning and assessment was generally separated from instruction and took the form of assessing isolated knowledge and skills. The past authoritarian system of teaching learning assessment placed a strong emphasis on the accumulation of isolated facts and skills learning were strongly promoted learning is a study method for (Hartzenburg, 2000: 11). Assessment was characterised by paper-and-pencil tests that emphasised academic exercises and that of textbooks-based knowledge. The assessment criteria were not at all explained or made explicit before learners attempted the assessment tasks. Learners exposed to single occasion and single attribute in nature.

Secrecy generally surrounded the way learners were assessed on individual bases (Department of Education, 1997, 23).

During pre-OBE schools were largely driven by the head to produce marks that could be recorded and reported to prove to the relevant authorities that assessment has taken place rather than being an integral part of the learning process. Teachers generally did not consider assessment until after teaching has occurred.

A document called a (Resumed of Instructional Programmes in public ordinary schools) (Report: 02-550), underlined the traditional summative testing methods for all learners. This national policy was driven by lack of accountability, lack of transparency, difficult and complicated rules; this consequently resulted in drop outs rates among learners, dismal failure rate. The main reason for this was the failure of stress and examination in a proper way. The National Assessment Policy (Department of Education.1988 (b), states that in the past education system tests were used to assess what learners did not know or to stump them.

Within this system assessment was largely summative norm referenced judgmental in nature (Department of Education, 1997, 3). Because norm-referenced testing was designed to highlight achievement differences among students, it also to “labelling” of students as being high or low achievers (Stiggins; 1994). Promotion and retention were key elements of the pre-OBE system in South Africa.

The National Assessment Policy (Department of Education.1988 (b)) defines assessment as the process of identifying, gathering and interpreting information about learner's performance as measured against nationally. Agreed upon outcomes for a learning phase, it involves gathering information and evidence collection, evaluating this evidence against the outcomes, recording the findings of the evaluation and using this evidence to support learner's developmental needs and for reflecting on improving teaching and learning practices.

Assessment should take place in an authentic context in a caring, non-judgmental environment. It should serve as a positive affirmation of the learner acknowledging whatever competencies and outcomes the learner has attained to date and taking into account previous performance levels. It should assist in the early identification of learners requiring additional support [it] must be broad enough to include attitudes, processes and skills as well as knowledge and concepts. [It] must acknowledge that learners process knowledge in unique and multiple ways (Department of Education, 1997).

Continuous assessment is not just a sequence of traditional test results. The national assessment policy (Department of Education.1998 (b)) states that continuous assessment should be used for developing learners and as a system for providing for developing teaching and learning.

### ***Problems associated with grade 9 CTASs***

There is a great need for more re-skilling programmes for educators and SMTs such as intensive skills-orientated programmes that are vital and important to reform and re-direct their practices and teaching comprehensively (Hollinger & Murphy 1987: 55).

Out of six schools, two schools were conducting CTASs differently. CTASs section A was conducted in a classroom and was kept and locked in a classroom. In four schools learners were allowed to take it out and do all activities as homework. They were allowed to obtain any assistance from friend, parents or anyone

Two educators from school C and D complained that they have never taught them. Attempts has been made to present a literature report on the research topic a critical

analysis of government documents legislation, policies and document from the provincial department of education, amongst others.

## 2.6 SECTION A OF THE CTAS INSTRUMENT

The CTASS was divided into four parts.

**Task 1** deal with "democracy" participation in the national elections.

Activity 1 is a 60 minutes, data collection tool. Activity 2 is a 45 minutes and it includes summary, analyses and preparation of data.

**Task 2** comprises an activity elections process activity that learners have to do independently. A marking memorandum for assessing learner's response is provided to assist educators (R.S.A, DoE. 2003 (e): 6-7).

**Task 3** deals with human rights and the time allocated for this task is 65 minutes for 35 marks. This task comprises activity 1 focusing on co-operation group work for the duration of 20 minutes. Learners are to provide a group summery, learners are to carry out an investigation and compare information to participate in co-operative learning to work in groups. Activity 2 was about access to clean water, how to conserve water and the importance of water in general.

**Task 4** comprises the following activity:

- Understanding national symbol such as the South African flag.
- Drawing of the South African flag. Instructions for drawing the flag are divided into steps as follows:

STEP 1: Draw a rectangle in a proportion of 3 in length to 2 in width (18cm \* 12cm is a convenient size for this activity). The angles should be named A, B, C and D clockwise from the top left angle.

STEP 2: Draw two horizontal lines to divide rectangle ABCD into three equal parts. Name the upper line EF from left to right, and name the remaining line GH from left to right.

STEP 3: Draw the diagonal AC and the diagonal BD.

STEP 4: Draw two parallel lines as follows:

- a) One line on each side of diagonal AC
- b) The line above diagonal AC should be named line IH1
- c) The line below diagonal AC should be named line J1J
- d) Line IH1 and line J1J should be parallel to diagonal AC
- e) The distance between line IH1 and J1J should be one third of the width of the flag and the length of line AJ1 should be one sixth of the width of the flag.
- f) The point of intersection of line IH1 and line EF should be named K.

Follow instruction (a) to (e) and do the same on diagonal BD but:

- a. The line above diagonal BD should be named G1M
- ii. The length of line DG1 should be one sixth of the width of the flag.
- iii. The line below diagonal BD should be named F1N
- iv. The point of intersection of line F1N and line GH should be named O
- v. The point of intersection of line J1J and line G1M should be named P\

STEP 5: Use a pen to highlight the margins of the following geometric figures:

- a. Quad IBFK
- b. Quad NOHC
- c. Triangle G1PJ1

STEP 6:

- (a) Draw line QR 0,8cm below and parallel to line IH1
- (b) Draw line ST 0,8cm above and parallel to line J1J
- (c) Draw line UV 0,8cm below and parallel to line G1M
- (d) Draw line WX 0,8cm above and parallel to line F1N
- (e) Draw line YZ 0,8cm below and parallel to line EF
- (f) Draw line A1B1 0,8cm above and parallel to line GH
- (g) The point of intersection of line YZ and line QR should be named C1
- (h) The point of intersection of line A1B1 and line WX should be named D1
- (i) The point of intersection of line UV and line ST should be named E1

STEP 7: a) Use a pen to highlight the following lines:

- Line QC1;
- Line C1Z;
- Line ZB1;
- Line B1D1;
- Line D1W;
- Line WD
- Line DU;
- Line UE1;
- Line E1S;
- Line SA;
- Line AQ

b) Erase all the letters and all the lines drawn in pencil

This activity took very long to complete much longer than the stipulated time.

## 2.7 SECTION B OF THE CTAS INSTRUMENT

The teacher's guide (R.S.A, DoE 2003 (e): 18), deals with the summative test component. This component is written under strict formal examination conditions. It has 2 hours duration. Instructions are given to educator on how to administer section B. The instructions to educators are to:

- Give learners 2 hours only for the exam and to advise them in this regard.
- Invigilates the exam
- Hand out the answer paper, the booklet containing the task sheet for task 1: response to text (passage and question); task sheet for task 2 (functional writing)
- Not read the instruction nor to clarify unknown words
- Not help learners with the tasks, nor to allow them to copy
- Use the provided marking memorandum only for assessing learners performance in section B (R.S.A, DoE 2003(e): 18)

It is necessary to point out here that the CTASS instrument is a national and provincial departmental imperative. Therefore, educator, in terms of the employment of educators act 76 of 1998 (R.S.A, DoE 1998 (c), section 4 (e) and 5 (e)) are obliged to carry out their duties and take full responsibility for the implementation of the CTASS instrument at classroom level. As employees of the government, they are bound by the contractual obligation to perform their professional functions in this regard. The quality of their performance directly connected to their training and development.

The *National Assessment Policy* (Department of Education. 1998 (b), paragraphs 4-5) provides the following of effective assessment:

- Learners should be informed about the purpose of assessment.
- The focus of assessment should be on the criterion referencing approach.
- Assessment must be continuous, authentic, balanced and varied.
- Assessment must be an integral and on-going process of teaching and learning.
- Assessment must be fair, valid, objective, prejudice free, manageable and time efficient.
- A range of tools, techniques and methods should be used to assess learning.
- The tools, techniques and methods of assessment must fit the purpose for assessing skills, knowledge, value and attitudes.
- Results must be communicated accurately and timorously.
- Progress must connect with the attainment of specific outcomes.

The *National Assessment Policy* (Department of Education. 1998 (b) paragraph 13) clarifies the purpose of assessment in *OBE* as:

- to identify whether any learner occurred in terms of the Specific Outcomes
- to establish what difficulties are experienced
- to report learners performance level to parents and other educational stakeholders
- to provide information for evaluating and reviewing the learning programmes
- to increase the potential of learners to attain the skills, knowledge and values prescribed in *C2005*

The *National Assessment Policy* (R.S.A, DoE. 1998 (b) paragraph 14) states that there are four different types of assessment in *OBE*. Firstly, formative assessment focuses on positively affirming the learner's performance by giving it recognition. Secondly,

summative assessment focuses on the overall achievement of learners. Thirdly, diagnostic assessment identifies barriers to learning. Fourthly, evaluative assessment provides information for reviewing and streamlining learning programmes.

The *National Assessment Policy* (R.S.A, DoE. 1998 (b) paragraph 9, sub-paragraph 9), states that Continuous Assessment (CASS) is the "...best model to assess outcomes of learning." This makes the CASS model compulsory for all schools; therefore, it must be implemented in all learning programmes for assessing learners (R.S.A, GDE. 1999 (c): 13).

The *National Assessment Policy* (R.S.A, DoE. 1998 (b), paragraph 14) states that assessment takes place while learners are engaging with integrated of the learning programme. With this, learners are taught the outcomes and simultaneously; they partially or fully achieve them demonstrating various levels of mastery of the skills knowledge and values.

The *National Assessment Policy* (R.S.A, DoE. 1998 (b), paragraph 21) stipulates that learners with different learning styles can be assessed through CASS at different stages and in various contexts of the teaching and learning process. Information on learner performance entails gathering information through the use of a balanced combination of the method, tools and techniques. Some of them are, group assessment ; group work, assignment, portfolio, project work and self-assessment .The tools should be used in a way that support learners and prejudice them; in any way thus, the CASS model is the mode of assessment in C2005.

Underlying the above discussion is uncertainty as to whether principal; SMTs and Grade9 educators in general fully understand what the CASS model entails. There is uncertainty as to whether there is a common understanding about its applicability, management; principles of continuous assessment, recording and reporting as they relate to the CTAS instrument in the learning Programme: Language, literacy and communication: English Primary language. The mechanics of assessment is complex. It requires a high level of educator competence (Wilmot 2003:313). Decentralisation and self-managing schools increase the pressure on principals, SMTs and Grade 9 educators to comply with new legislation for teaching, learners and assessment. It is thus evident that a discussion of

decentralisation and self-managing school is needed in order to fully understand the management of the CTAS instrument.

The implementation of *OBE, C2005* and the *National Assessment Policy* in South Africa introduces new challenges to principals and educators for which they were not ready. It is thus evident that a discussion of the evaluation of the assessment policy is needed in order to fully understand the management of the CTAS Instrument.

An evaluation report on the implementation of *OBE* and *C2005* by Khulisa Management Services (Pty) Ltd and the centre for Educational Policy Development, commission by the GDE and the Gauteng Institution for Educational Development, highlights problems experienced in South Africa during the implementation of the Grade 9 assessment policy, which relate to the work of principals (RSA, GDE, & Gauteng Institute of Education Development 2003:25-26) The problems are:

- information overload
- too much to do with too little to do it
- educators were unfamiliar with the meaning, definitions and principles associated with outcomes-based assessment, such as authentic teaching and expanded opportunities
- short notice and timeframes for implementing the Grade 9 assessment programmes
- insufficient time to properly plan, organise, guide and control the assessment programme
- assessment circulars from the GDE reached schools late and were unclear and ambiguous
- the GDE made additional changes to assessment circulars after schools had already received them
- the amended circulars did not reach the schools in time, so the amendments could not be implemented
- assessment strategies, which required careful thought and planning were a challenge
- assessment was a tedious exercise
- problems are experienced with assessment as a result of over-crowded classrooms
- assessment required an enormous amount of paper work



The research report by Khulisa Management Services (PTY) Ltd. and the Centre for Education Policy Development indicates that:

- assessment practices in general were not compatible with the provincial assessment policy
- Significant improvement in the way assessment is managed needs to take place in order to make assessment practices acceptable and compatible to provincial frameworks (RSA, GDE. & Gauteng Institute for Educational Development 2003: 47).

According to Killen the Principal should encourage sound assessment practices in schools by:

- becoming knowledgeable in assessment
- removing barriers and obstacles so that the educators own assessment knowledge and skills can improve
- allaying the fears of educators
- providing then resources educators need (Stiggins, 2001;20-22)

Grade 9 mathematics educators faced great difficulties and obstacles with teaching, learning and assessment. With low levels of assessment knowledge, competence and skill development, it was highly problematic for them to manage and implement the CTAS Instrument effectively and efficiently. The problems of assessment are not unique to South African educators. In the United Kingdom teachers experienced numerous problems with the School Assessment Test. Challenges faced by educators in the United Kingdom, whilst implementing the School Assessment Test, which was similar to the South African CTAS Instrument, needs to be discussed in order to fully understand the management of the CTAS Instrument.

### ***School assessment test and its challenges in the United Kingdom***

Some of the problems experienced by educators in the UK with respect to the School Assessment Test are presented here to foreground the possible challenges educators could face in the South African context. The problems are outlined as follows:

- It reduced educator's teaching and learning time in the classroom and
- It created supervisory problems of managing large classes.

## 2.8 SOME GAPS IN THE LITERATURE

The literature that was reviewed in this chapter provided and clarified a number of concepts and issues related to the critical question posed in this study. Most of the literature reviewed emanates from developed first world countries such as UK and USA. However, no literature was found which explicitly presented in a more meaningful way studies of evidence used by mathematics educators to actually make judgments in South Africa.

Even though there is less or no literature in South Africa on mathematics education and CTASs in particular, what is gleaned from literature developed countries cannot be generalised to the South African situation. Politics have been developed in South Africa i.e. Curriculum Development (DoE 1996; 1997; 1998) and it is very early to determine how teachers are actually coping with all this change in learning areas such as life science. Investigative teaching method has been well developed successfully (Crawford, 2002; Jita). This inquiry teaching method has not been seen in other learning areas such as mathematics and science. This could be, however due to lack of resources that would promote this requirement of the enquiry learning and performance assessment. Many researchers and a number of literatures gave a strong suggestion that the strongest weapon for integrating assessment and teaching assessment and teaching is formative assessment. However, formative assessment is understood and interpreted by educators and some of the authors' differently. This contradiction in applying and understanding of formative assessment could largely bring about confusing different feedback by teachers to the learners. While this different feedback from teachers does not exist, they have different potential for promoting and improving students' learning.

During the apartheid era, assessment was limited to measurements of learner's achievements. After 1994, the education system in South Africa has a broader view of assessment. This paradigm shift has put assessment on the spot and today assessment plays an important role in such a way that some authors argue that assessment drives curriculum (Gipps, 1994; Broadfoot, 1995; Murphy, 1996).

The department of Education in South Africa has shown some uncertainty on assessment policy issues. For example in 1999, (The Department of Education, KZN DEC, 1999d,

1999c) announced that the final mark for matriculation (grade 12) will be constituted by the year end examination 50% and school based school based “continuous assessment” 50%. Later on this was changed to 75% examination and 25% school based continuous assessment “year mark”. Grade 9 had to do CTAS (continuous assessment task) section A and section B which is a final examination. At the time of writing this study the number of has since discontinued CTASs. What informed all these changes is not known, however, it signals some uncertainty about policy implementation. The question that still needs to be answered to be answered is that, up to what extent are teachers involved in the development of the curriculum?

In this discussion, attempt has been made to present a literature report on the research topic after a critical analysis of local and international literature, government documents, legislation policies and documents from the provincial department of education, amongst others. The past education system resulted in narrow and inadequate training and development for teachers of different ethnic groups. The evidence from the literature pointed to the fact that they indeed require more intensive training and development because new policies were introduced to transform the education system in South Africa. In the next chapter, discussion on the qualitative research design, data collection strategies, selection of research sites and respondents, data processing and analysis, the researcher as an instrument, validity and reliability of qualitative designs, trustworthiness, and research ethics to investigate the efficiency and effectiveness of the management of the CTAS instrument in Grade 9 will be made.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 INTRODUCTION**

This chapter begins by examining the research problem and the focus of this investigation. The critical questions and issues that guided this study are listed.

We discuss the research paradigm, research approaches and methodology used the content site and sampling under which the selection of schools and teachers is discussed. The description of the school and the data collection techniques used in the study are also discussed.

#### **3.2 THEORETICAL FRAMEWORK**

In the study symbolic interactionism forms the principal component of the theoretical framework. The design and the approach of the research are based on the principal of this theory.

##### **3.2.1 Symbolic interaction**

In 1930s a man by the name of Herbert Blumer described the theory of symbolic interaction. However, researchers who embraced this theory consider Herbert Mead as the ancestral progenitor.

The symbolic interaction is based on three principles explicated by Blumer (1969). According to him symbolic interactionism rests on three simple premises:

- a) Human beings act towards things on the basis of meaning that the things have for them.
- b) The second premise is that the meaning of such things is derived from or arises out of the social interaction that one has with one's fellows.

- c) The third premise is that these meanings are handled in, and modified through an interpretative process used by the person in dealing with the things encounters (Blumer, 1969:2).

When studying human behaviour Blumer felt that the meaning of "things" is often ignored. Blumer suggested that human beings act towards those objects which have meaning for them. In the first premise, he uses the word "things" to mean physical objects, categories of human beings, institutions guiding ideals, activities of others and situations and individual encounters in his or her life. Therefore, shared meanings on the basis of which people are able to communicate and to act jointly towards commonly perceived objects. Symbolic interaction claims that the meaning arises during the process of interaction between people. Blumer (ibid) argues that meaning is created during an active interaction. According to the third premise he highlights the process of interpretation. People are largely characterised by a series of actions among themselves in a group setting. The meaning evolves from each member and other members of the group by interaction. The derived meaning is interpreted. The interpretation of the meaning guides the action of the member towards the other member or objects. (Blumer, 1969:38) stresses that in order for one to understand the "Group life" one needs to be "close to this life." Different objects are interpreted differently and can have different meaning when found in differently defined situations.

From all this then he argues for qualitative research and participation observation in particular. "No theorising, however, ingenious, and no observance of scientific protocol, however, meticulous, is substitutes for developing a familiarity with what is actually going on in the sphere of life under study, (Blumer, 1969) insists that the researcher needs to achieve intimate familiarity" with the group he or she is researching (Blumer 1969 cited in Prus 1996:73). This quotation now brings us to the method of data collection in symbolic interactionism. This statement makes it clear the need and presence of the researcher in the field from where he or she wants to conduct the study.

For data collection (Blumer, 1969:51-52) emphasises a "direct examination" of the empirical world. However, he seems to doubt that the accounts given by the observer are sufficient. He asserts that accounts should be subjected to probing and critical collective discussion by a group of well-informed participants in the given world to

guard against the admitted deficiencies of individual accounts. (Stakes, 1995:64) argues that the interview is the main road to multiple realities." In order to address critical questions in this study we shall use interviews and questioner for data collection. Interpretive paradigm underpins the quality part of study.

Neumann (1997) states that interpretive paradigm is characterised by people constructing their social reality on the basis of interpreting particular situations that apply to them and, therefore, findings cannot be generalised meaning of the data stems from the peoples finding. Events in the interpretive paradigm are discussed in an inductive manner i.e. themes emerge from the data.

### **3.2.2 Qualitative research approach**

According to Cohen (2007) a qualitative style of research is characterized by the following: It focused on interactive processes and events rather than on variables. It is situational constrained and uses thematic analysis to analyse the data. (Creswell, 1998) gives the following characteristics of quality study:

- Data is analysed in different levels e.g. codes, categories and themes.
- The usage of multiple methods to collect data.
- The study commencing with a single focus on an issue or problem but relationship may emerge later.

Neumann (1997) refers to qualitative data techniques as "data enhancers" i.e. they enrich the data enabling the researcher to see and understand the key aspect of the study more clearly. (Prus, 1996:103) refers to qualitative research as a "Study of the way of life of a group of people." One can also identify the following characteristics of qualitative research:

- Qualitative inquiry is distinguished by its emphasis on "holistic" treatment of phenomena (Schqandt, 1994).
- The primary property of qualitative study is the centrality of "interpretation" (Frederic Erickson, 1986).
- It also tries to establish an empathetic understanding for the reader through description, (Geertz, 1973; Denzin 1989).

According to (Stakes, 1995), qualitative research can be participative, holistic, hermeneutic, phenomenological and naturalistic. In order to ensure that this study is participative we made sure an attempt to be always present when we were conducting this research on grade 9 CTAS mathematics class, which also makes the study to be holistic and naturalistic as argued by Stakes.

The aim of this study stated in page 3 in the first chapter of the study is to find answers in the following questions regarding:

- Teachers concern about the role of CTASs
- Teachers' strategies used in teaching mathematics CTASs. What method is used? (e.g. problem solving or investigation application)?

When we conducted the study we tried to be "close" as possible to the situation and derive meaning of the interaction taking place in the classroom, interpret those meanings and arrive at some conclusion.

In order to cater for the triangulation of data we decided that the research instruments would consist of a questionnaire, interview and for the purpose of this study. We considered open-ended questionnaires to be more precise since they were made more flexible and provided the opportunity for more thorough analysis of teachers' responses. The first part dealt with role of CTASs in helping learners to be competent in mathematics. Part two related to educators understanding the role of CTASs.

### **3.2.3 Ethical Issues**

During the course of the research we were often faced with the following dilemma:

- What lengths can research go to investigating their subjects?
- What rights does the subject of a piece of research have?
- How can trust be established or the problem of ethical dilemma starts in the early stages of a research?

At the beginning of the research we started by negotiating the access to the participating schools. We had to give a cleaner explanation of the investigations, we did the following:-

- Give a clear explanation of my intention
- Describe the purpose of the study
- Why choosing the school

According to (Neumann, 1997) a fundamental ethical principle of social research is never to force anyone into participating, participation must be based on voluntary principle such as honesty, fairness, justice, privacy and confidentiality must be kept at all times.

These are very important for legitimacy and authenticity of the research at the beginning of the research during the negotiation for gaining access to school and to teachers. One needs to give a clear explanation of what I (the researcher) intends to do describing the purpose of the study and the decision of choosing those particular schools. However, we hope that dilemmas would be minimal, but when participants (e.g. teachers in the study) are aware of what is being observed they may begin to act unnatural. This then disturbs the naturalistic character of qualitative researcher but, on the other hand, does not reveal or disclose the information about what the research is all about that may be regarded as deception.

Qualitative research requires that the researcher be as close as possible to the situation and have an "intimate familiarity" with the interviewees (Blumer, 1969). Interference with the participants must be avoided as much as possible even though qualitative emphasises "intimacy and familiarity with participants". However, researchers may touch some sensitive issues during their interaction with participants and try by all means to do justice to the study.

We had to be honest and open with educators (Babbie & Mouton 2001: 530). For research to be ethical it should subscribe to the following points:

- Informed consent: the researcher in this instance acquired the relevant permission to conduct the research in schools.



- Confidentiality and anonymity: the researcher did not divulge the identities of educators in the report.
- I sought the educators' permission to audio tape the interviews (Bowling 1997:272; De Vos 1998:25-27; McMillan & Schumacher 2001:421-422).

### **3.2.4 Selection of schools**

We did not make a random choice when we chose six schools. The main concern was with selecting schools that were likely to yield different theoretical insights. We decided to categorise schools according to the different systems that existed under apartheid region.

School C and school D were selected because we wanted to include schools which were designated for Black African students under apartheid. Both schools C and D retained their exclusively African profile after the demise of apartheid. School B and school E belong to the House of Delegates and were exclusively Indian schools; many teachers who teach in school C, D, B and E had obtained their teaching qualifications in teachers training colleges. In those colleges what was taught there was in terms of subject content, regarded as far below the standard of what was offered at universities.

Although schools B and E “so called Indian school” were designated by the apartheid government were disadvantaged but they were better than schools C and D which were designed for only Black Africans in terms of resources.

School C and D as an African township schools were previously disadvantaged, for example, they were undefended as a result lacked physical resources. Learners in these schools received inferior education in the form of Bantu education. These schools were also affected by political violence in the past.

Another criterion that was used in choosing schools was that the chosen schools had to be a functioning school. We used that criterion in order to avoid unnecessary delays, due to absenteeism of educators or learners or school starting late and close early. In order to ensure anonymity, confidentiality and to enhance co-operative of educators the schools that we selected were given pseudonyms (A, B, C, D, E and F).

### **3.3 DATA COLLECTION STRATEGIES**

During data collection we used interviews, observations and document analysis as research methods. We chose the above methods because of their popularity, flexibility and compatibility. All of the above methods are good because they bring about personal contact and interaction between myself and the educators interviewed. We also used unstructured and semi-structured interviews for gathering data from educators.

Interview method has a number of advantages; in cases where there was misunderstanding we were more than willing to repeat the question for clarification.

#### **3.3.1 Interviews**

According to (Vockell & Asher, 1995) an interview is structured so as to enable those who are being interviewed to give information to the researcher. Cohen (2007) argues that there are some disadvantages with interviews. Disadvantages are:-

- The one-to-one method takes more time than questionnaire.
- The presence of researcher may intimidate the interviewee and spontaneity of the interviewee may be reduced to large extent.
- There is no anonymity and so the willingness to be completely frank and honest might be reduced.

There are three categories of interviews, namely:- structured, semi-structured and unstructured interviews.

In the study, it was decided to use both semi-structured and unstructured interviews. (Cohen, 2007) describes semi-structured interviews as interviews in which the interviewer prepares an interview schedule and is guided by it during the interview process but, also uses probes and prompts in between should the need arise. Confidentiality was assured to the interviewee in terms of the response they gave as well as their identity.

(Eisner, 1991:38) warns about interviews and states that conducting a good interview is in some ways, like participating in a good conversation: listening intently and asking

questions that focus on concrete examples and feelings rather on abstract speculations, which are less likely to provide genuinely meaningful information.

Eisner further suggests as follows. It is usually better to focus the interviewees' attention on things they have done. It is often useful for researcher to ask teachers to explain something they said in class (p183-4). There is a strong suggestion from many authors that a qualitative researcher should by all means establish a rapport with the interviewees (Yin 1994; Hitchcock & Hughes, 1989). Deeper and more meaningful information can be achieved if the researcher can develop good relationship with people that are being interviewed.

### **3.3.2 Response rate and completeness**

Respondents could freely take their time when answering, we gave no time limit. We ensured that all answers were completed. We had full control of the order of questions we asked. If we were not satisfied about the response we were able to go back until we were satisfied about the response.

Since we were using audio take we encouraged spontaneity since answers cannot be retracted once they have been uttered. We did not only record what the respondents were saying but we also assessed non-verbal behaviour of respondents on my note book. We also made sure that privacy and silence prevails all the time during interviews, by carefully choosing a suitable environment.

Prior to the fieldwork we sought the necessary permission to conduct the research from District manager, Circuit manager, Principals and Educators.

We decided to start negotiating from the bottom of the hierarchy: this is from the educators through the principal up to the district manager (see appendix). The main reason for doing this was to gain trust of the educators and to confirm his or her status in the research as the main actor. The top-down negotiation could cause resentment from educators.

We started formal negotiations with phone calls to set appointments to meet the educators. At these initial meetings we described the topic and the purpose of the research, we assured all educators involved in my research of confidentiality and anonymity. All educators involved were very happy to participate in the research.

After negotiating with the educators we then phoned the principals setting appointments to meet them. At my meetings with the principals we brought the official letter seeking permission to do research in their schools (see appendix), the purpose and topics were explained to the principal. The final and last part of negotiations was with the district manager.

After so much deliberation trying to set an appointment with him we succeeded, we handed an official letter asking for permission to do research together with a letter from university from my supervisor (see appendix). We were very lucky the district manager did not have any problem. He allowed me to proceed with the research (see appendix).

All the interviews were tape recorded with the educators consent. The tape recording of an interview produced the most complete record of what educators said. We then transcribed all the interviews according to the questions and follow ups emerging from issues related to the topic, for subsequent analysis even though we used a tape recorder we still took notes, we wrote down key points, to complete the data already captured on the tape recorder.

While we know that we were focusing on grade 9 CTASs assessment we were at liberty to adopt a particular conversation style and develop a discussion and ask spontaneous questions in order to get a deeper understanding about my topic. We started the interview by asking educators to describe their biological details, their experience as well as their knowledge of grade 9 mathematics CTASs, their perception of mathematics CTASs.

We asked them to describe their experience in grade 9, and their position in the school. The following main aspects were covered:-

- Strategies promoted by grade 9 mathematics CTASs

- How the strategies assist learners
- Group work: how they felt about it
- Grade 9 certification, if grade 9 mathematics CTASs prepares the learners for job opportunities, if exiting in grade 9 succeed
- Integration of mathematics with other learners areas
- Grade 9 mathematics CTASs prepares learners for grade 10 mathematics
- Educators role, if the educators understand their role in grade 9 mathematics CTASs learning.

At the end of the interview, we requested the educators to reflect on the whole conversation and to add what they want to add on the topic. Finally, we ended the interview by thanking all educators who participated in the study for their participation and qualitative comments. For data collection and triangulation we also used observation method and the discussion of this method follows.

We selected school A because of it being a newly racially-desegregated formed White school. School A was well resourced almost all educators had university degrees. We chose school F a racially integrated private school. Even though school A and school F were both White schools, but were different in terms of enrolment. Like many private schools, school F entered the matric examination run by the Independent Examination (IBE).

Finally, school F had an established Christian ethos that strongly cut across all its programmes. All the schools that we had selected namely school A, B, C, D, E and F could be reached by taxi or on foot.

It was going to be the best site if the study was about dysfunctional schools. The criterion which guided the selection was that the school had to be functional school. For example, school A and school B there was a school that we had chosen, but because of the problems that are facing the school such as absenteeism of learners, problems among the staff and also problems that are outside of school so we had to live out that school as this was not at all going to fulfil the purpose of the study. It was going to be the best site. We could have included the school where we were presently teaching, but

we decided that the school at which we were teaching would not be used as a researcher site, since biased information could have compromised the study.

To ensure anonymity and confidentiality selected schools were given pseudonyms. The schools in this document are referred as school A, school B, school C, school D, school E and school F.

### **3.2.3 Observation**

In addition to the interview method we also used observation method for data collection. We wanted to observe the following:

- Physical objects, such as desks arrangement.
- Teachers' organization of CTASs section A lesson.
- Pace and time allocation in all activities in section A of CTASs.
- Classroom relations, how learners work in those activities which requires group work.

We used an open observation method and recorded what an educator was doing, his or her actions and gestures, how he or she presents each task on CTASs and how he or she interacted with learners. Our observation was completely overt, as participants as an observer but we did not take part in the teaching process. At the end of my observation we always asked the educators about some things we had observed such as the arrangements of desks and the reason why learners were grouped the way we found them.

After the initial ice-breakers, the proper interview focused on the following:

- The positive aspect of Section A.
- The positive aspect of Section B.
- The negative aspect of Section A.
- The negative aspect of Section B.
- The impact of the CTAS Instrument on grade 9 mathematics achievements by learners.
- The recommendations for improving the CTAS instrument.

Probes were used as methods of questioning in order to get complete response from educators that were interviewed. Unstructured schedules were used to question all the educators who formed my study. The schedules served as logical and systematic guides for sequential questioning and to keep the interview on track by focusing on the predetermined aspects for investigation and keeping the interviewer's bias to a minimum (Sarantakos 1998:247).

### **3.4 PRESENTATION AND INTRODUCTION OF SCHOOLS AND TEACHERS**

#### ***Introduction***

In the next few pages we shall introduce the schools and teachers who participated in the study. Perceptible differences were noted during the process of data accumulation. Major factors which contributed greatly to the differences noted at these schools were the physical structures and layout of the buildings, the educators, student's body and curricula activities.

#### **3.4.1 Presentation of case studies**

##### ***3.4.1.1 Case study of school A***

###### ***Context and profile***

School A is a large co-educational high school. During the time of data collection the school had a student body of 1089. It is located in Scottsville area approximately 3 km from Pietermaritzburg city centre. The school opened its doors to its first pupil on 23 February 1960. At the beginning school A was only opened for boys only. After some years this culture changed and the school admitted boys and girls. School A was a model C school for whites only during apartheid era and for that reason school A had to be located in an area designated for Whites according to the group areas act enacted by the apartheid regime.

Significant changes took place in school A in response to the demands of "new" South Africa. In June 1991 the first black pupil was admitted in school A, and gradually as time goes by, Indians, Africans and Coloureds were admitted in large numbers and the school turned out to be a co-educational which reflects a non-racial non-sexist society.

School A also had the boarding establishment: this boarding establishment was built in 1966. It catered for boys. During data collection this facility could only take 120 boys as well as members of the staff, a superintendent of the boarding. School A is a very large beautiful complex with several double story's tranquillity and good management prevails in that school. Punctuality of learners and teachers is excellent and as soon as classes are in progress no learner would be seen moving around the premises aimlessly.

During the time of data collection school A had 1089 learners, 24 educators and 13 S.G.B employed educators. Members of the non-teaching staff are 15 this multiracial school consist of 1 principal, 2 deputy principals and 4 head of departments. At the time of data collection in term 3 learners figure stood as follows:

**Table 3.1: Number of learners per grade in school A**

<b>Grade</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>Total</b>
Number of learners per grade	221	206	237	235	190	1098

School A is also famous for excelling in metric results. The school has 80 classrooms. The school has 5 laboratories, 2 for life sciences and 3 for physical science. The big library is well equipped with 2 librarians. The school has 26 computers with internet connections.

School A has a large school hall a well-established administration block with 3 receptionists and a financial department with 4 staff members. What is also remarkable in school A are the huge well equipped sporting facilities catering for all sports, a large well maintained swimming pool. School A has a top marimba band in Pietermaritzburg.

Mr. A1 is a married man between the ages of 46 and 55. During the time data of collection he had the following qualification; a BSC degree and HDE measuring in mathematics. Mr. A1 is an HOD of school A. All mathematics teachers in school A teach all grades from grade 8 to grade 12 and mathematics literacy included. In school A learners in grade 9 are allocated in their sections according to their performance.



Grade 9 A consists of learners from position 1 to 39. e.g. This is a class for brilliant learners.

Grade 9 B position 40 to 79.

Grade 9 C position 80 to 191.

Grade 9 J position 120 to 159.

Grade 9 L from position 160 to 199.

Grade 9 M which is regarded as the poor class from position 200 upwards, and this class is regarded as weaker class. Mr. A1 has taught grade 9 Mathematics for more than 10 years, he has taught CTASs from the time they were introduced.

*i) Mr. A1's teaching style*

Mr. A1's classroom is huge and learners are divided into groups of 10, the desks are huge and different from other classroom in Mr. A1's class.

The front of the classroom had a chalkboard and a long demonstration bench. The bulletin board is full of posters most of them designed by learners themselves.

Mr. A1 was still busy with CTASs during the time of data collection. Mr. A1 introduced his lesson by first recapping the first stage of drawing a South African flag. Mr. A1 first wanted to make sure whether all learners managed to do the preliminary stage of drawing the flag. Since his learners were few he managed to check the work from all learners, and to those who were still struggling he managed to bring some clarity to their problems.

When Mr. A1 was satisfied about first steps of drawing a flag, he went on and explained how other steps need to be accomplished. Mr. A1 gave me permission to move around the class and see what problems that they were doing but according to my study I was only an observer and not allowed to engage or teach the learners. Mr. A1 was able to link all the first step of drawing a flag with previous one by summarising all preliminary steps, until he showed them how it should look like when completed. The learners were required to do the activity on designing and drawing a South African flag (refer to appendix F).

Mr. A1 was the only person who was moving around and learners were not allowed to interact, they could not look around and see what their peers were doing. In school A learners were not allowed to take CTAS section A out of the class or do it as homework or take it out and do it at the library. When the bell rings at the end of the period Mr. A1 collected all CTASs, the reason he gave me was that they are avoiding coping, and that different school do CTASs at different pace. At school A CTASs were conducted towards the end of the year, 3 days before exams. The last activity was completed towards exams, the reason given was that learners would still remember what they did in section A during exam time. When learners were experiencing problems in some areas of the activity, Mr. A1 used the chalkboard to highlight problems that were asked by different learners.

When Mr. A1 asked questions, he gave his learners enough time to answer, his waiting time was long enough for learners to get a chance to express themselves. Mr. A1 did not want his learners to answer in a chorus form and learners enjoyed expressing themselves individually.

Mr. A1 called his learners by their names he knew them well. He encouraged his learners to try and solve as many problems as they could, he only intervened when a learner raised his or her hand. His style of questioning was quite good and effective. He made it very simple for his learners to attempt most the hard activities. However, Mr. A1 did not encourage group work he felt it creates dependency.

### *Assessment of learners*

Mr. A1 assessment was comprised of class work, homework as well as assignment. Most of grade 9 syllabus was completed during the second term in order to accommodate the arrival of CTAS. Mr. A1's questioning style was more effective learners were not intimidated by him this created a good friendly environment. Learners were fully engaged and were also involved in creative thinking. In Mr. A1's class most learners were confident and not shy to participate in any discussion.

Mr. A1 dedicated most of his time to his learners especially those who were struggling, marks were recorded and he did some follow up to those learners whose scores were low and he organised intervention programme in order to assist his learners.

## **Mrs. A2**

The context and profile for Mrs. A2 is similar to that of Mr. A1. Mrs. A2 is a married woman between the age of 30 and 40. Mrs. A2 has a diploma in mathematics and an advance certificate in mathematics. She has taught mathematics grade 8 and 9 mathematics grade 10, 11 and 12, and mathematical literacy grade 10, 11 and 12.

### **ii) Mrs. A2's teaching style**

In school A most of the class that we had conducted and observed were traditional, in arrangements. Desks were arranged in rows, but learners were divided in groups of 3. In grade 9 where most of activities required group work, Mrs. A2 limited his group to 3 and not more. In school A it is a norm that CTASs are only done in class and after the lesson they were collected and locked in a safe place. All activities and tasks were done under the supervision of an educator, where group was required Mrs. A2 divided his learners into groups of 3 for the purpose of discussion, but the work was done individually.

Mrs. A2 used to allocate his learners problems that they had to do and discussed with the whole class. When learners arrive in class they already had tasks to perform. This method was good because it engaged all learners, every individual had something to do, but on the other hand, it had its shortfall it contributed to banking and absenteeism especially for those learners who cannot manage to do the problems and also shy to face the class.

Mrs. A2 was only left with activity of drawing the South African flag. Mrs. A2 started the activity by drawing attention to the learners, the importance of a national flag as well knowing the national anthem. Mrs. A2 explained all the steps and processes that learners need to follow to draw the flag, steps were clearly explained in the CTAS section A. The learners enjoyed this activity and Mrs. A2 had a chance of dealing with learners individually, what made it easy for her was that learners were very few in each class.

In school A learners sat in a class according to their performance. Learners with high scores in tests and perceived to be intelligent were placed in section A then followed by section B up to section M. The reason for grouping learners according to their scores

was that they wanted learners to learn according to their own pace so that clever learners were not delayed by slower learners.

There was excellent interaction between learners themselves and their teacher as well. Mrs. A2 used the chalkboard most frequently and also spent the time with all groups, this was possible because of small classes. The activity of drawing a flag is shown in appendix F.

### *Assessment of learners*

Mrs. A2 used a variety of assessment test, class work, homework and assignments. Mrs. A2's assessment had a formative component as well as summative components. Mrs. A2's questioning were more effective for a number of reasons, learners were fully engaged when they were involved in creative thinking. Learners were not shy to stand up and answer individually. They were all fully involved in the discussion. Mrs. A2 was very patient with her learners she gave them enough time to answer. Mrs. A2 also used past years question paper i.e. section B of the CTASs.

In school A they made it a norm to complete grade 9 syllabus during the first term in order to accommodate CTASs. In school A they tried to push CTAS section A close to the final exams, they did not rush to complete section A because they wanted learners to be able to recall what they did in section A which is assumed to be similar to section B.

### **3.4.1.2 Case study of school B**

#### *Context and profile*

School B is situated in Northdale which is a big Indian suburb in Pietermaritzburg. School B is situated in an area where most of the people work around neighbourhood with few professionals mainly nurses and teachers. The area is surrounded by factories where parents of learners are employed. There are many schools not far away from each other in Northdale where some of the parents of school B children work. Just on the vicinity there is a big provincial hospital and some police stations where parents of school B learners are employed.

Many houses that surround school B were constructed by the city council of Pietermaritzburg as part of a sub-economic housing scheme. Existing dwellings have been changed and some additions have been made over the years and old dwellings looked so different from the old economic housing scheme. In addition houses exist which have been erected by their owners.

Three kilometres from school B, is a beautiful Protea sports complex which is well maintained. This facility provides many different codes of sports for Northdale children.

***A. Physical structure of school B***

School B has a well-equipped library and administration block, well equipped laboratories and three double storey buildings. During the time of data collection, a new staff room, four classrooms and stock room were being constructed.

***B. Student body***

C. During the time data was collected the school had 1221 learners, 44 educators and 3 secretaries, five cleaning staff and one security guard.

***D. Teaching staff***

The teaching staff of 44 educators was made up of the principal, 2 deputy principals and 5 head of department and 36 post level 1 teachers. School B is famous in Pietermaritzburg for its good results almost every year. Table 3.2 shows the total number of grade 9 learners in school B during the time that data was collected.

**Table 3.2: Total number of grade 9 learners in school B**

Section	Girls	Boys	Total
A	22	16	38
B	18	21	39
C	20	19	39
D	18	21	39
E	19	20	39
			192

The school has 55 classrooms with an average of 39 learners, 2 computer rooms with 20 computers each and 10 computers in the administration building. Mr. B is a married man between the ages of 47 – 57. He has the following qualifications HDE and metric. He had an experience of 15 years teaching mathematics. He attended 4 inset courses on mathematics. He also took part in extra-mural activities. We visited Mr. B for five days for classroom observation.

### Mr. B's teaching style

Like most teachers Mr. B started his lesson by asking for homework, but what was surprising Mr. B did not check whether learners did the homework or not. Mr. B was teaching about graphs, straight line graphs, parabola and hyperbola. When he asked a question, he never gave learners a chance to raise their hands, but he simply pointed at one learner to go to the chalk board to draw a graph of  $y=2x$ . Mr. B corrected the boy, as he went to the board and drew the following table:-

**Table 3.3: A graph of  $y = 2x$  drawn by a learner**

X	3	2	1	0	-1	-2	-3
Y	6	4	2	0	-2	-4	-6

We observed that Mr. B did not explain how and where he got the numbers and how he substituted for  $y$  and  $x$ . He continued the lesson giving more equations.

Mr. B pointed at another boy to try and do the next problem, the learners laughed it seemed as if they knew that he could not do the next problem after number one was not even explained. Just like the first boy the second boy simply drew a rough sketch and could not explain how he arrived at his answer. Mr. B asked another learner to give it a try, this time a girl. The learner managed to get the problem correct according to Mr. B. What we observed was that Mr. B was not interested to explain to the learners and give feedback and explain where other learners went wrong.

The educator did not ask for any learner to do question 2, but without any feedback or notification he introduced fractions. Mr. B wrote the following equations 1.  $y=x$ , 2.  $y=2x$

and 3.  $y=1/2x$ , he also drew the sketches for each graph on the same axis and again he did not explain why the shapes were different.

In Mr. B's class there was no interaction at all between learners as well as between Mr. B and learners, he did not even try to create a relaxed atmosphere but where he was supposed to explain he simply gave the answer and did not give learners a chance to respond, this might have caused learners to keep on making mistakes. Mr. B controlled his learners by simply asking questions and pointed at any learner randomly. Learners looked nervous because they were scared at who was going to be pointed next.

### *Assessment of learners*

Mr. B used a variety of assessment such as class work, homework, class test, informal questioning and CTASs from previous years. From the beginning of the year up to September they wrote 3 control test and a number of mini tests. Mr. B used previous year's CTASs from 2006. Mr. B tried to pick up common questions that are always asked every year with the hope that these questions might be repeated.

Just like all schools that I have observed, all grade 9 educators hoped that by completing and drilling section A of CTASs, then maybe section B of CTAS will be similar to section A. They actually used CTAS section A as a syllabus.

### **3.4.1.3 Case study of school C**

#### *Context and profile*

School C is a co-educational school and it is situated at Edendale 10 km away from Pietermaritzburg city centre. It is a public school which serves a working class community. The school started on the second of August 1956. Originally in this area Blacks, Indians and Coloureds were all staying together up until the introduction of the notorious group areas act enacted by the apartheid regime in 1950. At the beginning the school was a vocational school catered for students needing skills and only skills such as brick-making and build, carpentry, upholstery, sign writing, basket making and weaving were being taught. The big section of the school became independent of the college in 1994, and subjects such as mathematics, physical science and business studies were introduced.

The parents of learners in school C work mainly in offices, schools, domestic workers and factories. Learners attending school C were all Africans and their main language was isiZulu. Appendix F contains a copy of the enrolment for school C for 2009. During the time of data collection the school had 1302 enrolment with 43 educators including the principal, 5 head of departments and 7 non-teaching staff. Since grade 9 forms part of my study table 3.3 shows the enrolment for grade 9 for 2009.

**Table 3.4: The enrolment for grade 9 for 2009 in school C**

Section	Boys	Girls	Total
C	18	25	43
F	17	25	42
G	19	24	43
K	22	18	43
M	22	01	44
S	23	20	43
Y	22	16	38

The school has 32 classrooms and 7 classes for grade 9. Information about other classes appears in appendix H. School C has one teacher for grade 9 mathematics and Mr. C takes all the 7 sections mentioned above. The time table for Mr. C is also included in appendix C. School C has one double story building and the administration block is found in that double storey. Formally, school C was a boarding school, besides the double storey building there are many buildings scattered around and all residence has been converted into classrooms. There are 32 classrooms, 2 classes are used as computer rooms, a well-equipped library which uses to be a dining hall, and very big hall which is used for meetings, examinations and is also used by the community for different events.

Each classroom can accommodate a maximum of 40 learners. The laboratory is not well-equipped. There are also blocks of workshops for motor mechanic, plumbing, woodwork and 2 classes for technical drawing. The school has vast sport field. Mr. C was not married during the time of data collection and his age range was between 25-30



years. Mr. C had a teaching experience of 3 years, during the time which the data was collected and had taught mathematics for 3 years. When the data was collected Mr. C had no qualifications in education, but had a BSc degree with physics and applied mathematics as his majors.

Mr. C was taking 7 classes only grade 9 during the data collection, refer to table 3.3 for Mr. C grade 9 classes. The distribution of his load is indicated in appendix G (Mr. C's time-table).

### **Mr. C's teaching style**

We were fortunate to observe 5 different activities in Mr. C's classroom. I was lucky to find Mr. C still busy with CTAS section A. Mr. C's classroom was arranged in an OBE style, the desks were arranged in groups according to learners performance. The first group of learners was made up of 10, those who were getting 80%-100% and the middle group until the poor group whose desks were at the back of the classroom.

We asked Mr. C the reason for arranging learners according to their performance and he said he wanted to pay more attention to the so called poor achieving group which was situated at the back of the class. Mr. C was busy with task 3 "human rights" activity 1 access to clean water. Mr. C read passage for learners found on page 12 of 19 about human rights contained in the Bill of Rights: The right to have access to adequate housing and the right to have access to sufficient food and water.

Mr. C told his learners to read the instruction found on page 12 of 19 of the CTAS section A of 2009 and he asked them to do the activity. Mr. C was rushing to complete the CTASs so when learners completed the activity he quickly marked it and recorded and the marks same time. If the learners got the activity wrong then they were not given the second chance and the group mark was recorded as it is. However, there was a lot of interaction in the class among different groups. All groups were working together but do the writing individually.

They were referring to each other which resulted from each group getting the same marks. That is a problem of working in groups where one or two dominant or top learners doing all the work for other learners. Most of the schools that we observed had

allowed learners to take their CTAS section A home or out of the class and different school were completing CTASs at different pace, making it possible for learners to share the answers beforehand.

On the last day of observation in Mr. C's class, learners were busy with activity 2 Mr. C asked the class if they attempted activity 2 on patterns and the so called list poor achiever group raised their hands to indicate that they had completed the activity. During that day Mr. C had forgotten his memorandum (teachers' guide) at home, but luckily we had my teachers guide. To Mr. C's surprise the so called poor group at the back of the class had attempted the question and were ready to do the problem on the chalk board. The group must have done their work well and they attained all the answers right and gave a good explanation as well.

The problem was that Mr. C did not trust their working and he could not refer to the memorandum because he had forgot it at home, so he went to the chalkboard to do the problem most unfortunately, he was stuck and he requested the class to leave the activity for the other day. Learners as always expected were so amazed to see their teacher getting stuck, they actually all laughed at him. When the class had left we had our talk and we showed him the memorandum (teacher's guide) that we carried and I also indicated that the group was right with their answers.

### **3.4.1.3 Case study of school D**

#### **i) Area in which school D is situated**

School D is a co-educational school and it is located in the Edendale area, about 7 km away from the city of Pietermaritzburg. The area of Edendale where school D is situated has been developed and has better services than during the time where Edendale was reserved by the apartheid regime in 1950. Edendale was mainly for Africans according to group areas act perpetuated by the apartheid government. Although this area is urban it still has facilities, which are very much inferior when compared with Whites, Indians and Coloured residential areas. Before group areas act Blacks, Indians and Coloureds were staying together harmoniously.

The area in which school D is situated is made up of people ranging from working class to middle class and professionals (Teachers, Nurses, Doctors, and Lawyers etc.) Many residents work in the city or in the neighbouring factories. Edendale area is known as the place of Christians (amakholwa) and many people own land and were born and bred in the area.

**ii) Physical structure of the school**

School D was built in 1994 and it is one of those new secondary school built to assist the two crowded high schools around the area of Edendale. School D consists of a triple storey classroom block. There is also a big Hall around the vicinity. The laboratory is found on the ground floor of the double storey.

The school has 35 classrooms each with a maximum capacity of 40 on average. There is a library which is poorly stocked and the laboratory which is simply a class and only one demonstration table for a teacher. Facilities for extracurricular activities at school were non-existent. The school hall is used only for meetings. The reason for lack of sport field in school D is the limited availability of space.

**iii) Teaching staff**

During the time of data collection school D had 38 educators including the principal, one deputy principal and 4 Head of Departments. All the teachers at school D were qualified teachers with diplomas and bachelor degrees.

**iv) Student body**

There were 998 pupils at school D when data was collected, 530 boys and 408 girls. The following table is the distribution of grade 9 in 2009 which forms the part of my study on grade 9 mathematics CTAS.

**Table 3.5: The distribution of grade 9 in 2009 in school D**

Section	Boys	Girls	Total
A	24	17	41
B	14	21	35
C	26	12	38
D	23	15	38
E	18	21	39
	105	86	191

### **Introduction of Mrs. D**

Mrs. D is a married woman between the age of 44 and 48. She has the following qualifications: teacher's diploma and matriculation, during the time of data collection she was offering mathematics in grade 9.

### **Mrs. D's teaching style**

Mrs. D's classroom was a traditional classroom with rows of desks. The front of the classroom had a chalkboard, on the bulletin board at the back of the class there was a cleaning roster with the same names of girls divided into groups of 8 for cleaning the class, boys were not included in the cleaning of the classroom list, and this says something about the gender equality in Mrs. D's class.

The following discussion is based on my visit to Mrs. D's school for collection of data interviews and lesson observation the analysis will deal with the entire lesson we had observed. The timing for the visit was good because we would have loved to observe Mrs. D teaching of section A of the CTAS more than anything, but she was not ready to teach any activity on section A of CTAS during my visit. Mrs. D decided to choose a topic on statistics as a revision for section B of the CTAS section A. Mrs. D started her lesson by asking a question "what is statistics?" we expected that she was going to ask for any homework or any work on CTASs, but I could not see any CTASs in the class.

We observed Mrs. D teaching statistics and patterns. What was obvious in this lesson was that the learners enjoyed the application of statistics and they demonstrated that when they participated by going to the board to complete the tally and frequency table.

At the beginning learners struggled with terminology and meanings, even after doing this activity Mrs. D did not explain the question she asked the learners at the beginning “what is statistics?” and she did not explain the use of statistics and the importance of it, when and why it is used. In section A of the CTASs of 2009 there was an interesting task 1 on democracy, participation in the national election, learners were expected to go out and collect data about elections. Activity 2 was about summary and analysis and presentation of data.

This section linked well with statistics, we were expecting that Mrs. D will use this activity and refer to it in preparation. We requested her if she could teach this activity or any activity of CTAS, but it could not happen and after few visit’s to the school she did not turn up, but at least we were able to observe her lesson on statistics for three sections of her grade 9.

Mrs. D’s school is one of the dysfunctional schools; all learners were standing on the verandas some moving around for the whole day. Mrs. D was the only teacher who was in class and learners were not banking her class. When we asked her about the set up in the school she told me that if teachers do not go to the classes the learners would stand outside and she said this is the order of the day in her school.

In the absence of any volunteers Mrs. D pointed at the girl who was sitting in front. She responded in isiZulu “it is collecting of things” Mrs. D could not comment on that response she looked for another learner and she pointed at the boy who also responded in isiZulu and said statistics is about starting a new business all learners who attempted to respond could not give the correct answer and all the learners who responded did so in isiZulu. After many attempts Mrs. D started teaching the topic without answering the question she had asked the learners, she could not define the word statistics, but she simply wrote a problem on the chalkboard.

Mrs. D left the class for a while and she brought some photocopies she made from the book. Copies were distributed to the learners and I was also supplied with a copy. From my observation this topic was done before the only problem was that learners can do the application but did not seem to understand what statistics is, why it is done, and what the use of it is.

Mrs. D wrote the following on the board;

Activity (statistics)

5 6 4 8 5 1 2 9 5 6

2 3 3 4 9 7 9 2 3 1

5 4 6 10 9 6 7 6 5 6

Set up a frequency table and answer the following:-

Which mark appears most frequently? (5)

Which test marks appears least frequently? (10)

How many pupils scored 9 out of 10? (3)

How many pupils scored 50% or more? (19)

Before learners attempted the above activity Mrs. D reminded her learners about drawing the following table which the learners recalled well, and together with the learners managed to complete the following table. However, they did well but Mrs. D could have done it better using the example which was on CTAS grade 9 CTAS of 2009 which was about voting and elections and also CTAS section B of 2008, page 8 of 11 question 6, soccer statistics about the clubs that they were familiar with. From the above activity Mrs. D's learners managed to do the following table:-

**Table 3.6: Activity done by learners in school D**

<b>Point gained</b>	<b>Tally</b>	<b>Frequency</b>
1	ii	2
2	iii	3
3	iii	3
4	iii	3
5	liiii	6
6		
7		
8		
9		

### **Assessment of learners**

Mrs. D had a collection of different Mathematics books at the long shelve behind her classroom. Mrs. D used assignments and class work as a form of her assessment. However, very little was written and marked in learners work books. What was also very obvious was that the school was seriously dysfunctional, only Mrs. D's learners entered the class when the bell rang, she was the best teacher compared to what I observed in that school. Mrs. D had very little of the work recorded, my wish to observe any CTASs done or taught was in vain.

If my study was about dysfunctional schools, school D was going to be the best candidate for my research.

### **3.4.1.5 Case study of school E**

School E is situated in Pietermaritzburg just at the bottom of the town. The area in which school E is situated may be classified as working class neighbourhood with few professionals. School E was a school of Indians only during the apartheid regime and after 1994 it was opened to all races. The children from school E come from different areas of Pietermaritzburg.

**i) Physical structure of school E**

School E has 3 double storey buildings housing the classes, the administration, library and staff rooms. The other double storey is for trade such as motor mechanic, plumbing, technical drawings and laboratory for physical science was not well equipped which is found next to the workshop. Grade 9 classes occupies the temporary buildings on the other side of the workshops.

During the time the data was collected the school had 1055 learners, 38 educators and 6 members of non-teaching staff. Learners attending school E were Indians, Coloureds and majority of Africans. The teaching staff of 38 includes 1 principal, 2 deputy principals, 5 Head of Departments and 30 qualified teachers. The following is the table of grade 9 learners in 2009:-

**Table 3.7: Grade 9 learners in 2009 in school E**

Section	Boys	Girls	Total
A	20	20	40
B	19	23	42
C	18	22	40
D	20	20	40
E	16	24	40
			200

The school has 28 classrooms with a maximum of 40 learners. The library which looks decent but not well stocked is included in the triple storey building. Mr. E's time table is included in appendix K. According to Mr. E they did not have enough text books for all learners however he used a variety of resources.

**Introduction of Mr. E**

Mr. E is a young man between the ages of 25-30. During the time of data collection he had the following qualifications; BSC and PGCE (Post Graduate Certificate in Education). Mr. E had more than 3 years teaching grade 9 mathematics. During the time



of data collection he was offering mathematics literacy to grade 10 and 11 mathematics to grade 8 and 9. His time table is summarised in appendix K.

### **Mr. E's teaching style**

During the time of data collection Mr. E had already completed CTASs and he was busy preparing for section B exam which is an examination. We observed Mr. E was teaching patterns, he was using an abstract taken from mathematics section B CTAS of 2008, this was from the past question paper. We managed to observe four classes. According to Mr. E they had already finished section A of CTAS and they were busy with preparations for section B.

The general trend from all schools that we had been observed and from 14 teachers that we had interviewed was that section A was used as a guide for preparing for section B, also past years section B which is an examination also serves as a guide. Every time when we asked the teacher "why do you teach this topic?" the answer would be that this came out in 2007 or 2008 or 2006 section B. Mr. E was doing a question taken from page 5 of 11 section B question 3.

Some learners had already had filled in the table, while other learners were busy coping from others. The teacher had the same table on the board and learners who were ready went to the chalk board and filled in the table. This style of going to the board and fill in the gaps had one bad thing, learners who did not do anything had an opportunity to copy. We asked Mr. E how he conducted CTASs section A. Were the learners allowed to take CTAS out of the class. Mr. E responded by saying "yes of course, why not", the problem of taking CTAS section A out of the class and do it as a homework encourages copying especially the pace of doing CTASs differ from school to school.

This activity was easy for learners especially 3.1 the completing of the table because the pictures were there. Learners began to battle to do arrangement 4. Mr. E did not wait long enough to see if the majority of learners understood the work, if one or two learners answered correctly, he moved to the next question. If the most trusted two learners could not get it right this time, Mr. E simply went to the chalk board and did the solution.

What we also observed was that just like in question 3.1.2 when learners gave the answer 64, Mr. E did not care to actually find out how they would get 64. In question 3.1.4 a learner by the name Thandeka gave the answer in isiZulu. Thandeka said “4 *kuwowonke*” Mr. E said to me it always happens that learners respond in isiZulu, the reason being that he was also Zulu speaking. “They do so if they find it easy to do that but I do not know what they do to the teachers who speak English.”

In question 3.1.4 Dawood and Thandeka had difficulties in answering the question, and the whole class could not respond as a result the whole class was quiet. In the absence of an answer Mr. E gave feedback for 3.1.4, total number of tiles in the  $n^{\text{th}}$  term is  $= n^2$ . This was an active class one learner by the name Siphon asked Mr. E what is “n” arrangement, what does it represent.

Mr. E battled with this one and he said the answer will come out in 3.1.5, he asked a boy whose surname was Xulu to go and do this problem on the chalk board at the beginning we thought he wanted me to do the problem, we did not realise that there was a learner with the surname as mine, Xulu went to the chalk board and did the problem as follows:-

$$\begin{aligned} 3.1.5 \text{ T.N.T} &= n^2 \\ &= 100^2 + 4 \\ &= 10004 \end{aligned}$$

### **Assessment of learners**

Mr. E was a very creative teacher, learners also liked him and his subject. He used a variety of assessments, instrument tests, class work and assignments. All the work was recorded and this was as a promotional mark for learners.

His main problem was the number of learners, which made it difficult for him to give individual attention that is why he was moving fast as long as he got a response from 2 or 3 learners. Most of his revision question and exercises were taken from past years question papers section B of CTAS.

### **3.4.1.6 Case study of school F**

#### **i) Area in which school F is situated**

School F is a Christian private school for boys and girls starting from grade R to grade 12. School F is located at the beginning of the city of Pietermaritzburg in a suburb area that used to be a white group under the apartheid regime. School F is part of a larger establishment, which includes a co-educational pre-school, grade R, co-educational primary school and high school. So it starts from pre-school up to grade 12.

Just like all private schools, school F has a wealth of resources per learner. The school fees is very high, so the parents who sent their children to school F are rich enough ranging from professionals, business people, doctors and department official government ministers. School F was originally a model C school and was later bought by the Anglican diocese of Natal. This was all the vision of the late Bishop Mkhize, Bishop Suffragan of Natal who from 1980-1990 had dreams and visions about having a type of primary school for African children. He proposed a resolution at the Synod of the diocese of Natal in 1984, asking the diocesan trustees to establish a church school and his was enthusiastically accepted.

The school consisted of vast buildings some of the buildings are common areas between the pre-school, primary school and the high school, school F has a boarding facility and some of the buildings are school dormitories for boys and girls. The school has after care facilities as well, just like most private schools with Christian character and ethos, the school had a chapel around the campus. During the time data was collected, the school had 615 learners, 48 educators including the principal, deputy principal and 4 Head of Departments (3 academic HODs and 1 Disciplinary). These 615 learners include pre-school up to grade 12. The boarding facilities accommodated 70 learners.

The school follows the Independent Examination Board (I.E.B.). School F had a number of sports facilities ranging from tennis courts, basketball courts, squash courts, netball fields and a large swimming pool. School F is famous for its music department with marimba band, steel band and number pianos. Members of non-teaching staff included a librarian, computer lab and laboratory technicians. What was also remarkable about school F was the presence of well-equipped library and a laboratory.

Grade 9 which formed a part of my research at the time of data collection had 52 learners consisting of two sections of 26 each class.

**Table 3.8 : Grade 9 which formed part of the research in school E**

Section	Boys	Girls	Total
A	12	14	26
B	13	13	26
	25	27	52

### **Mrs. F's teaching style**

When we requested Mrs. F to allow us to come and do some observations in her class, she said we were more than welcome and she was free to allow us to observe her teaching even if we did not make any arrangements, we were relieved because some teachers are uncomfortable about class visits. Mrs. F was doing a follow up lesson on discount percentage, profit and loss, she used a book called Sport On mathematics. According to Mrs. F they had already completed the syllabus and they were busy with revision.

Mrs. F's lesson was characterised by the discussion of homework or a summary of the previous lesson and the rounding of the lessons involved the instructions for homework.

Mrs. F was able to link the lesson with the previous one by summarising the previous lesson or by revising the homework. The topic that Mrs. F was teaching is also taught in EMS, but learners told Mrs. F that they had learned about the topic in learning area EMS but they could not understand it. Mrs. F was more than willing to do it all over again. The small number of learners made it possible for Mrs. F to give her learners individual attention. The discussion was dominated by Mrs. F and learners' paid full attention. In her teaching Mrs. F simply used daily life examples, things that learners were familiar with. This was very good because learners could easily grasp and identify what she said with the topic.

However, every time when she asked a question the learners answered in unison, as a result only the more confident and assertive learners were participating in the discussion and the rest of the learners were passive. What was also observed was that Mrs. F did not give the learners enough time to answer. Learners were sitting on their own desks arranged in rows in a traditional fashion. There was absolutely no interaction among the learners. Mrs. F was the only person who was moving around, giving the learners special attention and she was able to attend to each and every learner because her learners were very few about 26. All learners in the class were using their own textbooks, there was no shortage of books, and no learners were sharing with one another, they all had scientific calculators.

Mrs. F did not tolerate any class disturbance of any nature. She kept on threatening her learners that if she found anyone talking she would throw her or him out of the class, but learners knew that this was a threat because teachers are not allowed to send a learner out of the class for any reason in that private school.

We actually missed learners' voices in Mrs. F's class but, however, learners were getting full attention from Mrs. F's individual attention which was lacking and impossible in all the schools that we had visited.

### **Assessment of learners**

Mrs. F's assessment had formative component and a summative component, the formative range from informal questioning, class work, homework, projects, investigation and assignments. These were used by Mrs. F mainly to facilitate learning. Mrs. F also selected the class work and homework from the exercise found in Sport On mathematics book.

Discursive analysis of teachers' views and practices, teachers' perception of CTASs (Mathematics). Role of CTASs in helping learners to be competent in Mathematics.

All teachers that we had interviewed dismissed the content of the CTASs as not "pure" or "core" mathematics and regarded CTASs as mathematical literacy. They all felt that it is one sided and only designed to promote mathematical literacy and not at

all relevant to those learners who wanted to carry on with pure or core mathematics as a carrier.

Teacher C and teacher E regarded CTASs as a total waste of time. All teachers viewed pure mathematics as real, high status and valuable mathematics. Teacher E further explained that when learners are in grade 10, they have to choose between mathematics core and mathematics literacy, he regarded CTASs syllabus as an irrelevant document for those learners who would like to choose core mathematics.

### **A. Characteristics of Qualitative Interviews**

During interviews we did the following:

- Used open ended questions. e.g. Integrated on interviews
- Focused on an individual educator at a time.
- Used flexible structured questions.
- Changed and adjusted questions freely so as to attain the outcomes of the research.

It was found necessary to provide a brief discussion of the advantaged of the interview method that is discussed next.

Advantages of the interview methods are:-

- Question Order: Questions asked were in any order as much as we felt necessary.
- Spontaneity: Answers given by the respondent could not be retracted once they are given by the respondent due to audio recording of information.
- Environmental Control: During the interview privacy had to be maintained at all times, noise should be avoided by all means these are important to control the environment during the interview.
- Flexibility: We were happy to repeat the questions for clarification in case of misunderstandings.
- Non-verbal Behaviour: Gestures of respondent without any verbalisation can be assessed during the interview.

- Completeness: All given answers had to be completed without any interruption.
- Response Time: There is no time limit for respondents to answer question.
- Answers from Respondents only: No one but the respondents can answer the questions.
- Time of Interview: The date, time and place of interview can be arranged and recorded (Bailey 1994:174; Mahlangu 1987:89-90).

The above advantages provide a yardstick against which I systematically introduced during the interview in my quest to find solutions and provide depth to the topic.

## **B. Conducting and Recording Interviews**

Before the interviews, I sought the necessary permission to conduct the research from:

- The KwaZulu Natal Department of Education (KZN DoE),
- The respective district offices,
- Educators,
- The school principals.

We understood the interview material, practiced in order to be confident and made a commitment to complete the interviews. Personal effects that might impact on the interview were reduced (Baker 1994:194). Before the actual interview commenced, we discussed issues of confidentiality and the aims of the research with the teachers to gain their trust. All the interviews were tape-recorded with the participants' consent. The tape-recording of an interview produced the most complete record of what teachers said (Hitchcock & Hughes 1995:170). The interviews were then transcribed, according to the main questions and follow-ups emerging from issues related to the topic, for subsequent analysis. The use of a tape recorder did not stop from taking notes, but did allow one to concentrate and take strategic notes only, rather than laboriously attempting to write down the answers verbatim (Patton 2001:383). However, the researcher wrote down key points, phrases and short comments as a back-up during interviews to complement data capture on the tape recorder.

### **3.5 RESEARCH DESIGN**

Research design deals with discussion of the method that will be followed in a sequence of steps from the question and explanation of the selection of cases, which also involves the discussion of how the interview is constructed and how the questionnaire for teachers were constructed and connects up through the collection and analysis of data finally to interpretation of the findings. This is best described by Yin (1984) who defines research design as "an action plan for getting here to there". By "here" Yin means the start or initial set of research questions to be answered and "there" is some set of conclusions about these questions (Yin 1984:28).

This is the most important research instrument. In order for this research to be valid and reliable, we had to uphold the moral principles underpinning the code of ethics for research such as, *inter alia*, honesty, integrity, sincerity and empathy (De Vos, 1998:24).

#### **3.5.1 Validity and reliability of Qualitative Design**

Interviewees were presented and that alone is a powerful technique for validating and gaining insights into the nature of human affairs in all their complexity. In the research, validity refers to the honesty, depth, richness and scope of the data achieved, the participants approached, the extent of triangulation and the disinterestedness or objectivity of the researcher (Cohen, Manion & Morrison 2000:105).

#### **3.5.2 Strategies to enhance validity**

The following strategies can be used to enhance validity: prolonged field work, multi-method strategies, participant verbatim language, mechanically recorded data, low inference descriptors, participant research and participant review (McMillan & Schumacher 2001:407). In this study, as many strategies as possible were used to enhance validity.



### **3.5.3 Discipline**

Discipline subjectivity means that the researcher is part of the setting, context and social phenomena that was being examined. Hence, the researcher kept field logs and journals as chronological records for scientific interpretations. It is required that a researcher rigorously examines his or her own personal experiences and empathy during data collection and interpretation (Bailey 1994: 300; McMillan & Schumacher 2001: 411-413). The researcher did this.

### **3.5.4 Extension of findings**

Extensions of findings for others to understand similar situation through authenticity and usefulness were provided. Authenticity of the educators' perceptions was carefully reconstructed. This ensured that the research design was adequate to describe the phenomenon of the topic.

### **3.5.5 Trustworthiness**

In the study attempt was made to obtain valid results by pursuing the following aspect ensuring trust worthiness:

*Truth-value:* A qualitative research is deemed to be credible when it presents accurate description and interpretations of human reality that is recognised by the respondents who share that experience about the research phenomenon (De Vos 1998:348). The following strategies are used by the researcher to establish truth-value:

*Prolonged engagement :* We had to spend a reasonable period of time and to orally communicate with educators during data collection (De Vos, 1998:350). We did this and by communicating in English as well as IsiZulu with the participants and were able to gather valuable information on the topic. We spent approximately one and a half hours on each interview and observation at each of the school sites.

*Recording of data:* Another strategy is to ensure that data is recorded thoroughly (Sarantkos 1998:321). We used an audio tape recorder, interviews and observation notes to record data.

*Triangulation :* A strategy used to ensure trustworthiness, is triangulation (De Vos 1998: 359; Maykut & Morehouse, 1994:146). Triangulation is a system of using multiple methods of data collection, such as interviews, observations and case study for data collection (Denzin & Lincoln 1998:199). We had to ensure the trustworthiness of the data through rigorous triangulation of in-depth phenomenological interviews, observations, literature study, document analysis and case study for verifying and cross referencing the rich type of information.

*Applicability :* The strategy of applicability applied to whether the research findings could be applied to other settings, group or contexts (De Vos, 1998:349). The researcher ensured applicability in this study by means of nominates sampling and detailed description of research sites and respondents. We presented the dense and detailed background information of the research sites, settings and respondents in the next chapter which could assist other researchers to determine the extent of transferability of the findings of this research to their own settings (De Vos 1998:349).

*Consistency :* Consistency is a criterion of trustworthiness, Consistency means dependability, it applies to whether the research findings are consistent; if the inquiry was to be replicated (De Vos 1998:350). In the study, we ensured consistency by employing systematic and rigorous research methods. The researcher intended to keep the evidence for audibility purposes.

*Neutrality :* Neutrality is grounded in conformability. It is the degree to which the research findings are a direct results of the information gathered from the educators in the research sites and the conditions of the research (De Vos, 1998:350). The researcher ensured conformability through audits of prolonged engagement with educators and reflection.

In some, the researcher applied all these strategies in order to ensure trustworthiness of the research results. Research ethics impact on trustworthiness of the research results. Therefore, it is necessary for the researcher to present a discussion on research ethics in the next section.

### **3.6 RESEARCH QUESTIONS**

As stated earlier in chapter 1 the aim of this study is to address the following two critical questions about the grade 9 CTASs in mathematics learning area. The research questions are:-

- Do mathematics educators perceive CTAS as helpful in assisting mathematics learners to be competent in their mathematics learning?
- Do educators teaching GET level have common understanding of the role and aim of CTASs in their mathematics teaching? This study further investigates the extent to which educators were involved in the conceptualisation and design of as well as the challenges they encountered during the implementation phase of CTAS.

This section deals with the selection of schools. Six schools were selected and in the next paragraph I discuss the following criteria:-

- The schools were selected had to be offering mathematics from grade 8 to grade 12.
- Secondly the school chosen could be reached either on foot such as School A and School B. School C and School D could be reached by minibus. This was advantageous for me since I was not mobile when I started my research.
  - Some schools which I have chosen have common problems they were designate for African students under apartheid. Most of the teachers in these schools received a 3 year college Diploma as compared to other races. These schools in the past were affected by the political violence.

In this research design chapter, methods used to conduct the qualitative investigation, validity, reliability, research ethics, and aspects of trustworthiness were provided. In the next chapter, we shall focus on presenting the qualitative data after a process of detailed analyses and categorisation.

## **CHAPTER FOUR**

### **DISCUSSION OF FINDINGS**

#### **4.1 INTRODUCTION**

In this chapter the case studies and the data collection during the course of the investigation are analysed. The purpose of the chapter is to discuss and interprets the results of the analysis.

#### **4.2 DISCUSSION**

The chapter discusses the key findings of the present study. Important issues that emerged from observations and when we interviewed teachers will be examined.

#### **4.3 PROBLEMS AND CHALLENGES ASSOCIATED WITH CLASSROOM INTERACTION**

Interaction is a broad term and can only take many forms such as:

- Group work
- A learner (individual) and a teacher.
- A teacher and a group of learners, small group or big group.
- Whole class interaction and a teacher.

Among all cases examined the whole class interaction took different forms, such as, educator and an individual learner. As to which interaction the teacher prefers depends on the aim of the task and the situation surrounding that particular task or activity.

According to what was observed which was common in most schools in the study, was that CTASs activities involved the whole class. Teacher A, C, D and E were typical examples of this type of interaction. In their classes, learners answered in chorus form.

The problem with the whole class interaction is that it is based on the false assumption giving that impression that class is a homogenous group of learners whose abilities and talents are identical. The impression is that learners reach the same understanding at the same time.

In schools A, C, D and E I observed that when an educator asked a question, learners volunteered to contribute to the discussion by raising their hands. In all the classes I observed it was noticed that the most active learners participated more in the discussion than those who are withdrawn or less active usually get away with it, and they can be quiet if it is an educator-led discussion.

### **4.3.1 Group Work**

CTASs section A consisted of most activities which involved group work and very little individual work. Group work has a number of benefits. In small groups learners learn to think as a team that "sinks or swim" together (Adams and Hamm, 1990). This motivates learners to help one another as members of a team would do. However, in all schools it was observed that educators had different opinions about group work. This topic is going to be discussed in detail in the following page.

In school C, D, and E educators cited the problem of large classes. Teacher C was the only grade 9 mathematics educator, teaching 7 classes with an average learner of about 43 per class. Teacher D was also the only grade 9 mathematics educator, teaching 5 classes with an average of about 45 per class. School E had a similar situation as school C and D, but during the time of data collection, the school had employed a new teacher who had just completed at the university and had no experience.

The advantage of having a small class is that an educator is able to give his or her learners' individual attention, and he or she ends up knowing his or her learners by their names. Assisting individual learners, so called "individualisation" is not a new strategy. It only gained more attention after (Vygotsky, 1978) proposed the motion of zone of proximal development (ZPD). The zone of proximal development is defined as:

The distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or collaboration with more capable peers. (Vygotsky 1975:85).

The zone of proximal development can give a clear indication on what a learner is able to do his or her own, and also show how much she or he can do when assisted by an adult or more competent peer. Vygotsky claims that it can be solved by a 12 year old child.

A dynamic interaction needs to take place when the learner is being assisted by an adult or more competent learner. In most schools that we observed teachers were not in favour of group work but they cited had no choice because most of the activities and task in CTASs section A required group work. Their main concern was that in a group only few individuals do the work and the rest of the group simply copy. They also lack the strategies of monitoring groups because of large class.

In school A, and B, all activities were done in the classroom under the supervision of the teacher and all write ups were done individually, also no learner was allowed to take his or her CTASs outside the classroom. This was their attempt of trying to minimise copying.

But the problem is that in other schools learners were allowed to take CTASs out of the class and groups could meet at library or anywhere they could work out the answers. Even if other schools have controls on CTASs by locking them in class that was not a guarantee that those learners did not see them from their peer of friends from other schools, so that when they go to the classroom they already had an idea about the answers in some activities.

In all schools that we had observed learners were seated in straight rows with the exception of school C. Mrs. A favoured very strongly the idea of an old traditional class with learners seated in rows. She also criticised strongly the system of group work. Her criticism of group work will be discussed in the following sections of this chapter.

### **4.3.2 Questioning for Understanding versus Control**

One of the most important instruments of the interaction in a classroom is the informal classroom questioning. This facilitates the integration teaching-learning and assessment in a more meaningful way. It also depends on how educators use it, but it should not be viewed by learners as threatening or intimidating.

Mrs. D, however, does not seem to be able to use questions much more effectively due to a number of reasons, for example Mrs. D. was having problems where the school was dysfunctional, some learners bunk their class, some were talking while she was trying to teach so in order to draw attention she had to resolve to this method of Questioning for Understanding Versus Control, by asking questions and point to the learners, so in most cases the questions were not used to assess learners' understanding. Teacher D used questions to draw the attention of the learners.

### **4.3.3 Creating an Environment to Support Meaningful Learning**

What was also observed during class observation was that most mathematics classrooms were poor learning environments. The entire classroom had bulletin boards but there were no displays with the exception of school F in teacher F1 and F2 classes. Good materials designed by learners were displayed on the notice board such as learners work models and photocopied materials.

Displays that one can expect to find in a classroom include charts, magazine cutting, classroom rules which can be easily affordable irrespective of the financial conditions of the school. (Muijs & Reynolds, 2001) concur with this argument:

An aspect of a pleasant classroom that the teacher has a large amount of control over is creative attractive and pleasant display (Muijs & Reynolds 2001:60).

It is argued that environment plays an important role in influencing the behaviour and attitude of learners. (Moos, 1976), for example, have says the environment exerts considerable influence on human behaviour and constitutes a major determinant of effective functioning and satisfaction among milieu inhabitant.

The attitude and disposition of the learner is easily influenced by the classroom environment. Colourful and bright displays can cheer up the classroom and make it more pleasant environment, while also giving the educator opportunity to allow peripheral learning to occur (Muijs & Reynolds 2001). It is argued that the pleasant learning environment can motivate learners and improve the attitude of the learner and enhance learning (Ndlovu, 1999).

#### **4.3.4 Assessment**

During data collections and class observation, it was noticed that teachers used a variety of assessment methods. The 2 types of assessment can be classified as a summative and formative assessment.

Summative assessments are those assessments which are concerned with the accreditation of knowledge, collection of marks for promotion. Learners are assessed to certify their achievements. In most cases this takes place after the teaching and learning is finished and is then used to sum up learners achievements, it is used as yard stick to decide whether learner has succeeded or not succeeded. Tests and examinations remain the dominant formal summative assessment instruments. Also included in summative assessment are class work and assignment. Many teachers regard this as "continuous assessment".

Formative assessment was defined earlier as those assessments methods concerned with informing teaching and learning, it usually occurs during the learning process and can be used to get information about learners, teaching and materials.

This method of assessment can lead to improvement in teaching and learning. For this type of assessment teachers used informal classroom questioning class work, homework and assignment. The structure and the using of these assessment instruments were almost similar in all case studies.

During the times of Bantu education in South Africa teachers had no choice they were actually coerced (forced) by the apartheid government to follow the syllabus and prescribed books (text books). This scenario led to a situation which also emerged in



this study where teachers were lacking seriously in creativity, something which they could have inherited from their teachers. In a number of schools it was observed teachers could not develop resources. They only drilled the learners' factual knowledge for examination purpose.

They relied very strongly on prescribed text books, and they did nothing else other than summarizing the textbooks and gave that to learners. This was also evident from classroom exercises, tests and assignments at the end of each chapter, taken as they are from the prescribed text. In this particular study development of resources simply means simple things like development of textual materials and other artefacts such as teaching aids, models, charts, worksheet. Teachers did not develop and design their own problems for assignments and tests. However, this is unbelievable because in training colleges teachers used teaching aids or/and a chart during their training and when they are presenting.

All this is left out or has been forgotten once a teacher is qualified. All the teachers that were observed in this study praised certain textbooks; they all had textbooks which they preferred more than any other. Creativity was totally discouraged.

CTASs let a syllabus or a guide so teachers resorted in using CTAS section A as a syllabus to prepare learners for final examination which is CTAS section B. During data collection all teachers said CTAS differs from year to year and this made it impossible for teachers to use previous final exams (section B) for the preparation of learners. Some teachers complained that CTASs are difficult and they are not be able to attempt them without the teachers' guide (memorandum) for section A and B which is provided by the department of education for teachers.

#### **4.3.5 Interviews**

The interview questions were divided into two sections. Section A consists of 12 questions. It is about the **role of CTASs in helping learners to be competent in mathematics**. Section B consisted of 5 questions; It is all about **educators' understanding of the role of CTASs**. In presenting results we shall present the common teacher's responses as per section. English was the language used for

interviews, but there were cases where isiZulu and isiXhosa were used. We then translated the responses into English especially with teacher C and D who are isiXhosa and isiZulu first language speakers.

**A. Do you consider CTASs to be helpful in assisting learners to be competent in their mathematics learning?**

- Most educators argue that CTASs promote mathematical literacy, so they are only helpful in assisting those learners who would choose to do mathematical literacy and not pure mathematics.

For instance, **Educator A** expressed his views as follows:

*In grade nine (9) we are preparing learners for two completely different routes, one route is if they want to take pure math or core mathematics and the other route is for when they want to take mathematical literacy.*

*The majority of learners who cannot do pure or core mathematics choose mathematical literacy, but we still have to teach them the basic grade 9 mathematics syllabus.*

*The on-going challenge throughout the year is to maintain a good standard for those who are going to do pure mathematics and not to make others lose interest in that context.*

*The CTAS is basically a good preparation for mathematical literacy and completely worthless for pure mathematics.*

**Educator A2 said:**

*Not in pure mathematics perhaps in a preparation for some to see what mathematical literacy would be like, but certainly is not of much use. Mathematically speaking, CTAS is only promoting mathematical literacy.*

**Educator A4 explained** by making use of a question that was in section A of CTAS about drawing a South African flag and he said:

*There is little measurement in the question of drawing a flag. It is not mathematically inclined; rather we can talk of other learning areas that could be associated with drawing the flag such as technology or geography (H.S.S.). I think it is preparing mathematical literacy more.*

**Educator B2 said:**

*The content that is coming with CTASs is quite reduced, it does not quite cover the amount of work that is prescribed for grade 9 syllabus and also the content of CTAS is different from that of mathematics that we do in the grade 9 mathematics syllabus.*

**On the same issue, Educator C said:**

*CTASs are a waste of time because first of all they take so much time that we could be using to teach learners mathematics they will need in grade 10, 11 and 12. In 2009 CTASs arrived during the second term which means that we only taught grade 9 mathematics only half of the year and the other half of the year was wasted on teaching section A of the CTASs. We were forced to suspend the grade 9 syllabus and all the focus was on CTASs, this is not fair.*

**Educator D said:**

*Personally I find CTASs useless and confusing. From the beginning of the year I have been teaching real mathematics. 2009 CTASs theme was on democracy and elections which was not mathematics but general knowledge. This is not the stuff I have been doing.*

**Educator E said:**

*CTASs are beneficial to those learners who are going to choose mathematical literacy in grade 10, but those that are going to take pure mathematics, the CTASs syllabus is irrelevant to them since the CTASs are similar to mathematical literacy.*

**Educator F from a private school said:**

*I actually do think it is helpful but if it was not compulsory, if it is compulsory to do CTAS then I am sorry there is no time. It is not included in the grade 9 syllabus, I don't mind using it as an extension or use it as a project, and not like the way they are imposed.*

**Educator F2 also from a private school said:**

*The level at which CTASs are set are way above the level that we teach and a lot of things that are asked in CTASs is the stuff that we don't do in grade 9 syllabus or that we have not covered by the time the CTASs arrived.*

*Some questions on CTAS are difficult for the teacher, so if I struggle as a teacher, I can imagine that the learners are also going to struggle and also because English is their second language, it is even more difficult for the learners.*

**B. What are the strategies in learning mathematics which are promoted by the use of CTASs?**

**Educator A said:**

*The benefit they get would be at the level of problem solving, but in terms of preparation for work they have to do in mathematics, there are very little strategies.*

*If you look at the CTASs 2009, there is essentially no Geometry involved and Geometry is a fundamental part of grade 10 Mathematics.*

*There is no Algebra at all in CTASs not a single item of Algebra and yet algebra is one of the fundamental and core sections in grade 10, 11 and 12 Mathematics, there is absolutely no finance in the 2009 CTAS and yet finance is one of the major sections that has been introduced into core or pure Mathematics.*

*To me, it is clear that CTASs are geared completely towards Mathematical Literacy.*

**Educator A2 said:**

*They promote nothing, none of it is done as a copy of the board work, copy from the board. They are copying from the board. It has no incentives, no drawing work for the learners to even learn new topics.*

**Educator A4 said:**

*CTASs are promoting cooperative group work, dealing with a class of 30 to 40 learners; group work causes problems because they have stipulated time. To arrange learners into groups takes a lot of time.*

*Another strategy is individual work; their strategies assist learners to interact with one another.*

Educator B2, D, F and F2 felt that CTASs promote a strategy of problem solving which is different from the way they learn mathematics, e.g. word problems.

**Educator F2 has the following to say on the same issue:**

*It promotes out of the box thinking for the learners. The learners that we teach are used to the method, I have to teach them the method in order for them to get the answer, they cannot think out of the box, therefore I have to always taught them the method before they can answer the questions.*

On the same issue, most teachers argue that the main strategy promoted by CTAS is problem solving which benefit's learners who want to do mathematical literacy, e.g. Word problems.

**C. Are the strategies promoted by CTASs effective or not?**

• **Educator C said:**

*Strategies promoted by CTASs are not effective, if there are any.*

• **Educator D said:**

*During our time we understood democracy and voting without learning about this at school as promoted by CTASs 2009 section A. Learners don't like CTASs, they say they are boring.*

- **Educator E said:**

*CTASs are only promoting mathematical literacy and do not promote pure mathematics, at all.*

*The level of language used in CTASs is difficult for grade 9 learners.*

- **Educator E2 said:**

*CTASs teaches a different way of doing things such as stories which is different from the way we normally use to teach mathematics; maybe that way of looking at things in a different way is good for learners.*

- **Educator F1 said:**

*If they can do CTASs type of questions from grade 4 longer than starting them in grade 9, learners could benefit.*

*If they do those types of thinking questions from grade 4 where they learn at the level to think, that would help rather than starting at grade 9.*

*This type of CTAS thinking is done only in grade 9 and after grade 9, this way of thinking is dropped and you never find in the following grades.*

*CTASs do not come up with any beneficial strategies mainly because of the way they are done in terms of time, rushed in the third term and the language used in them seems to be a problem.*

**D. From the work that you have covered from the beginning of the year, what sections of the CTASs do you think learners benefit from?**

- Many of the educators from the participating schools were aware that CTASs arrives during the third term and from the beginning of the year they teach the normal grade 9 syllabus, some teachers use previous years CTAS questions just to give learners an idea of how CTASs are set . Most of the educators find CTASs different every year as a result they are not sure what the 2009 CTAS entails.

## Comparing CTASs and grade 9 syllabus

- **Educator A said**

*The CTASs in 2009 have only covered approximately 10% of the syllabus that we have already done.*

- **Educator A2 said:**

*These 2009 CTASs have been an absolute waste of time.*

- **Educator C said:**

*Since the beginning of the year, we have been busy with pure Mathematics such as Algebra, bearing in mind that CTASs are coming, and from my experience of CTAS'S, during the second term I try to change my style of teaching, grooming learners for CTAS. Then I teach word problems because CTASs are designed like that.*

- **Educator E said:**

*Grade 9 educators in my school look at the previous CTAS so that when we teach them, we work towards the same goal as CTAS, but you find that CTAS differs from year to year, e.g. 2008 CTAS is different from the 2009 CTAS, so we cannot keep in line completely. At the beginning we push this grade 9 syllabus fast to accommodate CTASs.*

- **Educator F1 said:**

In my school as from grade 6 we already teach our children on a high order level of thinking so our children are a little bit more exposed to the style in which CTASs are set.

*At the beginning we push the grade 9 syllabus, but CTAS contains no pure mathematics.*

Some educators such as school A, B and .....school F prefer to do CTAS section A in the fourth term towards the final examination so that they will remember easily when they write section B which is the final examination. They all believe that even if they are not sure about this that section A is somehow related to section B.

**E. How useful is the memorandum provided by the department of education to teachers of mathematics.**

Most of the educators said that the memorandum had some errors and they were not given any errata, some educators complained about marks allocation.

• **Educator A said:**

*When the CTASs came for the first time, we wrote a report and pointed out where there were mistakes, we sent that report to the examination department and very often there will be no comment or errata, but any report that we have sent was never replied to.*

*One of the difficulties that we often face in the memorandum was that the marking allocation was often quite strange in the sense that obviously as mathematics teachers have been teaching Mathematics for about ten years, now up until 2005, 2006 we were basically taught in terms of the work that we set.*

*We were basically told that you can give marks according to what the learner has to do, five or six different steps to solve the problem then the learner can reasonably get five or six marks, where as if the learner has to do two things to solve the problem then the learner can expect two marks.*

*What I discovered in CTAS was that for a simple task there were more marks given and a complex task was allocated very little marks and that was quite strange.*

• **Educator A2 said:**

*In other years we have found that there are so many mistakes in the CTASs, now for a teacher who has not done mathematics properly at school or at University level, they will never realise that there are mistakes, for that reason I don't pay more attention to the memorandum, I have never seen any errata from the department.*

• **Educator C said:**

*I only use memorandum as a guide, I believe in first working the problems myself and then compare my answers with those given in the memorandum.*



- **Educator E2 said:**

*I specifically do not trust any memorandum until I have worked it up, but I think that should be like that for all mathematics teachers. I have come across some errors in CTAS memorandum but I have never seen any errata.*

**F. How does CTASs Mathematics differ from year to year?**

Most of the educators said that CTASs differ completely every year. It is different themes every year, for example, in 2002 the theme was “the physically challenged, improving the school environment, creating an awareness of the visually challenged” paraplegics and deaf in the school community. In 2009, the theme was democracy voting and elections.

- **Educator B4 said:**

*CTASs differ completely, this year (2009) the theme was democracy voting and elections. Some years ago it was on environmental awareness; I think they should take current issues like air pollution.*

- **Educator C said:**

*They are so different every year, in such a way that I cannot take previous years CTAS and drill my learners for coming CTASs. Every year there are different themes, for example this year (2009), the theme is different from that of 2008.*

Most educators complained about the decreasing standard of mathematics every year.

- **Educator A said:**

*I think what I have noticed over the last couple of years is that there has been an attempt in previous years to try to include some type of algebra, however that type of activity has become less and less so in that regard CTASs differ from year to year.*

- **Educator A2 said:**

*This year (2009) there is nothing mathematical, not even formulas where learners have to do substitutions are there.*

- **Educator A4 said:**

*Where can one classify task four in CTAS section A 2009? The drawing of a South African flag? Is it core mathematics or mathematical literacy? This is just Mathematical Literacy.*

- **Educator E said:**

*Last year (2008) they gave the probabilities and this year there is nothing under probabilities. CTASs differ from year to year.*

- **Educator F1 said:**

*In the beginning with my first experience with CTASs I found that the first CTAS was a nightmare because nobody knew what was going on.*

**G. In those activities which require group work, what is your view with regards to giving group marks to learners?**

Most of the educators expressed great concerns about the limited participation demonstrated by many of the learners during group work.

- **Educator F2** explained this problem as follows:

*I personally find group work not being fair because in each group there is always one learner that is doing all the work for all group members, and they all get the same mark and that is not fair. If you want to test the ability of the learner, I would suggest that you test them individually and not evaluate a group.*

- **On the same problem, Educator A2 responded** as follows:

*I hate group work, maybe it's because I am old fashioned (belong to the old school of thought).*

*Mathematics is an individual activity. Group leaders engage in the task while the rest of the group are spectators. Most work in mathematics does not require group work except these CTASs.*

*I personally feel that mathematics talent and ability are inherited. You can add a little bit and develop it. Mathematics is not for all no matter how much you wish to do it is not for all.*

*I suppose in a language, group work is possible where they have to discuss and give different opinions and debate things, but not in mathematics.*

*We must also bear in mind that these learners are going to write final exam which is section B individually. Group work makes learners to rely on each other.*

*Yes you can do some other learning tasks in other subjects in groups but when it comes to mathematics, assessment, what you must produce mathematically must be your own, showing your own skill. It gives a wonderful pleasure of having it done yourself, personal satisfaction, personal strive, a bit of a struggle to get there, but with these CTASs we do not let learners to do what do them as groups.*

**H. Many educators said that weak learners were benefiting greatly from group work.**

**Educator D said:**

*With the CTAS, I just think it definitely benefit's the weaker learners because of the amount of group work and they know who the strong learner in a group is, and he or she does all tasks and this helps them earn high marks.*

Some teachers are aware of problems caused by group work but they feel that because they are dealing with big classes and have so much to mark, therefore group work is beneficial to the teacher.

• **Educator C said:**

*CTASs promote group work throughout, for example, task I in 2009 CTAS section A, everything in that task involves group work, I am aware that individuals in a group are different, in each group you will find lazy people and hardworking or clever people, as a result, lazy people end up getting the marks which they don't deserve, which is not fair to those learners who really applied themselves.*

*For me as a teacher, it benefit's me in terms of decreasing the amount of work, instead of marking 50 scripts per class I end up marking 10 scripts.*

- **On the same issue, Educator E said:**

*For the fact that there is a language problem (barrier), I am ok with group work because those learners who are good in English, they will help and explain to those who have language problems, because of that I am ok with group work.*

*The usual problem is that if there is group work there will be those learners who are lazy, who don't do anything for that reason group marks will not reflect individual contributions, but because the CTASs emphasize group work and group marks, I have never really questioned that, so I simply allocate the same mark to the whole group.*

- **Educator F1 said:**

*I am old fashioned Sir, I don't like to destroy learners and give them marks that they don't deserve, but again with CTASs we have no choice, they want the group mark which is most unfortunate.*

*Group work is the biggest drawback. It is ....., learners fall down flat, yet they pass. We are developing a generation of illiterates with group work in OBE.*

*Weak learners wanted the same marks as bright learners, they will fight the educator bitterly to the end if you say they don't deserve that good mark because they did not work for it, they don't hesitate to report the teacher even to the school inspector.*

- Most of the educators complained that they had an enormous amount of marking for a short time frame for the CTASs.

- **Educator D expressed her views as follows:**

*I feel guilty to give learners marks that they don't deserve, but I have no choice because I have many sections and I teach other grades other than grade 9. I know my learners well, I know those that are weak and those that are brilliant, I simply give them the same mark per group. If I could target those weak learners I could end up having problems because according to O.B.E we are not allowed to give learners a zero mark.*

*CTASs have lots of work really there is too much paperwork, it traumatizes you. It stresses you. You don't have time to do anything except having papers in front of you, for me group work helps me by decreasing the load of marking.*

**I. You have been exposed to CTAS section A and section B, does this experience enable you to prepare your learners for the next exams on CTAS section B.**

- Many teachers believe that when they have completed section A of the CTAS, their learners will be able to do section B which is the final exam. They all complained that there is no syllabus with CTAS, there is nothing that they can use as a guide in order to prepare learners for section B, which is the final exam. The only thing that they have is section A. On this issue:

- **Educator E said:**

*When I have taught them section A especially in 2007 and 2008, I found that learners managed to do section B, so section A is useful but I am not sure this year (2009).*

- **Educator F2 said:**

*There is no proof that section A prepares learners for section B.*

*CTASs do not fit into our daily way of doing things, but because of my way of teaching and my experience and knowledge, I have been able to help learners to be ready for section B which is an examination.*

- **Educator A2 said:**

*Section A gives them practice and skills that they need to do section B. Learners will not be able to write section B without completing section A, at least section A serves as an indication, but one cannot rely on that, the department does not give us any scope or guidelines to follow, so to say that learners need to complete section A to be ready for section B is just an assumption.*

*The long experience in teaching enables me to prepare learners for final examination section B.*

- **Educator C said:**

*There is an assumption that section B which is an examination may more or less be similar to section A. Section A is like a syllabus for examination which is section B, but learners may not notice that, I have seen similar topics in previous exams.*

- **Educator D said:**

*Section B, but those learners who simply copy from others may not see that link and they will fail section B. Section A work, if it is thoroughly done, does assist learners to master.*

- **Educator A said:**

*When I first heard about CTASs I thought they were a brilliant idea, I was very happy about the idea of assessing learners over a period of time rather than assessing them in a single once off exam, but I am afraid and very disappointed continually that the CTASs do not cover the majority of the grade 9 mathematics syllabus that we teach.*

*Section B now is a once off two hour paper which is supposed to be an extension of whatever the theme was in section A.*

*Section B is supposed to extend the type of questions that have been asked in section A. Section B to me had no relevance what so ever!*

*I think whether the learner did well enough or whether he or she did bad in it was actually not an indication of their ability at the end of grade 9.*

**J. & K. For how long you have been involved with CTASs, has this experience assisted you in making your learners to be competent in mathematics?**

- Most of the participating educators have taught mathematics CTASs for more than two years, they all argue that CTASs have done nothing to them rather than waste their time, they all argue that CTASs are one sided because they only promote mathematical literacy and nothing in terms of pure mathematics. They all argue that their knowledge and experience in teaching mathematics has made them competent in assisting learners to be competent in their knowledge and understanding of mathematics.

- **Educator B4 said:**

*It is the whole years' work which will make learners to be competent, the grade 9 syllabus which I have taught learners myself.*

*CTAS makes up only 10% if not less and this is one section of the syllabus. You cannot say one section makes you competent.*

- **Educator D said:**

*I have been involved with CTAS for three years. CTAS does nothing; I have done all grade 9 mathematics syllabuses myself. Maybe CTAS assisted those learners who want to do mathematical literacy; it can assist them in that line of thinking.*

- **Educator E said:**

*Competent in mathematics for which level? I also teach mathematical literacy in grade 10, 11 and 12 and I have not come across work similar to what is contained in the CTASs. So! CTASs prepare learners for mathematical literacy and nothing for pure mathematics.*

- **Educator F2 said:**

*No! CTASs are a burden to us, there is a lot of marking, lots of paper work and we don't have time for this load of work coming towards the end of the year, all of this prevents us from revising. In that sense CTASs are nonsense.*

- **Educator A, from a former “model c” school blames dropping of the standard of mathematics from primary school and he said:**

*I am afraid that basic mathematical competency is simply going down each year. The learners that we get from primary school, their mathematical skills are getting less each year.*

*The only way that we have been able to make sure that learners pass mathematics is by reducing testing standards, this implies that the problem now goes down to primary school level and this impacts on us when they get to grade 8, and we are then forced to lower the standard so that they can pass when they get to grade 9 and in that regard, the competency has gone down already and CTASs make it worse.*

- **Educator F, from a private school where they do I.E.B. CTASs said.**  
*CTASs do not make anyone to be competent in mathematics. In CTASs there are no basics and now I want to make my learners to be competent; I still need to give them foundation, before I could do CTASs.*

*CTASs are empty and are more of an extension. They are not at all competent.*

- **Educator A2 from a formal model c school said:**  
*CTASs are competent mostly for Mathematical Literacy and not pure mathematics, they are mostly exposing what mathematical literacy is all about, but the true mathematical children, children with a talent and an interest and an excitement for mathematics are finding CTAS quite boring.*
- *This year's (2009) theme is absolutely out of .....and they are doing it in nine learning areas. Something that is really very.....*

**L. Can you explain similarities and differences in how CTAS has been designed?**

All the educators said every year CTASs consist of group work and individual work but group work is more emphasised each year. They also said that CTASs consist of different themes every year. The first CTASs theme was physically challenged, improving the school environment, wildlife conservation, the first activity that assess basic data processing, numerical and arithmetical skills create an awareness of the visually challenged, paraplegics and the deaf in the school community. In some other years it was culture and pollution. In 2009 the theme was democracy, voting and elections.

All educators said that the level of Mathematics gradually decreases each year and CTASs only promoted Mathematical Literacy.

- **Educator C said:**  
*It is different themes every year. There is group work every year, word problems every year, little or no pure Mathematics every year.*



- **Educator A2 said:**

*This year (2009) drawing the South African flag, I don't think our children liked this activity of drawing a flag. In my school we do have internal elections [R.C.L] so our learners know about voting and secret ballots.*

**M. Does CTAS prepare the learners for grade 10 Mathematics, yes or no?**

Almost all educators said NO. They all said CTASs only prepare learners for mathematical literacy and not at all for pure Mathematics.

- **Educator D said:**

*If you talk about Arithmetic or Mathematical Literacy yes, but not for pure mathematics.*

- **Educator A3 said:**

*I like the idea that you are saying grade 10 Mathematics, when a student passes grade 9, some of them will choose Mathematics core or pure and others will choose Mathematical Literacy, from what I have discovered, CTASs only prepare learners for Mathematical Literacy.*

- **Educator B2 said:**

*CTAS does not really cover all the work that we normally covered before their arrival. What we did from the beginning of the year before the arrival of CTASs does not assist learners to be competent in pure mathematics, not at all.*

- **Educator F said:**

*No! No! CTAS does not prepare learners for grade 10 mathematics at all. I have a feeling that they are missing a point of what we need for grade 10. To give an example, we need factorisation, simple drawing of graphs in grade 10, we need interpretation of graphs. CTASs do not offer any of this.*

**N. Explain how effective are CTASs in preparing learners for the next level in Mathematics, which is grade 10.**

All the educators found CTAS to be ineffective in preparing learners for grade 10 Mathematics; they all said CTASs only prepare learners for Mathematical Literacy.

- **Educator B2 said:**

*CTASs are not at all effective in preparing learners for grade 10 Mathematics; they don't lay any Mathematics foundation required for grade 10 Mathematics.*

- **Educator E2 said:**

*CTASs are not effective in preparing learners for grade 10 Mathematics. I don't find CTASs as a real useful tool, they are not pure Mathematics. I find them more parallel for Mathematical Literacy and I do find that it is difficult for learners in terms of wording and story style.*

- **Educator A, on the same issue said:**

*In terms of pure Mathematics, no! In terms of Mathematical Literacy, Yes!*

**O. Are CTASs valid for any assessment of mathematics ability?**

All the educators interviewed unanimously rejected the CTAS as a valid assessment of Mathematical. All the educators interviewed dismissed the contents of the CTASs as not real Mathematics and regarded CTASs as a waste of time. They argued that CTASs left out important sections like factorisation and algebraic fractions as well as trigonometry and geometry. They argued that one cannot do any Mathematics without these sections and they all viewed the CTASs as assessing Mathematical Literacy that to them is not pure mathematics at all.

- **Educator E1 said:**

*CTASs are Mathematical Literacy; they only prepare a grade 9 learner for Mathematical Literacy. What they should have done in grade 9 was to discard all Mathematical Literacy and concentrate on pure Mathematics for continuity to grade 10. So, CTASs don't even attempt to value any assessment of Mathematics ability. I*

*even wonder why they called Mathematics Literacy mathematics; they should have omitted Mathematics and called Mathematics Literacy by another name.*

- **Educator C said:**

*Valid assessment of Mathematics according to what? If you want to assess their Arithmetic ability, how good they are in counting, yes they do, but if you are looking at an assessment of pure Mathematics, forget because CTASs cannot begin to be used.*

*The CTASs do not include pure Mathematics, mostly Mathematical Literacy and numeric skills as Mathematical ability. CTASs were a useless tool.*

- **Educator B4 said:**

*They don't. If you have seen CTAS this year (2009), you will recall that it was just voting and small calculations. Did you see any Algebra there? Did you see any Geometry there? Did you see any Trigonometry there? There was absolutely nothing except small numbers to explain the process of elections and voting.*

*It was just an explanation about how South African elections are conducted. How a certain town conducted its voting process and that is all.*

- **Educator A1 said:**

*A learner who is good in pure Mathematics, who knows his or her Algebra, Geometry and Trigonometry well, when faced with CTAS is totally confused as to what he or she is asked to do, because of the way the questions in CTASs because they are based on problem solving using basic Mathematics.*

*A learner who is more used to more complex Mathematical problem solving is going to be looking for that type of complex solution and the simple solution by CTASs cannot benefit them.*

**P. Grade 9 is an exit for learners who do not want to carry on to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learners with the skills they need for job interviews?**

All the educators interviewed dismissed the idea of exiting in grade 9. They all said they have never seen a grade 9 certificate.

- **Educator A1, from a model c school said:**

*Exiting has never happened and I have never seen a grade 9 certificate, and such a thing has never happened.*

- **Educator A2 from the same school said:**

*These children are young, they are 14 years old, and in our school they say, they don't leave school. We have never seen any certificate for grade 9 ever since it was mentioned that they will get them.*

- **Educator B1 said:**

*Grade 9 learners are young and I do not agree with exiting, I think learners still need to be at school and one reason is that they are still very young and not fit for the world.*

- **Educator F2 said:**

*Maybe exit to attend FET but grade 9 learners are very young to go and work, I would love to see children proceeding with school than exiting, however, it is not CTASs that prepare learners for job opportunities, it is just the knowledge that they have accumulated all these years up to that point.*

- **Educator B4 said:**

*The department has said that when the child reaches grade 9 they can exit school and go to work. You can charge that person for child labour because the child is 14 years old.*

*When the government made this ruling that you can exit at grade 9 and look for work, they did not consult with the public sector.*

- **Educator D said:**

*No parent will allow that, but I think children of today have rights they may be doing this without parents' permission. I don't think exiting was a good idea.*

**Q. OBE emphasises the integration across or within learning area. Do you find it possible to integrate Mathematics with other Learning areas?**

All the teachers agreed that integration of Mathematics is possible with subjects such as natural science, history (H.S.S.), geography. They gave examples of drawing graphs, statistics but they all pointed out that children cannot do it. If they have learnt a topic in another learning area, they simply forget that as soon as they leave the class.

- **Educator A1 said:**

*There is obvious integration between Mathematics, Natural Science, Accounting and Business Economics and those are things that we always draw learners attention too, but again, the problem is that the learners themselves are very compartmentalised in the way they approach the subjects so that you can tell them in the accounting class what the profit is, that profit is equal to income minus expenditure and they will accept that and work with that, but if you give them the same formula in a mathematics class, they will not recognise that as being something that they already know from the accounting class.*

*It is difficult to pinpoint whether the fault is with the teacher or the learner.*

#### **4.4 CONCLUSION**

In this chapter we have analysed, interpreted and presented data collection in a convincing way. The educators' points of views were cross-checked and verified. From the analysis and interpretation of findings, a rich tapestry of interwoven and integrated information emerged from their real life experiences. In the next chapter, a summary and discussion of the main findings, conclusion and recommendations for improvement are presented. In addition, limitations of the study are identified and suggestions of areas for future research are made.

## **CHAPTER FIVE PRESENTATION OF FINDINGS**

### **5.1 INTRODUCTION**

In this chapter we shall conclude the study by discussing the implications of the findings on policy practice limitation of the study and followed by issues for further research.

### **5.2 IMPLICATION OF THE FINDINGS**

#### **5.2.1 Policy**

When South Africa school curriculum was formed, a new approach was claimed to be outcomes based (DoE, 1997a 27). This was accompanied by a number of policies drawn by Department of Education (DoE, 1996, 1997a, 1986). Learning centeredness was the main principle proposed in the curriculum frame work. Educators had to fulfil many roles and the main roles were those of facilitator, developer, experimenter, expander and evaluation.

The principles also suggest how learners are viewed (notes tabular so) many teachers follow traditional practices, because it is the way they were trained and the way they felt things are done at school and never question why they are doing it.

It was not clear whether it is just the natural resistance to change or educators were not aware of the new policies. However, as mentioned above educators seemed to be strongly influenced by their beliefs that traditional methods are quicker and more reliable. This seemed a challenge to the inset and threat to the implementation of policy.

#### **5.2.2 Implications for Practice**

A number of factors such as the lack of resources and the pressure of the final examinations and the problem of large classes aggravated the way in which educators’

resources in promoting rate of learning and memorisation. However, the school can do something about some of the problem such as fundraising to get resources and arrange with the Department to build more classes to solve the problem of overcrowding and large classes.

### **5.2.3 Implications for INSET**

Bagwandeem & Louw, (1993:19) state that INSET embarrasses all the experiences that a teacher may undergo for the purpose of expanding his or her professional or personal education. Holly & McLaughlin, (1989) (write in-service when the formal) or informal is a general seem as the events and processes designed to facilitate new learning or development.

Veenman & Van Tulder, (1994; 303) describe INSET as a coherent set or activities to deepen and broaden knowledge attitude and skills that are directly connected with profession of teaching. The above definition is difficult to develop.

During data collection from all school we have chosen no educators who were upgrading his or her qualifications. All that means that educators in those schools only relied on department circulars and INSET for information and policy document teachers required the support of the INSET when implementing the new policies. There is strong challenge to INSET because it needs to be informed of changes and development in mathematics education. Teachers are required to learn and develop new skills and their skills cannot occur by accident. It is a strong challenge for INSET.

### **5.3 Implementation**

CTASs were conducted differently and haphazardly by all grade 9 schools especially section A, which arrived at different times in different schools. This created problems in the quality of implementing section A, as well as section B. Different schools and different districts were doing their own things. Everything was done differently in terms of quality of teaching and learning time tabling, control as well as administration. School A and school B treated section A strictly as an examination

and learners completed it under examination conditions, whilst in other learners took section A out of the class and were allowed to get help from any person. Poor management of section A as well as section B component impacted negatively on the quality of implementation of the CTAS Instrument.

Education transformation is a good idea but the speed of implementation of grade 9 CTASs had profound effects on educators and their classroom practices. It became very difficult for teachers to quickly acquire new knowledge skills in order to implement the reforms properly.

Schools that participated on my study implemented OBE in different ways, this was due to their understanding of *OBE* and *C2005* which varied from one school to another. Others knew, but resisted it one of their remarks was that *OBE* and *C2005* increased their workloads. The *OBE* principle of learners learning at their own pace, for example, caused serious problems especially in schools that have high educator to learner ratios. Educators interviewed argued that this *OBE* principle was not practical for the large number of slow learners and it could not be implemented properly because the time allocated for completion of tasks in Section A was inadequate. The idea of learners learning in their own pace, especially slow learners did not succeed as a result tasks and activities could not get completed timeously.

### **5.3.1 Continuous Assessment**

Even though Grade 9 educators were applying CASS in their classrooms, many of them had serious problems with the process of formative assessment. In most cases educators were still confusing the new way of assessment in *OBE* with the traditional method. This created problems in terms of keeping records and the management of assessment, as a result implementation of the CTAS Instrument became problematic. It's very important that educators need to be able assess learners formatively for implementation to be successful. What to assess, who to assess, why to assess, when to assess, and how to assess.

CASS was beneficial to learners because it enhanced their performance. They did better in section A because it was based on CASS and remedial support from parents,



peers and educators. Learners performed better in section A maybe because of group work, bright learners generally did well in both section A and B. The majority of learners performed poorly in section B which is examination because they had difficulty understanding the concept and the structure of questions. Many learners experienced problems in interpreting and understanding the questions.

Many educators believed that if section A was done thoroughly there was hope that learners could have found section B manageable. This was found not to be the case. The outcomes for section B were not aligned to the outcomes that learners worked on in section A during class work in preparation for section B. Since there was no syllabus for the CTAS Instrument, section A was taken as a guide to prepare learners for section B but that idea proved to be wrong because of poor results in section B.

### **5.3.2 Examination**

Examinations stressed learners and made them nervous because they did not know what to learn and what to expect in section B. Therefore, they were not adequately prepared for section B. This problem increased their anxiety and nervousness which impacted negatively on their performance in an examination (section B).

Educators who participated in the study received inadequate training on policy implementation. Educators received theoretical and abstract training on *C2005*, *OBE* and *CASS*. There was hardly any training on how to implement *OBE* and *CASS* at classroom level.

Learners learning at their own pace was problematic because most of the tasks were time based. Restricted and limited time allocations for tasks in Section A of the CTAS Instrument did not allow many slow learners, in particular, to learn at their own pace and also complete their work. This resulted in large number of slow learners falling behind performing poorly in both Section A and Section B.

### 5.3.3 The CTAS Instrument

There was a strong need for educators to be given enough time and training so that they can understand. Some educators who were not in favour of CTASs were looking superficially at the CTAS Instruments and preferred to use it as just another additional resource tool. Most of the educators interviewed had very little positive things to say about CTASs. Few teachers preferred to use it as just another resource, most of the educators rejected it, they argued that CTASs can promote Mathematical Literacy rather than pure Mathematics.

They argued that section B was not related to section A, they complained about the quality and standard of the CTAS Instrument, such as different outcomes for section A and B, de-motivation of learners, limited resource, extra workload and low morale of educators, inadequate time allocated for section A, poor implementation, poor preparation of educators, bureaucracy and jargon, inconsistency in terms of arrival of CTASs at different schools, individual work from learners poor allocation of marks. Activities that deserved little marks could be granted considerable many marks.

Most teachers argued that there was no syllabus for CTASs, and section A was the only guide available to be used to prepare learners for section B which is an exam but it was evident that whether a learner did well or poorly in section B, it was no indication of their actual academic potential and abilities because the test was not related to the teacher and learning that preceded it. Section A and B should be related and relevant to each other so that resulting performances would improve.

CTASs caused problems in many schools in terms of its management of good quality and required is easy to manage and implement. The participants has raised the point before in this study that grade 9 mathematics CTASs are geared towards mathematical literacy with word problems and stories. This caused considerable problems for second language English speakers. On the other hand, the first language English speaker found the quality and standard of the CTAS so inferior and inappropriate. The same amount of work posed no challenge to them because both section A and section B was very easy for them and they could finish all tasks in a very short space of time. Second language English speakers experienced many difficulties with tasks and

struggled trying to make sense of concepts and took a long time to internalise and make sense of what they have learnt.

What was common with CTASs was that the theme was the same in eight learning areas in 2009. The theme was about democracy and learners found that boring. Poor working ethics were demonstrated by the majority of learning during this period this caused lots of anxiety and frustration among educators, who had to crawl at learners in order at learners in order to complete and submit work in good time. Grade 9 mathematics educators were pressurised with marking especially those with big classes, in most cases this coupled with learner apathy, learners laziness and learners not submitting in their work.

Assessment practices were inconsistent across all the participants in a school. The way in which educators assessed their learners varied from one school to another. This problem was exacerbated by the fact that many heads of departments were not *au fait* with assessment in *OBE* and were of little assistance to them. Educators used mainly the traditional method instead of assessing formatively. It was found that many educators in the participant schools were not complying with the requirements of the *National Assessment Policy* (RSA, DoE. 1998 (a)) due to insufficiently training.

CTASs section A was conducted differently across all the participant schools. In two participant schools, it was controlled and conducted in a classroom under the supervision of a teacher, and learners were not allowed to take CTASs booklets outside the classroom, in other participant schools learners were allowed to take CTASs outside the classroom, and were allowed to get assistance from anyone.

In most activity in section A the assessment rubric was inconsistent with the targeted outcomes. All the educators complained that assessment in Grade 9 constituted was made of much administrative and paperwork for educators.

Inconsistency prevailed in a number of things such as time allocated for each activity, marks allocation inconsistent arrival of CTASs that will be dealt with below. Some educators in Grade 9 had to do research themselves for the majority of previously

disadvantage second language English speakers in their classes such as looking for the meaning used in CTASs mathematics problems. CTASs mathematics problem consisted of word problem and stories. All this took lot of time, more time than the one indicated for each activity.

### **5.3.3.1 Conclusions regarding the negative aspects of the CTAS Instrument**

Programme Organisers and themes were unsatisfactory for Grade 9 learners. These were the same for all the Learning Areas. Therefore, they were boring. They did not excite and interest Grade 9 learners in order to increase their involvement and participation in the CTAS Instrument.

We have pointed out on many occasions in my study that section B was problematic. It had no relevance to section A. There was no synergy of the outcomes between them. As a result the summative assessment in section B poorly mirrored the task and the outcomes in section A, which formed the CASS. The assessments focused on different criteria for the two sections. As a result of that learner performances would not be true reflection of their full potential.

Educators maintained that there was a lack of transparency in setting the CTAS Instrument. Most of the educators were curious to know as for who had set the CTAS Instrument. They said that such information would allay their fears on the authenticity, relevance and appropriateness of the evaluation tool to the provincial requirements of all schools doing mathematics.

The twenty five percentage weighting of the CTAS Instrument reduced its importance. All the educators were dissatisfied with the low weighting. It was inappropriate because the large amount of work it entailed. The educators said that CTASs are miss leading learners and decreased their morale to study specifically for this component as they felt that they had already passed the examination by completing seventy five percent of the work for the year for school-based assessment. The educators, therefore, wanted the twenty five percent weighting for the CTAS Instrument to be reviewed.

The bureaucracy and jargon of the *teacher's guide* complicated its understanding. All of the participant educators viewed the *teacher's guide* as an official document which was bureaucratic in nature. This puzzled them down. They poorly said that the jargon used in the guide, was problematic to many educators who were inadequately trained in *OBE* and assessment. They said the complexity of the language used in *teachers guide* made it impossible for them to understand and to unpack timeously.

#### **5.3.4 Insufficient preparation time for implementation**

None of Grade 9 participants knew when exactly the CTASs section A would arrive at their schools. It was then evident that the CTASs section A arrived unexpectedly without warning. This does not go without saying that Grade 9 educators as well as heads of department did not have enough time to prepare well for implementation. Most participants complained of errors in the memorandum and no errata provided, this poses a strong question about moderation of CTASs before they are sent to schools.

It was also evident that different school started CTASs section as at different times. Some schools started doing CTASs as soon as they arriving, while other school preferred to start CTASs section towards examination time. All this caused a lot of problems in implementation of CTASs in a proper way, resulting in unrealistic time frames for doing the tasks and activities.

#### **5.3.5 Poor preparation of educators for implementation**

In all participants school all educators argued that, there was no syllabus for CTASs that would have assisted them to prepare learners in advance. Both educators and the learners did not know what to expect in both section A and section B of the CTASs. Some educators guessed that if they completed section A properly maybe learners would be able to tackle section B which is an exam, this was just a speculation.

#### 5.4 LIMITATION OF THE STUDY

The first limitation resulted from the unpredictable arrival of CTASs, all these past years CTAS section only arrived during the third term, but no one knows when they were arriving exactly. In 2009 CTAS section arrived early during the second term, during my class observation some schools had already completed section A of the CTAS and they were busy doing revision for example Mr. B , Mrs. B, Mrs. B2 and Mrs. B3, (school B) and Mr. E, Mrs. F and Mrs. D. The aim was not to observe them teaching CTAS but it was good to observe them doing preparation for CTAS section B, which is an examination school A, school C decide to complete CTAS. Towards the examination so they do not believe in doing revision for section B because they did not have a clue of what section B (exam) was going to be like, but they just hope that is similar to section A. Spending extra time on section A was done deliberately. As a mathematics and science teacher that was another limitation this in one way or another could create subjectivity and bias in the interpretation of finding, probably in the form of empathising with my colleagues.

Another limitation was about discipline in the school and in the classroom especially because the study was about observing teachers practice inside the classroom beside the interviews that we conducted on the teacher's individual because of the above point one would conclude that discipline acted as extraneous variable. Schools D and school E was problematic, the standard of discipline was very low. In school D it was difficult to get learners into the classroom, they were defiantly standing outside on the verandas even if the school bell had gone. In school E the level of noise was very high but the learners were inside the classroom. In school A, B, C and F learners were very well disciplined. So to compare teachers practice under different situations become a bit unfair. In the next paragraph we presented areas for further researchers.

The investigation was conducted in the KwaZulu Natal province. Since six schools, fourteen educators were involved in the research sample the conclusions had an impact on the schools in the case study only. Therefore, the findings cannot be generalised for all the public and private schools in KwaZulu Natal. We present areas for further research.

## Areas for further research

- Credit accumulation and the General Education and Training Certificate,
- Recording and reporting learner performance, and
- Learner and educator portfolios.

## 5.5 ISSUES FOR FURTHER RESEARCH

Earlier in this chapter and during the discussion and analysis of the resources a number of issues and questions emerged that could not be answered in the present study. These issues and questions are highly below and are recommended for further research.

- The first issue is the introduction of mathematical literacy as a school subject in the South African school curriculum, how do learners after grade 9 choose between pure mathematics and Mathematical Literacy? What guides their choice? How much are parents involved in influencing learners to make such a choice? How much has CTAS contributed in influencing such choices?
- The second issue is the authenticity of (CASS) continuous assessment and the year mark system. Many sectors have raised some serious concerns that the year marks are seriously manipulated. There was also an issue in grade 9, when 75% was taken from informal (CASS) 25% from the formal examination. The grade 9 learner obtains a pass mark before the examination mark 25% is added.
- The present study was also conducted with schools in the urban areas and rural schools did not form part of the study. There is a general assumption that schools in the urban areas are better resourced than the schools in the rural areas, but some schools in the rural areas perform better than the schools in the urban areas. Further research into this phenomenon might give insight to the issue.
- Thirdly, during interviews on the question based on educators understanding of the role of CTASs it became very clear that many teachers did not understand CTAS at all there was complete lack of official support for meaningful implementation of the new form of knowledge and a number of contradictions in the official regulation. Teachers did not attend any workshop in-service training. This calls for a survey to determine educators' awareness of the new policies on education and what they are

supposed to be doing rather than just imposing. This then brings about the question as to how effective in-service training programme is in developing teachers.

## **5.6 RECOMMENDATIONS**

We recommended that adequate training must be provided on policy and concepts for educators and heads of departments. These should be intensified in order to deepen their understanding of *OBE*, C2005 and assessment.

Those involved in setting CTASs need to increase the time allocations for task for learners to learn at their own pace. While it is to allow learners to learn at their own pace, but it is also important to know that other schools have large numbers of learners per class which may not allow this. If the class size is large, and many of the learners are low achievers the principle of learners learning at their own pace is not practical. This means that the time allocation for task should be increased, and class size should be decreased. Educators would then be able to support slow learners to finish their work so that it could be marked in time.

The Programme Organisers and themes should interest grade 9 learners. Those who set CTAS should conduct research on Programme Organisers and themes that 15 years old learners find interesting and fun, so that they could be used for designing exciting and challenging activities for the CTAS Instrument. They should cater for learners who wish to do pure mathematics and those who want to do mathematical literacy.

The examiners should ensure that Section B relates to A. Assessment in Section A must mirror the assessment in Section B for the CTAS Instrument to be viewed a valid and reliable tool for assessing Grade 9 learners.

It is recommended that the use of unnecessary jargon, bureaucracy in the Teacher's Guide be reduced and where there are errors, an errata should be provided.



We have presented a discussion and summary of the main findings, drawn conclusions, made recommendations for improvement, presented the limitations of the study, and identified areas for further research.

In conclusion my research suffices to remind the reader of the purpose of the study. The purpose of this study was to address two critical questions about the CTAS in Mathematics Learning area:

- Do Mathematics educators perceive CTASs as helpful in assisting mathematics learners to be competent in their Mathematics Learning?
- Do educators teaching at any level have common understanding of the role and aims of CTASs in Mathematics teaching?

Most teachers argue that CTASs only prepares learners for mathematical literacy and not at all for pure mathematics. The rejection of CTAS in a number ways such as:

- CTAS are part of mathematical literacy;
- Focused on arithmetical and numeracy;
- Syllabus for CTAS is not provided;
- Errors in the memorandum;
- Lack of mathematics on CTAS;
- Believe that mathematics is an individual activity and teachers felt that the group of learners were the only one engaged in the test while the rest of the group are spectators;
- There was strong concern about the level of English used which was problematic for the majority of learners where English is the second language.

Most teachers that were interviewed irrespective of the race, gender and class reject the reconceptualised nature of mathematics in CTAS and in day to day resorted in teaching traditional mathematics. With reference to role and understanding of CTAS, there was nothing done to orientated teachers into CTAS (new subject loyalty). The lack of official support for educators impacted negatively on mathematics teaching.

A serious problem with CTAS was this contradiction between the knowledge and competences assessed in the CTAS and the high stakes matric examination confused

educators. Educators felt obliged to teach abstract and theoretical knowledge for continuity to the next grade (grade 10) another serious problem poor planning and poor process of implementation of CTAS which was very haphazard.

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## **APPENDICES**

- Appendix A : Application for permission from the department of education
- Appendix B : Letter from my supervisor Dr. H. B. Khuzwayo, University of Zululand
- Appendix C : Letter of the approval from the department of education to conduct Research on schools
- Appendix D : Observation Guide
- Appendix E : Teachers questions
- Appendix F : CTASs section A 2009
- Appendix G : Mr C's timetable
- Appendix H : CTASs section B 2008, page 5 of 1
- Appendix I : CTASs section A 2009, page 15-19
- Appendix J : Mrs D's timetable
- Appendix K : Mr E's timetable
- Appendix L : Interview

## **APPENDIX A**

### **Permission to conduct research within Midlands Circuit**

Suite 16 Postnet

P/Bag X9005

Pietermaritzburg

3200

18 August 2010

**THE CHIEF DIRECTOR**

**SERVICE DELIVERY SUPPORT SERVICES**

**ATTENTION: MR PH GUMEDE**

Dear Sir

### **REQUEST FOR ACCESS TO SCHOOLS TO CONDUCT RESEARCH**

I am writing to you kindly seek permission to conduct research in schools within midlands Circuit during September month.

The purpose of the study is to investigate assessment reform in Mathematics education in South Africa with reference to Common Assessment Tasks (CTAS). I will be focusing on Grade 9 teachers. I will be using an interpretative qualitative researched approach, utilizing questionnaires and individual interviews to collect data.

The project will in no way disrupt the school programme. Strict ethical standards will be adhered to with regards to confidentiality.

Attached is a letter from my supervisor, Dr HB Khuzwayo from the University of Zululand and the Research Questionnaire.

I shall be willing to respond to any further questions and concerns you may wish to raise on this research project. I can be contacted using the above address or cellphone: 083 476 2759

Thank you in advance for your support

Yours faithfully

---

Themba Xulu

Request Supported / Not Supported

APPENDIX B

**UNIVERSITY OF ZULULAND**  
***Faculty of Education***



Internal Box 309

University of Zululand

P/Bag 1001

Kwa Dlangezwa

3886.

035-9026542 (work)

[hbkhuzw@pan.uzulu.ac.za](mailto:hbkhuzw@pan.uzulu.ac.za)

24 February 2008

**To Whom It May Concern**

This is to certify that I know Mr. TR Xulu and also that he is a registered M. Ed. student

(Student no. 19991649) at the University of Zululand currently. I am supervising him in his Masters study. He has informed me that he would like to make use of your library facilities as he stays and works in Pietermaritzburg. I hope you will be able to assist him in his request. I can be contacted at any time should there be a need to do so.

Thank you,

Sincerely

Dr. HB Khuzwayo (Mathematics Education Lecturer, University of Zululand)

Comment



**PROVINCE OF KWAZULU-NATAL  
ISIFUNDAZWE SAKWAZULU-NATALI**

**DEPARTMENT OF EDUCATION  
UMNYANGO WEMFUNDO**

**Tel: 033 341 8610  
Fax: 033 341 8612  
Private Bag X9137**

**Pietermaritzburg  
3200**

**228 Pietermaritz Street**

**PIETERMARITZBURG**

<b>INHLOKHOVISI</b>	<b>PIETERMARITZBURG</b>	<b>HEAD OFFICE</b>
<b>Imibuzo:</b>	<b>Reference:</b>	<b>Date:</b>
<b>Enquiries: Sibusiso Alwar September 2009</b>	<b>Inkomba: 0054/2009</b>	<b>Usuku: 07</b>

## **APPENDIX C**

**MR T.R XULU**

**UNIVERSITY OF ZULULAND**

**P/BAG 1001**

**KWA DLANGEZWA**

**3886**

### **RESEARCH PROPOSAL: AN INVESTIGATION OF ASSESMENT REFORM IN MATHEMATICS EDUCATION IN SOUTH AFRICA WITH SPECIAL REFERENCE TO COMMON ASSESMENT TASKS (CTASSs)**

Your application to conduct the above-mentioned research in schools in the attached list has been approved subject to the following conditions:

1. Principals, educators and learners are under no obligation to assist you in your investigation.
2. Principals, educators, learners and schools should not be identifiable in any way from the results of the investigation.

3. You make all the arrangements concerning your investigation.
4. Educator programmes are not to be interrupted.
5. The investigation is to be conducted from [07 September 2009](#) to [07 September 2010](#).
6. Should you wish to extend the period of your survey at the school(s) please contact [Mr Sibusiso Alwar](#) at the contact numbers above.
7. A photocopy of this letter is submitted to the principal of the school where the intended research is to be conducted.
8. Your research will be limited to the schools submitted.
9. A brief summary of the content, findings and recommendations is provided to the Director: Resource Planning.
10. The Department receives a copy of the completed report/dissertation/thesis addressed to

The Director: Resource Planning

Private Bag X9137

Pietermaritzburg

3200

We wish you success in your research.

Kind regards

---

R. Cassius Lubisi (Ph. D)

Superintendent-General



**PROVINCE OF KWAZULU-NATAL  
ISIFUNDAZWE SAKWAZULU-NATALI**

**DEPARTMENT OF EDUCATION  
UMNYANGO WEMFUNDO**

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228 Pietermaritz Street

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<b>Imibuzo:</b>	<b>Reference:</b>	<b>Date:</b>
<b>Enquiries: Sibusiso Alwar September 2009</b>	<b>Inkomba: 0054/2009</b>	<b>Usuku: 07</b>

**MR T.R XULU**

**UNIVERSITY OF ZULULAND**

**P/BAG 1001**

**KWA DLANGEZWA**

**3886**

### **PERMISSION TO INTERVIEW LEARNERS AND EDUCATORS**

The above matter refers.

Permission is hereby granted to interview Departmental Officials, learners and educators in selected schools of the Province of KwaZulu-Natal subject to the following conditions:

- 1. You make all the arrangements concerning your interviews.**
- 2. Educators' programmes are not interrupted.**
- 3. Interviews are not conducted during the time of writing examinations in schools.**
- 4. Learners, educators and schools are not identifiable in any way from the results of the interviews.**
- 5. Your interviews are limited only to targeted schools.**



6. A brief summary of the interview content, findings and recommendations is provided to my office.
7. A copy of this letter is submitted to District Managers and principals of schools where the intended interviews are to be conducted.

The KZN Department of education fully supports your commitment to research: [An investigation of assessment reform in mathematics education in South Africa with special reference to common assessment tasks \(CTASs\)](#)

It is hoped that you will find the above in order.

Best Wishes

---

R Cassius Lubisi, (PhD)  
Superintendent-General



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<b>Enquiries: Sibusiso Alwar September 2009</b>	<b>Inkomba: 0054/2009</b>	<b>Usuku: 07</b>

**MR T.R XULU**

**UNIVERSITY OF ZULULAND**

**P/BAG 1001**

**KWA DLANGEZWA**

**3886**

### **LIST OF SCHOOLS**

1. Edendale Technical School
2. Nyonithwele Senior Secondary School
3. M.L Sultan
4. Alexandra High School
5. St Nicholas

Kind regards

---

**R Cassius Lubisi, (PhD)  
Superintendent-General**

## **APPENDIX D**

### **OBSERVATION GUIDE**

1. Description of teachers and students according to social grouping and backgrounds.
2. Administration leadership departments.
3. Buildings, classrooms and play grounds.
4. Time table-term year schedules.
5. Resources.
6. School events.

### **CLASSROOM OBSERVATION**

1. Classroom relations
2. Different assessment methods.
3. Organization of lessons.
4. Teaching method.
5. Classroom physical environment.
6. Integrating teaching and assessment.
7. Comments made by teacher- approval disapproval when he or she checks class activities, homework assessment.
8. Documents and resources used.

## APPENDIX E

### TEACHERS' QUESTIONS

#### WHAT ARE TEACHERS PERCEPTION ON CTAS (MATHEMATICS)

##### **A. Role of CTAS's in helping learners to be competent in mathematics**

1. Do you consider CTASs to be helpful in assisting learners to be competent in their mathematics learning? Yes or No.
2. If the answer is yes in 1 above, explain how.
3. What are the strategies in learning mathematics which are promoted by the use of CTASs?
  - 3.1 How do learners benefit's from the application of those strategies?
  - 3.2 How effective are those strategies?
4. From the work that you have covered from the beginning of the year, what sections of the CTASs do you think learners benefit from?
5. How useful is the memorandum provided for by the Department of Education to teachers of mathematics?
6. How does CTASs mathematics differ from year to year?
7. In those activities which require group work, what is your view with regards to giving a learners group mark?
8.
  - 8.1 You have been exposed to CTAS section A and section B does this experience enables you to prepare your learners for the next exams on CTAS section B?
  - 8.2 For how long you have been involved with CTASs?
  - 8.3 Has this experience assisted you in making your learners to be competent in mathematics?
  - 8.4 Can you explain similarities and differences in how CTAS has been designed?
9.
  - 9.1 Does CTAS prepare the learners for grade 10 mathematics? Yes or No?
  - 9.2 Explain how effective are CTASs in preparing learners for the next level in mathematics, which is grade 10?
10. Are CTAS values any assessment of mathematics ability?
11. Grade 9 is an exit for learners who don't want to carry according to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learner with the skills they need for job opportunities?
12. OBE emphasize the integration across or within learning areas. Do you find it possible to integrate mathematics with other learning areas?

## **EDUCATORS UNDERSTANDING OF THE ROLE OF CTAS'S**

1. Were you made to understand the role of the CTAS's in the teaching and learning of mathematics at the time of their introduction? Explain your answer.
2. Do you now understand what their role is in the teaching and learning of mathematics? Explain your answer.
3. How were the CTASs introduced in schools? Was the purpose of the CTASs explained to you?
4. If you were given a choice either to use/ not use CTASs, what will your choice would be? Explain your answer.
5. How has the introduction of the CTASs changed your perception about mathematics? Do you think this will also be true of your learners? Explain your answer.

## APPENDIX F

<b>TASK 3</b>	<b>RECOMMENDED TIME:65 min</b>	<b>MARKS:35</b>
---------------	--------------------------------	-----------------

### HUMAN RIGHTS

South Africa adopted a new democratic constitution in 1996. The Bill of Rights is a cornerstone of democracy in South Africa. It enshrines the right of all people in our country and affirms democratic values of human dignity, equality and freedom (Constitution of the Republic of South Africa Act 108 of 1997). Some of the rights contained in the Bill of Right are:

- Right to have access to adequate housing, and
- Right to have access to sufficient food and water.

The government must take reasonable measures to achieve these rights.

### Activity 1[Cooperative group work]

<b>Recommended time: 20 min</b>	<b>Marks: 17</b>
---------------------------------	------------------

#### Access to clean water

In an attempt to ensure reasonable measure to observe the right to have access to clean water the City council provides all households with free 6 000 litres of water per month to do basic functions. Some of the basic functions performed by Mrs Morena's family are listed in the following table:

<b>Basic function</b>	<b>Frequency (How often)</b>
Boiling 1,2 litres of water in a kettle to make tea	3 times a day
20 litres of water for washing dishes in a sink	3 times a day
10 litres of water for a single flush of toilet	11 times a day
50 litres of water to wash a single load of clothes	2 times a day
30 litres of water for cooking	2 times a day

### 1.1.2 STEP 2

Draw two horizontal lines to divide **rectangle ABCD** into three **equal parts**. Name the upper line EF from left to right, and name the remaining line GH from left to right (1 mark)

### 1.1.3 STEP 3

Draw the diagonal AC and the diagonal BD.

### 1.1.4 STEP 4

Draw two parallel lines as follows:

- (a) One line on each side of diagonal AC.
- (b) The line above diagonal AC should be named line  $IH_1$
- (c) The line below diagonal AC should be named line  $j_1j$
- (d) Line  $IH_1$  and line  $j_1j$  should also be parallel to diagonal AC
- (e) The distance between line  $IH_1$  and  $j_1j$  should be one third of the width of the flag and the length of line  $AJ_1$  should be one sixth of the width of the flag.
- (f) The point of intersection of line  $IH_1$  and line EF should be named K.

Follow instruction (a) to (e) and do the same on diagonal BD

**But:**

- i. The line above diagonal BD should be named  $G_1M$
- ii. The length of line  $DG_1$  should be **one sixth of the width** of the flag
- iii. The line below diagonal BD should be named  $F_1N$
- iv. The point of intersection of line  $F_1N$  and line GH should be named O
- v. The point of intersection of line  $J_1J$  and line  $G_1M$  should be named P

### 1.1.5 STEP 5

- a) Quad IBFK
- b) Quad NOHC
- c) Triangle  $G_1PJ_1$

### 1.1.6 STEP 6

- a) Draw line QR 0,8 cm below and parallel to line  $IH_1$
- b) Draw line ST 0,8 cm above and parallel to line  $J_1J$
- c) Draw line UV 0,8 cm below and parallel to line  $G_1M$
- d) Draw line WX 0,8 cm above and parallel to line  $F_1N$
- e) Draw line YZ 0,8 cm below and parallel to line EF
- f) Draw line  $A_1B_1$  0,8 cm above and parallel to line GH
- g) The point of intersection of line YZ and line QR should be named C1
- h) The point of intersection of line  $A_1B_1$  and line WX should be named D1
- i) The point of intersection of line UV and line ST should be named E1

### 1.1.7 STEP 7

a) Use a pen to highlight the following lines:

Line  $QC_1$

Line  $C_1Z$

Line  $ZB_1$

Line  $B_1D_1$

Line  $D_1W$

Line  $WD$

Line  $DU$

Line  $UE_1$

Line  $E_1S$

Line  $SA$

Line  $AQ$

b) Erase all the letters and all the lines drawn in pencil



## APPENDIX G

	1	2	3	4	5	6
Day1	Mat 9M	Mat 9Y	Mat 9K	Mat 9S	Mat 9	Mat
Day2	Mat 9K	Mat 9Y	Mat 9G	Mat 9F	Mat 9S	Mat 9C
Day3	Mat 9K	Mat 9M	Mat 9G	Mat 9F	Mat 9C	Mat
Day4	Mat 9M	Mat 9K	Mat 9F	Mat 9G	Mat 9C	Mat 9S
Day5	Mat 9C	Mat 9K	Mat 9G	Mat 9F	Mat 9Y	Mat
Day6	Mat 9M	Mat 9Y	Mat 9F	Mat 9S	Mat 9C	Mat
Day7	Mat 9Y	Mat 9M	Mat 9K	Mat 9G	Mat 9S	Mat 9C
Day8	Mat 9Y	Mat 9M	Mat 9F	Mat 9G	Mat 9S	Mat

## APPENDIX H

- 2.1 Complete the Patten by drawing water pipes arranged in two rows and six rows (2 marks)
- 2.2 Determine the formula you can use to generate the above Patten if  $r$  represents number of rows and  $p$  represents number of pipes. Your formula should be the form  $p =$  (2 marks)
- 2.3 use the formula in QUESTION 2.2 to generate a number Patten if  $r \in \{5; 6; 7; 8; 9\}$  (5marks)
- 2.4 describe the Patten in your own words (2 marks)

### Activity 3 [individual work]

Recommended tome: 25

Marks: 14

### Access to adequate housing

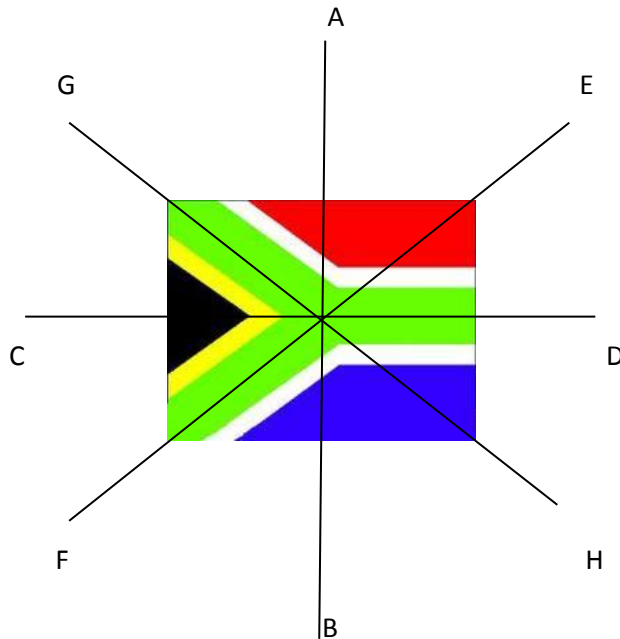
Eight pallets cement are transported in truck trailer to the RDP construction site for building the house. The mass of one bag of cement is 50kg and one pallet contains 40 bags.



- 3.1 How many bags of cement are contained in all 8 pallets? (2 marks)
- 3.2 Calculate the total mass of cement transport to the construction (2 marks)
- 3.3 The truck that transports the cement pallets can carry maximum of 8tons of cement. If the maximum load was carried, how many load of cement will be transported to complete all eight pallets if 1 **ton** is approximately equal to 1000 **kilograms**? (4 marks)

## APPENDIX I

- 2.4 The design of the South African flag is symmetrical what does this mean? Explain in your own words (**DO NOT CONSIDER THE COLOUR OF THE FLAG**) (1 mark)
- 2.5 Which one of the following lines is the line of symmetry in the flag? (**DO NOT CONSIDER THE COLOUR OF THE FLAG**) (1 mark)



- 2.6 Boitumelo, grade 3 learners, watches Uncle Tom as he hoists the flag in front of the school's administration buildings; Boitumelo stands 6 elevation of  $45^\circ$ . Draw rough diagram to represent the situation given above. You are required to:
- 2.6.1 Show the position of the flag (F) relative to the observer (B) (1 mark)
- 2.6.2 Draw a line to show the distance of the flag-from the observer (Boitumelo) (1 mark)
- 2.6.3 Show Boitumelo's position from the foot of the flag (P) (1 mark)
- 2.6.4 Draw the line to show Boitumelo's distance from the foot of the flag post (2 marks)
- 2.6.5 Show the angle of elevation (1 mark)

## APPENDIX: K

### Teacher timetable

	1	2	3	4	5	6	7	8
Monday	MTHLI G11(6)	MAT G9 C	MAT G9 E	MLIT G10 B	MLIT G10B	MTHLI G11(6)	MLITT G10(6)	MAT G9 C
Tuesday	MLITT G10(6)	MTHLI G11(6)	MLITT G10(6)		MAT G9 C	MLIT G10 B		MAT G9 E
Wednesday	MAT G9 C	MTHLI G11(6)	MLITT G10(6)	MAT G9 E		MAT G9 C	MLIT G10 B	MTHLI G11(6)
Thursday	MAT G9 E	MLIT G10 B	MAT G9 C	MLITT G10(6)		MTHLI G11(6)	MLIT G10 B	MAT G9 E
Friday	MLIT G10 B	MLITT G10(6)	MAT G9 E	MTHLI G11(6)		MLITT G10(6)	MAT G9 C	MAT G9 E

## Appendix: J

	1	2	3	<b>BREAK</b>	4	5
DAY1	MATH G9 9A	MATH G9 9B	MATH G9 9C		MATH G9 9D	MATH G8 8D
DAY2	MATH G9 9D	MATH G8 8E	MATH G9 9E			MATH G9 9C
DAY3	MATH G9 9D	MATH G8 8E	MATH G9 9A		MATH G9 9B	MATH G8 8D
DAY4	MATH G9 9A	MATH G9 9C			MATH G8 8D	MATH G9 9E
DAY5	MATH G9 9H	MATH G9 9E	MATH G8 8D		MATH G8 8E	MATH G9 9D
DAY6		MATH G8 8E	MATH G9 9B		MATH G9 9C	MATH G9 9A
DAY7	MATH G9 9D	MATH G9 9A	MATH G9 9E			MATH G8 8D
DAY8		MATH G8 8E	MATH G9 9B		MATH G9 9C	MATH G9 9E

## APPENDIX L

### INTERVIEW

#### INTERVIEW

The interview questions were divided into two sections. Section A consists of 12 questions. It about the ROLE OF CTAS's IN HELPING LEARNERS TO BE COMPETENT IN MATHEMATICS.

Section B consisted of 5 questions; it's all about EDUCATORS's UNDERSTANDING OF THE ROLE OF CTAS's.

In presenting results the researcher will present the common teacher's responses as per section. English was the language used for interviews but there were cases where Zulu and Xhosa were used, the researcher had to translated the responses into English especially with teachers C and D who are Zulu and Xhosa First language speakers

A1

*Do you consider CTASs to be helpful in assisting learners to be competent in their mathematics learning? Yes or No.*

No not mathematics and yes for mathematical literacy.

*If the answer is yes or no in 1 above, explain how.*

I think I could probably take you back a step on a question like that in grade 9 we are preparing learners for two completely different roots. One root is if they take core mathematics or pure mathematics and the other roots is if they take mathematical literacy. Now the biggest challenge that we face in grade 9 is the fact that the majority of learners who want them to pass but in the most cases as many as fifty percent that simply cannot do the subject and those are the ones that will end up doing mathematical literacy, but we still have to teach them the basic grade 9 mathematics syllabus so we are caught in a situation where when these learners go to grade 10 half of them are going to do mathematical literacy and half of them are going to do pure mathematics and the on-going challenge throughout the year is to maintain a good standard for those who are going to do mathematics and not to make others loose interest now in that context.

The CTAS is basically a good preparation for mathematical literacy and a completely worthless one for pure or core mathematics. In given circumstances no we don't because what generally happen by the time we get half way through grade 10 we find that it's work like two thirds who are doing mathematical literacy and the other third is doing pure mathematics.

*What are the strategies in learning mathematics which are promoted by the use of CTASs?*

*How do learners benefit's from the application of those strategies?*

I suppose one strategy that they do promote in CTAS is a type of problem solving, if you at look the CTAS 2009 the issue of working out the proportions of the sit's for elections but the problem of solving which is useful for learners to learn the issue of how many litres of water do you use in a day and how many litres of water do you use in a month those are basic problem solving and so that type of skill is obviously useful especially if you are going to be doing mathematical literacy.

If I look at the CTAS 2009 there's essentially no geometry involved and that is a fundamental part of grade 10 Mathematics. The only geometry that you have in CTAS 2009 is instruction for drawing the south African flag and then from very basic transformation space from the South African flag which really somebody [outer] to be able to work have to be able to work out at the end of grade 7, there is no algebra at all in the CTAS not a single item of algebra and yet algebra is one of the fundamental core section in grade 10, 11 and 12 mathematics, there is no finance.

There is absolutely no finance in 2009 CTAS and yet finance is one of the major sections that have been introduced into core [pure] mathematics so to me that is the most simple part and it's clear that CTAS is geared completely towards mathematics literacy.

The benefit that they get as I say would be at the level of basic problem solving but in terms of preparation for work they have to do in mathematics very little strategies so, only benefit's those learners who want to do mathematical literacy.

*How effective are those strategies?*

For core mathematics the strategies promoted by CTAS are not effective at all but for mathematical literacy yes it does have a value it teaching them to analyse questions and try and get to the basic mathematics required in order to answer and it is teaching them a type of mathematical marbling because when the ask a question they have to try and present some type of mathematics skills in order to answer it.

*From the work that you have covered from the beginning of the year, what sections of the CTASs do you think learners benefit from?*

The CTAS we normally do them in fourth term and if you are speaking in terms of what syllabus in grade 9 and the amount of the syllabus of the CTAS give. The CTAS in 2009 has covered approximately 10% of the syllabus that we have already done.

*How useful is the memorandum provided for by the Department of Education to teachers of mathematics?*

The memorandum is usually reasonable but ii think that one of difficulties that we often face that memorandum the marking allocation is often quite strange in the sense that obviously as a mathematics teacher have been teaching mathematics for about ten years now up until 2005, 2006 we were basically taught in terms of the work that we set.

We were basically told that you can give marks according to what the learner has to do so that if a learner has to do five or six different steps to solve the problem then the learner can reasonably expect 5 or 6 marks where as if the learner have to do just 2 things to solve the problem then the learner can expect 2 marks and the difficulties that we have experienced in the past I have to admit if I haven't looked so closely at the memorandum in 2009 because we are still in the process of doing task but in the past we have often found that the relatively simple task would give 3 or 4 marks which is more than we would normally would have allocated and a complex task might only get 2 or 3 marks where as we would have allocated 6, 7 or 8 marks.

The set certain and amount of truth is that it may be that if I set the test and I offer 2 marks somebody else would offer 3 and it maybe that I would offer 4 marks and somebody offer 2 or 3 that is true to a certain extent but mathematics is fairly standard and the thing that you have to do so to find a certain disagreements of one or two marks is not a big deal but to find a disagreement of 5 or 6 marks that is quiet significant. I think it more than simply who is setting the paper. I think it's a different philosophy of how to give marks and what to give marks for and I think under those circumstances the CTAS don't explain what the philosophy



behind the mark allocation occasionally there have been mistakes on the CTAS but no errata provided.

When the CTAS came for the first time we wrote a report and pointed out where there were mistakes we sent that report to the examination department, beside CTAS we found they make errors in March, June and September common paper happens for mathematics grade 11 and 12. The June and November common paper that we use to write in 2006 the memo were usually full of mistakes, 2007 memo and very often there will be no comment or errata but any report that we have sent was never replied. No

*How does CTASs mathematics differ from year to year?*

I think what I have noticed over the last couple of years is that there have been an attempt in previous years to try to include some type of algebra so that learners would be given formulas and would have to substitute or use the formula under different conditions and the statistics that they have been asked to do is usually been fairly specific and they have to work out definite statics like the mean, the median and the mode some of in previous years the exercise has been built around asking what we would recognize as mathematically patterns and question. I think in 2007 there was even a quadratic equation and factorization.

However that type of activity has become less and less so in that regard CTAS differ from year to year e.g. this year 2009, the statics as that they have to do is simply to draw a graph and determine the range and the mean and unfortunately there was no reference to the median and no reference any other statistics. [and only one aspect of doing a formula only for 2 marks]

*In those activities which require group work, what is your view with regards to giving a learners group mark?*

Generally I don't have negative attitude in group work as long as I am able to incorporate in some way of making sure that everyone is actually involved so that one way I have done that is that I would set a task which is for example worth 10 marks and I would allocate another 5 marks which the learner must distribute to among themselves according to how well or badly individuals participated.

In my school CTAS are done in classrooms and are not taken home and the work is done in class under my observation and at that level I can usually check or gage whether or not a particular group is being unfair but I can honestly say generally speaking group work is okay they are quite if I use another system where the total mark of group work is 60 then I will mark it out of 40 then and everybody will get that mark and then will decide how the remaining 20 are allocated they might say for example if it a group of 4 they may say everybody deserve 5 marks.

You have been exposed to CTAS section A and section B does this experience enables you to prepare your learners for the next exams on CTAS section B?

When I first heard about CTAS I thought they were brilliant idea, I was very happy about the idea of assessing learners over a period of time rather than assessing them in single once of assessment. I thought assessing them over period over period. Period was a good thing of 1 or 2 weeks was a good but I am afraid and disappointed continually that the CTAS do not cover the majority of the mathematics syllabus that we teach in grade 9. Section B is a once of 2 hours paper which is supposed to be an extension of whatever there was in section A.

Section A you have a theme and there are various tasks with different or very little amount of mathematical application. Section B is supposed to extend the type of question that has been asked in section A.

To answer a question on whether our learners could pass section B which is an exam without section A, I can say it is very difficult for learners to do badly I section A or section B because the mathematics content is quite "it's too easy"

*For how long you have been involved with CTASs?*

For 10 years

*Has this experience assisted you in making your learners to be competent in mathematics?*

Competent

I am afraid basic mathematics competency in mathematics is simply going down each year in general. In other words on average the learners that we get in the school the mathematics skills are getting less each year and the simple example of that would be to look at grade 8 pass rate. The grade 8 pass rate each year has decrease basically since the year 200 and the only way that we have been able to make sure that learners pass subject {mathematics} is by reducing standard that we test and this implies that the problem goes down to primary schools and this impact on us when they get to grade 8 and we are forced to lower the standard so that they can pass. When they get to grade 9 the competency has gone down already.

*Can you explain similarities and differences in how CTAS has been designed?*

The first or original CTAS there seemed to be more method to cover more mathematics content and so the idea of having scene and then asking mathematical type question around that scene e.g. Democracy improving the school.

There was one year where there was a question of people with disability. Now that has the change that I have seen is that the standard of mathematics and mathematics content was higher in the beginning of and it gradually got lower and lower as we can see in 2009. The scene dealing about human disability was useful in mathematics because it involves teaching triangles it was then relevant only in that scene teaching triangles. I also believe there some statistics involved, algebra solving equations learners to build ramps and around that topic of building ramps there were calculations involved.

*Does CTAS prepare the learners for grade 10 mathematics? Yes or No?*

Absolutely No. not in terms of pure mathematics, they do prepare learners for mathematical literacy.

*Explain how effective are CTASs in preparing learners for the next level in mathematics, which is grade 10?*

In terms of mathematics absolutely No. in terms of mathematical literacy Yes.

*Are CTAS values any assessment of mathematics ability?*

It quite possible that a learner who is good at factorizing, good at co-ordinate geometry working out the equation of the line that we are supposed to be doing in grade 9 and who can solve equations and who is quite able to substitute , simply has a good understanding of Pythagoras.

*It is very possible that a learner who is doing well in those areas that when he is faced with CTAS he/she is totally confused as to what he or she has to do.*

It because of the way the questions are asked and the questions are based on problem solving in a using basic mathematics a learner who is more used to do more complex mathematical problem solving is going to be looking for that type of complex solution and the simple solution cannot benefit them.

*Grade 9 is an exit for learners who don't want to carry according to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learner with the skills they need for job opportunities?*

Exiting has never happens and I have never seen any grade 9 certificate. So according to my understanding such things are no longer happening, in fact they have never happened. Business is also not a disquietly offer the type of employment that grade 9 learner leaving at the end of grade 9 would be able to do and also business is unable to allow grade 9 learners, that age of learner to discontinue their studies. That is the official thing business people are not willing to employ such young people.

*OBE emphasize the integration across or within learning areas. Do you find it possible to integrate mathematics with other learning areas?*

Integration

The problem is that learners themselves don't seem to be able to do that. In grade 11 mathematical literacy is one of the presumably a place where you can wonderfully prepare learners for the outside world and I have explained or taught 5 lessons trying to help learners to see how to use cell phone contact and calculate for themselves, how much it cost them according to what type of contract they have and make calls and how long the calls last, and this is in grade 11.

The learner unfortunately do not see that as a useful thing for them to know they simply see it as a mathematical exercise that they don't wants to do. I would have also said that it would be this is a real mathematical exercise which will be based, which will have simple practical everyday consequences not necessary a text of other learning areas as such.

There is obvious integration between mathematics, science, accounting and B.E those are things we work draws learners attention too but again the problem is the learners themselves are very compartmentalized in the way they approach the subject so that you can tell them in accounting what the profit, that the profit is equal to income minus expenditure and they will accept and work with that but if you give them the same formula in mathematics class they will not recognize that as being something that they already know from accounting.

#### Problem

It is difficult to pinpoint whether the fault is with the teacher or learner. Another example is in a topic where we were changing the subject of a formula I could put 5 or 6.7 formula and I would include things like profit and loss.

Force = mass x acceleration.

Things that they would have done in science, things that they would have done in B.E and I would specifically tell them these are formulas that they are using in other subjects but they would not be able to recognize which they are using them.

#### Problem

Integration is difficult.

A colleague of mine has a joke which I think has a certain amount of truth the majority of learners it's as if there is a hidden metal bolt approximately which tight so that as they walk out of the classroom everything that they have done is erased and when they go to the next classroom it's a completely different thing.

## **EDUCATORS UNDERSTANDING OF THE ROLE OF CTAS's**

*Were you made to understand the role of the CTAS's in the teaching and learning of mathematics at the time of their introduction? Explain your answer.*

Yes I think it was fairly clear what the idea was and what the intention was it there were various workshop that we attended at that time.

*Do you now understand what their role is in the teaching and learning of mathematics? Explain your answer.*

I certainly understand the role; I think the issue is whether they are or not full filling it. It is precisely what I have been always saying throughout the interview in terms of mathematical literacy the CTAS are a good preparation in terms of pure and core mathematics they are total waste of time.

*How were the CTASs introduced in schools? Was the purpose of the CTASs explained to you?*

In our school basically what happened was during the course of the year various teachers attended various workshop of mathematics and we were told that the CTAS were going to arrive and then we were told

*If you were given a choice either to use/not use CTASs, what will your choice would be? Explain your answer.*

I would never teach mathematics the way I use to before the CTAS precisely because there is some good staff in the CTAS and there something which are good and worth doing so that in term or grade 9 for example : any especially when terms are preparing the learners for these two completely different choices of mathematics and mathematical literacy some of the work which is supposed to be done or doing in the CTAS is good and reasonable and is not about thing for learners especially those who will be doing mathematical literacy to be exposed to those types of questions.

When we set our exams in June and when we used to set our exams in November but we don't do it any longer because the CTAS took over but we work deliberately and consistently have a combination of both types of question so that we would have an even in our testing of the year. When we were doing form of testing we would have the type of question which would be geared towards a learner who is going to do math literacy and we would also have more formal and convectional mathematics for those who want to do pure mathematics. The aim is to give exposure to learners from both types.

I set a test out of 50, 20 of the marks for mathematical literacy and 30 for pure mathematics. The chances are that those learners who might choose mathematical literacy will get 40%. But at the same time that gives them what is required to pass the subject and they do have the exposure to the mathematics type question and if they are able to do something with them they are able to pick some of the marks and experience and if they are unable at least they don't completely fail the paper because they do get 40% pass mark.

*How has the introduction of the CTASs changed your perception about mathematics? Do you think this will also be true of your learners? Explain your answer.*

I think the issue that is touching our man is that department of education has never adequately address how to help learners at the school to be good at art, at drama and yet the department is expecting every single learner to be able to do mathematics and what they did in introducing this dichotomy between mathematics and mathematical literacy is that they introduce what can only be described as a second class subject and the learners who cannot do mathematics and have to do mathematical literacy consistently a d almost completely hundred percent (100%) are unhappy having to do that subject and the best and the fact that they have to do mathematics which they don't want to do, they also have to do a second.

Grade mathematics

During the use in terms of high and standard grade mathematics rating. A learner who was doing a standard grade mathematics knew that he or she was still doing emphatically are recognized as mathematics subject he was doing it at a lower level where as a learner who is doing mathematical literacy is not counted in any way as being the mathematical subject it is not accepted by university and it is not accepted technikon in any way at all and also the big issue is about the name.

Why call it mathematical literacy?

It makes it sound second class. Quite honestly if they have chosen a name like “numerical engineering” which have nothing to do with mathematics no question that it was a second class mathematics option but was simply a subject. So if they do mathematics or you do numerical engineering that simple change the (law load) which will makes a numerous difference as the attitude of learners.

I don't agree that “mathematics for all” but I do agree that everybody need some basic numeracy and everybody required some basic mathematical skills but teaching them mathematics at high school is not the way to go what you would require I think that is mathematics and other subject.

That the other subject which is to grouping to reach basic mathematical skill should be prevented in such a way that it is not in any way connected to mathematics so that those who do mathematics and like to do mathematics can do it and those finish up doing something you might call numerical engineering, any other name you may wish to use which has no reference to mathematics they can know that while we are doing that they are gaining some type of mathematical competency.

In terms of the end of grade 9 I will not throw away CTAS but I will not accept it as is I would want a combination of CTAS and pure mathematics to cater for two streams mathematical literacy and mathematics pure. CTAS are basically a very good idea of learners. Trying to be assessed over a period of time but precisely in the way that the CTAS are trying to do I think that is precisely a good idea so that giving learners a series of test over a period of one or two weeks and giving them a major assessment of how they perform in those tests that I think is good my issue is always going to be where the mathematical content contain of what they are asking us to do.

A 2

*Do you consider CTASS to be helpful in assisting learners to be competent in their mathematics learning? Yes or No.*

No

*If the answer is yes or no in 1 above, explain how.*

Not in mathematics perhaps in a preparation for some for some of them to see what mathematics literacy might be like but certainly it is not of much use mathematical speaking. CTASS is only promoting Mathematical literacy not core mathematics, No it's just mathematical literacy. That is promoted, not mathematics per say.

What are the strategies in learning mathematics which are promoted by the use of CTASS?

Not if it's been done a copy of the board work, copy from the board. They are coping from the board it has no incentives no draw work for learners to even learn new topics.

How do learners benefit's from the application of those strategies?

Yes, but you can do it an exposure to that you can do it once a week throughout the year it's been a lesson on doing the work that is typical of the story style and on which they must extract the mathematical details you get it crunched into a fourth term wasting that whole term.

In the next year the learners are going to go into mathematics pure mathematics and those that cannot manage (afford) go to mathematical literacy so now they spent three terms of grade a doing real mathematics and then at the end of the year there is nothing going on again. It only means they become that greatly disadvantaged by the time they get to grade 10. Some of the work we should be drilling in the fourth term in readiness for grade 10 core mathematics. This is during the year we do exposure to mathematical literacy type of work that would be your greater benefit to everyone concerned.

How effective are those strategies?

So strategies promoted by CTASS are not at all effective it should be run perhaps side by side during the grade 9 year instead of being lump fourth term for grade 9

From the work that you have covered from the beginning of the year, what sections of the CTASS do you think learners benefit from?

This present one for 2009 there is nothing in it, in other years they have introduced a bit or transformation and with co- ordinates involved with it, we might have been. There have

been previous CTASs which have been more detailed and of more general use, this 2009 one has been an absolute waste of time.

How useful is the memorandum provided for by the Department of Education to teachers of mathematics?

I don't even look at it. No! I just adjust the questions to make into what I believe is more worthwhile, so I don't actually do the CTASS as it is, I just glanced at it. In other years we have found that there are so many mistakes in the CTASS for a person (a teacher) who has not done mathematics probably at school or the university level they will never realise that there are mistakes, for that reason therefore I don't personally pay attention to that memorandum. I have never seen any Errata from the department. I am not being arrogant when I say all this.

How does CTASs mathematics differ from year to year?

It's not the same standard or quality or debt of a particular topic, last year 2008 they brought a bit of real mathematics some equation solving. This year (2009) there is nothing there is not even mass or a formula substitution. I think there is only one occasion where they were supposed to draw a graph. Drawing graph skills knowing how to place axis and plot position and draw a graph is a basic skill that learners need for all the around of learning areas. For instance the biology staff often say that is the section in which the learners needing guidance with even though they have been in grade 8 and 9 and even in grade 10 they need more guidance in their issue, so CTASS this year (2009) is not giving any of those

In those activities which require group work, what is your view with regards to giving a learners group mark?

No! No! One person those all the work and the others perhaps copy, we try very hard in this school to prevent learners from copping work and getting credit from copping work so I personally discourage that what they do, they do all the work in the classroom under my supervision when I decide that they work together I then allow that in pairs not in groups. I suppose in a language where they have to discuss and give different opinions and debate things that is another scenario.

I usually tell them that pairs are just in order to facilitate the speed in which they calculate things to just assist each other that way and some of them still get different marks of that. These children are not always really listening even to each other but it's not the whole class that do the work in pairs part of the class do that. Just to facilitate to get doing the work a bit fast. We must always bear in mind that these learners are going to write section B individually so I don't separate the whole class in pairs, just part of the class. So to do the learning or preparation programme yes I can even work in pairs on practising an example of what is going to be required and once they have practised that together than they go individually so we only use pair or group for purposes of practising. I don't support group work at all school level. Group work limit's independent testing they rely on each other.



You have been exposed to CTAS section A and section B does this experience enables you to prepare your learners for the next exams on CTAS section B?

It's supposed to be section A to give them practice and also assessment skills that they need to do section B. learners cannot write exam section B without having done section A because it could be anything and nothing at least section A serve as indication the department could have given a list indicated that these are the skills given at least or later just a little when you start the year there are certain skills that by the end of grade 9 a learner must have acquire so that they got enough skills to cope with the next level grade 10 it's a building process all the time, most unfortunately this is not the case with CTAS. The long experience in teaching enables me to prepare learners for the next level grade 10 and not for CTAS.

For how long you have been involved with CTASs?

I have been involved with CTAS ever since they were introduced.

Has this experience assisted you in making your learners to be competent in mathematics?

Mostly not mathematics but mathematical literacy (mostly exposing to what mathematical literacy is all about) but the true mathematical children the children with a talent and an interest and an excitement for mathematics are finding CTAS quiet boring in places depending also on the theme. This year's theme is absolutely out of each and they are doing it in learning areas. Same thing that is really a very scary experience for an intelligent person.

Can you explain similarities and differences in how CTAS has been designed?

Different themes at the beginning disable people (compassionate) make ramps democracy wildlife conservation the other year it's all different themes even these themes are relevant to mathematics issue that only similarity, the aspects of it can be seen as a mathematical issue. This year's drawing the flag I don't if these children are interested in drawing a flag they are too young they only 14 years and in this school we do have internal election, they know about voting at the school level.

At this school we do have internal election RCL so they are actually already trained as to know about ballot secret vote and everyone does tally table and counting and so on in their aspect of the work in mathematics, save it actually very simple. Simple on skills that we have practiced with far more differ to it than what the CTAS offers. It gives inflated the assessment mark and ends up being so inflated. It should perhaps be done at the beginning of the year not now as an introduction maybe as some of it.

CTAS are certainly not a measure out of all the serious work that we have done for three terms now one gives this simpler irrelevant staff. To a class at the end of the forth term. It should be given at the beginning of the year only for two weeks or at the end of the first term so that in the fourth term briny of the next grade really in all subjects polisicup and get finer details done in readiness for the next level (grade 10).

These children arrive in grade 10 and they are and this final terms mark any grade 9 CTAS start is not a sincere reflection or an accurate reflection of their ability.

Does CTAS prepare the learners for grade 10 mathematics? Yes or No?

No, maybe mathematical literacy but not mathematics core.

Explain how effective are CTASs in preparing learners for the next level in mathematics, which is grade 10?

CTAS are partially effective in preparing for grade 10 mathematics less than a third.

Are CTAS values any assessment of mathematics ability?

Very partially, you see what they are doing in CTAS is that they would be using the skills that we have taught since grade seven, so now the CTAS expect them or giving them a choice to show those in such a more simpler way than they have been working. It like a car at 120 kilometres and for the next 50 kilometre you go ten kilometres an hour, so what was the point of having this car all nicely checked and serviced and so on you train for six months and you run a 5 kilometres run instead of comrade ( Pietermaritzburg to Durban) that you were trained for. What a lead down.

Grade 9 is an exit for learners who don't want to carry according to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learner with the skills they need for job opportunities?

Certainly not technical certainly not, if a learner want to go and become apprentice where you need a technical matter. It might be some kind of a bunch up for general not even commercial per say but general officer work.

They only 14 and they are still children and in our school they stay they don't leave school. We have never ever seen any certificate for grade 9 ever since it was mentioned that they get there never even seen them learners have not seen and piece of certificate.

OBE emphasize the integration across or within learning areas. Do you find it possible to integrate mathematics with other learning areas?

Yes we can because we can do there is an opportunity to do that when I teach Afrikaans which is a language I even bring some mathematics, I do some activities in another language. Integration is possible in history, biology, natural science. Graphs are involved in these learning areas and their interpretation is able to complete tables of results, measurements they have made. In LO they can do research and graphs compare.

## **EDUCATORS UNDERSTANDING OF THE ROLE OF CTAS's**

*Were you made to understand the role of the CTAS's in the teaching and learning of mathematics at the time of their introduction? Explain your answer.*

I cannot recall, probably we were.

*Do you now understand what their role is in the teaching and learning of mathematics? Explain your answer.*

Let's say that the clear message of what they mean to do is fade because the hasn't been upgrading of the quality of CTAS with, this ear (2009) especially has just been taking it down

the ship in other years one would have thought task, it's becoming so that it becomes more way back we use to have distinction lessons I think several subjects where you deeply core syllabus and then according to the group type or learners we herein (we were with) interest with they had you would ..... them this was or that way it's not serving that purpose anymore it might have earlier on.

*How were the CTASs introduced in schools? Was the purpose of the CTASs explained to you?*  
It must have probably been explained to us I can't recall.

*If you were given a choice either to use/ not use CTASs, what will your choice would be? Explain your answer.*

I will not use it. I would rather go through it and perhaps use part of it which I would evaluate as been in my opinion of user or interest of attention of great learners skills. To show learners that skills can be used in another way or in another aspect of life but thinking in terms of mathematical literacy but other than that I do replace a lot of this straight board questions with more suitable for grade 9 promotion style promoting grade 9 concepts.

CTAS can come but we must be allowed to select it to offer it to the learners depending on the group or learners we have in a class, a class must be boar under their minds at the moment where as a lower group of learners when I say lower I mean children who need slower pace or work. They might have found (CTAS) part of work they can cope with because it's not so much in a lesson it's a theme in that way but I would like the teacher to have the opportunity to select what it is that they would like to teach. Many teachers think grade 9 CTAS has lot of work daily we also have literacy who have assess as memos.

*How has the introduction of the CTASs changed your perception about mathematics? Do you think this will also be true of your learners? Explain your answer.*

I don't. CTAS has changed my perception as much as I have explained that they are actually mathematical literacy and in a way it has sort of reminded me during the time of arithmetic it is called mathematics now in CTAS that are some arithmetic sketching scale plans, what we used to call technical drawing there are those aspects in it. Learners do need those skills but we do them during the year we bring them during the years the syllabus now the learning program now allows one to do that, CTAS promote more mathematical literacy than core mathematics.

They may be needed but I don't think it should be the complete activity for the fourth term, earlier in the year for part of it or at least leave the teachers to select what they wants to do and say to learners now this is another way on which mathematical literacy can be applied it's called commercial mathematics and that the name I would like to use. Before there was functional mathematics and that was thrown out because of its connotation. Just like mathematical literacy and CTAS it was mathematics that could be functional to be applicable to day to day living.

No, mathematics for does not mean that everybody has that enjoyment action has got the personality type to persist struggle through and get that enjoyment state to get it done. It's

not everybody we can't all sing opera we can all sing and therefore in the junior years and being allowed to do aspect of the work. But when we get at the end of grade 9 and you are ready for grade 10 and now you choose your career path if you are artistic yes you can be mathematical because that goes together , but if you want to go to the business world yes you can do accounting but mathematical thinking getting to that they are striving to our economy to meet the challenges to make things work honestly there is no swing ling of anything just making do not, sort or say or low or lets, that is really a very important trait of responsibility.

So I see mathematics as a training group or opportunity to let people face the facts I can do this, I tried, I have struggle now I can allow myself as say I can't manage this, I need help or I am not going to continue with this and agree lesson of differ than we need as learn. We can't jump and fly because we want it there are learners. Core mathematics and performance at that level is talent we have or we don't have just little artist we can scribble and draw but we are not all artist that would be world famous.

It must be available from the beginning of the year so that it is done then on the first or second term so that the mathematics preparation for grade 10 can be concentrated on. In the second stage of the year where grade 9 learners are more mature as well than when they came in grade 9. So let them bring it from the beginning of the year so that teachers could be able to select from CTAS which topics to do or alternatively let it happen a bit earlier in the year so that we don't stop doing real mathematics in preparation for grade 10 at the end of the third term and the forth term becomes in many cases can be just a games playing. Games with supposing doing the work in the sense that we work in the group and we all make a poster we all get the same mark that is not preparation for high school learning.

CTAS has got some elements of mathematics in it but not mathematics as we see in mathematics as core mathematics but there are option topics. Here in Alexandra High what we do, we teach the mathematical literacy option topics which learners programmer there is lots of comparable I personally try and offer in the way that functional mathematics and standard grade mathematics is done so that they are exposed to skills which is more than what they need for exams because some other.....

Have it because it is a resource there are many schools perhaps which need exposure, as Alex we have access to so much at our own school.

### A3

*Do you consider CTASS to be helpful in assisting learners to be competent in their mathematics learning? Yes or No.*

Yes to some extent.

*If the answer is yes or no in 1 above, explain how.*

Especially when am considering the syllabus as well as the questions that are behind the CTASS syllabus promote the independent learning there are individual activities and group activities.

*What are the strategies in learning mathematics which are promoted by the use of CTASS?  
How do learners benefit's from the application of those strategies?*

Strategies

In the learning of mathematics there are some formulas that are designed the CTASS want the learner to describe some formulas and to make use of the formula and I think that aspect of CTASS is better to a greater extent Learners benefit from these strategies some of the formula that I am talking about has been derived from the given passage and then from those passages student were supposed to come up with formula and have to apply these formula so I can say that they are actually providing the like between pure mathematics and mathematical literature. And also promote cooperating learning.

*How effective are those strategies? From the work that you have covered from the beginning of the year, what sections of the CTASS do you think learners benefit from?*

CTASS is divided into 2 sections. Section A and B. What we have done is Section A is more practical than theory.

I think we have covered a lot that is in Section A and hopefully learners will be able to do Section B which is an exam.

*How useful is the memorandum provided for by the Department of Education to teachers of mathematics?*

To me it was very useful and I could not notice any errors in memo.

*How does CTASs mathematics differ from year to year?*

Last year CTASs were better likened to the syllabus because I saw some work that we also teach and covered. This year one [2009] is more mathematical literacy.

There are different things every year.

*In those activities which require group work, what is your view with regards to giving a learners group mark?*

The element of group work that was in the CTASS to me was very much appetising. I am saying so because we have some dominant members in a group who can easily express their views very well and out of those dominant members in a group and as a result what is expressed by people on different pieces of papers will be the idea of those dominant members [learners] so mathematics as I see does not require a lot of group work there students who would like to do work individual so student themselves did not prepare themselves well. Students do group work and are given time to discuss and differ that the groups disperse and do the work individually.

You have been exposed to CTAS section A and section B does this experience enables you to prepare your learners for the next exams on CTAS section B?

From the work that I have done I have discovered the syllabus well and also Section A and B are related this implies that Section A has done well kids will not have problems with Section B which is an exam but I have been told that kids will be tested on the whole years' work so we will see mathematics as aver so it not now going to be related to Section A. We have informed our learners to study their work from the beginning of the year.

For how long you have been involved with CTASs?

One year

Has this experience assisted you in making your learners to be competent in mathematics?

To some extent yes, I feel there is no link between mathematics and CTASS the people who have set CTASS to some extent don't have their knowledge of what is happening in a classroom because as I have said in the beginning that the CTASS Section could have been done without the help of a teacher they could has a tone Section A was just a general paper easy.

Can you explain similarities and differences in how CTAS has been designed?

When I looked at last year's 2008 the CTASs consisted of lots of mathematics pure and this year 2009 it was just mathematical literacy or general knowledge. In both 2008 and 2009 similarities is that they have individual task and group work task.

Does CTAS prepare the learners for grade 10 mathematics? Yes or No?

I like the idea that you are saying grade 10 mathematics when student pass grade 9, some of them will choose mathematics core and others will choose mathematical literacy from what I have discovered CTASS only prepares learners for mathematical literacy.

Explain how effective are CTASs in preparing learners for the next level in mathematics, which is grade 10?

CTASS might be effective only to prepare learners who want to do mathematical literacy only

Are CTAS values any assessment of mathematics ability?

No. The arithmetic involved because they are mathematical literacy description ratios there is no mathematics link Algebra, Quadratic Equation, Expression. The passage there when your command of English is required for mathematics lines CTASS values assessment ability there.

Grade 9 is an exit for learners who don't want to carry according to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learner with the skills they need for job opportunities?

Personally I don't think a grade 9 learner will be equipped enough to deal with like challenges most grade 9 are very young just at the beginning of the adult scene they are very immature and the way they have a different mentality from some all the grade above so I can say that if someone has done grade 9 he or she won't be able to deal with life challenges such as working so they cannot be employable.

Also these CTASS e are talking about are trying to asses learners according to their understanding and academically they have not grown enough to make judgement or understand they still need to be in the classroom for 2 or 3 years and they will be matured enough by then.

OBE emphasize the integration across or within learning areas. Do you find it possible to integrate mathematics with other learning areas?

Yes, It very possible to integrating mathematics with other learning areas what I am talking about in CTASS are written in English and then you are given a passage that you need to understand English well in order to understand. Thereafter other learning such as mathematics, science and accounting.

There is a link between mathematics and other subject I have mentioned above drawing a flag in that problem I think the aim was just based on making learner to understand National Flag as well as history involved remember 1994. The Day of Independence there was that statement in the problem about Independence [1994].

## **EDUCATORS UNDERSTANDING OF THE ROLE OF CTAS's**

*Were you made to understand the role of the CTAS's in the teaching and learning of mathematics at the time of their introduction? Explain your answer.*

No. Not at all. I only found out myself on the way (mid-year). I was never work shopped. It was just the instruction from the department I was never sure what to express. I also find out from my H.O.D. and asked him what CTASs is

*Do you now understand what their role is in the teaching and learning of mathematics? Explain your answer.*

To some extent, still not very sure but I would have been better if workshop were organised. I guess it was just that learners are acting as a bride to grade 10. Between grade 9 and 10 and to asses learners but only mean a lot.

*How were the CTASs introduced in schools? Was the purpose of the CTASs explained to you?*

I don't know. I just heard from my H.O.D. I went to ask what that is.

*If you were given a choice either to use/ not use CTASs, what will your choice would be? Explain your answer.*

I would rather use my classroom mathematics and complete the grade 9 syllabus and come up with much more convincing learning problem examination I leave CTASS On paper they look convincing but when it comes to linking the CTASS is there is no relationship and also it is possible to sit down for this CTASS at the end of the year and passed. One that there is lots of group work that is there so one does not need actually even to attend lesson class so that you can do CTASS you can pass them without attending.

They are not preparing learners for anything it better to follow the syllabus. CTASS are not a good yard stick they should be measuring the ability of learners to do mathematics but they don't even try.

The danger is that the kids pass mathematics with high marks (flying colours). They will be deceive and jump for run mathematics and that will be a distance because some of them the marks that they will get will be the from dominant learners in a group. They will then encourage serious problem with are mathematics.

When I feel educators should guide the learners as what to choose because they know them better. L.O talks about careers that could also help the parents also guide them so it's parent teaching L.O teachers. But the kids cannot be forced to choose.

*How has the introduction of the CTASs changed your perception about mathematics? Do you think this will also be true of your learners? Explain your answer.*

I think whether about CTASS I thought they are the only syllabus, so I thought learners will just do them as exam at the end of the year but now when I saw that the section A I got confused. I thought we will teach the syllabus [mathematics] and learners will write exam



from what we taught. I described to learners that there will be section A and Section B will be an exam.

#### **A 4**

*Do you consider CTASs to be helpful in assisting learners to be competent in their mathematics learning? Yes or No. If the answer is yes or no in 1 above, explain how.*

I say this because some of the activities have got good mathematical principals but also some of the activities have deviated from the mathematical ideas and principles that we would want the learners to have. For example the flag (section A 2009) I believe drawing the flag there is more mathematics involved in drawing the flag although I understand, the flag is an important part of our national identity.

There is little measurements and staff but it is not mathematical inclined rather we can talk of other learning area that could be associated with drawing the flag such as technology. The questions involved in CTASS are more of mathematical literacy rather than core mathematics. I think it is preparing mathematical literacy more.

*What are the strategies in learning mathematics which are promoted by the use of CTASs?*

*How do learners benefit's from the application of those strategies?*

CTASs are promoting cooperative group work, the kids can share work together but on the other hand dealing with a class of 30 to 40 kids group work causes a problem remember also that group has a stipulated time. To arrange learners into groups takes a lot of time, for them to get settled could take something like 5 to 10 minutes.

Another strategy that I see is individual work.

These strategies such as group work are beneficial to learners because they learn from each other, not only from the teacher. They learn to interact with one another.

*How effective are those strategies?*

These strategies are effective in that some learners understand better if they are taught by their peers.

*From the work that you have covered from the beginning of the year, what sections of the CTASs do you think learners benefit from?*

There are several tasks that are similar to the syllabus that I teach the kids.

Our kids in alley could master the exam (section B) even if they did not attempt section A. This I say because of the exam in which we teach them.

All grade 9 syllabuses have been covered thoroughly.

Section A is the highlight of what section B is going to be with regard to the topics we have covered for the syllabus I believe my kids will stand up to the section B task quite easily I use classroom mathematics and many others. The only problem that they might come across is what I have mentioned before that CTASs are designed in a manner that they only prepared ell learners who are going to do mathematical literacy then this becomes a problem the weakness of CTAS is that they are testing mathematical literacy and nothing on mathematics core

Mathematical literacy is more about understanding the language. Can you relate from the statement this could cause some problems in some of the learners because of them English is their second language.

*How useful is the memorandum provided for by the Department of Education to teachers of mathematics?*

Already I have noted some discrepancy in the memo at times I wonder whether these are real errors or they have been made deliberately the department does not provide the errata. I have never seen one errata I am not sure whether it is with my H.O.D. I have shown my H.O.D. all the errors that I have come across in a memo as well as in section A.

*How does CTASs mathematics differ from year to year?*

Yes they are different if I look back from when I started papers in 2006,2007 until now I realised that in that year from 2006 the tasks were congested, condensed they included quite a lot of principals like the one that they gave us this year [democracy] the principals involved are very few as compared to the previous years. Before there was half mathematics and half mathematical literacy as year goes by and especially this year 2009. The CTAS consists of lots of mathematical literacy before it was half.

Where can one classify task 4 the drawing of a flag, South African flag is that core mathematics or mathematical literacy? This is just obvious mathematical literacy, even task 2 more mathematical literacy.

Kids have to derive mathematics out of literature the literature involved so it's difficult for the kids to derive an expression and work in it. So mathematical literacy is tricky in the sense than does kids know what they are doing, what is happening. It is tricky in the sense that they must know the language (English).

When I was still at school we used to do word problems. Word problems were difficult for us why? Because to understand the wording English that was used the statement before coming up with an expression.

*In those activities which require group work, what is your view with regards to giving a learners group mark?*

In my class in terms of group work, I make sure that my learners are arranged in a group of 3(three) or 4(four) because I want to avoid the movement of kids around the class they can just do the work as they are sitting in three or four.

The group just share ideas so that each one can have an input and after that they can know the work and produce answers. If I remember well there was a task on data collection for election (voting) what I did was told them to gather information individually put together information and come up with the table required at least with the different data collected putting them together that means they will work together with the information collected.

It is not specified however that the group will have the same answer script, working together is to share information but at the end they work individual they may come up with the same answer and their answers may be different. In my school CTASSs are done at the school, so when they write their work they are under my supervision. Before CTASS I have taught my kids not to copy but to be able to do their work individually.

So! In group work, they first come together and share some ideas and after that they separate

*You have been exposed to CTAS section A and section B does this experience enables you to prepare your learners for the next exams on CTAS section B?*

Looking at previous CTASS I have discovered that section A leads to section B. If section A has been done well learners will never have problems with an exam which is section B.

*For how long you have been involved with CTASSs?*

For four years

Has this experience assisted you in making your learners to be competent in mathematics?

It's difficult especially this year 2009 if one looks at the content, not all sections of the syllabus have been dealt with. I mean grade 9 syllabus, I hope that in future they will try to incorporate more of the covered content.

However CTASSs has no syllabus. I suppose that the guide that we are given is the syllabus to Safeguard myself from I made sure that I completed the syllabus immediately before CTASSs arrived. So the experience that assisted me was just that I have to complete the syllabus CTASS has not given me any experience.

CTASS has not helped me in any way what helped me was my teaching style and completing the syllabus in advance so it's not CTASS When you look at the text book content and you look at the CTASS tasks and questions like I have just told you that it's different CTASS in

general are more mathematical literacy especially this one for 2009 CTASS has more mathematical literacy and nothing or less core mathematics. In the textbook that I am using the emphasis is on core mathematics when I completed the syllabus before CTASS It was as if I have predicted that CTASS will have no mathematics core.

I can then say I have to equip my learners for mathematics core(pure) mathematics not from the CTASS at all but I can say CTASS are just another form of assessment that would also require our kids to learn some principals like mathematical literacy principal. But it's not all the learners that want to do mathematical literacy that is the biggest short fall of the CTASS

If in the CTASS there was fifty percent(50%) of the pure mathematics and the other half mathematical literacy in that way there was going to be a balance and learners were not going to be confused on what they choose so CTASS are misleading in that way.

*Can you explain similarities and differences in how CTAS has been designed?*

The similarities are that there is always a question that is way off the mathematics principal. Like a question which is supposed to be a question of transformation the one on a flag, there was another one in 2008 where they needed to design something.

There are different themes every year, question are them based that given theme in democracy learners had to gather information using statistics but on democracy in South Africa for the years that people have voted we went on and on until we got a question how to draw a South African National flag which is also part of the new democracy that we have in South Africa

*Does CTAS prepare the learners for grade 10 mathematics? Yes or No?*

CTAs do not prepare learners for mathematics core or mathematics pure for grade 10. However CTASS does prepare learners for grade 10 mathematical literacy.

*Explain how effective are CTASs in preparing learners for the next level in mathematics, which is grade 10?*

They are only effective in preparing learners to be able to choose between mathematics core and mathematical literacy in grade 10.

*Are CTAS values any assessment of mathematics ability?*

Yes and No.

Yes, in the sense that we have been depriving learning of some mathematics by not offering some form of mathematics before like mathematical literacy so that those who find mathematics core to difficult can have another option which is mathematical literacy.

No, In the sense that now the kids have known that if I am too lazy to think that I have somewhere to go and rot. So it is a disadvantage because we are also depriving some potential mathematicians to discover their abilities because they would find easy to just go and sit do nothing. [To do mathematical literacy]

Mathematical literacy benefit's weak students

Teachers should encourage learners that mathematics core can be done. It is not that difficult but now because there are these parallel we and up losing potential learners and they will choose the easy root.

Yes, so that kids are enable to derive mathematical expression which is good and necessary rather than being given.

The objective of CTASS is to ensure that the kids are able to relate statement into mathematical expression that is a skill. Then can read through come with the expression without being given. In the mathematics pure or core where the expression is given for them so I think in that case mathematical literacy kids are learning more through they give them easy problems they don't go into depths.

*Grade 9 is an exit for learners who don't want to carry according to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learner with the skills they need for job opportunities?*

Yes, they can depending on the type of job, not really to work it can be an exit from this formal type of education to a more or less informal type of education where they can learn more or less informal type of education where they can learn technical skills it will work because in woodwork they simply require to do measurements, so it's easy they know how to use a ruler. I want to be realistic in the world of work there are three jobs where mathematics is required. If one wants to be a pump operator that person just needs to look at the numbers, a person can also be a till operator also with grade 9 mathematics just getting chances and look at numbers and counting using the calculator. And from their own they go in serving training so that they can find it easy.

Grade 9 ages range between 13 to 15 years. I am not talking of just going straight to work but I should the east come the west there is a problem in one way or the other this person is not redundant because he has acquired some knowledge surely that knowledge can be used in areas that I have mentioned. However no certificate has even been produced for grade 9 also the competition is great outside there for jobs because others may have grade 12 or even more and a grade 9 learner cannot compete with those people who are so qualified. Where does one go or get up with grade 9 certificate because the job market is flooded.

*OBE emphasize the integration across or within learning areas. Do you find it possible to integrate mathematics with other learning areas?*

Yes it does integrate there is a lot of connection between subjects like accounting B.E geography in terms of direction bearing. Natural Science there is a lot of interaction between subjects. Another section of mathematics can be taught is another learning area and what may differ is the method which is a good thing. I don't see anything wrong in inviting a B.E. teacher to do a section on mathematics that is a perfect scenario. A geography teacher can come and teach Pythagoras or any math theory found in geography then I move from there the kids would appreciate more the relationship between three subjects rather than me telling them that this is geographical and kids will wonder and ask why this section is not taught in geography.

## EDUCATORS UNDERSTANDING OF THE ROLE OF CTAS's

*Were you made to understand the role of the CTAS's in the teaching and learning of mathematics at the time of their introduction? Explain your answer.*

No, no one has ever informed me about the role of CTASS Maybe it is my fault that I have never inquired.

*Do you now understand what their role is in the teaching and learning of mathematics? Explain your answer.*

I am gradually getting into grips with reality it is a common assessment where the kids should see the mixture between core mathematics and mathematical literacy type of questioning and still does some mathematics still apply some mathematical skills thought which the ultimate goal so I feel in that way they are beneficial.

*How were the CTASs introduced in schools? Was the purpose of the CTASs explained to you?*

I was not around when they were introduced, so I cannot answer that one.

*If you were given a choice either to use/ not use CTASs, what will your choice would be?*

*Explain your answer.*

I will set my own paper there's a lot of things that I don't like with CTAS, but it is a piece of material that is worth browsing at I suppose so, but I will set my paper.

*How has the introduction of the CTASs changed your perception about mathematics? Do you think this will also be true of your learners? Explain your answer.*

CTAS has not at all changed my perception but what I can say it is just a piece of assessment that was rushed to be used by schools, I am not sure whether it used to be moderated or not, I am not sure who is the examiner. CTAS I can say it is a document where people were trying to push certain ideas which they did no succeeded to do. There are short falls on the CTAS's as well as the memo. Learners don't like CTS at all.

## B1

*Do you consider CTASs to be helpful in assisting learners to be competent in their mathematics learning? Yes or No.*

Not really

*If the answer is yes or no in 1 above, explain how.*

Not in line with the flow that would lead to mathematics examination.

*What are the strategies in learning mathematics which are promoted by the use of CTASs? How do learners benefit's from the application of those strategies?*

Maybe just to apply knowledge to situations around us other than that it does not promote any strategies because it is not inline it not leading what we expect learners to n mathematics grade up to 12. Not really learners does not benefit to strategies that are promoted by CTAS because it not following or repeating us in line with what we are doing in

mathematics. We taught the whole year than the CTAS seems to be like sidestep and then we go back and after the CTAS go back to the normal syllabus, because we are preparing them for an exam paper for the end of grade 10, 11 and 12 and those exams are not of the same make up as that of CTAS.

*How effective are those strategies?*

So strategies promoted by CTAS are not really effective in helping learners, we can build in one or two of those CTAS aspects into our normal tables but I don't think there is a need to have a separate CTAS in our syllabus.

*From the work that you have covered from the beginning of the year, what sections of the CTASs do you think learners benefit from?*

What happens you find that when you start with the CTAS they maybe some aspect that are connected to the work that we taught but then you also find that before certain activities in CTAS you have to teach. So you teach one lesson and then learners have to do activities from the CTAS for the next lesson you are teaching them what is there in the CTAS rather than just having done the entire syllabus. And then it's just a matter of applying that knowledge in the CTAS because what happening in the class is that our teaching is like not geared specifically to CTAS its geared towards grade 10, 11 and 12.

*How useful is the memorandum provided for by the Department of Education to teachers of mathematics?*

It is useful in terms of the CTAS understanding exactly what is it that they wants. However there are lots of errors we have found many errors in the memorandum and we correct them ourselves. They did send one errata once I can remember well but there lots of errors with CTAS.

*How does CTASs mathematics differ from year to year?*

The first CTAS seemed to be more complicated than the 2<sup>nd</sup>, the second one seemed to have more direction and it was cleared as to what is needed to be done and the application of the mathematics seemed to be like more acceptable more plausible the way in which they were applying the mathematics not like unrealistic situation but fairly realistic situation.

*In those activities which require group work, what is your view with regards to giving a learners group mark?*

I am not happy with group work we changed it we altered the way in which it is to be done because you find that in group work one or two people end up doing all the work and all the members or the group get the same mark. We still do group work but the way we allocate this mark may be different. Everybody has to show that they made a good input into the group work before we allocate the mark.

*You have been exposed to CTAS section A and section B does this experience enables you to prepare your learners for the next exams on CTAS section B?*

You see from the previous years when I was doing CTAS for the first time you went through section A, section B (exam) of that paper was based on section A. last year that did not happen, we went through section A but section B was based on the enterer whole years'

work in grade 9. So it did put things a little bit awkward caused problems now this year (2009) we are not sure what is going to happen. This now put us in a more difficult situation we are not sure whether to emphasize on the learners that what came out in section A is going to come out for sure in section B or it also going to be based on the entire years' work.

*For how long you have been involved with CTASs?*

Just two years

*Has this experience assisted you in making your learners to be competent in mathematics?*

No, not at all I have already mentioned that CTAS does not teach the mathematics that we use for grade 10, 11 and 12. It's different mainly numeracy.

*Can you explain similarities and differences in how CTAS has been designed?*

in the first CTAS the application of mathematics to those situations did not seem plausible situation, remember the mathematics did not seem to work very well in those situations but in the second one they developed the situation where it was fairly good you know the mathematics applied was sort of ok.

*Does CTAS prepare the learners for grade 10 mathematics? Yes or No?*

No, it only prepares learners for mathematical literacy.

*Explain how effective are CTASs in preparing learners for the next level in mathematics, which is grade 10?*

I have mentioned above that CTAS mathematics is geared towards mathematical literacy; it will only be effective to help learners who want to do mathematical literacy not pure mathematics. I don't think CTAS are effective at all maybe they are for mathematical literacy but not pure mathematics as such.

*Are CTAS values any assessment of mathematics ability?*

In a very small degree you find that when we set our own paper and we design towards bringing them up to grade 10, 11 and 12 those values a better indication of mathematics ability but not CTAS.

*Grade 9 is an exit for learners who don't want to carry according to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learner with the skills they need for job opportunities?*

No I don't think so, maybe one or two of the activities in the CTAS may lead itself well in the working situation but in terms of mathematical thinking that you find FET I do not think it possible. Grade 9 are young I do not agree with exiting I think learners still need to be at school one reason they are still very young not yet fit for outside world.

*OBE emphasize the integration across or within learning areas. Do you find it possible to integrate mathematics with other learning areas?*



Integration is possible especially with natural science, English and accounting it also depends on the educator if he or she is willing to teach across his or her learning area. But integration is possible.

## **EDUCATORS UNDERSTANDING OF THE ROLE OF CTAS's**

*Were you made to understand the role of the CTAS's in the teaching and learning of mathematics at the time of their introduction? Explain your answer.*

Ja! They said it's to try and bring about situational application of mathematics whatever learners learnt in mathematics that her or she master and put in the situation and solve problems and basically that was the indication. Our local facilitators told us all that in workshops.

*Do you now understand what their role is in the teaching and learning of mathematics? Explain your answer.*

Not completely because as I have said it is side tracking from the normal slope going up to matric and we find that grade 8 with their grade 9 and we side track with CTAS come back.

How were the CTASs introduced in schools? Was the purpose of the CTASs explained to you? It was explained but not completely I don't think it was explained well. To me the entire *If you were given a choice either to use/ not use CTASs, what will your choice would be? Explain your answer.*

How has the introduction of the CTASs changed your perception about mathematics? Do you think this will also be true of your learners? Explain your answer.

## **B2**

*Do you consider CTASs to be helpful in assisting learners to be competent in their mathematics learning? Yes or No.*

No! Because such an idea is not comprehensive enough

*If the answer is yes or no in 1 above, explain how.*

certainly I think that with regard short syllabus the syllabus is quite large with regard to grade 9 work but the content that are coming out in CTAS is quite reduced if I can say and it's not so much it doesn't quite cover the amount of work with the content work that we do during the year and also with regard to the type of work that is done vastly different as well so to me.

*What are the strategies in learning mathematics which are promoted by the use of CTASs? Yes!*

*How do learners benefit's from the application of those strategies?*

If you look at it in that particular way yes it is positive because it is forcing the learners to think in a different direction where they need to be more creative as other aspect is coming into learning as well it is not pure mathematics it's being extracted from them with regards

to CTAS there are 15 other learning areas which come across as well if we can say it should be tested in comprehension which they pass. There are drawings required when you look at the amount and staff there are other learning areas that are being taught in it. That's a tough one but when I look at the CTAS of what they are compared to the normal testing that we get from throughout school I just think there is a vast difference so I think CTAS should be structured more around like how exams sections are structured.

*How effective are those strategies?*

They are therefore not very much effective.

*From the work that you have covered from the beginning of the year, what sections of the CTASs do you think learners benefit from?*

Some sections have been covered did come out on CTAS but a lot of what's out in CTAS are not part of our mathematics and the problem is that by completing CTAS now at the end of the third term the learners still have the holidays plus the beginning of the next term to go through before they write their final CTAS B and I think the time span is too great we should have written section A at the beginning of the fourth term and then have section B so that the learners would still know or remember without them trying to refresh their minds what is it that they did in section A similar things going to come out in section B to alien a lot of section A we have not completed a syllabus as yet a lot may be one or two things we have to stop teaching because of coming of CTAS.

*How useful is the memorandum provided for by the Department of Education to teachers of mathematics?*

There were mistakes in other questions that I found that is why it is advisable for the teacher to first draw his memo before referring to the department one. The department did not even send the errata to correct mistakes.

*How does CTASs mathematics differ from year to year?*

What changes in CTAS is the topic they focus on e.g. this year they have a topic or theme which they focus on, this year over 90% of the CTAS was about elections. The kids asked that mam elections were done way back in 1994 why then bring this issue now. The kids want things that are present with them now wanted some stimulation.

*In those activities which require group work, what is your view with regards to giving a learners group mark?*

With regards to group work if it's an activity where this learner need to do work but each person has a specific thing item to do then it's off because then you get work from each person and can assess individual but quite often with group work one learner does everything and the rest of the group get a mark for doing anything but in CTAS and OBE in particular the set a question and a teacher must give same marks for all the group and I just have to give the mark. I don't really approve of this but I have no choice it's unfair even learners cannot expose their peers and say this one or those one did not contribute.

*You have been exposed to CTAS section A and section B does this experience enables you to prepare your learners for the next exams on CTAS section B?*

Not really because every year I find the department very much inconsistent where in another year only one section of CTAS comes and we are not told anything about another section B which usually used as an exam or they were coming in later or earlier or not at all the time just continuously changed and there is always no explanation about this inconsistency this year it came out earlier, in some years it is easy in other years difficult. At times it's easier in such a way that grade 7 can do it perfect. Levels continuously changes take for example last year 2008 it was very difficult even for a brilliant learner have problems to look at such questions. So every year we have a problem always waiting in anticipation waiting to see what the department is going to come out well

*For how long you have been involved with CTASs?*

7 years.

*Has this experience assisted you in making your learners to be competent in mathematics?*

Hell it does give them a broader knowledge with regard to.... When it comes mathematics a lot of one direction of question straight forward question I suppose it shows learners how to tackle some of the things in life, concerning me no.

*Can you explain similarities and differences in how CTAS has been designed?*

It teaches different aspects about culture e.g. fishing river and staff when child go buy fish at the shop not knowing that rivers have been polluted and this causes fish to die at some stage fish will not be available there is culture that depends on fish from river by polluting would suffer.

*Does CTAS prepare the learners for grade 10 mathematics? Yes or No?*

No! Not at all. CTAS does not really cover all the work that we normally covered before the introduction of CTAS what we did before CTAS assisted learners to be competed in mathematics but CTAS not at all.

*Explain how effective are CTASs in preparing learners for the next level in mathematics, which is grade 10?*

CTAS's are not at all effective they don't lay any mathematics foundation required for grade 10 mathematics.

*Are CTAS values any assessment of mathematics ability?*

No! Not at all because if you look at grade 10 and grade 11 syllabus mathematics I think you cannot even compare grade 9 CTAS towards grade 10 and 11.

*Grade 9 is an exit for learners who don't want to carry according to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learner with the skills they need for job opportunities? OBE emphasize the integration across or within learning areas. Do you find it possible to integrate mathematics with other learning areas?*

Integration is there in fact that is what they do to integrate across or within the learning areas e.g. English, HSS, NS Agaric may be not all L.A in one activity but it happens excellently.

## **EDUCATORS UNDERSTANDING OF THE ROLE OF CTAS's**

*Were you made to understand the role of the CTAS's in the teaching and learning of mathematics at the time of their introduction? Explain your answer.*

I don't think I have been for training with regard to CTAS, all that I know I got it from my HOD and gets us work shopped we work out the time table that suite us all and we get together have discussion and get clarity from HOD.

*Do you now understand what their role is in the teaching and learning of mathematics? Explain your answer.*

With regard to my opinion I think CTAS when a child does CTAS it's not something like the normal exam where the child has got to learn and write out CTAS is more about the learner how they perceive information how they understand data it's more of an individualistic approach CTAS are trying to make learners think OBE wise. Where they are going handle aspect differently, e.g. learner with activity of a fish most learners may think logically and take polluting rivers and environment seriously.

*How were the CTASs introduced in schools? Was the purpose of the CTASs explained to you?*

I learn how to deal with CTAS through my experience of my own teaching years and information from my HOD. I was told by HOD

*If you were given a choice either to use/ not use CTASs, what will your choice would be? Explain your answer.*

No I will not use CTAS in another question in your questioner there was mention grade 9 exit's and ever since CTAS started I was told this exiting but I have never seen any learner exiting or even getting a grade 9 certificate I don't even know how it looks. However it is fun to have those integrations with the learner brought about by CTAS. But I will choose to set my own paper one other reason this inconsistency of the department I have mentioned previously. I will rather have my own exams it going more comprehensive and more content will be covered in our own school exam our internal school exam rather than CTAS even when you look at CTAS to my knowledge it is very different compared to exams written in matric so something along those standards question wise.

*How has the introduction of the CTASs changed your perception about mathematics? Do you think this will also be true of your learners? Explain your answer.*

I think CTAS are trying to make it easy for learners but when you look at the content of CTAS it's not really easy they are testing whatever what is required to such an extent that it has entire changed my perception of mathematics all that much because what is expected of what we do in class we teaching learners what is required of them. I think CTAS misguide the learners because is when you look at CTAS it sort of like show learners that this is mathematics that they are doing whereas CTAS are not pure mathematics. Mathematics is a beautiful subject it's a very interesting subject but as you go back grade your subject matter

widens mathematics becomes more in-depth and you learn the whole lot more and with regard to sum of the staff given in CTAS to me according to my opinion I don't think CTAS give justice to our subject

What are CTAS?

They are not pure mathematics they are not mathematical literacy it just a mixture probe mixture of what? It's a mixture of mathematics with other learning areas but I just feel that it should be made different.

*Are you happy with CTAS or you like them?*

50; 50 happy and not happy but dislike them more then liking them. I do CTAS because they are compulsory, my HOD told me we have to do CTAS liking or not

## CONCLUSION

Teachers don't like CTAS. I think children are misled to think that they can handle mathematics when they do CTAS also when they get their marks combined with continuous assessment which usually give them a high marks grade 10, 11 and 12 mathematics are totally different from what CTAS gives that is why I said they misguide the learners.

## **B3**

*Do you consider CTASs to be helpful in assisting learners to be competent in their mathematics learning? Yes or No.*

No

*If the answer is yes or no in 1 above, explain how.*

The CTAS is limited it basically what the CTAS does it is testing them on I say reality life situation like there in mathematics we use in real life, but now if the learner is deciding to take mathematics in matric or university I don't think the CTAS help that much in it because it does not really test pure mathematics that is required for mathematics in grade 10, 11 and 12 as well as university. The CTAS is limited it's more geared towards mathematical literacy learners that is what I think, that is my point

*What are the strategies in learning mathematics which are promoted by the use of CTASs?*

If you look at CTAS it is promoting lot of strategies in mathematics because you look at finding area, volume what else is there in the CTAS. It also allows some concepts of equations the equations which is helpful there is also something on monitoring values interest rates and staff like that.

*How do learners benefit's from the application of those strategies?*

Learners will benefit from these strategies promoted by CTAS over the learner's finishes matric certain aspect of the CTAS that you have then is very beneficial to the learners especially when you are an adult it will help you out.

*How effective are those strategies?*

In a scale one to ten. We looking at I would say I would give about between 7 and 8 it is quite effective but as I have said the short coming to that is how if the learner wants to take up mathematics and staff there is a short fall in the CTAS it is not catering for those learners who want to do mathematics in higher classes or after school.

*From the work that you have covered from the beginning of the year, what sections of the CTASs do you think learners benefit from?*

I would say this has been catered for that the syllabus was geared towards the CTAS so the aspect of mathematics that we are doing we are covering like from the first term the work that we have been doing is geared towards the CTAS. It has been geared towards the CTAS.

*How useful is the memorandum provided for by the Department of Education to teachers of mathematics?*

The marking instrument is like to comprehensive to many ticks like the key to the marking instrument is broaden, you looking at between one and three you giving a mark and staff which the marking instrument can be more simple there are many errors and no errata provided by the department for the past couple of years I have taught CTAS there were errors even in this years and as teachers we made adjustments to that I cannot remember specifically which questions and which year, but errors are in all CTAS. No errata but in the solution there are definitely errors but as an educator you don't actually have to wait for the memo we do our own and compare with the department one and we mark according to the memo.

*How does CTASs mathematics differ from year to year?*

There are different themes every year mathematics is getting less and less this year 2009 CTAS are 100% mathematical literacy type. Marks allocation are not distributed.

*In those activities which require group work, what is your view with regards to giving a learners group mark?*

Group work CTAS has group work activities and individual activities but if we look at group work, group work is mostly if you work in group that know will put an input [they will contribute more] those that don't know they don't even actually make an attempt because they know they are going to get a mark as everyone else is working. The brighter learners will get the answer quickly and because the group work the mark has to be shared. So the learners that did not contribute that does not know anything will also get a mark so in that way it is unfair to the brighter learners where the brighter learner will get the same mark with mediocre or learner that did nothing. So because the group has done the task and has given the solution I have to give the same mark to the whole group because they work in a group.

My view in a group work is totally in mathematics I don't think group work is beneficial to learners I think I still believe in that old school of thought where individuality is important in mathematics as an individual you should be working on your own you should be practicing on your own in order to learn context on the other hand group work has got some benefit most probably when the learner is too shy or too scared to ask questions in class but with some peer in group, they might be able to talk among themselves and try to learn from them as well so there are benefits and there are shortfalls with group work.

*You have been exposed to CTAS section A and section B does this experience enable you to prepare your learners for the next exams on CTAS section B?*

Section A it does but as for any exams there are extra work from section A that will appear in section B but the entire syllabus has to be covered in order to cater for section B. Section A is helpful to the learners because in that state of mind they get into that stage of mind that these are the questions which are going to be asked. It's not straight forward mathematics where you are asked to solve for  $x$ ; it's more solving problem techniques that are used.

*For how long you have been involved with CTASs?*

For more than 10 years

*Has this experience assisted you in making your learners to be competent in mathematics?*

The CTAS is basically it's been similar in question which are more problem solving, basically you have to understand situation given them and apply the knowledge they learn in previous lesson, so basically if you look at CTAS the CTAS is similar every year not the questions but the setting of it where a scenario is given to them. CTAS's are based scenarios are given to them and problems are actually phrased to them and they have to interpret it and they need to use the previous knowledge that they have learnt in other lesson to apply then.

*Can you explain similarities and differences in how CTAS has been designed?*

*Does CTAS prepare the learners for grade 10 mathematics? Yes or No?*

CTAS does not prepare the learners for grade 10 mathematics is completely different if you look at grade 12 papers the paper is not scenario based. The grade 12 paper is given to you as question 1, solving for  $x$ , simultaneous equations and different aspects it's broken up. It is not scenario based it is not linked to the entire scenario that is given to you the grade 12 paper is close? [scenario means they give you a theme, this year the theme was DEMOCRACY VOTING. Every question was based on that scenario (voting) in matric paper even in this OBE it is still set in old style where each question is an individual question.

*Explain how effective are CTASs in preparing learners for the next level in mathematics, which is grade 10?*

So they are not effective at all in grade 10 you do something totally different to CTAS.

*Are CTAS values any assessment of mathematics ability?*

It does evaluate a lot of mathematics but basically it is geared to mathematics literacy style, if you mean assess mathematics its but if you want to do mathematical literacy yes.

*Grade 9 is an exit for learners who don't want to carry according to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learner with the skills they need for job opportunities?*

For a learner that does not want to continue with school basically that means they don't wants to do mathematics further? The CTAS will only give them daily usage of mathematics. Grade 9 learner cannot work, who is going to employ a 15 year old person basically have they can exit and go to FET college to learn trade. They made exit for grade 9 just for FET college if the learner struggles to continue with school trade subjects, brick laying, and motor mechanics. The CTAS helps learning only with daily knowledge to count money then shopping etc. but not job market also depending in field they are doing

OBE emphasize the integration across or within learning areas. Do you find it possible to integrate mathematics with other learning areas?

Yes, data handling in social science economics pie graph, bar graph, interpreting graphs and the concept has been taught in mathematics first. Natural science as well as data handling can be carried across different subjects. There is a definitely a link between mathematics and other subjects technology, but not every part of mathematics. Data handling is found in HSS economics N.S agriculture and other paper as well. That one aspect of mathematics I can think of as well as physics interpretation of graphs, physics and mathematics are basically related as well.

## **EDUCATORS UNDERSTANDING OF THE ROLE OF CTAS's**

*Were you made to understand the role of the CTAS's in the teaching and learning of mathematics at the time of their introduction? Explain your answer.*

Basically we were given we attended workshop organized by the department and of course my HOD worked shopped us as well.

*Do you now understand what their role is in the teaching and learning of mathematics? Explain your answer.*

I think I do the role is basically just to enable the learner to learn basic mathematics which they require in daily life that is how I understand the role of CTAS as they exit in grade 9 that means they have finished with mathematics and they going into the different field. They will be able to shop, to buy a house a car all the basics necessity and the role has been meet for those who exit however those who study further to grade 10,11 and 12 they will be doing mathematics.

*How were the CTASs introduced in schools? Was the purpose of the CTASs explained to you?*

At the workshop it was explained to me all the stories about exiting and section A and section B which is an exam.



*If you were given a choice either to use/ not use CTASs, what will your choice would be? Explain your answer.*

If I say I will choose my old style of teaching I would be selfish I am of the idea of exiting for those learners who cannot cope with school environment if they exit to FET. So I can use both CTAS and old style. I think the role of FET is important we did not get that change. I will choose CTAS.

*How has the introduction of the CTASs changed your perception about mathematics? Do you think this will also be true of your learners? Explain your answer.*

Really CTAS did not change my perception of mathematics, I am contradicting myself here. I belong to the old school of thought I still like teaching pure mathematics normal mathematics should be taught however CTAS are basically mathematical literacy and mathematical literacy is important to the learners who does not want to carry on with pure mathematics so CTAS are ok. CTAS does not change my perception about mathematics I think mathematics need should be taught needs to be practiced all the time but mathematics is not for all learners most learners dislike the subject they say it is difficult, the find it's not necessary for them after school.

## **B4**

*Do you consider CTASs to be helpful in assisting learners to be competent in their mathematics learning? Yes or No.*

No I don't think so competent.

*If the answer is yes or no in 1 above, explain how.*

You see if we were given at the beginning of the year the scope what is in the CTAS I would be teaching certain aspect in classroom what happens is that the scope sometimes in the CTAS is not the same scope that I would have been teaching the whole year around and this year the learners had to draw the south African flag, I know this is an easy thing but you have to draw it in scale, I taught scaling in other learning areas have taught in many subjects I know that in geography you teach to scale in technology you also tech scale and hear the child had to draw the graph, there were certain aspects certain things that was similar to what I have taught and there were certain things that was not in scope for this year.

The main thing is that if we know these are 5 topics that the department is going to choose and one of the topics is going to be chosen for the CTAS we would look at the scope for those areas and say ok I think I will teach this section and this section and by the certain time

of the year when the CTAS comes and we will be ready, but this year we did the CTAS this term (term 2) it came early (transformation) according to my scope for mathematics for grade 9 mathematics I was covering certain areas but all of a sudden the transformation was going to be taught this month and I had to squeeze in quickly. The part of the scope was you see mathematics we using algebraic expression, you learning financial mathematics sometimes a child cannot see similarities in the CTAS to what he or she get in class I think our children are limited thinking in a box they don't expend their knowledge.

*What are the strategies in learning mathematics which are promoted by the use of CTASs?*

*How do learners benefit's from the application of those strategies?*

No, the topic of the CTAS was very much interesting about the South African flag it was voting it was a very nice topic the children like it, I had to teach them how to analyse the data what are the process of voting what did the election committee did so it was a very nice topic.

Xulu in other years.

Look I taught the natural science. Before I did 2 years NS, there were some nice topics in environmental studies but all of a sudden maybe my school we went we covered certain scope of the paper but I know in some other school where a teacher does not follow the scope you are going to end up with a lot of covered all of a sudden you end up with a lot of one month teaching where you are have to teach new things for a child to learn, I think across the board my child move from one school to another and came here, what that school taught we did not all follow the same thing.

*How effective are those strategies?*

*From the work that you have covered from the beginning of the year, what sections of the CTASs do you think learners benefit from?*

All of a sudden in CTAS we were teaching mathematical literacy, it was not mathematical literacy it was not pure mathematics there were certain things I could adjust and I could change around as a teacher to make learning of that section easier because I did teach before but I had to change the method (problem) to accommodate CTAS which were mathematical literacy, I taught them data handling all lots of things of data handling with possibly and it did come out such because it was relevant to the topic was relevant to that question, you know that question like voting so you have to do data handling, but as a teacher. You have to adjust your methods you have adjust ok. You are not now teaching mathematical literacy and go with the flow.

*How useful is the memorandum provided for by the Department of Education to teachers of mathematics?*

The answers were fine but as a teacher you can't just say it's ok let's adhere to memo, read question. You have to read the memo and say this how I am going to teach in my class to get the expected answer.

### **Prove**

Sometimes there is a problem with the memo where the answers are incorrect but the errata are not always given to correct the wrong problem. I taught mathematical literacy in grade 12 we got a memo now with five answers which are incorrect so what you should do as a teacher you double check; before the memo comes I have to do my memo that is how I found those five answers incorrect. If I simply follow the memo that was provided by the department I was going to victimize my learners who might have actually given the correct answer

*How does CTASs mathematics differ from year to year?*

They differ completely. This year it was voting from years ago it was environmental studies. I think they take current issues like air pollution all CTAS in every learning area it was air pollution so now the one we are doing in 2009 involves voting. South African voting election commission. Human's rights this is in every learning area. The theme is the form but we are looking at different aspect of it.

*In those activities which require group work, what is your view with regards to giving a learners group mark?*

The problem with the group mark is that at this time of the year where we have so much of work with CTAS everyone of us (educators) give learners work, sometimes the children in a group you find the "workers" and the "cheaters". The "cheaters" don't do any work anything so I tell the learners lesson have to decide for yourself if you allow the cheater to do the work for you, you will get.....

You do get people who do absolutely nothing, you work in the group let's say I give a group 10 marks each one in a group must decide now ok you are sitting in a group do you think everybody is going to get 10 marks [each] that what is supposed to be according to OBE CTAS. Now children in a group decide, did that person work hard enough and to the group has to decide but at the end of it I give a group mark so reluctant because at the back of my mind I know that out of a group of 6 maybe only one or two learners contributed but I just have to give the mark because it is also not possible to supervise each and every group also most of this group work has been done by the group during their own time.

*You have been exposed to CTAS section A and section B does this experience enables you to prepare your learners for the next exams on CTAS section B?*

Section B is based on section A to my knowledge once have completed section A, which they have done all activities and they submit the answers, I mark it and keep it in a profile I have got a special file of everyday learning CTAS.

Much as the department is full of surprises I do hope that with their successfully completing section A, learners might be able to attempt section B exam but at least there are more marks for section A and only 25% for section B.

*For how long you have been involved with CTASs?*

Two years for mathematics. NS 4 years

*Has this experience assisted you in making your learners to be competent in mathematics?*

No, I think it is the whole year's work which will make them more competent not the CTAS is just 10% of it. You can't say one section makes you competent or one exam competent mathematical literacy is a long process.

*Can you explain similarities and differences in how CTAS has been designed?*

*Does CTAS prepare the learners for grade 10 mathematics? Yes or No?*

Not at all, No! No! No! it prepares them for grade 10 mathematics literacy not mathematics at all. However mathematical literacy it's sort of mathematical literacy is not mathematics.

*Explain how effective are CTASs in preparing learners for the next level in mathematics, which is grade 10?*

It takes mathematics and using it is not at all mathematics. In mathematics you learn the formulas you take the formula probe. Grade 9 CTAS mathematics does not at all prepares learners for grade 10 mathematics. In mathematics you are learning trigonometry and solving for x.

*Are CTAS values any assessment of mathematics ability?*

10 to 15% but it does value an assessment mathematical ability Sir! Did you see CTAS this year? If you did you will realize that it was just voting small calculation. Did you see any triangle there? Did you see an trigonometry or geometry? Did you see any analytical? There was nothing except small numbers to explain this how election goes this how they work with numbers. This is how South African election is conducted this how this town or province got its vote how this person got selected.

*Grade 9 is an exit for learners who don't want to carry according to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learner with the skills they need for job opportunities?*

No the department has said that when the child reaches grade 9 they can exit school and go to work. Which person in a public sector want to employ a grade 9 learner? You can charge that person for child labour because the child is 14 years old. The child is not even 16. The government when they made this ruling that you can exit at grade 9 and look for work they did not speak to the public sector. The public sector there is a job interview and if there four thousand application that is going to take a grade 9 when there are also matriculates or graduates went for that job?

*OBE emphasize the integration across or within learning areas. Do you find it possible to integrate mathematics with other learning areas?*

Yes they do integrate with other learning areas but unfortunately we as educators sometimes don't have that time to actually do the say in that particular question. A

technology teacher mark the technology aspect. A Natural Science teacher mark the N.S aspect etc. e.g. drawing of the flag. In that case the learners work could be made a little easier. Both 2 or 3 L.A can assess the same project done.

## **EDUCATORS UNDERSTANDING OF THE ROLE OF CTAS's**

*Were you made to understand the role of the CTAS's in the teaching and learning of mathematics at the time of their introduction? Explain your answer.*

Yes the department and my HOD gave us some workshop as to how the whole process go, but as educators we had no input to creation of CTAS we accepted it without asking any question but in grade 9 we were told by HOD that it is for promotion purpose.

*Do you now understand what their role is in the teaching and learning of mathematics? Explain your answer.*

The department told us that the role for this is part of the promotion to grade 10. Us as educators we had to explain to the learners that to the activities, the group work, working in a group is very good to enrich your life because when you out of school you will be working with other people, team work but at the end of the day we (educators) were all told this is part of your promotion to go to grade 10.

*How were the CTASs introduced in schools? Was the purpose of the CTASs explained to you?*

Only promotion purpose was explain by HOD who was also told by the department that section A done in class will form Cass. Section B exam. In fact CTAS were imposed we just have to do them. To ensure that we do it cluster moderation started this year, so that all schools do the same thing. We had no choice to do it.

*If you were given a choice either to use/ not use CTASs, what will your choice would be?*

*Explain your answer.*

I will go for my own paper my own exams I will ever choose CTAS. CTAS took one month of school time to six weeks of my time; during that time have my scope to finish for grade 9. This is impossible of you have many sections, and also needs to move with the pace of a child. I just cannot rush and leave learners behind. At the end of the day children need to cover the work and understand. Time limit has been stipulated but it is impossible to go according to time limit. In my school I was told that if the child does not understand I cannot proceed, I must go back till the child understand. It takes six weeks or more to complete those CTAS booklet.

*How has the introduction of the CTASs changed your perception about mathematics? Do you think this will also be true of your learners? Explain your answer.*

Well! My perception is that it does teaches you every little aspect of mathematics something completely to what I am teaching on financial mathematics, algebra expressions, trigonometry sometimes it's a new idea I suppose it shows you how to use mathematics in a

different situation. CTAS is not pure mathematics it's mathematical literacy. have you seen any mathematics paper sir? Is there any stories? Mathematics it's pure diagram glalaks do this; find this A-intercept, B do graphs. CTAS is mathematical literacy it is asking stories asking the child to read. To interpret the mathematical formula to find the answer. It not finding equation solve for x like our mathematics paper, mathematics papers does not have lot of English on it.

It will go for setting my paper because in 2 years when the child comes into grade 8 and 9 we teach pure mathematics solving for x finding the quadratic equation, drawing in straight line, use circle, find the area all. This pure mathematics that is and in 2 years we don't have time to introduce the new subject to this children because in grade 10 they need to choose between mathematics and mathematical literacy. Last year I had a group of children that were as intelligent and had picked up a cramming subject because the din not know whether they would cope with mathematics and yet they have potential, my grade 12 last year they got 28 A's they could have been possible matter candidates but because they did not know about choosing could have been possible mathematics candidates.

They were scared because they thought they wouldn't cope with mathematics they got 28A in mathematical literacy, and on the other hand you have a child that cannot think but chose mathematics and they have tough time to cope with mathematics. Mathematical literacy has the combination it's got N.S, Accounting, Economics, Consumer study and Mathematics. Some kids cannot handle mathematics but all kids can handle mathematical literacy.

## C

*Do you consider CTASs to be helpful in assisting learners to be competent in their mathematics learning? Yes or No.*

No.

*If the answer is yes or no in 1 above, explain how.*

CTAS are a waste of time because first of all they take so much time that we could be using to teach learners things they will need in grade 10, this year CTAS arrived during the second term now that means we only taught our learners only half of the year and for another half of the year we were busy with section A of the CTAS in order to assist learners to be able to do the activities of which according to my knowledge there is absolutely nothing that learners gain for these CTAS. We have suspended the grade 9 syllabus and all the focus is now on CTAS.

*What are the strategies in learning mathematics which are promoted by the use of CTASs?  
How do learners benefit's from the application of those strategies?*

I am not sure of any strategies that are promoted by CTAS because the content of CTAS are actually advanced they need a person who knows mathematics well I as a teacher could understand what CTAS wants but learners are still too young to have a good understanding of CTAS.

*How effective are those strategies?*

Strategies promoted by CTAS are not effective if there is ever any strategies.

From the work that you have covered from the beginning of the year, what sections of the CTASs do you think learners benefit from?

Since the beginning of the year we have been busy with pure mathematics such as algebra bearing in mind that CTAS are coming and from my experience of CTAS then during the second term I try to change my style of teaching grooming learners for CTAS, then I teach word problems because CTAS are designed like that.

*How useful is the memorandum provided for by the Department of Education to teachers of mathematics?*

I only use memorandum as a guide, I believe in first working the problems myself and then compare my answers with given memorandum.

*How does CTASs mathematics differ from year to year?*

They are so different every year I cannot take previous years CTAS and drill my learners for the coming CTAS's also every year there are different terms- for example this year's CTAS (2009) is totally different from last year 2008.

*In those activities which require group work, what is your view with regards to giving a learners group mark?*

Well CTAS promote group work throughout, for example test 1 (2009) everything is group work and the marks that I have used are from the groups, however individuals in a group are different in each group you will find lazy people and hardworking people as a result lazy people find up getting the marks which they don't deserve which is not fair for those learners who really applied themselves for me as a teacher it benefit's me in terms of decreasing the amount of work instead of marking 50 scripts per class I only mark about 10.

*You have been exposed to CTAS section A and section B does this experience enables you to prepare your learners for the next exams on CTAS section B?*

In a way yes because there is that assumption that section B which is an exam may more or less be similar to section A. section A is like a syllabus for exam which is section B, but learners may not notice that for example the rates I have seen rates almost every in previous CTAS but questions on this are not clear.

*For how long you have been involved with CTASs?*

For three years.

*Has this experience assisted you in making your learners to be competent in mathematics?*

Very little such as what I have mentioned above on rates exchange rates, before I could not see the correction but now because of the experience I am able though that is very little so for me is to give learners lots of examples assuming that among all those examples there could be a question on section B exam, which is similar to my examples.

*Can you explain similarities and differences in how CTAS has been designed?*

It's different themes every year but every year there is group work and every year it's word problem, also every year there is little or no pure mathematics.

*Does CTAS prepare the learners for grade 10 mathematics? Yes or No?*

For mathematical literacy they do but for pure mathematics CTAS is a waste of time. Even for mathematical literacy the standard is not the same every year, this year 2009 CTAS is better than the previous years, but in terms of mathematical literacy.

*Explain how effective are CTASs in preparing learners for the next level in mathematics, which is grade 10?*

They are not at all effective in preparing learners for grade 10 mathematics. I have mentioned about that they can assist a learner only for mathematical literacy.

*Are CTAS values any assessment of mathematics ability?*

In terms of numeracy counting adding for daily living, if you are testing their numerical ability may be yes but in mathematics they don't even try there is English also which is different for our learners however CTAS is much more easy for learners that are good in mathematics.

*Grade 9 is an exit for learners who don't want to carry according to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learner with the skills they need for job opportunities?*

Grade 9 learners are very young to work also CTAS's level is advance for learners though it is designed in such a way that may be they are able to work or exit but grade 9 learners are very young about 13 to 14 years. They are still not matured form if they cannot work because they cannot even apply those problems that they get in CTAS.

*OBE emphasize the integration across or within learning areas. Do you find it possible to integrate mathematics with other learning areas?*

Yes, with natural sciences, history, and accounting but at grade 9 it's still early. Some activities like drawing the flag and all those drawing technology but learners cannot realize that if they are in a mathematics class, they cannot they are in a mathematics class but if they go to other learning areas the cannot realize that the same statistics that they find in accounting or other L.A is the same they did in a mathematics class.



## EDUCATORS UNDERSTANDING OF THE ROLE OF CTAS's

*Were you made to understand the role of the CTAS's in the teaching and learning of mathematics at the time of their introduction? Explain your answer.*

No I find myself in a system and I tried to adjust because I had no alternative I just have to do CTAS in workshops nothing was said because we did not even had a subject adviser in that regard.

*Do you now understand what their role is in the teaching and learning of mathematics? Explain your answer.*

I don't understand the role of CTAS at all. I just do them because I am teaching grade 9.

*How were the CTASs introduced in schools? Was the purpose of the CTASs explained to you?*

I don't know I was not working yet during their introduction at schools so I don't know. My HOD does not have the experience because I don't think she has ever taught grade 9 at all.

*If you were given a choice either to use/ not use CTASs, what will your choice would be? Explain your answer.*

I will go for my own paper, I will drop away CTAS because CTAS takes all the time, when I choose my own paper I will get more time to go through the whole syllabus for grade 9 without any interferences that always caused by the arrival of CTAS. I want to complete grade 9 syllabus and assist learners and prepare them for grade 10 mathematics. For the past two years CTAS arrived late, but this year (2009) they came very early. What is lacking with CTAS is the syllabus; we are always not sure what to do every year.

*How has the introduction of the CTASs changed your perception about mathematics? Do you think this will also be true of your learners? Explain your answer.*

CTAS are more advanced for learners especially those learners whom their language is not Zulu. They are difficult and some of the teachers could struggle if the guide is not given. In 2003 my cousin was doing mathematics CTAS then she asked me if I could assist her, but she did not tell me that they have already done with the teacher in a class. I did the activity and I completed it when we compared the answers, she showed me that each warned that the answer in a memo was wrong and the teacher showed them the answer that is different from the memo.

But the answer I got was similar to that one in the memo, so the teacher was actually wrong mainly because CTAS are difficult and too advanced. This shows that grade 9 learners are not in that level to be able to do CTAS.

In my opinion I think CTAS must be removed completely or maybe start at a matric level most of the time CTAS problems are created towards mathematical literacy, this is my preparation and learners does not enjoy CTAS. They do them because they have no choice, they need the mark. The introduction of CTAS has not changed my percentage at all I only viewed them as a waste of time and something that has been forced to educators, teachers had no input in these CTAS, they were forced on teachers and everyone.

D

## **WHAT ARE TEACHERS PERCEPTION ON CTAS (MATHEMATICS)**

Role of CTAS's in helping learners to be competent in mathematics

*Do you consider CTASs to be helpful in assisting learners to be competent in their mathematics learning? Yes or No.*

Maybe it helps or it does not help so yes or no.

*If the answer is yes or no in 1 above, explain how.*

2009 CTAS theme is on democracy and elections may be learning to know this. But as from the beginning of the year I have been teaching real mathematics algebra etc. and all of a sudden CTAS arrives and they come with things that you have not been doing. Personally I find them useless and confusing.

*What are the strategies in learning mathematics which are promoted by the use of CTASs?*

*How do learners benefit's from the application of those strategies?*

I am not sure whether teaching about democracy is a strategy maybe they want to make kids come out of mathematics and involve other knowledge that is what I can say to produce a particular theme is a strategy. I suppose the learners needs to know this way of thinking.

*How effective are those strategies?*

It is difficult to say these strategies are effective or not effective but during our times we did not do CTAS and we understood democracy and voting without learning about this at the school. Learning doesn't like CTAS they find them boring. It is easy to say learning new anything about elections or voting or they did not know but maybe it was worth mentioning that in a mathematics class.

*From the work that you have covered from the beginning of the year, what sections of the CTASs do you think learners benefit from?*

Learners benefit very little from CTAS. This year 2009 there is no mathematics in CTAS it only theory, voting, drawing of flags. I have taught pure mathematics from the beginning of the year.

*How useful is the memorandum provided for by the Department of Education to teachers of mathematics?*

It was not very useful there were some errors in other activities I had to consult other mathematics colleagues. What is very funny is that the department don't provide errata.

*How does CTASs mathematics differ from year to year?*

It different themes every year, also this year there was no mathematics it was just stories word problem like mathematical literacy. What is similar about CTASs are these group work activities and individual activities so it hard to even refer to pass years CTAS's

*In those activities which require group work, what is your view with regards to giving a learners group mark?*

Strong learners assist every learners in that sense maybe group work is ok because learners benefit more from their peers and they can ask questions which they cannot ask me as a teacher. But I also have disadvantages such as learners simply copy a group work is the production of one brilliant learners and every one benefit's and get marks which they did not work for. To teacher it is beneficial because you have few papers to mark. It saves time but we are not allowed to give any learner zero, so I simply give the mark.

*You have been exposed to CTAS section A and section B does this experience enables you to prepare your learners for the next exams on CTAS section B?*

Section A work if done thoroughly does assist learner to master section B. but those learners who simply copy other learners work find section B difficult.

*For how long you have been involved with CTASs?*

For three years.

*Has this experience assisted you in making your learners to be competent in mathematics?*

CTAS does not, but I have done all grade 9 mathematics syllabus. I hope what I have taught them will help them not CTAS. Maybe CTAS teaches them to think differently don't forget that CTAS are just mathematics literacy.

*Can you explain similarities and differences in how CTAS has been designed?*

I have mentioned before that every year in CA we get different themes.

*Does CTAS prepare the learners for grade 10 mathematics? Yes or No?*

When you talk about arithmetic or mathematical literacy yes they do prepare learners mathematical literacy not pure mathematical.

*Explain how effective are CTASs in preparing learners for the next level in mathematics, which is grade 10?*

CATs are effective in preparing learners for mathematical literacy I have already mentioned that there is no pure mathematics in CTAS.

*Are CTAS values any assessment of mathematics ability?*

Yes mathematical literacy and accounting for general daily use such as counting money and word problems which is also difficult for our learners. They don't value any assessment mathematical ability but I can say mathematical literacy ability.

*Grade 9 is an exit for learners who don't want to carry according to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learner with the skills they need for job opportunities?*

Grade 9 learners are very young not mature yet they are about 13, 14, 15 or so they are not yet responsible. I don't think exiting was a good idea. We were told they will get certificates when they exit, but I have never ever seen any grade 9 certificates. Also that is child labour

always feel bad when I see young children working as a taxi conductor. No parent will allow that but I think kids of today have rights they may be doing this without parents' permission.

*OBE emphasize the integration across or within learning areas. Do you find it possible to integrate mathematics with other learning areas?*

Integration is possible such as history especially this year theme on democracy integration is possible with natural science, accounting, economics. Yes integration is possible.

## **EDUCATORS UNDERSTANDING OF THE ROLE OF CTAS's**

*Were you made to understand the role of the CTAS's in the teaching and learning of mathematics at the time of their introduction? Explain your answer.*

My HOD told me to take CTAS. I have never attended any workshop on CTAS this was simply imposed to us.

*Do you now understand what their role is in the teaching and learning of mathematics? Explain your answer.*

I don't think I do but I do them because I am forced to do them I have no choice. I just take the struggle forward even the arrival of CTAS differ from year to year in 2009 this year they came early other years October or November.

*How were the CTASs introduced in schools? Was the purpose of the CTASs explained to you?*

No the purpose of CTAS was not explained I had to inquire from other teachers who also did not have full knowledge of this.

*If you were given a choice either to use/ not use CTASs, what will your choice would be? Explain your answer.*

I will choose my way and I will drop CTAS completely. Also I sit with grade 10 colleagues and look at what learners are ready for grade 10 mathematics. These CTAS only cater for one stream that is mathematical literacy kids don't enjoy them either.

*How has the introduction of the CTASs changed your perception about mathematics? Do you think this will also be true of your learners? Explain your answer.*

CTAS has not changed my perception for mathematics and I hope same goes for learners too. Maybe if they were introduced properly and don't get imposed I may use CTAS as just another source a way of looking at thing differently. I liked the question that you have asked me before how CTAS were introduced. Who told us about CTAS? My HOD simply called me and told me to sign that I have received them and that was end of the story.

*Do you consider CTASs to be helpful in assisting learners to be competent in their mathematics learning? Yes or No.*

Yes

*If the answer is yes or no in 1 above, explain how.*

Yes in mathematical literacy, no in pure mathematics. You see the problem is that you find that at grade 10 they have to choose between mathematics and mathematical literacy And those that are choosing mathematical literacy it's beneficiary to them but those that they choose pure mathematics the CTAS syllabus is irrelevant to them since CTAS are similar to mathematical literacy. This imply that CTAS are mathematical literacy

*What are the strategies in learning mathematics which are promoted by the use of CTASs?*

CTAS are only promoting mathematical literacy, if we talk about mathematical literacy; yes they do but not pure mathematics.

*How do learners benefit's from the application of those strategies?*

Only learners, who will take mathematical literacy, do benefit but not pure mathematics.

*How effective are those strategies?*

CTAS are effective at a certain level you find the language that is used in CTAS even though they benefit from CTAS strategies is difficult for grade 9 learner

*From the work that you have covered from the beginning of the year, what sections of the CTASs do you think learners benefit from?*

You see what happening is that some of the things that we teach during the year and from the beginning of the year comes out in CTAS most of it when we decide the curriculum for the year what we need to teach, we do the scheme of work, what we do we look at the previous CTAS so that when we work we work towards the same goal as CTAS but you find that last year's (2008) CTAS is different from this year (2009) CTAS so we cannot keep in line but you find that things like transformation functions is that in the syllabus

*How useful is the memorandum provided for by the Department of Education to teachers of mathematics?*

If you mean teachers book when you say memorandum that one is useful but in every memo before you use it one has to go through it but in every memorandum one is bound to come across mistakes even last year there was a mistake but of course no errata has ever been given but we sit around with other teachers and correct it.

*How does CTASs mathematics differ from year to year?*

Last year (2008) they gave the probability and this year there is nothing under probabilities but this is just section A I am not sure what will come out in section B CTAS differ from year to year.

*In those activities which require group work, what is your view with regards to giving a learners group mark?*

For the fact that there is a language problem (barrier) I am ok with group work because those who are good in English they will help and explain for those who have a language problem with that I am ok with group work the usual problem is that if there is a group there will be those who are lazy group mark will not reflect individual contribution but because the CTAS emphasize group work and a group mark have never really questioned that so I just allocate the mark to the group.

*You have been exposed to CTAS section A and section B does this experience enables you to prepare your learners for the next exams on CTAS section B?*

Yes, When I taught them section A last year 2009 and 2007, I find that learners managed to do section B so section A is useful I am not this year 2009.

*For how long you have been involved with CTASs?*

Two years.

*Has this experience assisted you in making your learners to be competent in mathematics?*

In mathematics for which level? No not 100% because I also teach mathematical literacy in higher classes and you find that things that are in CTAS are more in line mathematical literacy so it prepares them for mathematical literacy.

*Can you explain similarities and differences in how CTAS has been designed?*

Similarity CTAS are mathematical literacy that is what is similar. Differences it's all different themes every year.

*Does CTAS prepare the learners for grade 10 mathematics? Yes or No?*

No, you see there are quite a lot of things that are involved in pure mathematics and grade 9 CTAS I would say had 10% of pure mathematics e.g. algebra

*Explain how effective are CTASs in preparing learners for the next level in mathematics, which is grade 10?*

They are not effective at all

*Are CTAS values any assessment of mathematics ability?*

No!

Mathematics and mathematical literacy I even wonder why they called mathematical literacy mathematical literacy mats they should have omitted math and call mathematical literacy by another name what they should have done in grade 9 was to discard all the mathematical literacy and concentrate on pure mathematics for continuity to grade 10. CTAS only prepare a learner for mathematical literacy and not at all or pure mathematics so CTAS don't even attempt to even value any assessment mathematics ability.

*Grade 9 is an exit for learners who don't want to carry according to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learner with the skills they need for job opportunities?*

I would not say yes or no in this question because it will differ from the job in which the learners is going to take. I also taught exiting is for maybe going to FET for a specific job like bricklaying, plumbing. If the child want to do trade as I have already mention and also maybe electronics that child could exit in grade 9 and go for trade job so maybe get to N level 4 which is matric in that way e or she can be employable but only concept rating on trade only.

*OBE emphasize the integration across or within learning areas. Do you find it possible to integrate mathematics with other learning areas?*

Mathematics can be integrated with other some of the subjects because the more you work mathematics you get an idea of where it came from where it originated e.g. science.

## **EDUCATORS UNDERSTANDING OF THE ROLE OF CTAS's**

*Were you made to understand the role of the CTAS's in the teaching and learning of mathematics at the time of their introduction? Explain your answer.*

Yes! They gave me introduction my HOD told me about exit points and all that was required of the CTAS and that was it I just accepted things as I was told.

*Do you now understand what their role is in the teaching and learning of mathematics? Explain your answer.*

I have an idea now about the role of CTAS while it's not like the national senior certificate but as an exit point it has to be something that is national with the same standard that is why I only think as far as that why the department invented CTAS all over.

*How were the CTASs introduced in schools? Was the purpose of the CTASs explained to you?*  
HOD told me all about CTAS at the time CTAS were new to me I was doing them for the first time. You just accept everything.

*If you were given a choice either to use/ not use CTASs, what will your choice would be? Explain your answer.*

You see the problem of setting my own paper my concern would be the standard it may not be like the same paper from other schools and the rest of the country. I don't mind CTAS or setting my paper but I am worried about the standard. If teachers had to set their own paper that means all grade 9 mathematics will be different, teachers may emphasize different things also depending on the situation on which they find themselves.

*How has the introduction of the CTASs changed your perception about mathematics? Do you think this will also be true of your learners? Explain your answer.*

The CTAS I have explained before it does not give the true content of mathematics you see for example statistics is not mathematics but it there in the CTAS but when you talk of

mathematics, real mathematics you find very little of small percentage mathematics in CTAS. Mathematical literacy is not real mathematics.

## E2

*Do you consider CTASs to be helpful in assisting learners to be competent in their mathematics learning? Yes or No.*

Yes I do consider CTAS to be helpful

*If the answer is yes in 1 above, explain how.*

I do because I feel any activity that gives exposure to context which I find the CTAS to be contextually based is helpful in developing mathematical thinking especially thinking that a lot of our learners do go on to mathematical literacy so you can also test understanding in a context that actually helps develop our learners understanding that is part of our curriculum to that they can apply mathematics to real context life.

*What are the strategies in learning mathematics which are promoted by the use of CTASs?*

*How do learners benefit's from the application of those strategies?*

I think by doing a vertically structure by having a vertically structured in the way that questions are done it builds up on the level of questioning I think these strategies benefit the learners. I think they are in that they are doing certain sections which they do sort of peer learning or maybe with the aid of the teacher and then they are advised to do assessment task so actually not giving and also doing some exploratory learning as well.

*How effective are those strategies?*

So strategies are effective.

*From the work that you have covered from the beginning of the year, what sections of the CTASs do you think learners benefit from?*

No if you follow work schedule provided by the department it's actually is the section, however we now find from the time constrain that we have we are not always able to do the section in depth and so sometimes you may find that the CTAS the extent of the knowledge of the learners may not be suitable for our learners for example the depth in the learning outcome for geometry like calculating surface area we may actually find that we did not do all different types of prisms with the learners at that stage and some things are not covered but also because the department does not give you [teacher] a guide again which learning outcomes should be done first in the year but it could be that some schools would be disadvantaged.

*How useful is the memorandum provided for by the Department of Education to teachers of mathematics?*

I specifically don't trust any memorandum till I have worked it up but I think that should be all for all mathematics teachers. So! I always check the memorandum and then I mark. However I have come across some errors in the CTAS memo that I picked up but I have



never seen the errata from the department not in all years that I have taught mathematics CTAS.

*How does CTASs mathematics differ from year to year?*

I think sometimes the context differ sometimes they differ a lot, sometimes in terms of the content like there is a greater focus in some aspects it's not like a carbon copy which is not a bad thing. Also every year there is a specific theme like this year the theme is democracy.

*In those activities which require group work, what is your view with regards to giving a learners group mark?*

Typically I design a rubric so that I manage group work in order to mark for a group fortunately in our school we have an excess to internet and we have a lot of resources we do use group work. Even though you may form part of the team for example I will design a rubric for assessing which will show where someone has actually been contributing meaningfully to the group or whether they were able to communicate or do their share of the work or were actually be able to put their point across even though you may be part of the group you don't necessarily get the same mark as everyone else in a group while doing their group work. I also observe group dynamic and how they work what they have written. We also look at their working.

*You have been exposed to CTAS section A and section B does this experience enables you to prepare your learners for the next exams on CTAS section B?*

I think that a challenge in mathematics that is you can never be too show because children tend to remember things best when they have just started for example, today I teach substitution and tomorrow everybody knows and also putting everything together the children do not know their mathematics well suddenly if you do a section together whereas in your class you know is called " mathematics fluency" they are in their calculations sometimes if you put things together it does confuse them but generally it should prepare them well enough.

*For how long you have been involved with CTASs?*

2 to 3 years.

*Has this experience assisted you in making your learners to be competent in mathematics?*

Yes I think it helps in their competency, but we also like need to realize they are some unrealistic expectation in the CTAS, for example our children are not allowed to use calculators but the type of values given in the CTAS like for example multiplying and multiplying decimal fractions calculating volume  $7, 2 \times 8, 4$  not always even though we cover that work. Sometimes the number are quite large and difficult to work with so it makes in a sense even though I am positive about CTAS there are also some draw backs and typically our learners do find CTAS very much challenging.

*Can you explain similarities and differences in how CTAS has been designed?*

There are different themes every year. 2009 CTAS is more inclined to mathematical literacy whereas in the past CTAS there was enough mathematics the similarities is about the emphasis on group work.

*Does CTAS prepare the learners for grade 10 mathematics? Yes or No?*

No for me I think they only prepare learners for mathematical literacy. for me because must also look at the CTAS sections and maybe look at the external paper that is set in grade 10 to see that pure mathematics seem to be not contextual it focus a lot on algebra calculations, geometry, trigonometry and area volume. We do have integration in grade 10 but I think in pure mathematics it's important to have a core foundation of geometry in order to develop the learners in order to move a level of geometrical thinking.

*Explain how effective are CTASs in preparing learners for the next level in mathematics, which is grade 10?*

They are not effective I don't find CTAS a real useful tool they are not pure mathematics. I find them more useful and more parallel for mathematical literacy but I do find that it is difficult for learners in terms of wording, the story style.

*Are CTAS values any assessment of mathematics ability?*

Again more mathematical literacy they value mathematical literacy ability. The type of context in CTAS is very much contextual based. They are more worded like grade 11 mathematical literacy.

*Grade 9 is an exit for learners who don't want to carry according to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learner with the skills they need for job opportunities?*

Maybe to FET but grade 9 learners are very young to go for working I would love to see children proceeding with school than exiting however it's not CTAS that prepares the learners for job opportunity or it's just the knowledge they have accumulated all these years at that point.

*OBE emphasize the integration across or within learning areas. Do you find it possible to integrate mathematics with other learning areas?*

Integration is very possible with learning areas such as H.S.S, N.S, Accounting and B.E. it does in N.S, Geography e.g. water, English. However I like to point out that CTAS Cass is misleading. Learners end up with high marks they can even think they know mathematics because of high marks and end up making bad choices.

## **EDUCATORS UNDERSTANDING OF THE ROLE OF CTAS's**

*Were you made to understand the role of the CTAS's in the teaching and learning of mathematics at the time of their introduction? Explain your answer.*

No! I was not yet teaching at the time of their introduction however my head of department told me about CTAS and we have meetings and workshops at the school.

*Do you now understand what their role is in the teaching and learning of mathematics?*

*Explain your answer.*

Yes I think I understand the concept of it, just that I do feel that CTAS are a waste of time. I do understand the concept and aims of it in terms of all school grade 9 following the same curriculum.

*How were the CTASs introduced in schools? Was the purpose of the CTASs explained to you?*

No I am not sure how it was introduced I was only told by my H.O.D what CTAS is, it's meant to be exit student have to follow same curriculum.

*If you were given a choice either to use/ not use CTASs, what will your choice would be?*

*Explain your answer.*

I will go for my own paper for me it's not the context that is so much it's just the magnitude of the numbers and the wording the language and in CTAS algebra mathematics core is seriously lacking.

*How has the introduction of the CTASs changed your perception about mathematics? Do you think this will also be true of your learners? Explain your answer.*

I think it made me realize different avenues that we can show learners of this age different mathematics. I suppose it's mathematics or calculation for everyday general use. They are more negative things in CTAS than positive thing. CTAS should be designed differently to include algebra that is pure mathematics.

F1

*Do you consider CTASs to be helpful in assisting learners to be competent in their mathematics learning? Yes or No.*

Yes.

*If the answer is yes or no in 1 above, explain how.*

I actually do think it is helpful but if it was not compulsory. There are lovely question in the CTAS and it is sort of an extension to what once teach to what you teach kids but it is not really a syllabus I enjoyed some types of questions on CTAS I am talking about CTAS 3 years

ago and earlier but if it is compulsory to do them I am sorry there is no time if they say you just have to do CTAS it's compulsory there is no time if they say section A counts 10% and section B 15% and it takes the form of an exam and takes the place of an external exams there is absolutely no time for this.

The problem is that if it is imposed upon you and you have never taught that kind of syllabus so you have to make space of that becomes it is a must where as if they give it to you as something to help you with more interesting question that you can teach children how you can use mathematics and how it can be asked than it's nice or if you can use it as a project. I am thinking like I said last time to you specifically about an area and volume where they have that lovely question about not just working the area of a room but after you have worked out the area and volume where will you fit this cylinder with container in a room for the fish would you rather have a triangular pyramid or a of a set or a square that was interesting because I teach in grade 9 area and volume so now can consider how to work out the volume work out the area and I can say apply that knowledge but if they come with data handling basically as teacher as to look at answers that means that we have to teach learner something they have never done on that level. We teach data handling but not that way so if it's not focused on to you but if it's really for help. If we are forced to do it we have time.

*What are the strategies in learning mathematics which are promoted by the use of CTASs?*

I think what they are trying to do is to increase the thinking level of the children. What I think they are trying to do they ask a very basic question I remember in some other year they had a question about rural area with this houses and the children stuck to apartheid and this had to do with apartheid it had to do with statistics and basically working out what is the median and the miss the point because the just looked at the rural area and poor people and rich people they had to look at the area that bigger houses takes up and the area that the small houses takes up and how much more can you, you will be able to build in the different area where they have smaller houses so they really did try to improve the thinking level of the children not to just be parrot and think like a robot

*How do learners benefit's from the application of those strategies?*

The learners could benefit from those strategies; they could do it longer than in grade 9. If they can do CTAS type of question from grade 4 other than that those strategies are not effective if this CTAS type of questions start along grade 9 because if they do those types of thinking question from grade 4 where they learn at that level to think that way will help than by grade 9 we will see the difference and improvements but now we do this in grade 9 and we don't do it before. After grade 9 this way of thinking dropped and it's good.

*How effective are those strategies?*

CTAS does not come up with any beneficial strategies mainly because of the way they are done in terms of times that they are given. Short time learners were going to benefit if CTAS are not rushed and pushed to them and the language seems to be a problem I still feel they must be given earlier in grade 4 at least.

*From the work that you have covered from the beginning of the year, what sections of the CTASs do you think learners benefit from?*

I will never think they could do this without the help of the teacher because of the type of question e.g. IEB exam the level is different they are very difficult. We will never be able to allow kids to do it on their own even as I say it work like area and volume the way the level of question because they are trying to improve their level of thinking the children are battling to think at that level so they need the teacher. What happens basically in our school in grade 6 and grade 7 we already teaching the children on high order thinking level because we do the cause still in grade 6 as well from IEB the course still in G6 as well it is already that type of stall for thinking differently so our children are little bit more exposed to it and even so they battle with high order thinking so I don't think our kids ever been able to do anything on their own.

*How useful is the memorandum provided for by the Department of Education to teachers of mathematics?*

It's not in detail enough because many of our teachers are older we also have to learn mathematics that way now we get a memo and it gives you a mark for the answer and you have no idea how they got into that answer because you are not to that way of thinking so you got to work out that answer in your old fashioned way to get to the answer then you think shoo!! Only one mark? But maybe they have some way where else that they have another way we cannot teach the children the memo is not detail enough so that we can teach it in a new way but we can follow that way and carry over to the children. I have not found many mistakes in the memo maybe one or two but that is normal. Previous years on CTAS I had found a mistake and I had to call other teachers to work around that problem. The problem was also that the memo was not detailed enough I really would like to have a detailed memo (why there is a mark for this)

*How does CTASs mathematics differ from year to year?*

In the beginning with my first experience with CTAS I found that the first CTAS was a nightmare nobody knew exactly what was going on. The second was better and the third one was ok now we getting into what or how we can teach in a class. The other thing we really like it was mathematics but it was not what we teach but then it was improved it started getting better I think with IBE CTAS they listen to us and they heard it was a learning process however it is now gone and we are not going to have CTAS in 2010. We will have an option if we want to carry on with it. We will but we are not going to take that option IEB

*In those activities which require group work, what is your view with regards to giving a learners group mark?*

I am old fashioned sir I have seen that the child that battle that does not do anything and he get the same mark, I try to give them their individual mark within the group if you have done nothing I wouldn't give you a mark, but again with CTAS they don't want it like that, they wants it to be a group mark, and this result in a pupil getting the mark that he doesn't deserve the mark that he did not work for. I personally don't like that if I do my own assessing a group everyone should have done something to get the mark and divide the task if the task is out of 10 each one will get 10 marks different from someone else but the 10 he

or she worked for. I group them, those that battle same group so that I can assist them and those who are ok their same group as well and this forces everyone to do something.

*You have been exposed to CTAS section A and section B does this experience enables you to prepare your learners for the next exams on CTAS section B?*

Yes but again the first year it was very interesting the section or question were still to very difficult in section B. The kids could not actually see the link between the two, but we could as teachers but the third year they provided us with assessment syllabus so they gave it to us in every subject and the syllabus was showing which things to be covered and must be covered because these would be the things that would be in CTAS section A and that would be tested in section B so we got a syllabus which helped a lot because then we say if we have done everything in the syllabus in our classroom we could be able to cover the work in CTAS section A except that the level of questioning is a bit more difficult but we can help the children with that and then because they have done the work and they have done CTAS section A they could recognize some of the question in section B so when we got the syllabus it was possible but before that it was difficult.

*For how long you have been involved with CTASs?*

3 years.

*Has this experience assisted you in making your learners to be competent in mathematics?*

No! No!

Because in CTAS I had no basics now I want to make my children competent for a grade for or for the level they have to be at, they still need the basics every time before I could do CTAS so the CTAS is more of an extension not competent, helping them to be better if they are good so it's not helping them to pass if they cannot pass.

*Can you explain similarities and differences in how CTAS has been designed?*

*Does CTAS prepare the learners for grade 10 mathematics? Yes or No?*

No! No!

It does not prepare them at all for grade 10 because I have a feeling that they missing the point of what we need for grade 10. You know to give you an example we need factorization in grade 10 we need simple drawing of graphs in grade 10 we need interpretation of graphs.

*Explain how effective are CTASs in preparing learners for the next level in mathematics, which is grade 10?*

In the CTAS they got the data handling they got interpretation of graph. Then we say great that will help them to interpret the graph after they have learnt the graph so now that is not effective. I think CTAS is a wonderful resource for extension and to while you teach other children that is battling these that are coping can go on with work like this and it helps the teacher to see question at a different level it exposes us to different way of doing things. I don't see it as preparation for grade 10 at all.

*Are CTAS values any assessment of mathematics ability?*

Yes I do think so but I think it's the order of thinking out of the box you know with you mathematics I know there was a question sometimes where there was an arch and they had to recognize that it a parabola but no one told them that and the child that is able will now go and look in the city and say now the architect must have used a parabola must have used mathematics so! Yes it does teach them or asses the mathematical ability in a certain sense that is why I say it's I think it's a high order thinking outside the box not just the obvious.

*Grade 9 is an exit for learners who don't want to carry according to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learner with the skills they need for job opportunities?*

The same thing is coming back it's for a child that doesn't want to leave the school because it's high than the basic thing a child that needs to be able in the work place to add and subtract and multiply and to know those basic things because at grade 9 level they don't know much more than that really and handling data, I don't think the CTAS are preparing learners for that, I think the school is preparing them for that for that the CTAS is for a child that wants to stay in school.

I think this my personal opinion completely I have not had a grade 9 learner that I would say with confidence can go and work but that is also because of the fact that they are not responsible enough yet, they cannot cope with the load of the work place over and above that they need to have academic experience which is so still at the beginning of their life they just don't know enough I would say rather take them into grade 10 the thing which we use to do in our days where the child had to be 16 and to have passed grade 10 at least then have a little bit of experience at a high level of their academic life, grade 9 I don't think so they are very young. If you can ask a grade 9 today in the street you say to them go and buy some groceries for me make sure that it not more than R200, they would first say I don't have a calculator, if they think that they have to add it and when it comes to R200 they must stop, I promise sir they don't think that way, they would just go and start buy what they want. I promise sir that level of thinking is just too young.

*OBE emphasize the integration across or within learning areas. Do you find it possible to integrate mathematics with other learning areas?*

Oh yes I do I find many ways of doing that (integrate) though I don't have enough time. There is a definite link to science we have discussed it when I was doing grade8 and 9 mathematics. We discussed that the grade 8 data handling and mathematics will be given completely to the science teacher so that because the natural science teacher is very serious about data handling bar graph so we took out mathematics and put it in to NS though yet we assess to the mathematics as well that was wonderful. In years ago OBE was there but known as differentiation for me it was not a new thing the new thing was that we are teaching according to learning outcome which become your syllabus but in general I think it good to have this cross reference and going from one subject to the other . I do think it's more possible to apply that at primary school because that not much time to cover your learning outcome in your subject and still remember to work with another teacher in another learning area but can be done.

## EDUCATORS UNDERSTANDING OF THE ROLE OF CTAS's

*Were you made to understand the role of the CTAS's in the teaching and learning of mathematics at the time of their introduction? Explain your answer.*

No! No! It was given to us and we have to do it, it was impose we had no choice we have to do it we have to leave with it and we have to understand it.

*Do you now understand what their role is in the teaching and learning of mathematics?*

*Explain your answer.*

I understand CTAS role and I understood that very quickly as well, I just don't think that the role they had in mind like I keep on saying that I would have had in mind for CTAS because I don't is the role I would have had in mind for the CTAS because I don't assess them for what they should know for grade 9 I however think it is a wonderful tool.

*How were the CTASs introduced in schools? Was the purpose of the CTASs explained to you?*

No! Not to me but I found out I went to the department and I went to Johannesburg to IEB and I said what are we doing and I made sure that my staff new in NCS but no one. But literally have to take three days off to find out what are we doing now, and my staff was informed by me but at the beginning I didn't know and no one told me, it was not told to me.

*If you were given a choice either to use/ not use CTASs, what will your choice would be?*

*Explain your answer.*

I am always open for new things I would not say no because I have got my way, I think I would have said give it to me to look at I know other teacher would say no, but they are willing to use part of the CTAS but I always ask them to acknowledge the source. I have ordered CTAS this year to use it as a source but not as another tool.

*How has the introduction of the CTASs changed your perception about mathematics? Do you think this will also be true of your learners? Explain your answer.*

I cannot say it has change my way of thinking every time I have to say this it is an extra tool which I add to my knowledge of mathematics, it make me think out of the box it make me realize that "you know the children always ask" when are we using that they in real life teaching us? Help me to say here we are going to use it. In that way I think it has also changed learner's life and way of thinking about mathematics. Gave me more material Lear.

F 2

*Do you consider CTASs to be helpful in assisting learners to be competent in their mathematics learning? Yes or No.*

No.

*If the answer is yes in 1 above, explain how.*

The level at which CAT are set are way above the level that we teach and a lot of things that are asked in CTAS's is the staff that we don't do in the syllabus or that we have not covered



by that time the CTAS's arrived, so that I have to quickly teach that or that section and then I do the CTAS by you know it's like doing a chapter by chapter I have to work through to ensure that all the work is covered. The work that I have not covered in the staff in the CTAS is very difficult some of the work and questions are difficult even myself I have to look at the memo and also consult other teachers to ensure it that answer is what is required. So if I struggle as a teacher I can imagine that learners are also going to struggle and also because English is their second language it is even more difficult for the learners.

*What are the strategies in learning mathematics which are promoted by the use of CTASs?*

*How do learners benefit's from the application of those strategies?*

It promotes out of the box thinking for the learners, the learners that we teach are used to method one has to teach them the method in order for them to get the answer they are used to method learning and they cannot think out of the box because they really struggle with mathematics especially those who are weak in mathematics, the CTAS are very good when it comes to certain questions but for weaker learners I have to teach the method first before they can attempt the question.

*How effective are those strategies?*

Learners do not at all benefit from strategies promoted by CTAS. Strategies are not at all effective for the good learners maybe they can be effective in a way but for weaker learners no.

*From the work that you have covered from the beginning of the year, what sections of the CTASs do you think learners benefit from?*

I would say they will benefit only the work that we have covered and also CTAS questions are practical that also help lot of statistics that are asked in the CTAS. We normally leave them towards the exam.

*How useful is the memorandum provided for by the Department of Education to teachers of mathematics?*

It is useful but I don't agree with the marks allocation. Too many marks for the question which is not supposed to be like that. There are always mistakes/errors on the memo, without any errors. What helps most is that I first do my own memo and also consult other mathematics teacher and we compare our answers with those that are on the memo before we start marking.

*How does CTASs mathematics differ from year to year?*

The level of CTAS is not the same from year to year and also the first CTAS at the beginning was a nightmare, but it gradually improved. It's all different every year.

*In those activities which require group work, what is your view with regards to giving a learners group mark?*

I personally found group work not being fair because in each group there is always one learner that is doing the work for all the group members and they all get the same mark and

that is not fair. If you want to test the ability of the learner I would say test it individually not evaluate in groups.

*You have been exposed to CTAS section A and section B does this experience enables you to prepare your learners for the next exams on CTAS section B?*

No, not at all doesn't it fit in to our daily way of doing things but because of my way of teaching and my experience and knowledge I have been able to help learners to be ready for section B which is an exam. So! It's not CTAS sorry there is also no proof that section A prepares learners for section B.

*For how long you have been involved with CTASs?*

Three years.

*Has this experience assisted you in making your learners to be competent in mathematics?*

No! it is a burden to us lots of marking lots of paper work and we don't have time for this load of work coming towards the end of the year all of this prevents us from revising, in that sense CTAS is a nonsense.

*Can you explain similarities and differences in how CTAS has been designed?*

*Does CTAS prepare the learners for grade 10 mathematics? Yes or No?*

No! because the way that the questions are asked are not the way that we ask questions.

*Explain how effective are CTASs in preparing learners for the next level in mathematics, which is grade 10?*

That's a difficult one maybe good for a top learner but for a weaker learner No but also CTAS are more inclined to mathematical literacy as well.

*Are CTAS values any assessment of mathematics ability?*

No! if you want to test the child number concept then give them numbers and equations and things to work with if you want to test the child's ability to solve the problem you give them the problem in words that what CTAS are actually testing first giving a story word problem is high order thinking especially considering that this is the second language to our learners.

*Grade 9 is an exit for learners who don't want to carry according to this new curriculum (FET). According to your view, do you think grade 9 CTASs in mathematics prepare the learner with the skills they need for job opportunities?*

No not at all the time we spend on a CTAS compare to the time that we spent in class during normal work is like a fraction is like ten percent of the time we spent on CTAS. We as teachers we are very honest on our work. It's such a fight to do CTAS and we have to rush learners. We don't see grade 9 CTAS as an exit for anything grade 9 learners are young and I have never seen any grade 9 certificate. 14 to 16 years.

*OBE emphasize the integration across or within learning areas. Do you find it possible to integrate mathematics with other learning areas?*

Integration does occur for example with natural Science, accounting, HSS and Economics (EMS) just as you have seen when I was teaching profit and loss in the class some kids knew the stuff from Business studies, but others were not sure I had to do it again. Technology also, but it's not easy to come together and say this topic must be done in a particular class, but integration does occur.

## **EDUCATORS UNDERSTANDING OF THE ROLE OF CTAS's**

*Were you made to understand the role of the CTAS's in the teaching and learning of mathematics at the time of their introduction? Explain your answer.*

No.

*Do you now understand what their role is in the teaching and learning of mathematics? Explain your answer.*

How were the CTASs introduced in schools? Was the purpose of the CTASs explained to you? I don't remember anyone telling me about CTAS. It was given to us and we just have to do them we were told there is going to be section A and section B an exam and have two weeks to complete.

*If you were given a choice either to use/ not use CTASs, what will your choice would be? Explain your answer.*

I will set my own paper oh yes because CTAS are actually mathematical literacy and don't cater for pure mathematics I know what the scope in mathematics the children find it hard to do that integration to do the word problem. So I will give them less word problem. The CTAS consist of 100 word problem and that is disadvantageous to learners who do English as their second language. The level of understanding and thinking is too difficult.

*How has the introduction of the CTASs changed your perception about mathematics? Do you think this will also be true of your learners? Explain your answer.*

It may be said an aim I teaching mathematics incorrectly am I integration enough or to the other subject what do they require at me, or will I be able to teach OBE or increase the learner's ability to do the CTAS. But me and most of the teachers we find the CTAS as a waste of time. Learners did not really enjoy CTAS because they could not do it. I am not sure about other subject. CTAS do not prepare learners for pure mathematics at all it was all mathematical literacy. Where do you go with CTAS? It's not regarded as pure mathematics.

## **PRESENTATION AND INTRODUCTION OF SCHOOLS AND TEACHERS.**

Introduction

This chapter introduces the schools and teachers who participated in this study. Perceptible differences were noted during the process of data accumulation. Major factors which contributed greatly to the differences noted at these schools were the physical structures and layout of the buildings, the educators, student's body and curricula activities.

presentation of case studies.

case study of school a

context and profile

School A is a large co-educational high school. During the time of data collection the school had a student body of 1089. It is located in Scottsville area approximately 3 km from Pietermaritzburg city centre.

The school opened its doors to its first pupil on 23 February 1960 at the beginning school A was only opened for boys only. After some years this culture change and the school admitted boys and girls.

School A was a model C school for whites only during apartheid era and for that reason school A had to be located in an area designated for whites according to the group areas act enacted by the apartheid regime.

Significant changes took place in school A in response to the demands of "new" South Africa. In June 1991 the first black pupil was admitted in school A, and gradually as time goes by, Indians, Africans and coloureds were admitted in large numbers and the school turned out to be a co-educational which reflects a non-racial non-sexiest society.

School A also had the boarding establishment when data was collected this boarding establishment was built in 1966. It catered for boys only. During data collection this facility could only take 120 boys as well as members of the staff a superintendent of the boarding. School A is a very large beautiful complex with several double storey's tranquillity and good management prevails in that school, punctuality of learners and teachers is excellent and as soon as classes are in progress no learners will be seen moving around the premises aimlessly.

During the time of data collection school A had 1089 learners, 24 educators and 13 S.G.B. employed educators. Members of the non-teaching staff are..... this multiracial school consist 1 principal, 2 deputy principal and 4 head of departments. At the time of data collection in term 3 learners figure stood as follows:

Table 3.1

Grade	8	9	10	11	12	total
Number of learners per grade	221	206	237	235	190	1098

School A is also famous for excelling in matric results. The school as ..... Classrooms. The school as 5 laboratories 2 for Life Sciences and 3 for Physical Science. The big library is well equipped with 2 librarians. The school has 26 computers with internet connections.

School A has a large school hall a well-established administration block with 3 receptionists and a financial department with 4 staff members. What also remarkable in school A are huge well equipped sporting facilities catering for all sports a large well maintained swimming pool. School A has a top marimba band in Pietermaritzburg.

Mr. A is a married man between the age of 46 and 55. During the time of data collection he had the following qualification: - a BSC degree and HDE measuring in mathematics. Mr. A is an H.O.D of school A. all mathematics teachers in school A take all grades from grade 8 to grade 12 as well as mathematics literacy. In school A learners in grade 9 are placed in a section according to their performance.

Grade 9 A consist of learners from position 1 to 39.

Grade 9 B positions 40 to 79.

Grade 9 C positions 80 to 119.

Grade 9 J positions 120 to 159.

Grade 9 L from position 160 to 199. Grade 9 M which is regarded as the poor class from position 200.

Mr. A is..... the school has ..... classrooms. Mr. A has taught grade 9 mathematics for more than 10 years, he has taught CTAS from the time they were introduced.

Mr. A's teaching style

Mr. A's classroom is huge and learners are divided into groups or 10, the desks are huge and different from desks of other classroom in Mr. A's class.

The front of the classroom had chalkboard and a long demonstration bench. The bulletin board is full of posters most of them designed by the learners themselves.

Mr. A was still busy with CTAS during the time of data collection. Mr. A introduced his lesson by first recapping the first stage of drawing a South African flag. Mr. A first wanted to make sure whether all learners managed to do the preliminary stage of drawing the flag. Since his learners were few Mr. A managed to check the work from all learners those who were still struggling Mr. A manage to bring some clarity to their problems.

When Mr. A was satisfied about first steps of drawing a flag, he went on and explained how other steps need to be accomplished. Mr. A gave me permission to move around the class and see what problems were doing provided I don't participate. Mr. A was able to link all the first step of drawing a flag with previous one by summarizing all preliminary steps and when through all the steps, until he showed them how it should look like when completed. The learners were required to do the following activity.

Mr. A was the only person who was moving around and learners were not allowed to interact, they could not look around and see what their peers were doing. In school A learners were not allowed to take CTAS section An out of the class or do it as homework or take it out and do it in the library. When the bell rings at the end of the period Mr. A collected all CTAS the reason he gave me was that they are avoiding coping, and that different school do CTAS at different pace. At school A CTAS were conducted towards the end of the year, 3 days before exams. The last activity was completed, reason that learners

will still remember what they did in section A. when Mr. A has completed solving problems with individuals; he used the chalkboard to highlight problems that were asked by different learners.

When Mr. A asked questions, he gave his learners enough time to answer his waiting time was long enough. Mr. A discourages completely his learners to answer in a chorus form and learners enjoyed expressing themselves individually. The kind of interaction between Mr. A and the whole class was very good during the 3 days of my observation. Mr. A called his learners by their names he knew them well. He encouraged his learners to try and solve as many problems as they could, he only intervened when a learner raise his or her hand. His style of questioning was quite good and affective. He made it very simply for his learners to do most of the hard activities. However Mr. A did not encourage group work he felt it creates dependency.

#### Assessment of learners

Mr. A assessment was comprised of class work, homework as well as assignment. Most of grade 9 syllabus was completed during the second term in order to accommodate the arrival of CTAS. Mr. A's questioning style was more effective learners were not intimidated by him this created a good friendly environment. Learners were fully engaged one could notice that they were involved in thinking. In Mr. A's class most learners were confident and not shy to participate in any discussion.

Mr. A dedicated most of his time to his learners especially those who need help Mr. A showed his portfolio and that of his learners, marks were recorded and he did some follow up to those learners whose scores were low and ha had lots of intervention program in order to assist his learners.

#### MR A 2

the context and profile is similar to Mr. A1

Mr. A 2 is a married man between the age of 30 and 40. Mr. A2 has a diploma in mathematics and an advanced certificate in mathematics. He has taught mathematics grade 8 and 9 mathematics pure grade 10, 11 and 12, and mathematical literacy grade 10, 11 and 12.

#### Mr. A2's teaching style

In school A most of the class that I have seen are traditional in arrangements. Desks are arranged in rows, but learners are divided in groups of 3. In grade 9 where most of activities require group work, Mr. A2 limited his group to 3 and not more. In school A it is a norm that CTAS are only done in class and after the lesson they are collected and locked in a safe place. All activities and tasks are done under the supervision of an educator where group work is required Mr. A2 divided his learners into group of 3. The group will work together the write up is done separately.

Mr. A2 used to allocate his learners problems that they must do and discuss with the whole class. When learners arrive in class they already have a task to perform, this method was good because it engages all learners every individual had something to do but on the other hand it had its shortfall it contributes to banking and absenteeism especially for those learners who are not ready to do the problems in front of the class, other learners can do the problems but they are shy to face the class.

Mr. A2 was only left with activity of drawing the South African flag. Mr.A2 started the activity by drawing attention to the learners the importance of a national flag as well as knowing the national anthem. Mr. A2 explained all the steps and processes that learners need to follow to draw the flag, steps were clearly explained in the CTAS. The learners enjoyed this activity and Mr. A2 had a chance of dealing with learners individually, what made it easy for him was that learners were very few in each class.

In school A learners are placed in a class according to their performances. Learners with high scores in tests and perceived to be intelligent were placed in section A and those regarded as poor and with low scores are in section M.

There was excellent interaction between learners themselves and their teacher as well. There was lot of talking only about mathematics, learners asking for each and every step of their activity, learners were not shy to ask questions. Mr. A2 used the chalkboard most frequently and also spent the time with the group. The activity of drawing a flag is as follow.

#### Assessment of learners

Mr. A4 used a variety of assessment test, class work, homework and assignments. Mr. A2's assessment had a formative component as well as summative components. Mr. A2's questioning were more effective for a number of reasons, learners were fully engaged when they were involved in thinking or reasoning. Learners were not shy to stand up and answer individually, learners most of them were fully involved in all the discussion.

Mr. A2 was very patient with his learners he gave them enough time to answer. Mr. A2's questions were more challenging learners were involved. Mr. A2 had such expectation for his learners. Mr. A2 also used past years question paper section B. Mr. A2 was also emphasizing to learners the way and the approach used in section B.

Grade 9 syllabus was completed in time to accommodate CTAS. In school A they tried to push CTAS section A close to the final exams, they did not rush to complete section a because they wanted learners to be able to recall section A which is assumed to be similar to section B.

## SCHOOL B

### 3.2.2 CASE STUDY OF SCHOOL B

### 3.2.2.1. CONTEXT AND PROFILE

School B is situated in Northdale which is a big Indian suburb in Pietermaritzburg. School B is situated in an area which where most of the people work around neighbourhood with few professionals mainly nurses and teachers. The area is surrounded by factories where parents of learners are employed. There are many schools not far away from each other where some of the parents of school B children work. Just on the vicinity there is a big provincial hospital and some police stations where parents of school B learners are employed.

Many houses that surround school B were constructed by the city council of Pietermaritzburg as part of a sub-economic housing scheme. Existing dwellings have been changed and some additions have been made over the years and old dwellings looked so different from the old economic housing scheme. In addition houses exist which have been erected by their owners.

Three kilometres from school B is a beautiful protea sports complex which is well maintained. This facility provides many different codes of sport for resident and Northdale children.

#### Physical structure of school B

School B has a well-equipped library and administration block, well equipped laboratories and three double store buildings. At the far end of the school there are workshops for metal work, wood work and technical drawing. As the school kept on growing a new staff room and about four new classrooms and stock room have been added.

#### Student body

During the time the data was collected the school had 1221 learners, 44 educators and three secretaries, five cleaning staff and one security guard.

#### Teaching staff

The teaching staff of 44 educators was made up of the principal, 2 deputy principals and 5 head of departments and 36 post level 1 teachers. School B is famous in Pietermaritzburg for its good matric results almost every year.

Table 3.2

Section	Girls	Boys	Total
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A	22	16	38
B	18	21	39
C	20	19	39
D	18	21	39
E	19	20	39
			192

The school has 55 classrooms; the class had an average of 39 learners. 2 computer rooms with 20 computers each and 10 computers in the administration building. Mr. B is a married man between the age of 47 – 57. He has the following qualifications HDE and matric. He had an experience of 15 years teaching mathematics, during the period 1998-2001. He attended 4 inset courses on mathematics. He also took part in extra-mural activities.

I visited Mr. B twice for classroom observation; Mr. B gave learners homework before he left for his leave.

#### 3.2.2.2. Mr. B's teaching style

Like most teachers Mr. B started his lesson by asking for home-work, but that what was surprising Mr. B did not check whether learners did the home-work or not. Mr. B was teaching about graphs, straight line graphs, parabola and hyperbola. He did not waste too much time and he pointed at one boy to go to the board and draw the graph of  $y= 2x$ . The boy was so reluctant, but he moved to the board and made a simply sketch. The graph was wrong and also the boy did not draw the table so as to serve as a guide also with some points. Mr. B corrected the boy, as he went to the board and he drew the following table:-

X	3	2	1	0	-1	-2	-3
Y	6	4	2	0	-2	-4	-6

It was observed that Mr. B did not explain how and where he got the numbers and how he substituted for x. he continued the lesson giving more equations.

Mr. B pointed at another boy to try and do the problem, the learners laughed it seemed as if they knew that he could not do number 2 after number one was not even explained. Just like the first boy the second boy simply drew a rough sketch and could not explain how he

arrived at this answer. Mr. B asked another learner to give it a try this time a girl. The graph was correct, better this time but reason why this one was correct and the one done by the boy wrong was not explained or discussed.

The educator did not ask for any learner to do question 2 but he gave another question with a fraction. Fraction usually confuse learners and this time the educator was also confused. The first confusion was the drawing of the table. Learners wanted to know how Mr. b arrived at the conclusion that he gave them, first of all he said draw  $y=x$ ,  $y=2x$  and  $y=1/2x$ . and he drew the shapes which looked correct but what was going to be more clear for learners if he drew the table for each graph and showed the shape for each.

However Mr. B tried hard to involve his learners, he interacted well with the learners trying to create a relaxed atmosphere but where he was supposed to explain than just writing the answer tis might have caused learners to keep on making mistakes. There was lack of feedback, Mr. B is good in controlling is class but it was going to be even good if he complemented this with explaining and thorough teaching.

#### 3.2.2.3. **Assessment of learners**

Mr. B used a variety of assessment such as class work, home-work, class test, informal questioning and CTAS from previous years. From the beginning of the year up to September they wrote 3 control test and a number of mini tests. Mr. B used previous year's CTAS's from 2006. Mr. B tried to pick up common questions that are always asked every year with the hope that these questions might be repeated.

Mr. Bb said to me, it is just unfortunate that there is no set syllabus for CTAS section B,

but hoped that through revision and thorough drilling of CTAS section A is the only hope and also a tool that he used for preparing his learners for CTAS section B which is grade 9 examinations.

## SCHOOL C

### 3.2.3 **CASE STUDY OF SCHOOL C**

## Context and profile

School C is a co-educational school it is situated at Edendale 10km from Pietermaritzburg city centre. A public school which serves a working class community. The school started on the second August 1956. Originally in this area blacks, Indians and coloureds were all staying together up until the introduction of the notorious group areas act enacted by the apartheid regime in 1950.

At the beginning the school catered for students needing skills of brick making and building, carpentry, upholstery, sign writing, basket making and weaving. The big section of the school became independent of the college in 1994.

The parents of learners in school C work mainly in offices, school, domestic workers and factories. Learners attending school C were all Africans and their main language was isiZulu. Appendix F contains a copy the enrolment for school C for 2009. During the time of data collection the school had 1302 enrolment with 43 educators including the principal, 2 deputy principal, 5 head of departments and 7 non-teaching staff.

Since grade 9 forms part of my study table 4.3 shows the enrolment for grade 9 for 2009.

Table 3.3

Section	Boys	Girls	Total
C	18	25	43
F	17	25	42
G	19	24	43
K	22	18	43
M	22	1	44
S	23	20	43
Y	22	16	38

The school has 32 classrooms and 7 classes for grade 9. Information about other classes appears in appendix H. school C has one teacher for grade 9 mathematics and Mr. C takes all the 7 sections mentioned above. The time table for Mr. C is also included in appendix C. school C has one double storey building and the administration block is found in that double storey. Formally school C was a boarding school, beside the double storey building there are many building scattered around and all residence has been converted into classrooms. There are 32 classrooms, 2 classes are used as computer rooms, a well-equipped library which use to be a dining hall and a very big hall which is used for meetings, exams and is also used by community for different events.

Each classroom can accommodate a maximum of 40 learners. The laboratory is not well equipped. There are also blocks of workshops for motor mechanic, plumbing, woodwork and 2 classes for technical drawing. The school has vast sport field. Mr. C is not married between the age of 25-30. Mr. C had a teaching experience of 3 years during which the data was collected and had taught mathematics for 3 years. When the data was collected Mr. C had

no qualification in education, but had a BSC degree with physics and applied mathematics as his major.

Mr. C was taking 7 classes only grade 9 during the data collection, refer to table 4.3 for Mr. C grade 9 classes. The distribution of his load is indicated in appendix G (Mr. C's time-table).

#### Mr C's teaching style

I was fortunate to observe 3 different activities in Mr. C classroom. I was lucky to find Mr. C still busy with CTAS section A. Mr. C's classroom was arranged in an OBE style, the desk were arranged in groups according to learners performance. The first group of learners was made up of top 10, those who were getting 80% - 100% and the middle group until the poor group their desks were at the back of the classrooms.

I asked Mr. C the reason for arranging learners according to their performance and he says he wanted to pay more attention to the so called poor archiving group. Mr. C was busy with task 3 "human rights" activity I access to clean water. Mr. C read passage for learners found on page 12 of 19 about human rights contained in the bill of rights.

Right to have access to adequate housing and  
Right to have access to sufficient food and water.

I was very cooperative group work. Mr. C told his learners to read the instruction found on page 12 of 19 and he asked them to do activity. Mr. C was rushing to complete the CTAS so! When learners completed the activity he quickly marked it and recorded the marks same time. If the learners got the activity wrong then they were not given the second chance and the group mark was recorded as is. However there was a lot of interaction in the class among the group all groups were working together but do the writing individually though. They were referring to each other which resulted from each group getting same mark.

That is a problem of working in groups where one or two dominant or top learners doing all the work for other learners. Most of the schools I have observed had allowed learners to take their CTAS section A home or out of the class and different schools were completing CTAS at different pace, making it possible for learners to share the answers beforehand.

On my last day of observation in Mr. C class, when learners were busy with activity 2 Mr. C asked the class if they attempted activity 2 on patterns the so called list poor achiever group raised their hands to indicate that they have completed the activity. During that day Mr. C had forgotten his memorandum home but luckily I had my teachers guide with me. Because the group who managed to complete the activity was the one Mr. C did not expect to have got the answer correct, Mr. C asked the group to go to the chalkboard to do the problem for the class. The group must have done their work well and they got all the answers right and giving good explanation as well.

The problem was that Mr. C did not trust their working and he couldn't refer to the memorandum because he forgot it at home, so Mr. C went to the chalkboard to do the problems most unfortunately he got stuck and he requested the class to leave the activity for the other day. Learners as always expected were so amazed to see their teacher getting stuck, they actually all laughed at him. When the class had left we had our talk and I showed him the memo guide that I was carrying also indicating that the group was right with their answers.

### 3.2.4 Case study of school D

#### Area in which school d is situated

School D is a co-educational school located in the Edendale area, about 7 km from the city of Pietermaritzburg. This area of Edendale where school D is situated although developed and has better services than most other areas in Edendale was reserved by the apartheid regime in 1950 mainly for Africans according to group areas act perpetuated by the apartheid government. Although this area is urban it still has facilities which are very much inferior when compared with whites, Indians and coloured residential areas act, blacks, Indians and colours were staying together harmoniously.

The area in which school D is situated is made up of people ranging from working class to middle class professionals (Teachers, Nurses, Doctors, and Lawyers etc.). Many residents work in the city or in the neighbouring factories. Edendale area is known as the place of Christians (amakholwa) and many people own land and were born and bred in the area, people classify them as "ononhlevu" which means they originate in the area were born and bred in the area.

#### PHYSICAL STRUCTURE OF THE SCHOOL

School D was built in 1994 and is one of those new secondary school built to assist the two grounded high schools around the area of Edendale. School D consists of a triple storey building, a single storey administration building and another double storey classroom block. There is also a big school Hall around the vicinity. The laboratory is found on the ground floor of the double storey.

The school has 35 classrooms each with a maximum capacity of 40 on average. There is a library which is poorly stocked and the laboratory which is simply a class and only one demonstration table for a teacher. Facilities for extracurricular activities at school were non-existent. School hall served only the purpose of meeting between parents, teachers and pupils. The reason for lack of sport field in school is the limited availability of space

#### TEACHING STAFF

During the time of the data was collected school D had 38 educators including the principal, one deputy principal and 4 head of departments. All the teachers at school D were qualified teachers with diplomas and bachelor degrees.

## STUDENT BODY

There were 998 pupils at school D when data was collected. 530 boys and 408 girls. The following table is the distribution of grade 9 in 209 which forms the part of my study on grade 9 mathematics CTAS.

Table 3.4

SECTION	BOYS	GIRLS	TOTAL
A	24	17	41
B	14	21	35
C	26	12	38
D	23	15	38
E	18	21	39
	105	86	191

## INTRODUCTION OF Mrs. D

Mrs. D is a married woman between the age of 34 and 48. She has the following qualification; teacher's diploma and matriculation during the data collection she was offering mathematics in grade 9.

What was obvious in this lesson? Was that the learners enjoyed the application of statistics and that was demonstrated when they participated by going to the board to complete the tally and frequency table.

At the beginning learners struggled with terminology and meanings, even after doing this activity Mrs. D did not explain the question she asked the learners at the beginning "what is statistics" and she did not explain the use of statistics and what the importance of it and where and why it is used. In section A of the CTAS of 2009 there was an interesting task 1 on democracy, participation in the national election, learners were expected to go out and collect data activity 2 was about summary and analysis and presentation of data. This section linked well with statistics I was expecting that Mrs. D will use this activity and refer to it in preparation for this activity or I requested her if Mrs. D could teach this activity or any activity o CTAS but this could not happen and after few visit to the school she did not turn up, but at least I was able to observe her lesson on statistics for three section of her grade 9.

Mrs. D School is one of those dysfunctional school, all learners were standing on the verandas some moving around for the whole day. Mrs. D was the only teacher who was in class and learners were not banking her class. When I asked her about the set up in the school she told me that if teachers don't go to the class the learners stand outside and she said this is the order of the day in her school.

## Mrs. D teaching style

Mrs. D's classroom was a traditional classroom with rows of desks.

The front of the class room had chalkboard, on the bulletin board at the back of the class there was a cleaning rooster with the names of the girls divided into groups of 8 for cleaning the class, boys were not mentioned in the cleaning o the classroom, and this says something about the gender equality in Mrs. D's class.

The following discussion is based on my visit to Mrs. D school for collection of data interviews and lesson observation the analysis will deal with all the lesson I have observed. The timing for my visit was good because more than anything I would have loved to observe Mrs. D teaching section A of CTAS but she was not ready to teach any activity on section A of CTAS during my visit. Mrs. D decided to choose a topic on statistics as a revision for section B of CTAS section A. Mrs. D started her lesson by asking a question "what is statistics?" I expected that Mrs. D was going to ask for any homework or any work on CTAS but I could not see any CTAS in the class.

In the absence of any volunteers Mrs. D pointed at the girl who was sitting in front. She responded in isiZulu "it is collection of things" Mrs. D could not comment on that response she looked for another learner and Mrs. D pointed at the boy who also responded in isiZulu and he said statistics is about starting a business all learners who attempted to respond could not give the correct answer and all the learners who responded did so in isiZulu. After many attempt Mrs. D started teaching the topic without answering the question she had asked the learners, Mrs. D could not define the word statistics but she simply wrote a problem on the chalkboard.

Mrs. D left the class for a while and she brought some photocopies she made from the book. Copies were distributed to the learners and I was also supplied with a copy. Form my observation this topic was done before the only problem was that learners can do the application but they did not seem to understand what is statistics? Why it is done? And what is the use?

Mrs. D wrote the following on the board;

5 6 4 8 5 1 2 9 5 5

2 3 3 4 8 7 9 2 3 1

5 4 6 10 9 6 7 6 5 6

Set up a frequency table and answer the following questions:-

Which mark appears most frequently? (5)

Which test marks appears least frequently? (10)

How many pupils scored 9 out of 10? (3)

How many pupils scored 50% or more? (19)

Before learners attempted the above problem Mrs. D reminded her learners about drawing the following table which the learners recalled well and together with the learners managed to complete the following table. This they did well but Mrs. D could have done it better using the example which was on CTAS grade 9 2009, about voting and elections and also CTAS section B 2008, page 8 of 11 question 6. Soccer statistics, the clubs that they are familiar with it, which appears on appendix

From the above problem Mrs. D learners managed to do the following table:-

Point gained	Tally	Frequency
1	li	2
2	lii	3
3	lii	3
4	lii	3
5	liiii	6
6		
7		
8		
9		

#### Assessment of learners

Mrs. D had collection of different kinds mathematics books at the long shelve behind his classroom. Mrs. D used assignments and class work as a form of her assessment. However very little was written and marked in learners work books. What was also very obvious was that the school was seriously dysfunctional only Mrs. D learners entered the class when the bell rings, she was the best compared to what I observed in that school.

The educator had very little of the work recorded. My wish to observe any CTAS done or taught was in vain.

If my study was about dysfunctional schools, school D was going to be the best candidate of my research.

#### SCHOOL E

##### 3.2.4. CASE STUDY OF SCHOOL E



School E is situated in Pietermaritzburg just at the bottom of the town. The area in which school E is situated may be classified as working class neighbourhood with a few professionals. School E was the school for only Indians during apartheid and after 1994 it was opened to all races. The children from school E come from different areas of Pietermaritzburg.

### **PHYSICAL STRUCTURE OF THE SCHOOL**

School E has 3 double storey buildings housing the classes, the administration, and library and staff rooms. The other double storey double storey for trade such as motor mechanic, plumbing, technical drawings and laboratory for physical science which is not well equipped is found next to the work shop. Grade 9 classes occupies the temporary buildings on the other side of the workshops.

During the time the data was collected the school had 1055 learners, 38 educators and 6 members of non-teaching staff. Learners attending school E were Indians, Coloureds and majority of Africans. The teaching staff of 38 includes one principal, two deputy principals, 5 head of departments and 30 qualified teachers.

The following is the table of grade 9 learners in 2009.

Table 3.4

Section	Boys	Girls	total
A	20	20	40
B	19	23	42
C	18	22	40
D	20	20	40
E	16	24	40
			200

The school has 28 classrooms with a maximum of 40 learners. The library which looks descent but not well stocked is included in the triple storey building. Mr. E time table is included in appendix.... According to Mr. E then don't have enough text books for all learners however he uses a variety of resources.

Mr. E is a young man between the age of 25-30. During the time of data collection he had the following qualification BSC and PGCE (post graduate certificate in education). Mr. E had more than 3 years teaching grade 9 mathematics. During the

time of data collection he was offering mathematics literacy to grade 10 and 11 and mathematics to grade 8 and 9. His time table is summarized in appendix...

#### 3.2.4.1.2. Mr. E's teaching style

During the time of data collection Mr. E had already completed CTAS and was busy preparing for section B exam. Mr. E was observed teaching patterns he was using an abstract taken from mathematics section B of 2008 this was from an exam. I managed to observe four classes. According to Mr. E they had already finished section A of CTAS and they were busy with the preparation for section B.

The general trend from all schools that I had observed and from 14 teachers that I have interviewed was that section A was used as a guide for preparing learners for section B and also past years section B which is an exam also serve as a guide. Every time when I asked the teacher why do you teach this topic? The answer would be that this came out in 2007 or 2008 or 2006 section B.

Mr. E had the hand-out page 5 of 11 section B question 3.

Some learners had already had filled in the table, while other learners were busy coping from others. The teacher had the same table on the board and learners who were ready went to the chalk board and filled in the table. This style of going to the board and fill in the gaps had one bad thing; learners who did not do anything had an opportunity to copy. This reminded me to ask Mr. E how he conducted CTAS section A were the learners allowed to take CTAS out of the class. Mr. E responded by saying yes of course why not" the problem of taking CTAS section A out of the class and do it as homework encourages coping especially the pace of doing CTAS differ from school to school.

This activity was easy for learners especially 3.1 the completing of the table because the pictures were there. Learners began to battle to do arrangement 4. Mr. E did not wait long enough to see if the majority of learners understood the work, if one or two learners answered correctly, he moves to the net question. If the most trusted two learners could not get it right this time, Mr. E simply went to the chalk board and did the solution.

What I also observed was that just like in question 3.1.2 when learners gave the answer 64. Mr. E did not care actually find out how they would get 64. In question 3.1.4 a learner by the name Thandeka gave the answer in isiZulu. Thandeka said 4 kuwo wonke Mr. E said to me it happens always that learners respond in isiZulu the reason being that he is also Zulu speaking. "they do so if they find it easy to do that but I don't know what they do to the teachers who speaks English"

In question 3.1.4 I Dawood and Thandeka are stacked, nobody can and the whole class is quiet. In the absence of an answer Mr. E give feedback for 3.1.4 total number of tiles in the  $n^{\text{th}}$  term is  $= n^2$ . this was an active class one learner Siphso asked Mr. E what is “n” arrangement what does it represent?

Mr. E battled with this one and he said the answer will come out in 3.1.5 Mr. E asked a boy whose surname was Xulu to go and do this problem on the board a he beginning I thought that he wanted me to do the problem, I did not realized that there was a learner with the same surname as mine, Xulu did the problem 3.1.5  
 $T.N.T = n^2$

$$=100^2 + 4$$

$$= 10004$$

#### **3.2.4.4 ASSESSMENT OF LEARNERS**

Mr. E was very creative teacher learners also liked him and his subject. He used a variety of assessment, instrument test, class-work and assignment. All the work was recorded and this was as a promotional mark for a learner.

His main problem was the number of the learners, which made it difficult for him to give individual attention that is why he was moving fast as long as he gets a response from 2 or 3 learners. Most of his revision questions and exercises were taken from past ears question papers section B CTAS.

SCHOOL F

#### **3.2.5 CASE STUDY OF SCHOOL F**

##### **3.2.5.1. Area in which school F is situated**

School F is a Christian private school for boys and girls starting from grade R to grade 12. School F is located at the beginning of a city of Pietermaritzburg in a suburb area that used to be a white group area under apartheid regime. School F is part of a larger establishment which includes a co-educational pre-school, grade R, co-educational primary school and a high school. So it's starts from pre-school up to grade 12.

Just like all private schools, school F has a wealth of resources per learner. The school fees is very high, so the parents who sent their children to school F are rich enough ranging from professionals, business people, doctors and department officials government ministers. School F was originally former model C school and was later bought by the Anglican diocese of Natal. This was all the vision of the late bishop Mkhize, bishop suffragan of natal who from 1980-1990 dreamt dreams and had vision about having a type of school primarily for black children. He proposed a resolution at the Synod of the diocese of natal in 1984, asking the diocesan trustees to establish a church school and his proposal was enthusiastically accepted.

The school consists of vast buildings some of the buildings are common areas between the pre-school, primary school and the high school. School F has a boarding facility and some of the buildings are school dormitories for boys and girls. The school has after care facilities as well, just like most private schools with Christian character and ethos, the school had a chapel around the campus. During the time the data was collected, the school had 615 learners, 48 educators including the principal and deputy principal and 4 head of departments (3 academic HOD and 1 Disciplinary). These 615 learners include pre-school up to grade 12. The boarding facilities accommodated 70 learners.

The school follows the independent exam board (I.E.B). School F had a number of sports facilities, ranging from tennis courts, a basketball courts, squash courts, netball fields and a large swimming pool. School F is famous of its music department with marimba band, steel band and a number of pianos. Members of non-teaching staff included a librarian, computer lab and laboratory technicians. What was also remarkable about school F was the presence of a well-equipped library and laboratory.

Grade 9 which formed part of my research at the time of data collection had 54 learners consisting of two sections of 26 in each class.

Section	boys	girls	Total
A	12	14	26
B	13	13	26
	25	27	52

### 3.2.5.2. **Mrs. F teaching style**

When I requested Mrs. F to allow me to come and do some observation in her class, she was more than welcome and she was free to allow me to observe her teaching

even if I did not make any arrangements, I was relieved because some teachers are uncomfortable about class visit's. Mrs. F was doing a follow up lesson on discount percentage, profit and loss Mrs. F prepared a new book called spot on mathematics. According to Mrs. F they had already completed the syllabus and they were busy with revision.

Mrs. F's lessons were characterized by the following steps:-

Discussion of homework or a summary of the previous lesson.

The rounding off of the lessons involved the instructions for homework.

Mrs. F was able to link the lesson with the previous one by summarizing the previous lesson or by revising the homework. The topic that Mrs. F was teaching is also taught in EMS, but learners told Mrs. F that the topic in learning area EMS but they could not understand it. Mrs. F was more than willing to do it all over again. The small number of learners makes it possible for Mrs. F to give her learners individual attention. The discussion was dominated Mrs. F and learners' paid full attention. In her teaching Mrs. F simply used daily life examples things that learners were familiar with. This was very good because learners could easily grasp and identify what she said with the topic.

However every time when she asked a question the learners answered in unison, as a result only the more confident and assertive learners were participating in the discussion. The rest of the learners were passive. What I also observed was that Mrs. F did not give the learners enough time to answer. Learners were sitting on their own desks arranged in rows in a traditional fashion. There was absolutely no interaction among the learners. Mrs. F was the only person who was moving around, giving the learners special attention and she was able to attend to each and every learner because her learners were very few about 26. All learners in the class were using their textbooks, there was no shortage of books, and no learners were sharing with another. They all had scientific calculators.

Mrs. F did not tolerate any class disturbance of any nature. She kept on threatening her learners that if she found anyone talking she would throw her out of the class but learners knew that this was a threat because teachers are not allowed to send a learner out of the class for an reason, it could be unfinished homework, talking in class or sending a learner to another teacher or to fetch something from the office.

I actually missed learner's voice in Mrs. F's class, but however learners were getting full attention from Mrs. F's individual attention which was lacking and impossible in all the schools that I have visited.

### 3.2.5.3. Assessment of learners

Mrs. F's assessment had a formative component and a summative component the formative range from informal questioning, class work, homework, projects, investigation and assignments. These were used by Mrs. F mainly to facilitate learning. Mrs. F also selected the class work and home work from the exercise found in spot on mathematics book.