School - Based Assessment: the interface between Continuous Assessment (CASS) and the external summative examination at Grade 12 level with special focus on Mathematics and Science

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Dedication

We are guilty of many errors
And many faults
But our worst crime is abandoning the children
Neglecting the fountain of life
Many of the things we need
Can wait,
The child cannot.
Right now is the time his bones are being formed,
His blood is being made
And his senses are being developed.
To him we cannot answer: Tomorrow
His name is today.

(Gabriel Mistral)

To my children
Jeremy, Jared and Santhuri

Abstract

In 2000, the Minister of Education, Professor Kader Asmal announced that all learners exiting the Further Education and Training band as from 2001 must accumulate marks in the subjects offered at Grade 12 through a process of Continuous assessment (CASS) (DoE, 2001d).

Apart from indicating the value of CASS to the external summative component in the ratio of 25% for CASS and 75% for the summative examination, there were and there still is no other policy to regulate the conduct of CASS at Grade 12 level. The situation is worsened by the non-preparation of educators to cope with the challenges of CASS implementation.

This study focuses on the implementation of CASS in Mathematics and Science since there is a body of firm evidence, which indicates that, the results in Mathematics and Science in South Africa is not very good. The TIMSS-R study conducted in 1998/1999 indicates that South African learners performed poorly in Mathematics and Science when compared to other participating countries (Howie, 2001). Since it has been established that continuous assessment conducted in a formative manner in subjects such as Mathematics and Science can lead to improved academic performance (Black & Wiliam, 1998), it is essential that attention be given, and initiatives taken to improve the quality of assessment in these critical subjects.

In the analysis of the 2001 Senior Certificate examination, it became evident that the CASS marks of learners in many instances were not valid (SAFCERT, 2000a). To address the concern of inflated CASS marks, Umalusi resorted to the use of statistical moderation to ensure that the CASS marks do not deviate drastically from the examination marks of learners.

This predominantly quantitative study makes use of surveys to gather data on the problems and challenges experienced by Grade 12 educators in the effective implementation of CASS and the kinds of support provided to educators to strengthen and to sustain the effective implementation of CASS in the classroom.

In addition, the study seeks to examine to what extent the Grade 12 CASS marks are fair, valid and reliable.

Data was collected from a non - random sample of 21 subject advisors and 60 educators of Mathematics, Biology and Physical Science across six provinces namely, Eastern Cape, Northern Cape, Limpopo, KwaZulu - Natal, Gauteng and Mpumalanga and across all locations (rural, township and urban). Individual interviews were also conducted with four experts on CASS from national, provincial and district levels and an official from Umalusi.

It is apt to end this abstract by indicating that, "*our education system has been subjected to many far - reaching initiatives which, whilst taken in reaction to concerns about existing practices, have been based on little evidence about their potential to meet those concerns. In the study of formative assessment there can be seen, for once, firm evidence that indicates clearly a direction for change, which could improve standards of learning. Our plea is that national policy will grasp this opportunity and give a lead in this direction*" (Black & Wiliam, 1998).

List of Key Words

Continuous assessment

Formative assessment

Summative assessment

Educator

Learner

Fairness

Reliability

Validity

Statistical moderation

Portfolio

Assessment criteria

LIST OF ACRONYMS

ABET	Adult Basic Education and Training
C2005	Curriculum 2005
CASS	Continuous Assessment
CHE	Council for Higher Education
DET	Department of Education and Training
DoE	Department of Education
EDS	Educator Development and Support
FET	Further Education and Training
FETC	Further Education and Training Certificate
HE	Higher Education
HG	Higher Grade
IEB	Independent Examinations Board
IPEC	Inter-provincial Examinations Committee
IPO	Input - Process - Output
NAPTOSA	National Professional Teachers Organisation of South Africa
NCS	National Curriculum Statements
NFLP	National Forum for Learner Performance
NQF	National Qualifications Framework
NGOs	Non-Governmental Organisations
OBE	Outcomes-Based Education
OBA	Outcomes-Based Assessment
PALCs	Public Adult Learning Centers
PSD	Personal and Social Development
SAFCERT	South African Certification Council
SADTU	South African Democratic Teachers Union
SAQA	South African Qualifications Authority
SASA	South African Schools Act
SBA	School-Based Assessment
SG	Standard Grade
SRN	School Register of Needs
UK	United Kingdom
WSE	Whole School Evaluation

CHAPTER 1

Overview of the Chapter

This chapter presents an overview of the research, beginning with the research aims, the problem statement, the purpose of the research, the rationale for the research and the limitations experienced in the process of undertaking the research.

1.1 Aims of the Research

This study aims to investigate the problems and challenges experienced by Grade 12 Biology, Mathematics and Physical Science educators in the effective implementation of Continuous Assessment (CASS) at Grade 12 level. CASS can be defined as assessment which takes place on a continuous basis, meaning assessment which takes place on and off throughout a course or period of learning (Sieborger & Macintosh, 1998).

Further, this study seeks to determine the kinds of support provided to educators to strengthen and to sustain the effective implementation of CASS. Finally, it examines the extent to which the Grade 12 CASS marks are fair, valid and reliable.

1.2 Problem Statement

In 1999, the Minister of Education, Professor Kader Asmal invited the Cambridge International Examinations to conduct an investigation into the credibility of the Grade 12 (commonly referred to as the “matric”) examinations (DoE, 1999a). At the time, three provincial examining bodies, namely, Western Cape, Northern Cape and Gauteng had already introduced CASS as part of the teaching and learning programme. The marks generated through CASS in these provinces were also being included as part of the final examination results of their Grade 12 learners. Reporting on the state of CASS implementation in these three provinces, the Cambridge team of consultants indicated that on the evidence produced by the three examining bodies, they were not convinced that the CASS marks will be moderated in such a way that differences in the rigour and quality of work and in the awarding of marks at school level, will be brought into line between the

thousands of centers involved (Howarth, 1999). In essence, the report highlighted that the implementation of CASS in these three provinces was problematic since there was no consistency in the manner in which CASS was being implemented. Based on their findings the Cambridge report recommended that CASS should only be introduced in the other six provinces once proper subject specific guidelines had been written to indicate the kind of work to be done and how teachers and moderators can assess the work. They further indicated that the structure and uniformity of assessment seems to be lacking (DoE, 1999a).

Despite the recommendations of the Cambridge report the Minister of Education announced that all learners exiting the Further Education and Training (FET) band as from 2001 must accumulate year marks in the subjects offered at Grade 12 level through a process of CASS (DoE, 2001d). The National Education Policy (2001) stipulates that CASS is a compulsory component of the final promotion marks at Grade 12 level (DoE, 2001d). The policy states further that the weighting of CASS must be at least 25 percent of the final examination marks, or a maximum of 50 percent in the case of practical subjects such as Music and Art (DoE, 2001d).

The period between the announcement to introduce CASS at Grade 12 level and the actual implementation thereof was short and untimely. Most provincial examining bodies had not yet instituted systems and structures to deal with this new, complex and challenging innovation. The nature of CASS demanded a dramatic shift from the assessment practices of the past. It entails the adoption of a new and complex approach to teaching and learning and in particular, it involves a change in assessment methodologies, the type of tasks given to learners and the manner in which these tasks are evaluated and feed back given to learners. The introduction of CASS meant that sufficient preparation had to be made in terms of ensuring that the systems and structures were in place to deal with this complex challenge. The main area that should have been prioritised and addressed is that of the preparation of educators to deal with CASS. Ideally, educators should have undergone high quality professional training to familiarise themselves with the new assessment methodologies which would have improved

their levels of competence and skills so that they are able to cope effectively with the implementation of CASS in their subjects.

However, having witnessed the first year of CASS implementation in 2001, both national and provincial examination authorities have realised that the implementation of CASS was problematic in certain schools (DoE, 2003c). In the analysis of the 2001 and 2002 Senior Certificate examination results by SAFCERT[1], huge disparities were found in certain schools between the raw CASS marks and the adjusted examination marks of the same learners in a number of subjects. In 2001, a total of 10 182 examination centers supplied CASS marks that were more than 20% above the adjusted examination marks (SAFCERT, 2002a). The term "examination centers" refers to all educational institutions, including schools, colleges and Public Adult Learning Centers (PALCs) that offer Grade 12 classes either on a full or part - time basis.

According to the findings of SAFCERT, "subjects are offered at many schools/examination centers by one or more educators at every school/examination center. Each of these educators, together with their learners, establishes a standard of education and compiles a year mark by means of CASS. The nature of the tasks and the standard of CASS therefore differ from school to school" (DoE, 2001b, p. 5). As revealed by the Cambridge report, SAFCERT is also of the view that there is no uniformity in the manner in which learners are assessed.

Given the well - intentioned objectives of CASS, which is the advancement of knowledge, skills and understanding that will enable learners to demonstrate competence across a range of contexts, it is essential that CASS be regarded as one part of a coherent system that leads to the holistic assessment of learners (DoE, 1999a). In the context of this study the main concern is whether educators are able to implement internal school - based assessment (SBA) so as to ensure national comparability of standards (DoE, 1999a).

[1] SAFCERT was the quality assurance council responsible for the integrity and credibility of the Senior Certificate examinations. In 2003, SAFCERT was replaced by Umalusi.

School - based assessment can be referred to as the evaluation of learner performance against a set of criteria, which takes place during the teaching and learning process in the classroom. School - based assessment may comprise assessment of oral and practical work, assessment of classroom - based work, class tests, assignments, portfolios, projects, controlled tests and examinations (DoE, 2000a).

CASS is a form of school-based assessment that is aimed at continually improving teaching and learning and provides opportunities in assessment that are logistically impossible to include in a single once - off external examination (Oberholzer, 1998). However, contrary to the multiple standards of CASS at operational level (DoE, 1999a) the external component of assessment in Biology, Mathematics and Physical Science became a national responsibility since 2001. The examination question papers in these subjects are set and moderated at national level to ensure consistency in standards across provincial examining bodies. The marking guidelines are also discussed between the national panels of examiners and representatives from provincial examining bodies and standardised to ensure that there is uniformity in the interpretation of the marking guidelines so that moderators and markers know how to apply the marking guidelines.

The formal, externally set and marked examinations in Biology, Physical Science and Mathematics sets a common standard and measures the performance of all learners in a common question paper whereas the assessment of learners in CASS lacks standardisation and is largely dependent on the educator's perception of what constitutes a national standard of achievement (Oberholzer, 1998).

Based on the research evidence that there is not an acceptable standard of CASS at operational level (DoE, 1999b; DoE, 2003c; DoE, 2002c), drastic measures are taken by Umalusi (ex SAFCERT) to reduce the impact of CASS on the examination marks of Grade 12 learners. In this regard Umalusi states that the raw CASS marks of Grade 12 learners "*do not give a true reflection of the learner's achievements in terms of the national norms and must be statistically adjusted*" (DoE, 2001b, p. 5). The CASS marks are statistically adjusted so that the mean of the CASS marks are not more than 5% above the mean of the examination mark

for every subject offered at Grade 12 level at every school (DoE, 2003c). However, Umalusi and the Department of Education regard this as an interim measure to ensure the validity and reliability of the CASS marks. It is accepted that the CASS marks cannot be standardised against the exam marks indefinitely and that appropriate measures must be taken to stabilise the CASS system so that the CASS marks can be accepted as is.

Since CASS has been introduced as an essential component of the final exit examination of the schooling phase and the fact that the validity and reliability of the CASS marks are doubted in certain instances, it is critical that the implementation of this component of the assessment system be properly investigated and appropriate measures are taken to enhance its fairness, validity and reliability. The fairness and appropriateness of examination results are always a matter of public concern (Riding & Butterfield, 1990). These measures will add credibility to the Senior Certificate examination.

Appropriate measures to enhance the fairness, validity and reliability of CASS can only be proposed if there is a good understanding of the problems and challenges that are experienced by educators with the implementation and use of CASS. The principles of fairness, validity and reliability of CASS will be examined in detail in Chapter 3. It is in this context that the purpose of this study is to investigate:

1. the problems and challenges experienced by Grade 12 Biology, Mathematics and Physical Science educators in the effective implementation of CASS;
2. the kinds of support provided to educators to strengthen and to sustain the effective implementation of CASS; and
3. to what extent the Grade 12 CASS marks are fair, valid and reliable.

1.3 Rationale for the Research

This research has been motivated by numerous reports and discussions at national level on the problems relating to CASS implementation at operational level. The report on the Audit of the Systems and processes of Examining Bodies

to implement CASS, states that the capacities of individual examining bodies differ and so are their levels of readiness to implement CASS (SAFCERT, 2002a). Investigations conducted by the Department of Education (2002a) on the role of district offices indicate that the dissemination of policy and guideline documents to schools is not being effectively managed. This investigation also adds that CASS implementation is especially problematic in poorly resourced schools. Since most poorly resourced schools are located in the rural and township areas, it is expected that CASS implementation in these schools would be problematic. The educators in the rural and township schools would therefore apply and implement CASS differently compared to those educators in areas where the provision of resources are adequate. An article by Bisseker (2003) indicates that although there have been considerable advances in education, many schools still lack basic utilities, and teachers are still under skilled and largely unaccountable for what happens in the classroom.

The report of the Ministerial Committee on Examinations (DoE, 1998), also highlights that the oral marks (and even year marks) are inflated and are at times far above the provincial average. The key findings of the National Forum for Learner Performance (NFLP) indicate that many schools are compiling CASS marks just before the commencement of the final examination and that there is a perception amongst certain educators that CASS is a separate activity from the daily teaching and learning activities (DoE, 2003c).

According to the Department of Education (2003c, p. 6) “some teachers, from their experience, will be stricter than others, others will be more lenient, others may not have the necessary experience to know what an acceptable standard is, and yet others may not even conduct the assessments but still provide some mark”. Umalusi also states that the development of assessment instruments or assessment criteria for CASS happens mainly at the upper levels of the public system due to the limited expertise among educators (Umalusi, 2002b).

Despite some of the above - mentioned shortcomings in the implementation of CASS, it is widely accepted that the introduction of CASS in the schooling phase is a major step forward in the South African education system (Oberholzer, 1998;

DoE, 2002c). However, it must be made worthwhile for teachers and learners to implement it properly (DoE, 2003c). The Report on the Investigation and Advice on a Single Examination and Assessment System for NQF levels 1 to 4 supports this view. This report indicates that SBA forms a critical part of sound assessment practice, and that, if properly conducted, it enhances both the fairness and validity of the assessment process (DoE, 2002c).

CASS helps the learner develop a variety of skills through multiple opportunities under different conditions and situations. For educators, it helps in their development through understanding, generating and creating appropriate standards. This two - fold function is expected to influence the culture of teaching and learning thereby resulting in improved learner performance.

If CASS is to count 25% of a learner's promotion mark at the most crucial point in her/his schooling career, it is axiomatic that the implementation of CASS should be thoroughly workshopped and training provided to implementers. If there are possible ways in which policy makers and others (meaning subject advisors, curriculum specialists, subject heads and school principals) can give direct help and support to the everyday classroom task of achieving better learning, then these ways ought to be pursued vigorously (Black & Wiliam, 1998).

It is envisaged that the findings from this research may be useful to:

(a) the Department of Education who is involved in policy making, whole school evaluation, systemic evaluation, and the overall conduct of the Senior Certificate examinations;
(b) Umalusi, who is responsible for the quality assurance of the Senior Certificate examinations and CASS, and has to ensure that the marks obtained through CASS are fair, valid and reliable;
(c) provincial, district and regional managers who are involved in the training, quality assurance and moderation of CASS;
(d) subject advisors and curriculum specialists who render advisory services and who play a key role in the moderation of CASS; and
(e) educators who are involved in the implementation of CASS.

1.4 Limitations of the Research

The following limitations have had an impact on this study:

Since the sampled subject advisors and educators of Biology, Mathematics and Physical Science do not represent the entire Grade 12 Mathematics and Science subject advisors and educators and the fact that only five individuals involved in the management and monitoring of CASS were interviewed, the results from this study cannot be generalised to the entire Grade 12 population of which these participants are only a part. The study should be seen as an exploratory one.

Further, the return of questionnaires by subject advisors and their educators in certain provinces was poor. For example, in Mpumalanga, only 4 out of 12 questionnaires were returned by educators and in the case of the Northern Cape 8 out of 12 questionnaires were returned. In certain provinces, for example, KwaZulu - Natal, Gauteng and Limpopo, not all questionnaires were returned by subject advisors. This has had a limiting effect on the sample size used in this study.

1.5 Conclusion

This chapter outlined the context of the study in terms of its aims, the problem statement, the purpose of the research, the rationale for the research and the limitations experienced in the course of this research. From the problem statement it is evident that much more attention needs to be given to the implementation of CASS at Grade 12 level as it forms 25% of the final exit examination. Since the fairness, validity and reliability of the Grade 12 CASS marks impacts on the integrity and credibility of the Senior Certificate examinations, education authorities must take appropriate measures to ensure that the qualification and certification of learners exiting the schooling phase reflect their true skills, attitudes and capabilities.

Chapter 2 presents an overview of the education transformation in South Africa that has led to the introduction of Outcomes - Based Education (OBE) in schools and the introduction of continuous assessment (CASS) at Grade 12 level. Chapter 3 deals with the moderation and other quality assurance measures adopted by both the Department of Education and Umalusi to ensure the integrity and

credibility of the Senior Certificate examinations. Chapter 4 undertakes a critical review of some of the existing literature on assessment. In presenting the literature review the focus is on the research questions and the conceptualisation of the theoretical framework underpinning this study. The research design and methodology is presented in Chapter 5. This chapter further describes the research questions, the research design and methodology, the sampling framework, the instrument design, the data collection and the data analysis procedures.

Chapter 6 presents the overall results of the research and is structured according to the three main research questions. The results of the research are reported using descriptive statistics. Chapter 6 begins with a profile of the location, qualifications and experience of the sampled subject advisors and their educators. This provides a context for the interpretation of the data. The data gathered from the educators are compared and contrasted with the data reported by subject advisors. The responses from the five interviews have also been used to verify the data from the survey. This would also enhance the internal validity of the data on the implementation of CASS across the six provinces and across rural, township and urban areas. The chapter ends with a discussion on the fairness, validity and reliability of the Grade 12 CASS marks.

Chapter 7 presents a summary of the main findings of the research, a discussion on the lessons that can be learnt from the research methodology and the recommendations for further research, recommendations for educational policies relating to CASS and recommendations for educational practice at district and school level.

CHAPTER 2

CONTINUOUS ASSESSMENT IN THE SOUTH AFRICAN CONTEXT

Overview of the Chapter

This chapter focuses on the new democratic government's vision for quality public education for all learners in South Africa, which is articulated in the many policies, programmes and intervention measures adopted by the Government. It examines the rationale for the focus on Mathematics and Science, the current status of the Senior Certificate examinations and highlights the shift from a predominantly content - based approach to teaching and learning to a more Outcomes-based approach, which introduces continuous assessment (CASS) at Grade 12 level. The role of continuous assessment and the importance of teacher training, teacher development and support to implement CASS are discussed.

2.1 Introduction

The Nationalist government of pre - 1994 instituted apartheid policies that impacted negatively on education and training in South Africa. The fragmentation of the education system into 19 racially based sub - systems meant that each sub-system had its own examinations and assessment policies, which differed significantly in the manner in which teaching, and learning was conducted. These examination and assessment sub - systems entrenched inequalities in learning opportunities. Assessment practices during the apartheid era benefited the state by employing a system that deliberately and methodically disempowered its black citizenry and forced them to join the cheap labour market (SADTU, 1999).

Since examination and assessment are important in determining the educational and training opportunities for individual learners, the transformation of the education system, particularly in the area of curriculum and assessment, necessitated a radical and comprehensive change in policies, procedures and administration. With the ushering in of a new constitutional order based on the principles of equality, freedom and human dignity, a number of interventions and

new policies have been introduced to bring about uniformity, fairness and credibility in the public examination and training system.

The following section presents the transformative principles that led to the adoption of outcomes - based education to teaching and learning. Mention is also made of some of the education policies that were promulgated with the aim of improving the quality of education in South Africa.

2.1.1 The Transformative Principles

The transformation of education in South Africa emphasises the right of all to quality education. The first intent is to redress the discriminatory, unbalanced and inequitable distribution of the education services of the apartheid regime, and secondly, to develop a world - class education system suitable to meet the challenges of the 21st century (DoE, 1995). The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) makes provision for curriculum transformation and development in South Africa. The following principles are stated in the preamble to the Constitution (Government of South Africa, 1996):

- heal the divisions of the past and establish a society based on democratic values, social justice and fundamental human rights;
- improve the quality of life of all citizens and free the potential of each person;
- lay the foundations for a democratic and open society in which government is based on the will of the people and every citizen is equally protected by law; and
- build a united and democratic South Africa that is able to take its rightful place as a sovereign state in the family of nations.

The above principles contribute significantly to the educational transformation in South Africa and have led to the review of curriculum and assessment in the schooling phase.

2.1.2 Policies for Educational Transformation

The Lifelong learning through a National Curriculum Framework (1996) was the first major curriculum statement of a democratic South Africa. It is based on the transformative principles of the National Qualifications Framework (NQF) that provides opportunities for people to learn regardless of their age, circumstances and the level of education and training (Education Information Centre & Independent Examinations Board, 1996). The NQF is a framework for transformation in which quality enhancement is an integral component. It seeks to bring together education and training, skills development and the needs of a critical democracy, personal, social and economic development (DoE, 2001d).

The following principles have been adopted that underpin education and training in South Africa (Education Information Centre & Independent Examinations Board, 1996):

Integration

Integration in the new education system means that education and training will be combined so that both knowledge and skills are obtained. This will enable a person to move from one place of learning to another.

Relevance

Historically, there has been little relevance between what has been taught at school and the needs of the economy and the workplace. This has been addressed theoretically in the NQF by providing opportunities for people to gain the skills, knowledge, experience and understanding necessary to build a strong, productive and skilled workforce.

Credibility and Standards

Whilst in the past, organisations, examining bodies and private institutions have had their own pass requirements, this has been changed by the establishment of the NQF which stipulates that any acceptable assessment system must now meet the standards and qualifications registered on the NQF.

Flexibility

The NQF makes it possible to achieve national qualifications through both formal and informal learning situations. A formal learning situation refers to the learning that takes place at a school, Public Adult Learning Center (PALCs), Higher Education Institution or any other institution that is recognised as an assessment provider. Informal learning refers to learning that takes place in informal situations such as in a community, or through courses offered by Non-Governmental Organisations (NGOs), churches and in the workplace.

Access and Redress

Access and redress is provided by enabling learners to enter and exit the different levels of education and training by crediting previous experience and /or qualifications.

Portability

The NQF in theory allows a person to transfer qualifications and credits more easily from one learning situation to another; for example, a person may transfer her/his credits from one learning institution to another. Although this is articulated in the framework document, in practice it is sometimes difficult to transfer credits since institutions have their own syllabus requirements.

Articulation

The NQF allows a person to move between the education and work environments, once all the relevant credits have been successfully accumulated. This means that a person can move from a work situation as in the case of an apprentice to a study situation, where she/he is able to complete her/his studies.

Progression

In terms of the NQF, any person wishing to resume their studies after a period of time will be allowed to do so. This means that credit will be awarded for experience and knowledge already gained.

Recognition of Prior Learning

This principle allows individuals to be assessed and credited for knowledge, skills and experience obtained through formal and informal learning. Although this has been mentioned in policy documents, not much is being done to afford learners the opportunity to receive recognition for prior learning. Both the South African Qualifications Authority (SAQA) and Umalusi are responsible to ensure that recognition of prior learning is effected.

Guidance of Learners

The NQF provides for the counselling of learners by specially trained individuals who meet nationally recognised standards. Here too, provision is only made in theory, without the facilities and human resources to deal with the practicalities of implementation.

The above NQF principles have been informed by the White Paper on Education and Training (1995), the South African Qualifications Act (No. 58 of 1995) and the National Education Policy Act (No. 27 of 1996). The White Paper on Education and Training (1995) emphasised the need for major changes in education and training in South Africa to normalise and transform teaching and learning in South African schools (DoE, 2002d).

One of the most significant changes in the education system is the unification of the racially based examinations into a single non - racial public examination system administered by the nine provincial education departments. Thereafter, a number of policies and interventions have been introduced with the aim of improving the quality of education of all learners.

The adoption of *outcomes - based education (OBE*) in all education and training policies is another intervention that facilitates a major paradigm shift away from content orientated learning to a liberating, learner - centred approach to teaching and learning. It also emphasizes the acquisition of skills and values.

OBE was operationalised in Curriculum 2005. The introduction of the school curriculum plan, referred to as *Curriculum 2005* - which suggests a time - scale for

implementation began in 1998 in Grade 1, followed by Grade 2 in 1999, Grade 3 and 7 in 2000, and Grade 4 and 8 in 2001. According to this curriculum plan, learners in the General Education and Training (GET) band had to achieve a total of 66 learning outcomes during the course of their schooling career.

The new curriculum statement promotes a vision of:

"A prosperous, truly united, democratic and international competitive country with literate, creative and critical citizens leading productive, self-fulfilled lives in a country free of violence, discrimination and prejudice" (DoE, 2002b, p. 13).

According to William Spady (1999), the narrow content focus of the existing matric exam system should be replaced as soon as possible with a more performance oriented alternative that directly embodies the 7 critical outcomes and the performance challenges that youth face in today's world of continuous discovery and constant change. Hence OBE and Curriculum 2005 (C2005) were introduced. C2005 involves learners as participants in curriculum and learning, responds to their learning styles and cultures, and builds on their life experiences and needs (DoE, 2001c).

However, in the South Africa context, the introduction of C2005 was met with much resistance amongst educators and educational managers. One of the reasons being that it was literally pushed down their throats, without sufficient training and support to implement and understand the challenges facing educators**.** According to Sieborger (1999), his involvement in the processes leading to the adoption of C2005 has revealed that key stakeholders (meaning educators) were not consulted during the review of the curriculum. He cited that the lack of time coupled with the authority with which the national Department of Education led this process created a situation where the new curriculum had to be accepted.

Assessment in Curriculum 2005

Curriculum 2005 was said to promote a continuous formative assessment where teachers and learners accept responsibilities for assessment, to promote

continuous learning and enable the assessment of competence and complex performances. Assessment is conducted on a continuous basis and in different ways in order to accurately record learner's progress. Hence the term “continuous assessment” (CASS) which provides opportunities for the assessment of learners in an informal and relaxed atmosphere. The importance of CASS is that it is designed to assess those attitudes, skills and values that cannot be easily assessed in for example a 2 - hour examination question paper (Oberholzer, 1999).

The adoption of CASS in line with the principles of OBE suggests that educational authorities believe that the traditional methods of assessment are not sufficient for the creation of a responsible and productive society (Oberholzer, 1998). To create a platform for the realisation of these goals, the education system must incorporate the changed principles and multiple methods of assessment from an early age.

The Assessment policy for Grades R to 9 and ABET[2], which caters for assessment within the framework of OBE, was launched in 1998 (DoE, 1998c). This policy provides for the conducting of systemic evaluation at the key transitional stages, viz. Grade 3, 6 and 9. Systemic evaluation is a quality assurance measure taken to evaluate the teaching and learning at Grades 3, 6 and 9. It is conducted as a means of determining on a periodic basis the strengths and weaknesses of the learning system thereby providing constant feedback to role - players for the purpose of improving performance of schools and the education system as a whole.

Another policy that is aimed at improving the quality of education is the *Whole School Evaluation (WSE*). The WSE requires that schools conduct internal self-evaluations by analysing their strengths, weaknesses, opportunities and threats, and developing strategic plans to address ways in which the school can improve the quality of teaching and learning. External evaluations are also conducted by provincial examining bodies. As a further measure, school implementation plans

[2] Adult basic Education and Training (ABET) provided for at levels 1-4 on the National Qualifications Framework (NQF) and level 1 on the General Education & Training Band.

are developed for the purpose of improving the culture and quality of teaching and learning.

Many other statutes and policies exist which are aimed at improving the quality of education in South Africa. Examples of such policies are, the South African Schools Act, No 84 of 1996 (SASA) whose main aim is to promote access to quality education and democratic governance in the schooling system, the Further Education and Training Act, No 98 of 1998 (FET), Education White Paper 4 on FET (1998) and the National Strategy for Further Education and Training (1999-2001), which provides the basis for developing a nationally co-ordinated further education and training system comprising the senior secondary school component and technical colleges (DoE, 2001c). Legislation such as the Employment of Educators Act (1998) regulates the professional, moral and ethical responsibilities and competencies of teachers. The professional Council responsible for teacher conduct and professionalism, established in terms of the latter act is the South African Council of Educators (SACE) (DoE, 2001c).

Whilst emphasis is being placed on the promulgation of policies to improve the education system as a whole, regrettably very little is being done to ensure that the policies being introduced are effectively implemented (Pahad, 1998). However, it must be emphasised that a number of education policies were introduced due to political pressure and the need for accountability in the education system (Jeevanantham, 1998). The main challenge remains to evaluate the success of the many policies being implemented.

The next section examines the rationale for the focus on Mathematics and Science in this study.

2.2 Rationale for the focus on Mathematics and Sciences

"Science today is a highly globalised activity. Even in developed countries, concern is being raised about the shortage of scientists. Many scientists are also leaving their countries, namely, in Germany and Canada to join the United State's highly successful science programme" (Government of South Africa, 2002, p. 51).

This study focuses on mathematics and science because of the diminishing number of secondary school learners taking these subjects and the poor performance of learners in these subjects. One of the aims of this study is to enhance the effective implementation of CASS so that it can contribute to the improvement in learner performance in mathematics and science.

Decreasing enrolment in Mathematics and Science

In South Africa, Mathematics and Science is fast becoming less popular amongst young learners, especially girls (DoE, 2001f). In 2002, 18 867 full - time male learners wrote mathematics on the higher Grade compared to 16 598 full - time female learners. In Physical Science the same pattern emerged, 28 279 full - time male learners wrote Physical Science on the higher Grade compared to 22 713 female learners (DoE, 2002f). The difference in the enrolment figures between the boys and girls may seem insignificant, however, considering the fact that there were approximately 38 000 more female learners than male learners who wrote the senior certificate examination in 2002, the small number of female learners taking mathematics and science is a cause for concern.

According to Bisseker (2003) there are many reasons for the low enrolment in Mathematics and Science. He indicates that the most critical being that principals are failing to ensure that teachers cover the curriculum, provinces are under-spending and failing to deliver textbooks and the national education department is failing to assure the quality of teacher's work.

Lack of Qualifications of Professional Staff in Mathematics and Science

The findings of the TIMSS-R study indicates that 38% of pupils were taught science by teachers with no formal qualifications in science and 27% of pupils were taught mathematics by teachers with no formal qualifications in mathematics (Howie, 2001). These figures are disturbing. The level of qualifications, knowledge and skills of educators have a direct impact on the effective teaching of mathematics and sciences in the classroom.

According to the HSRC, other factors that impact on the low quality of teaching and learning in Mathematics and Science is the lack of professional staff at district offices to lend support to schools (Kanjee, Paterson, Prinsloo, Khosa, Moore, Kivilu & Pheiffer, 2001). Bisseker (2003) also adds that in 41% of districts across provinces there are no mathematics specialists. He states that district officials are unable to monitor schools due to the resistance from teacher unions to visit classrooms. This lack of direct support has impacted on the provision of quality teaching and learning over the past years.

Lack of Skills in Mathematics and Science

Research conducted by Bisseker (2003) shows that the majority of pupils are unemployed as they leave school, incompetent in Mathematics and Science and barely equipped for further study.

The concern raised here is that large numbers of learners who leave school have either not studied mathematics or science at school or even if they did, very few learners have passed with good results. Currently there is a demand for people with skills in the field of engineering, science and technology (Government of South Africa, 2002). Without the necessary knowledge and skills in these fields, the chances of becoming employed are greatly reduced. Higher Education Institutions (HEI's) are also expressing their dissatisfaction on the small number of learners that are exiting the schooling phase with Mathematics and Science (Bisseker, 2003). HEI's are also not confident that Grade 12 mathematics and science graduates possess the necessary knowledge and skills to cope with tertiary education in the mathematics and science field (Bisseker, 2003). Their concern is justified on the grounds that even the quality of passes in mathematics and science is not very good.

Table 2.1 shows the pass % for full - time learners in Physical Science and Mathematics for the period 2000 to 2002.

Table 2.1 Pass percentage of full - time learners in Physical Science and Mathematics Higher Grade and Standard Grade for the period 2000 - 2002

Subject		2000			2001			2002		
	Grade	No. Wrote	No. Pass	Pass %	No. Wrote	No. Pass	Pass %	No. Wrote	No. Pass	Pass %
Mathematics	HG	38 520	19 327	50.2%	34 870	19 504	55.9%	35 465	20 528	57.9%
	SG	245 497	79 631	32.4%	229 075	72 301	31.6%	225 524	96 302	42.7%
Physical Science	HG	55 699	23 344	41.9%	48 996	24 280	49.6%	50 992	24 888	48.8%
	SG	107 486	54 884	51.1%	104 851	45 314	43.2%	102 863	56 741	55.2%

Source: (DoE, 2001f; DoE, 2002a)

HG = Higher Grade
SG = Standard Grade

With reference to Table 2.1, although the pass rates for Mathematics Higher Grade have shown a steady improvement from 50.2% in 2000 to 57.9% in 2002, the pass rates are still relatively low since there are a significantly larger number of learners taking Mathematics on the Standard Grade than on the Higher Grade. The performance of learners in Mathematics Standard Grade is poor.

The performance of learners in Physical Science Higher Grade has improved from 2000 to 2001 but has remained more or less stable in 2002. It is disappointing to note that the number of learners taking Physical Science on the Standard Grade is approximately two times the number of learners taking Physical Science on the Higher Grade (see Table 2.1). More learners should be encouraged to take Physical Science on the Higher Grade than on the Standard Grade. However, this would depend largely on whether there are sufficient qualified and skilled educators to teach the subject on the Higher Grade.

The overall pass rate in Mathematics, Biology and Physical compared to other popular senior certificate subjects for 2001 is shown in Figure 2.1.

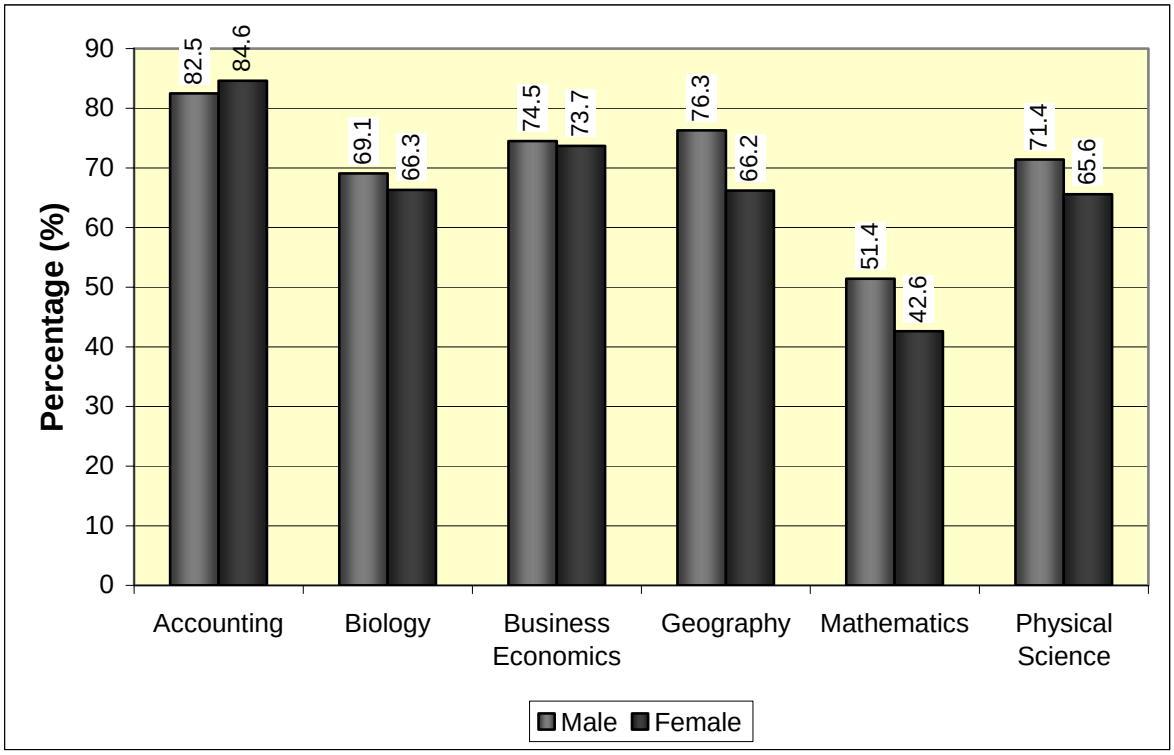
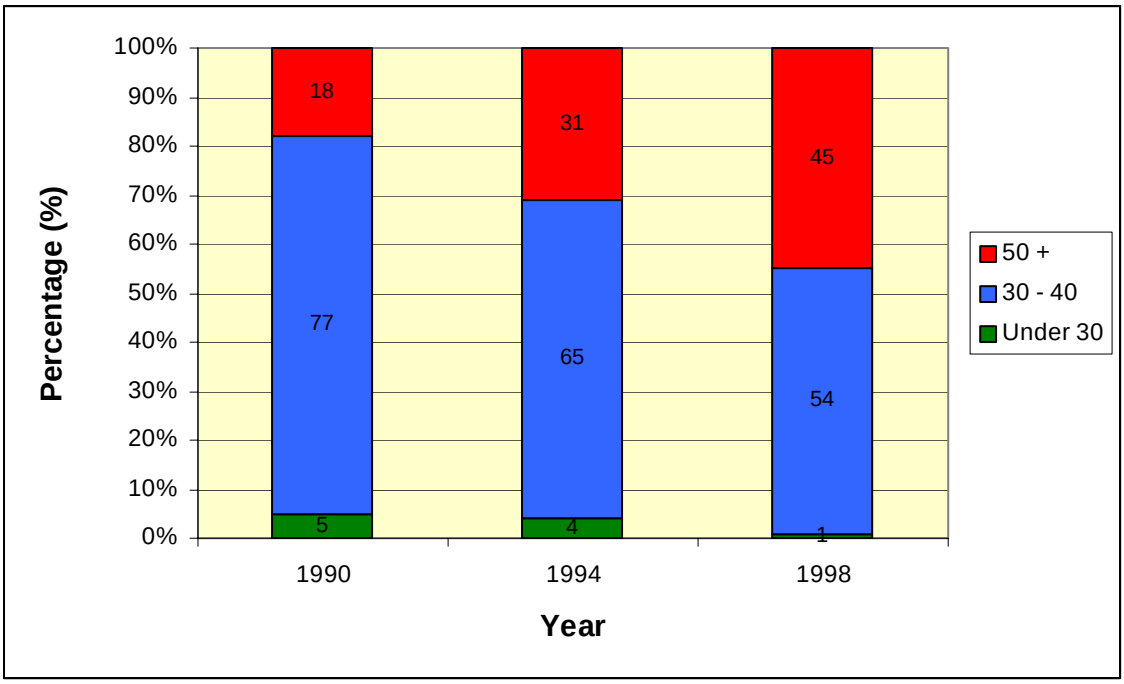


Figure 2.1 The overall pass rate in Mathematics, Biology and Physical Science compared to other popular Grade 12 subjects for 2001 (DoE, 2003b, p. 28)

The above figure shows that the overall pass rate in Mathematics, Biology and Physical Science is lower than the pass rate in the other subjects. This means that fewer learners will be obtaining the necessary skills in Mathematics and Science which will enable them to enter tertiary institutions to further their studies. According to the findings of South Africa's National Research and Development strategy, South Africa has an ageing scientific (Mathematics, Science and Technology) population (Government of South Africa, 2002). A disturbing factor is that currently about 50% of scientific output is contributed by scientists over the age of 50, as opposed to 18% in 1990. The statistics are presented in Figure 2.2.



Note: No information was available on the number of scientists between the ages of 40 and 50.

Figure 2.2 The diminishing number of scientists by age (Government of South Africa, 2002).

The above graph illustrates that the number of scientists in the age bracket of 30 - 40 is steadily decreasing. In 1990, only 5% of the population was under the age of 30. This figure decreased to 4% in 1994 and to just 1% in 1998, which confirm that the number of learners taking Mathematics and Science and qualifying in these fields is declining rapidly.

In 1994, only 4% of the total population of researchers in Science and Technology were black. Although this figure has improved to 30% today, the numbers of black researchers are still low. Figure 2.3 shows the percentage of scientific publication by race.

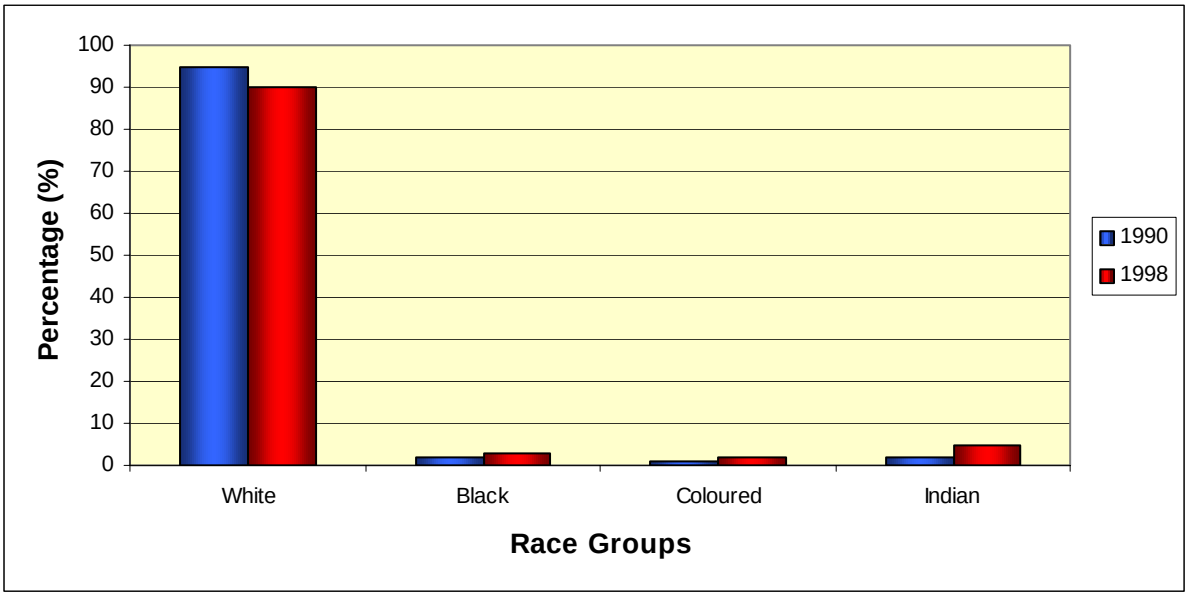


Figure 2.3 Scientific Publication by race for the period 1990-1998 (Government of South Africa, 2002).

In 1990, the white population produced approximately 95% of the scientific publication. The Black, Coloured and Indian race groups produced the other 5%. In 1998, the situation did not improve significantly. The figures illustrate the key concern, which is the low number of black learners passing Mathematics and Science at school level.

In 2000, out of a total full - time matric population of 489 900, only 20 243 African learners wrote mathematics on the Higher Grade and only 3 128 learners passed. In 2002, 3 300 black learners passed Mathematics on the Higher Grade and about 6 000 passed Science on the Higher Grade (Bisseker, 2003). Although the pass rates from 2001 to 2002 have improved in both subjects by 20% in Mathematics and Science, the actual numbers represent a pass rate of 23% for Mathematics and 22.4% for Science. Of particular interest is the variation of passes in Mathematics and Science across provinces amongst African learners.

Table 2.2 shows the total enrolment figures in Mathematics and Science for 2000 and the number of African learners taking the subject in each Grade. The table clearly reveals that a larger number of African learners are taking Mathematics and Science on the Standard Grade than on the Higher Grade. It is also

disappointing to note that the number of learners passing these subjects is very low.

Table 2.2 Number of African learners across provinces that passed Mathematics and Science in 2000

	Mathematics						Physical Science					
Province	HG No of African Learners	Total Higher Grade Enrolment	HG No Passed	SG No of African Learners	Total Standard Grade Enrolment	SG No Passed	HG No of African Learners	Total Higher Grade Enrolment	HG No Passed	SG No of African Learners	Total Standard Grade Enrolment	SG Pass
Northern Cape	12	330	9	671	2 580	218	24	354	4	333	1 351	178
Free State	471	1685	115	12 066	15 203	2454	2098	3 797	619	5 146	6 506	2 639
Eastern Cape	362	1440	113	36 736	41 307	11101	1060	2 251	136	21 435	23 738	8 548
KwaZulu-Natal	5772	11325	746	40 367	52 750	10309	7108	13 208	1221	16 109	1 967	7 062
Mpumalanga	1381	2446	159	1 6451	18 923	3235	3567	4 866	264	7 048	8 476	2 730
Limpopo	7780	8389	1041	36884	38 262	5683	12902	13 592	1621	10 499	11 127	3 897
Gauteng	812	7332	329	20497	37 467	5478	1566	8 835	471	11 495	20 129	5 286
North West	3575	1880	595	12644	20 715	2200	5239	4 886	755	3 411	8 334	1 434
Western Cape	78	3693	21	3889	18 290	662	93	3 910	45	2 204	8 258	1 100
Totals	***20 243***		***3 128***	***180 202***		***41 540***	***33 657***		***5 136***	***77 680***		***32 874***

Source: (Bisseker, 2003)

HG = Higher Grade
SG = Standard Grade

It is plausible that the variation in enrolments and passes across provinces can be attributed to the availability of professionally qualified and competent Mathematics and Science educators especially in the rural areas where the majority of African learners attend school. In 1997, it was reported that although 85% of mathematics educators were professionally qualified, only 50% had specialised in mathematics in their training. Similarly, while 84% of science educators were professionally qualified, only 42% were qualified in science (DoE, 2001f).

The Teaching of Science subjects in schools

The teaching of science subjects is complex and the nature of work involves a lot of "finding out". Science involves the conducting of experiments with the aid of the appropriate apparatus and chemicals. In the case of Biology for example, models of the human body are required and practical experiments are also carried out using test tubes and chemicals. If these are not made available to all schools, the task of teaching science subjects becomes problematic.

Science lessons are mostly practically orientated and teaching and learning is very much dependent on the quality of interaction and feedback between educator and learner. Black and Wiliam (1998) indicates that classroom activities such as CASS which is accompanied by on - going feedback, support and development can play dividends in terms of improving learner achievement in that formative assessment strategies can increase examination and test success. Further they indicate that to raise the standard of mathematics and science and to improve the quality of teaching in science classes, particular attention must be paid to the following:

- questions and instructions of assessment tasks must be clear. Questions and instructions must be designed to improve the learners thinking and reasoning skills; their deeper understanding of concepts, processes, laws and principles; and

- learners should receive constructive feedback and guidance about how to improve in order to plan the next steps in their learning.

It is likely that the effective implementation of CASS in science subjects can make a difference to the teaching and learning of science subjects. However, this can only happen if educators are endowed with the appropriate qualifications, skills and training in the area of CASS.

To encourage and attract young learners to take the science courses at school, it is essential that proper guidance be given to learners. In addition learners must be made aware of the benefits of pursuing a career in the field of Mathematics and Science. But most of all, learners could be attracted to the subjects by the richness and excitement the science classroom has to offer. The manner in which CASS is conducted in the science classroom will impact on the motivation levels of learners. Improvement in the conduct of CASS will significantly improve learning in Mathematics and Science (Black & Wiliam, 1998). The main thrust is to develop, enhance and strengthen Mathematics and Sciences practices in the classroom.

The DoE Mathematics and Science Strategy

To promote learner interest in Mathematics and Science and to address the problem of quality teaching and learning the Department of Education has developed a Mathematics and Science strategy. The main aims of the strategy includes (DoE, 2001f, p. 14):

(a) to raise participation and performance by historically disadvantaged learners in Grade 12 Mathematics and Physical science;

(b) to provide high quality Mathematics, Science and Technology education for all learners taking the first General Education and Training Certificate and Further Education and Training Certificate; and

(c) to increase and enhance the human resource capacity to deliver quality Mathematics, Science and Technology education.

The "100 schools project" initiated by the Department of Education entails paying special attention to the teaching and learning of Mathematics and Science in 100 schools that have been identified throughout the country on the basis of the lack of resources.

In the long term, if the education department wants to seriously address the low numbers of learners taking Mathematics and Science (Physical Science and Biology) and the poor performance of these learners, then it ought to increase the magnitude of its commitment and go beyond the 100 schools.

Against the rationale for the focus on Mathematics and Science sketched above, it is necessary to reflect on the current status of the most important exit examination in the schooling system namely the Senior Certificate examinations.

2.3 The current Senior Certificate Examination

The current Senior Certificate examinations are regulated in terms of Section 3(4) of the National Education Policy Act, 1996 (DoE, 2001d). The policy makes provision for the determination of a national education policy regarding curriculum frameworks, core syllabi and education programmes, learning standards, examination and the certification of qualifications. However, specific details regarding programme requirements are recorded in a *Résumé of Instructional Programmes* in Schools, Report 550 (DoE, 2001g).

The Grade 12 examinations (Senior Certificate examinations) are viewed by the public as the most important examination written by learners at the culmination of their schooling career. Learners perceive the success achieved in the Senior Certificate examination as a determinant of their future career prospects. The achievement of a good quality pass such as the Senior Certificate with endorsement is crucial, particularly if learners wish to enter Higher Education. A

Senior Certificate with endorsement can only be obtained if a learner achieves a pass of 40% or more in four of the six subjects taken at the Higher Grade, providing the learner also passes two languages, namely, the language of teaching and learning (first language) and one other approved language (first or second language) (DoE, 2001g).

The Senior Certificate examinations currently serve as a measure of the effectiveness of public education in the schooling phase in South Africa. With the pressure on schools to perform in the Senior Certificate examinations, and the publishing of the names of schools that performed well to those that performed poorly, many schools have resorted to the weeding of over - age learners from their system so that the school pass rates could improve (DoE, 2002a). Research evidence shows that generally over - aged learners do not perform very well and this results in the lowering of a school's pass rate (DoE, 2002a).

Table 2.3 shows that the pass rates for the Senior Certificate examinations have steadily improved over the years, however, there has also been a steady decline in the Grade 12 - enrolment figures. The decrease in enrolments is partly due to the introduction of age - Grade norms in 1999, which reduced the number of over-age learners in the system and the "constriction" by some schools to discourage certain "at risk" learners from progressing from Grade 11 to Grade 12 (DoE, 2002a). According to the Department of Education, the increase in the pass rate is due to the conscious effort of educators to improve pass rates. The NFLP reports that numerous intervention programmes have been introduced that has made a significant difference in the culture of teaching and learning at schools (DoE, 2002a).

Table 2.3 Pass rates for the Senior Certificate examinations, 2000-2002

Year	No. of full-time learners who wrote	Overall pass rate	Learners passed without endorsement	Learners passed with endorsement
2000	489 941	57.9%	214 668 (43.9%)	68 626 (14.0%)
2001	449 371	61.7%	209 499 (46.6%)	67 707 (15.1%)
2002	443 821	68.9%	230 726 (52%)	75 048 (16.9%)

Source: (DoE, 2002a)

Although the overall pass rates have improved from 2000 to 2002, the quality of the results has not improved significantly. The number of learners who passed the Senior Certificate with endorsement only increased by 7 341 from 2001 to 2002 whereas the number of learners who obtained the Senior Certificate without endorsement increased by 21 227 learners during the same period. Thus a greater number of learners are obtaining the Senior Certificate without endorsement than with endorsement.

This means that only 16.9% of the 68.9% (which is 24.5% of the learners that passed) are able to enter Higher Education. However, the retention of these learners is problematic as many fail or drop out of university before the completion of their studies. Table 2.4 shows examples of statistics on enrolled and graduate students at universities by institution, population group and gender in 2000 (DoE, 2000b).

Table 2.4 Number of enrolled and graduate students at universities by institution and population groups in 2000

Institution	Enrolments					Graduates				
	African	Coloured	Indian	White	Total	African	Coloured	Indian	White	Total
University of Cape Town	4 667	2 350	1 274	9 163	17 454	861	496	230	2 144	3 731
University of Fort Hare	4 411	6	2	18	4 437	703	0	0	1	704
University of Zululand	5 092	26	88	134	5 340	908	2	15	32	957
University of Pretoria	34 281	2 225	1 329	21 317	59 152	4 284	129	189	4 644	9 246
University of South Africa	53 276	5 481	13 073	43 464	115 294	4 349	373	880	4 614	10 216
Totals	***101 727***	***10 088***	***15 766***	***73 996***	***201 677***	***11 105***	***1 000***	***1 314***	***11 535***	***24 854***

Source: (DoE, 2000b)

Table 2.4 shows that large numbers of students are not successfully completing their studies at Higher Education Institutions. Only 24 854 of a total of 201 677 students from the five universities were able to successfully complete their studies in the year 2000.

Academics have commented on the standard and quality of the Senior Certificate examinations, indicating that it does not fully prepare learners for Higher Education (Jansen, 2003). Hence the drop out rate at Universities is quite high. Some of the shortcomings of the Senior Certificate include (DoE, 1998a), that it:

- is not designed to create coherent qualifications for access to careers;
- does not provide any mechanism for redressing historical inequity;
- does not provide mechanisms for lateral movement;
- is based on the current list of school and technical college subjects, which are outdated and restrictive.

Other criticism of the Senior Certificate examinations is that it does not cater for the acquisition of values and skills needed to develop professionally. Despite achieving a matriculation with endorsement many learners are also unable to pursue their most preferred career choices due to the point system levelled against certain academic and prestigious career pathways such as Medicine, Chemical Engineering, Chartered Accountancy, etc. Research also indicates that the Senior Certificate is not entirely successful in terms of providing an effective tool for selection into Higher Education (HE) institutions (DoE, 1998a). Many HE institutions therefore devise their own entrance requirements and set entrance level examinations to suit the demands of the various learning pathways.

Prior to 2001, assessment at Grade 12 at most provincial education departments was based solely on the summative examination written at the end of the academic year. Although learners were assessed during the course of the year in aspects such as tests, classwork, homework, assignments and projects, these were not included as part of the final examination mark. The focus was on the acquisition of knowledge with very little attention paid to the development of critical thinking and problem solving abilities of learners. In many cases learners were

forced to study certain subjects because subjects were packaged and had to be taken as a group over a period of three years from Grades 10 to 12. This left no room for flexibility. The grouping of subjects into packages still exists and it prevents learners from choosing individual subjects to suit their needs.

At present public examinations at Grade 12 level are set and administered by the various provincial examining bodies. This means that the nature, format, standard and quality of the question papers differ from one provincial examining body to another. However, the national Department of Education sets question papers for the Senior Certificate examinations in six subjects, namely, Accounting, Biology, English Additional Language, History, Mathematics and Physical Science. Apart from the national subjects where there is uniformity across provinces in the standard and quality of the question papers, the assessment in the rest of the senior Certificate subjects varies from province to province since the syllabi are dependent on each province's interpretation of the core syllabus. The provincial examination question papers are set at provincial level by examiners appointed by each province.

The decision to introduce common examination question papers emanated from an investigation by the Cambridge International Examinations into the examinations systems of the various provincial examining bodies (DoE, 1999a). The request for this investigation was made in 1999, following the Mpumalanga incident where the marks of learners were deliberately inflated to increase the province's pass rates. This incident caused a scandal and the public began to question the integrity of the Senior Certificate examinations. The Minister of Education, Professor Kader Asmal made the following statement at a media conference in Johannesburg (DoE, 1999, p.1):

"*When I became Minister of Education I committed myself to conducting an examination process whose integrity is beyond reproach. My decision to invite this credible international body, once again, bears testimony to my determination to clean up the examination process in particular and the education system in general. I therefore appeal to all those involved in the examination process to*

conduct themselves in a manner that will enable us to deliver a high quality and credible examination."

Soon after the release of the report by the Cambridge International Examination team, the Council of Education Ministers (CEM) took a decision to commence with the setting of common examination question papers. This decision was motivated by one of the recommendations made in the Cambridge report, which reads (DoE, 1999a, p. 2):

"*As a next step towards rationalising present procedures for setting question papers in the same subject in each of the nine provinces, the establishment of a national question bank, probably based at the National Department of Examinations should be considered*."

The Cambridge exercise was soon followed by the International Benchmarking exercise, where the 1999 Senior Certificate examination question papers in five subjects, namely, English Additional Language, Biology, Mathematics, Physical Science and Accounting was gathered from the nine provincial examination bodies and the Independent Examinations Board (IEB) and sent to the Scottish Qualifications Authority (SQA) for international comparison and analysis. The recommendations that emerged from this exercise highlighted the need for question papers of a common standard and quality for all learners.

The setting of national question papers in the above - mentioned five subjects thus began in 2001. The obsession with improving the standard and quality of learning at Grade 12 resulted in the Investigation and Advice on a Single Examination System for NQF exit points (1 to 4) in schools and Colleges. This investigation was conducted in 2002. Here too, it became quite clear that the assessment system needed strengthening in terms of its processes to enhance the validity and reliability of examination results (DoE, 2002a). The concepts validity and reliability will be discussed in greater detail later in this chapter.

Pertinent to this study is the report's recommendation on school - based assessment, which indicates that, "the national subjects should be charged with

the design of the common tasks for assessment, in collaboration with specialist expertise in this area" (DoE, 2002c). The report also states that appropriate in-service training, learning support materials and assessment tasks must be provided well in advance of implementation and that district officials and educational managers be trained to moderate and monitor SBA. In effect what this means is that there is a lack of attention paid to prepare educators, subject advisors and education managers on the effective implementation of SBA. The realities of OBE and the conduct of Outcomes - Based Assessment (OBA) within the OBE framework have not been adequately addressed.

However, to ensure that the Senior Certificate examinations results are fair and credible, it is necessary that all processes leading up to the final results are thoroughly interrogated and approved. This is the role of Umalusi.

2.4 The Role of Umalusi in the Quality Assurance of the Senior Certificate Examination

Prior to June 2002, Umalusi was referred to as the South African Certification Council (SAFCERT). SAFCERT was responsible for determining the credibility of the Senior Certificate examination and the issuing of the qualifications (certificates). The credibility of the Senior Certificate examination was enhanced by the appointment of external moderators by SAFCERT to moderate the examination question papers of all examining bodies. In effect, although the question papers were moderated, this in itself is no indication that the Senior Certificate examinations are credible. SAFCERT also monitored the writing of the examinations. However, these were carried out in a small sample of schools.

With the promulgation of the General and Further Education and Training Quality Assurance Act, No. 58 of 2001 (GENFETQA), the role of SAFCERT was to become greater by including many other responsibilities necessary for ensuring the credibility of the entire education system (Umalusi,, 2002e). It is insufficient to focus on the exit examination alone whilst the education system is not producing quality results prior to the Grade 12 examinations.

The core functions of Umalusi at the Senior Certificate level include the quality assurance of school-based assessment, the quality assurance of the external examination and the marking and capturing of marks. In terms of the first function, Umalusi is to monitor the implementation of CASS and verify the quality and standard of the assessment tasks. In terms of the second function, Umalusi is responsible for the external moderation of all the Senior Certificate question papers to ensure that they are of the correct standard and quality. Ensuring consistency in the standard and quality of question papers across examining bodies is a near impossible task. Moderators appointed by Umalusi have indicated that question papers from the different examining bodies arrive on their desks at different times. It is therefore not possible to compare question papers of different examining bodies, to check for consistency in the format of the paper, the nature and type of questions, the levels of difficulty of questions, the allocation of marks, etc. Moderators have admitted that each question paper is moderated in a vacuum.

The areas of focus during moderation is:

- syllabus coverage,
- the length of the question paper,
- the mark allocation of the question paper and whether it agrees with policy,
- the differentiation between the higher Grade and standard Grade (only if both the papers belonging to the same set are sent for moderation together);
- the type and levels of difficulty of questions within a question paper; and
- the weighting of the different types of questions.

In addition to the functions mentioned above, Umalusi plays a critical role in ensuring that the CASS scores of learners do not deviate drastically from their examination scores. This is done by effecting statistical moderation to all CASS and examination scores. This is perceived as an essential tool to address the validity and reliability of the CASS scores and to ensure that the quality and standard of the Senior Certificate examinations is not affected by the inclusion of the CASS marks (Umalusi, 2002a).

Although Umalusi supports the introduction of CASS into the Senior Certificate examination, it is nevertheless concerned that CASS is not implemented sufficiently well or effectively to ensure that the CASS marks awarded to learners are valid and reliable (SAFCERT, 2002b). A major observation made by Umalusi is that educators in general are poorly trained in assessment and are therefore poorly equipped to implement CASS satisfactorily.

A discussion on the role of assessment in a broad context is presented in the next section.

2.5 The role of Assessment

The term "assessment" in education is not a new concept. It is what educators have always been involved with. However, it has become more pronounced in South Africa since the introduction of OBE (Sieborger & Macintosh, 1998). Assessment in OBE is associated with change and improvement in the way learning takes place. For the learners, assessment must motivate them to improve on past performances. This can be achieved by using results positively (Sieborger & Macintosh, 1998). Assessment must be seen as an integral part of the learning process.

First the definition, purpose and objectives of assessment will be discussed in 2.5.1 followed by the reasons for the introduction of OBE in South Africa in 2.5.2 and 2.5.3 examines the formative role of CASS.

2.5.1 The definition, purposes and objectives of assessment

Definition of Assessment

In a broad sense the term assessment may be defined as "an ongoing process aimed at understanding and improving student learning. It involves making our expectations explicit and public; setting appropriate criteria and high standards for learning quality; systematically gathering, analysing, and interpreting evidence to determine how well performance matches those expectations and standards; and using the resulting information to document, explain, and improve performance"

(Angelo, 1995, p. 1). This definition implies that assessment has both a formative/diagnostic and summative function. In addition, the entire assessment process is seen as being transparent and learners are informed in advance of what is expected from them. In a narrower sense Van der Horst and McDonald (1997), define assessment as all those activities undertaken by educators and learners in making judgements about themselves. This provides information to be used as feedback to modify the teaching and learning activities in which they are engaged. However, the above definitions have a common thread and that is, it is aimed at improving learner performance.

According to an unpublished document by SAFCERT, titled, "External Moderation System for School - based assessment for the Senior Certificate" (SAFCERT, 2000, p. 2), assessment is defined as, "the process of identifying, gathering and interpreting information about a learner's achievement in order to assist the learner's development and improve the process of learning and teaching and provide information about a learner's level of competence at the completion of a Grade, level or programme."

The above definition includes the application of continuous formative assessment, feedback to the learner with the aim of improving learner development and performance, modification to the teaching and learning process and decision making about the learner's level of competence. The follow - up and feedback given to learners is fundamental to the learning process.

Purposes of Assessment

Freeman and Lewis (1998), indicate that the two main purposes of assessment are to select or certify and to stimulate learning. In this context selection and certification is associated with the educator being judgmental and making decisions about the learner's performance whereas assessment for learning adopts a more developmental approach with feedback being more important than the grading of the learner's achievement. The point is that on the one hand the judgment is to select or certify, and at the other hand the judgment is aimed at feedback for improvement. In the current education system the emphasis is on the developmental aspect of learning, where learners are able to advance and make

planned progress in their learning. Assessment in OBE is ongoing, which means that a learner's progress will be monitored continuously (Van der Horst & McDonald, 1997). Ongoing assessment is also referred to as "Continuous Assessment (CASS)."

Objectives of Assessment

The Green Paper on Education (1998b) indicates that assessment has two distinct, but related objectives. These objectives are the same as mentioned by Freeman and Lewis (1998) above, wherein assessment is used to select or certify and has a summative function, and assessment used for developmental purposes, namely to enhance the formative function. The Green Paper adds that at the macro level, assessment must provide reliable and valid information regarding learner achievement and competency. This will ensure the legitimacy and currency of qualifications, especially exit qualifications such as the Senior Certificate examinations with future employers, with Higher Education institutions and the public in general.

Secondly, at the micro - level, assessment must be developmental and formative, to provide guidance to learners through appropriate evaluation and feedback. With meaningful feedback received from educators, learners must be able to make progress in their own learning. It is important at this stage to elaborate on the merits of formative assessment since although it is much talked about, very little is done to ensure that CASS is being implemented in a formative way.

Formative assessment gives the teacher and the learner information about whether the learning objectives or outcomes have been reached with the purpose of improving the learner's performance. The feedback to learners focuses on the areas of strengths and weaknesses and the potential of learners (Jones & Bray, 1986). Informing learners of their areas of weakness immediately after a task has been performed will enable them to correct themselves since the work is fresh in their minds. It is also important that the educator informs learners about their strengths and potential since it serves as a source of motivation. The more immediate the feedback to the learner, the more useful the information. The teacher too needs constant feedback on whether the teaching/learning outcomes

have been achieved (Jones & Bray, 1986). This will enable her/him to plan future lessons in such a way that she/he is mindful of whether the outcomes of the previous lesson/s have been achieved.

The opposite of formative assessment is *summative assessment*. Whilst formative assessment is developmental in nature and informs an educators planning, summative assessment is conducted at the end of a lesson, a unit or a course (Van der Horst & McDonald, 1997). Summative assessment also shows how much the learner has achieved by a certain stage (Sieborger & Macintosh, 1998) and usually takes place in the form of a test or an examination, where a learner demonstrates whether she/he is able to achieve the outcome/s of the content/skills being assessed.

Although a clear distinction is made between formative and summative assessment, summative assessment conducted during the course of the year may be included as part of the formative assessment. In this instance the summative components (tests and mid - year examinations) should play a more formative function since the feedback from these components can help to improve learner performance. On the other hand, the marks obtained through CASS (formative assessment) are added to the marks obtained by learners in the summative assessment. In other words CASS forms part of the summative assessment. Hence there is a dual function played by both formative and summative assessments.

Also of importance is the conduct of *formal assessment*, compared to assessment conducted in an informal way. Whilst formal assessment refers to assessment that is specially planned and is not part of the normal classroom teaching and is always announced to the learners before it takes place; *informal assessment* is assessment that is carried out as part of normal classroom teaching where learners are unaware that they are being assessed. Informal assessment activities include homework, the answering of questions in class during lessons, participation of learners during group sessions, oral and practical work, etc. (Sieborger & Macintosh, 1998). Formal activities include the writing of tests,

examinations, project work and assignments, where learners are aware of such assessments and are given adequate time to prepare for the assessment task.

The next section focuses on some of the reasons for adopting CASS in South Africa.

2.5.2 Why Outcomes - Based Assessment?

The shift from a content - based approach to an outcomes based approach to teaching and learning was introduced amid political pressure (Sieborger, 1997). It was seen as a logical and essential part of the transformation envisaged in new policies (DoE, 2000c). Sieborger (1997) makes the following statement about the reason for the introduction of OBE in South Africa, "a new curriculum had to be in place before the 1999 general election, as the government had to be seen to be delivering on its promises in education. According to Jeevanantham (1998), the introduction of OBE in South Africa is also in response to international trends in educational development. The aim of this new curriculum is to provide equity in terms of educational provision and to promote a more balanced view, by developing the learner's critical thinking powers and their problem - solving abilities (Van der Horst & McDonald, 1997).

The new Outcomes - Based Assessment policy for the General Education and Training band for Grades R - 9 and Adult Basic Education and Training was introduced to schools in 1998. However, its implementation was later reviewed by a Ministerial Committee in 2000, when it was recommended that the curriculum needed strengthening and streamlining on the basis of its alignment to assessment, the need to improve teacher orientation and training, learning support materials and provincial support (DoE, 2002b). Subsequently in 2001, these revised National Curriculum Statements were sent for public comment and introduced to schools in 2002 as a streamlined and strengthened version of Curriculum 2005 affirming the commitment to OBE (DoE, 2002b).

The new curriculum and methods of assessment impacts on how educators teach and how they should be trained to be able to successfully implement the new

system. According to the report on the Norms and Standards for educators (Welch, 1999), the assessment practices of a programme must be applied and integrated. This means that the programme must lead to the application of knowledge and skills and assess the extent to which learners are able to integrate the knowledge and skills delivered through the different courses that constitute the programme (horizontal integration). The report adds that the assessment practices of a programme must be so designed as to permit the learners to demonstrate practical, foundational, and reflexive competence, and must assess the extent to which learners are able to integrate these competencies. Integrated and applied competencies must be ongoing, developmental, and contextualised. In the real life situation, the integration of theory and practice is important to the learning process.

The first document to be drafted to address curriculum and assessment policy issues in the Further Education and Training band (FET)[3] is the National Curriculum Framework for Further Education and Training (DoE, 2000c). In this document, the Minister of Education, indicates that, "the integrated education and training will stimulate and empower learners to acquire and apply knowledge, skills and values to confidently and creatively respond to the challenges of the changing social, political and economical environment through lifelong learning" (DoE, 2000c).

Through the South African Qualifications Authority Act No. 58 of 1995, the NQF provides for an integrated FET system that will ensure, amongst others, the following (DoE, 2002d):

- nationally agreed upon outcomes
- a single system of qualifications
- articulation among various programmes, qualifications and providers
- accumulation and transfer of credits
- international comparability of qualifications

[3] The FET band covers learning, teaching, assessment and qualifications of all learners in Grades 10-12 in the school system and N1-N3 in the Technical College system.

This framework also addresses issues on Assessment and Quality assurance. It stipulates that assessment and a system of quality assurance are fundamental to ensuring that FET programmes meet the needs of learners, communities, employers and society. Since curriculum and assessment cannot be separated, assessment at Grade 12 has also undergone fundamental changes.

Assessment of learning is an essential element of OBE where use is made of alternative forms of assessment such as practical work, portfolios, projects, investigations and the use of problem solving approaches for the purpose of grading and reporting (Van der Horst & McDonald, 1997; Black & Wiliam, 1998). The new assessment system deviates from the traditional content - based methods of assessment such as exams and tests. These traditional methods may not have given learners adequate and appropriate opportunities to reveal their knowledge, skills, values or attitudes (Van der Horst & McDonald, 1997). Through the adoption of OBE in South Africa, 7 critical outcomes and 5 developmental have been identified to promote an integrated approach to education and training. The critical outcomes require learners to be able to:

- identify and solve problems and make decisions, using critical and creative thinking;
- work effectively with others as members of a team, group, organization and community;
- organize and manage themselves and their activities responsibly and effectively;
- collect, analyse, organize and evaluate information critically;
- communicate effectively, using visual, symbolic and /or language skills in various modes;
- use science and technology effectively and critically and showing responsibility towards the environment and the health of others; and
- demonstrate an understanding of the world as a set of related systems by recognising that problem - solving contexts do not exist in isolation.

On the other hand, *the developmental outcomes require learners to be able to:*

- reflect on and explore a variety of strategies to learn more effectively;
- participate as responsible citizens in the life of local, national and global communities;
- be culturally and aesthetically sensitive across a range of social contexts;
- explore education and career opportunities; and
- develop entrepreneurial opportunities.

OBE is based on the philosophy that all learners can learn and achieve, the focus is on learning by doing, learning how to learn, learning through experience and using critical contextual information for analysis. Learners gradually become responsible for their own learning and progress, and are constantly motivated by feedback and positive comment on the value of their efforts (DoE, 2000a). The outcomes encourage a learner - centred and activity - based approach to education (DoE, 2002a). The focus is on changing the approach to teaching, learning and assessment.

According to the Department of Education (2001b) the inclusion of CASS at Grade 12 level is aligned to the principles of outcomes - based assessment. Ideally this type of assessment should:

- promote learning
- be adequate, comprehensive and authentic
- be continuous; and
- include a formative and summative component.

In terms of section 5 of the schools policy document, titled, *A Résumé of Instructional Programme in Schools, Report 550* (DoE, 2001g), Continuous Assessment must be a compulsory component of the final promotion marks at the end of Grade 12. This became policy in 2001 and is supported by research and development that indicates that CASS must be conducted in a formative and diagnostic manner (DoE: 2000d). This so-called 'formative assessment' aims at improving the quality of student learning through its constant feedback to the

learner regarding the achievement of the learning outcomes (Angelo and Cross, 1993). Formative assessment is aimed at improving learner performance. The formative role of CASS is discussed in 2.5.3.

The reasons for introducing CASS as part of the final promotion mark (which refers to the summative function of CASS) in South African schools is based on the following principles (DoE, 2000a):

- assessment is ongoing and therefore learners are compelled to work consistently and this will contribute to the culture of teaching and learning;
- learners will be assessed using different and appropriate assessment methodologies and this will provide a more valid assessment of the learners' performance;
- assessment will now take place in an authentic context, i.e. the learner will be assessed in a realistic situation which is integral to the learning process;
- assessment will feed back immediately into the learning process, thus promoting the formative role of assessment;
- assessment of the learner's performance (summative assessment) will now be carried out by the educator who works closely with the learner.

CASS was introduced to expand the education system from one that is content driven, where rote learning takes place with theory - based external examinations, to a system where the emphasis is on understanding and contextual application and where a multitude of assessment methodologies with the retention of equity, norms and standards are used to assess learners (DoE, 2003a). Learners will now be assessed on an ongoing basis with different assessment methodologies aimed at assessing different skills. The Department of Education stipulates that CASS at Grade 12 should comprise the following (DoE, 2000a):

- assessment of oral and practical work
- assessment of classroom based work

- class tests
- assignments, homework
- portfolios
- projects, and
- controlled tests and examinations including preparatory examinations.

Continuous assessment must be formative and developmental, if it is not, it loses its meaning. The next section examines the formative role of CASS.

2.5.3 The Formative Role of Continuous Assessment

Assessment in *Curriculum 2005* is intended to be continuous, formative and criterion - referenced (Cowie, 1996). This assessment checks, on an ongoing basis, whether the learning outcomes have been achieved through activities that are centered on the learner performing tasks or assignments that are teacher directed and facilitated to meet the expected criteria (Clarke, 1997). This so - called “formative assessment” aims at improving the quality of student learning through its constant feedback to the learner regarding the achievement of the learning outcomes (Angelo & Cross, 1993). Such assessment becomes formative assessment when the evidence is actually used to adapt the teaching work to meet the needs of learners (Black & Wiliam, 1998) and help shape the learner through the learning process (Van der Horst & McDonald, 1997).

Formative assessment is aimed at improving learner performance. Harlen and James (1997) (cited in Klenowski, 1999, p.39), indicate that "it is knowing about pupils existing ideas and skills, and recognising the point reached in development and the necessary steps to take is formative assessment. Formative assessment is integral to teaching, and "learning with understanding depends on it."

For the learner, formative assessment assists in the development of skills, understanding of content and the acquisition of values and attitudes (Clarke, 1997; Kahn & Volmink, 1999; Kahn, 2000). The learning outcomes are stated before a learning activity occurs and are used to measure achievement of the learner’s performance in the activity against the specified criteria of achievement (Sieborger

& Macintosh, 1998). In this way the learner is focused on working towards the outcomes during the activity and is then able to measure her /his ability using the criteria (Kahn & Volmink, 1999).

For the teacher, formative assessment assists in informing planning, describing learning outcomes in terms of specified criteria, which makes assessment fair and honest (Johnson, 1998). Formative assessment in the context of the classroom requires that educators have a body of scientific knowledge and skills associated with the content to be taught and an understanding of how students are likely to learn it, a knowledge of the progression of ideas within the topic being taught and an ability to recognise where students are in their development (Sieborger & Macintosh, 1998). The individual teacher decides what to assess, how to assess, and how to respond to the information gained through the assessment (Angelo & Cross, 1993).

Harlen and James (cited in Klenowski, 1999, p.38) also add that, "formative and summative purposes of assessment have become confused in practice and that as a consequence assessment fails to have a truly formative role in learning." This implies that educators are treating all assessment as if it counts towards the summative aspect of the assessment. This could be the case if educators are unable to differentiate between the two types of assessment or if for example educators are focused on the completion of the syllabus rather than on ensuring that meaningful teaching and learning is taking place. Proper planning, guidance and knowledge about how to conduct assessment in a formative way needs to be addressed.

The next section examines the current status of CASS at Grade 12 level.

2.6 The current status of CASS at Grade 12 level

This section examines the phasing-in of CASS by the various provincial examining bodies (2.6.1) and the problems experienced at school and at classroom level (2.6.2)

2.6.1 The Phasing - in of CASS at Grade 12 level

Prior to 2001, assessment in most provinces at the Senior Certificate level was based on a single summative examination written as an external examination that was set and conducted at provincial level. A learner's promotion therefore depended on how well she/he performed in the external written examination. Marks accumulated throughout the year for other assessment tasks were not considered as part of the learner's promotion mark. However, certain provincial examining bodies, for example, Gauteng, Northern Cape and the Western Cape Department of Education, had, prior to 2001, already introduced CASS at Grade 12 level (DoE, 2001b).

Table 2.5 The phasing - in of CASS by provincial education departments

Year	Choice	Province	Chosen Method
1999	Pilot	Gauteng	CASS implemented and Statistical Moderation Pilot run
		Northern Cape	CASS implemented and Statistical Moderation Pilot run
		Western Cape	External Moderation of CASS marks
		Other Provinces	No CASS implementation
2000	Optional	Gauteng	Fully implemented
		Northern Cape	Fully implemented
		Western Cape	External Moderation of CASS marks
		Other Provinces	Adjust examination mark by 1.25% in all subjects
2001	Mandatory	For all provinces	Full implementation of CASS and Statistical Moderation

Source: (DoE, 2001b)

The phasing - in of CASS as a pilot by Gauteng, Northern Cape and Western Cape in 1999 enabled these provinces to gain more experience and prepare their educators for the implementation of CASS that became mandatory for all

provinces in 2001. The level of readiness to implement CASS in these provinces was therefore better than those provinces where CASS was being implemented for the first time in 2001. Provinces that implemented CASS for the first time in 2001 were the North West, Limpopo, Mpumalanga, KwaZulu - Natal, Free State and the Eastern Cape.

The majority of educators need guidance in CASS, due to the unfamiliarity with its implementation requirements and procedures. To help guide educators in the new format and structure of the national question papers, subject guidelines were prepared in each subject. National guidelines on CASS for these subjects were also developed. However, it must be indicated that not all schools were provided with these guideline documents, although they were made available to provincial examining bodies.

Towards the end of 2001, some schools were still making enquiries regarding where they could obtain the CASS guideline documents for the national subjects. Apart from these guideline documents in the six national subjects, there is no evidence of policy that provides details on what CASS is all about, how CASS should be conducted in the different subjects, what aspects of the syllabi should be examined for CASS, how the assessment should be conducted, how the evaluation of the evidence produced by the learner should be assessed and how the results should be interpreted and recorded.

The implementation of guideline documents

The National guideline document for the implementation of CASS at Grade 12 (DoE, 2000a), stipulates that before a provincial education department decides to adopt CASS the following key measures must be in place:

- clear guidelines on CASS be drafted per subject;
- educators are trained on the implementation of CASS; and
- appropriate moderation mechanisms are in place

The document also adds that the provincial education departments will be responsible for the implementation of CASS and this will include:

- training teachers to use the manuals and guidelines provided;
- providing the necessary infrastructure and human resources to do face moderation. Face moderation entails personal (face to face) interaction between the moderator and the learner whereby the learner's portfolio (evidence of assessment) is examined and validated against the results achieved by the learner; and
- statistical moderation throughout the province. Statistical moderation refers to the statistical adjustment made to the CASS scores so that it does not deviate significantly from the examination scores (Umalusi, 2002a).

Although some provinces have taken the trouble of drawing up provincial guidelines to support educators in the implementation of CASS, other provincial examining bodies have yet to address issues adequately on the implementation of CASS. The North West Department of Education has developed a provincial guideline for educators on CASS. These guidelines are extremely important to ensure that all educators involved in the implementation of CASS at Grade 12 level, know and understand what is expected of them. The North West department has gone a step further and has recently promulgated policy in respect of the conduct, administration and management of assessment in the Senior Certificate within the province. This is what all provincial examining bodies should have done. In addition to this general policy, there should be a subject manual/policy in each of the senior certificate subjects.

The subject must provide clear direction on the following:

- number of tasks to be completed for the year;
- a breakdown of the tasks in terms of the topic/sections of the syllabus and the nature and type of tasks, for example, tests, assignments, practicals and projects so that CASS is integrated into the teaching and learning programme;
- the weighting and grading of the questions; and
- exemplars for each type of task together with the appropriate assessment criteria or rubric.

The provincial CASS guideline of the North West province reads, “to ensure that the CASS marks are compiled in a consistent manner throughout the province, the following guideline is supplied to educators” (North West Department of Education, 2001):

- CASS marks must be compiled using a number of evaluation methods that determine the learner’s progress continuously;

- CASS marks must be determined accurately in accordance with the learner’s performance and the provincial standard required for the specific subject. This process therefore also measures the ability of the educator to determine an accurate mark in accordance with the provincial standard expected for the specific subject;

- class tests that cover only a small part of the syllabus and where learners obtain high marks cannot be used for the CASS mark because this will increase the CASS mark unrealistically and bring the learner under a false impression as to the standard expected for the subject; and

- class tests covering larger parts of the syllabus, for example a module or learning unit, according to the expected standard, must be used for the calculation of the CASS mark**.**

A major criticism is the reference to “provincial standard” when in fact the standards that apply to one examining body should apply to all such examining bodies. The standard of the national question papers and the memorandums could be used as a benchmark to achieve national standards. All examining bodies should therefore work towards the attainment of national standards.

The problem of CASS implementation will now be discussed.

2.6.2 Problem of CASS Implementation at school and at classroom level

Much has been written in South Africa on schools where the necessary "ingredients" for successful policy implementation are lacking (DoE, 2000a; Malan, 2000; Kanjee et al., 2001). In spite of the evidence put forward over the last thirty years showing the powerful influence of assessment, particularly in high stakes examinations, it is still the most neglected aspect of curriculum policy (Pahad, 1998). Although this statement was made five years ago, the situation in terms of the implementation of assessment has not changed much.

In 1999, South African Democratic Teachers Union (SADTU) made the following comments regarding assessment and change:

> The process of change, brings with it uncertainty and resistance. As curriculum 2005 is in the process of unfolding we need to voice our concern over the incapacity of the Department of Education to deliver this change effectively. Firm commitment from the Department of Education to capacitate teachers to deliver Outcomes Based Education via Curriculum 2005 is lacking (SADTU, 1999).

This statement was made as a result of the concerns raised by many educators who felt that the Department of Education should make provision for the training of educators to implement CASS and that the grooming of educators should be done well before the implementation date.

In 2002, the Report on the Investigation and Advice on a Single Examination and Assessment System states that, "even the most excellent educators find it difficult and challenging to undertake assessment on their own, and many inspired practitioners are not good at assessment" (Department of Education, 2002c).

The comments by Pahad (1998, p. 247) when she states that, "*there is very little practical help for teachers and other practitioners trying to assess learners within the new outcomes based curriculum*" are to be supported. Pahad indicates that whilst a general understanding of the need for a paradigm shift on assessment has

been acknowledged, the actual implementation is hampered by a lack of understanding of the complexity of the issues involved.

When CASS became policy in 2001, very little attention was paid to its implementation. Ideally, what should have been done prior to its implementation is that educators should have been trained to deal with the changed methodology of assessment according to the OBE approach. However, policymakers tend to assume that decisions to bring about change automatically result in changed policy or changed institutional behaviour. This accounts for a lack of planning of the implementation following upon the decision. At this stage it is important to also mention that CASS was promulgated as policy in August 2001, eight months after its implementation date. The policy document records the following:

"Continuous assessment must be a compulsory component of the promotion marks. The continuous assessment component must be at least 25 per cent, with a maximum of 50 per cent of the mark on the report card, or of the promotion mark" (DoE, 2001d).

Apart from the above - mentioned policy statement, there is no other policy to regulate the implementation of CASS. The decision to introduce CASS as policy was soon to be followed by the implementation itself. This left very little time for preparing educators to successfully manage the implementation process.

The introduction of CASS as policy also suggests that it will be implemented uniformly across all provincial examining bodies. This is however not the case. In practice, where educators are expected to perform the same functions, there will be marked differences in the manner in which these will be executed. The reason for this is simple. There is yet no clear policy, which provides consistency and coherence in each subject across the examining bodies. Diverging policies can only result in confusion amongst educators and learners. This became evident in a report by Umalusi addressed to the Minister of Education. The report indicates, "although the CASS policy/guideline documents are available at provincial and school level, and these have been used as the basis for the composition of the provincial policy, in certain provinces deviation from the national policy has been

noted as in the following instances, Gauteng (Mathematics), Limpopo (Physical Science), Eastern Cape (Mathematics), KwaZulu - Natal (Mathematics) (Umalusi, 2002a).

If this is the case, then one may argue that CASS is not being implemented uniformly across provinces. In addition, differing interpretations of policy concepts and definitions impact on the effectiveness with which educators are able to perform their functions. This becomes clearer when one looks at the practical implementation of CASS in the nine provinces. According to Umalusi (2002a), "educators tend to deviate from the provincial guideline document and this could be as a result of educators being unable to accurately interpret the document due to a lack of guidance and training".

There is also a perception that the only reliable results in assessment are those that are achieved in the external examination - one cannot rely on teachers for accurate assessment (Oberholzer, 1999). This statement was made as a result of the discovery of huge disparities between the external written examination component and the internal oral component for the province as a whole and for five schools within KwaZulu - Natal. Oberholzer questions whether the difference of 28% between the two components is acceptable. She further asks, whether such a difference does not also indicate a difference in the standards applied in the two components. The comparison of the results achieved in the oral component against the achievement of the same candidates in the written examination raises some important questions about the reliability and validity of both the assessment and the assessment processes.

This brings to mind the situation experienced in the 2001 and 2002 Senior Certificate examination where huge differences were discovered between the marks obtained through school - based assessment and the marks obtained in the summative assessment at certain examination centers. In this regard, Umalusi claims that this may be partly attributed to the fact that there is great variance in the standard and suitability of CASS tasks assigned to learners amongst and within the various examining bodies (Umalusi, 2002a).

NAPTOSA is of the view that 'assessor standards' need to be included in the compulsory core learning categories for all future teacher qualifications, particularly for those in the schooling sector. The document adds further that many educators in the past (and certainly those who qualified prior to the early 1990's) were seldom taught about assessment. The motivation for expecting educators at Grade 12 level to be qualified assessors, is that CASS is part of the assessment towards awarding the qualification (FETC) and that, as such, this assessment is as important as the external summative assessment. Based on this premise, it is therefore essential that learner performances assessed in the classroom should be based on sound educational/assessment principles and should meet quality assurance requirements in terms of its fairness, validity and reliability.

It is without doubt that the effective implementation of CASS relies largely on the competence and professionalism of educators. The government's decision to implement a curriculum based on the tenets of OBE will therefore only be successful if teachers are adequately prepared for this challenge (Van der Horst & McDonald, 1997).

It is apposite to quote from a memorandum written by William Spady (1999, p. 3) to the Minister. The paragraph reads:

"*As they now exist, high schools are the least Outcomes - Based institutions on the planet (except for Universities). They will need time to assimilate these ideas and models - in multiple stages of implementation and refinement. This cannot be accomplished in two - week training for teachers on how to use curriculum materials. It will take years, and you need a highly qualified design team to begin work on how to tackle that 'system change' challenge right now*."

The statement is to be supported for the reason that it will take time for educators to digest the new approach. A series of workshops or training sessions is needed to cultivate assessment skills in educators, subject advisors and education managers.

2.7 Conclusion

Mass of research evidence indicates that OBE was introduced in South Africa as a result of both political pressure, the need for accountability and the need to participate in a global society (Sieborger, 1997; Jeevanantham, 1998). The sudden introduction of continuous assessment (CASS) in the FET band raises important questions on educator preparedness to deal with the challenges of its implementation. As indicated by Spady (1999) even a two - week training session is insufficient to adequately equip educators with the necessary knowledge and skills to meet the challenges of CASS.

Given the fact that the Mathematics and Science results in South Africa are generally poor (Howie, 2001), it is plausible that the effective implementation of CASS in these subjects may lead to significant learning gains (Black & Wiliam, 1998).

Since the integrity and credibility of examinations is always a matter of public concern and the fact that the results must show continued reliability and public acceptability, the adoption of statistical moderation and various quality assurance measures is currently the only mechanisms used to ensure the validity and reliability of the examination marks.

The next chapter therefore examines the moderation and quality assurance procedures adopted by the Department of Education and Umalusi to ensure the credibility of the Senior Certificate examinations.

CHAPTER 3

THE MODERATION AND QUALITY ASSURANCE OF THE SENIOR CERTIFICATE EXAMINATIONS

Overview of the chapter

This chapter examines the moderation and quality assurance measures adopted by the Departments of Education and Umalusi to ensure the integrity and credibility of the Senior Certificate examinations. The Senior Certificate examinations (also referred to as the 'matric' examination) is the first formal qualification awarded to learners after 12 years of formal schooling and has become one of the main focuses of attention for social and political comment (Oberholzer, 1998). The Government of South Africa in collaboration with the Ministry of Education must adopt suitable quality assurance measures to ensure that national standards for the awarding of a school exit qualification to a learner has been fully met.

Further, the result of the Senior Certificate examination is presently the only indicator of how well the South African education system is performing. Given the social, political and economic importance of the matric examination, it is also necessary that the examinations are of an acceptable standard and quality so that the results can be considered as fair, valid and reliable.

Since 25% of the Senior Certificate results are constituted from CASS, it is essential to reflect on how this component is compiled so that the extent of its fairness, validity and reliability can be endorsed.

3.1 Introduction

Moderation can be defined as "a quality assurance process of ensuring the validity of the assessment instruments, fairness of the assessment processes and reliability of the assessment decisions by all assessors, according to agreed standards" (SAFCERT, 2000). The word "assessors" refer to educators, examiners, moderators and verifiers involved in the moderation and quality

assurance of all aspects of the Senior Certificate examinations. Quality assurance on the other hand refers to structures and systems that operate from the school level up to national level to ensure that the degree of excellence, standard and quality that is specified is achieved (SAFCERT, 2000, p. 1). Moderation can be seen as one of the quality assurance measures adopted at various stages of the assessment process to ensure that the assessment has been conducted in line with agreed practices, so that the results can be declared as fair, reliable and valid (Umalusi, 2002b). Hence moderation is one aspect of quality assurance and is used to support quality assurance. Quality assurance in the school context is achieved through a process of moderation.

However, for moderation and any other quality assurance measures to take place there must be systems and structures established to handle the logistics of the task. Other quality assurance measures include the internal and external moderation of question papers, the moderation of the CASS marks, the verification of the CASS marks, the monitoring of the conduct of the examinations, the monitoring of the marking process and the auditing of the examination marks as well as the statistical moderation of the CASS marks and the standardisation of the examination marks (Umalusi, 2002b).

Section 3.2 presents a discussion on the above - mentioned moderation and other quality assurance measures and is followed by section 3.3 which shows how the Senior Certificate results are calculated. Section 3.4 looks at the principles of assessment, namely, fairness, validity and reliability, and section 3.5 examines the compilation of portfolios by learners and the evaluation of the portfolios by educators according to the agreed assessment criteria /rubrics.

3.2 Moderation and Quality Assurance of Assessment at the Senior Certificate level.

The moderation and quality assurance of the Senior Certificate examinations for public schools is the responsibility of the Departments of Education and Umalusi. The Departments of Education refer to the nine provincial education departments and the national department of education since collaboratively they are

responsible for the conduct of assessment at Grade 12 level. Whilst the provincial education departments are currently responsible for setting the majority of the Grade 12 examination question papers, the national department of education through the Chief Directorate: Public Examinations and Administration has since 2001 taken the responsibility for the setting of common question papers in five critical subjects namely, Accounting, Biology, English Additional Language, Mathematics and Physical Science. In 2003, a sixth subject, namely History was also examined at national level.

The departments of education are also regarded as assessment providers/provincial examining bodies and are required by the Umalusi Act to be registered with Umalusi (SAFCERT, 2002a). Umalusi is the independent quality assurance body that has been established in terms of the General and Further Education and Training Quality Assurance Act (58 of November 2001) to quality assurance the assessment processes leading to the issuing of certificates to learners at Grade 12 level (SAFCERT, 2002a). A number of quality assurance measures are adopted by both the examining bodies and Umalusi to ensure that the Senior Certificate examinations are of a high quality and of the acceptable standard, each of them being briefly discussed.

The internal and external moderation of examination question papers

In the current Senior Certificate examinations, the provincial examination question papers are set by a provincial examiner/s and are internally moderated to ensure that the assessment instrument is of the appropriate standard and meet the requirements as indicated in the provincial subject guidelines. However, since Grade 12 is the final exit level examination of the schooling phase, all examining bodies both public and private are obliged to submit their Grade 12 examination question papers to Umalusi for external moderation. To fulfill this function, Umalusi appoints subject specialists as external moderators to ensure that the question papers across examining bodies are of the appropriate standard and meets the requirements as stipulated in the subject guidelines and core syllabi.

However, a major concern is that the guidelines of the different examining bodies may not be the same although they are based on the interim core syllabus. The differences emerge in the manner in which the core syllabus is interpreted by the educators, examiners and moderators of the different examining bodies. Despite the external moderation of question papers by Umalusi, one cannot state with confidence that the examination question papers of all examining bodies are of the same standard and quality. Relating to this issue, Umalusi reported the following to the Minister of Education (SAFCERT, 2002b, p.15):

"*Despite careful attention and diligence of competent and experienced examiners, moderators and markers, it is impossible to determine whether a question paper is actually of the required standard until it has been written and marked*."

Although, all the question papers are moderated by Umalusi, it also happens that, "papers get sent to the printers before they are sent for moderation" (DoE, 1998a, p. 26). This illustrates the negligence of examining bodies to comply with the regulations stipulated by Umalusi. There may also be instances where a question is asked in an examination paper that has not been taught in the classroom or is not covered by the syllabus. An example of such a situation is captured in the following marker's comment (DoE, 1998a, p. 20):

"*I came across many scripts where students claimed that they met books for the first time in the examination room. As a result of this, a number of candidates handed in their answer books without anything written on them. Most of the candidates wrote little notes at the end of their answers to say that they did not read the books, they did not understand, they were not taught and that they read books that were not prescribed*."

It is evident that it can be quite dangerous not to have the examination question papers internally and externally moderated before the conduct of the examination. The role of the Umalusi moderators is critical in this regard. For learners to be examined on aspects of the syllabus or books that they have not studied in class is totally unacceptably and unfair. Surely, examining bodies, educators, examiners and moderators must know the work to be covered and the books to be consulted

in preparing learners for tests and examinations? Assessment is unfair when learners do not know what is expected of them (McMillan, 2001). In instances like these it is the function of Umalusi to determine the correct measures to be taken to ensure that learners are not disadvantaged in any way.

On the other hand, the six common question papers set by the national Department of Education does ensure that there is consistency in the external assessment of these subjects across the provincial examining bodies. The setting of common question papers takes place through the appointment of a panel of examiners (4) who have had at least three years of experience in the setting of examination question papers at provincial level. Consistency in the setting of question papers is ensured through the development of national subject guidelines, which are disseminated to all public examining bodies for implementation. As with the provincial question papers, the national question papers are also internally and externally moderated, with the external moderation conducted by Umalusi to check that the question papers are of the appropriate standard and meets all the subject requirements as specified in the subject guideline documents.

The moderation of the CASS mark

It is highly unlikely that Grade 12 educators across the country in the different subjects are able to assess learners according to the same standards. Many reports and official documents have indicated that the implementation of CASS is problematic and that the results from CASS cannot be accepted as is (DoE, 1998a; Spady, 1999; DoE, 1999a; DoE, 2001b).

According to the report on the investigation into the Senior Certificate Examination by the Ministerial Committee (1998a), concern was raised about the introduction of CASS at Grade 12 level. This report recommended to the Minister that CASS should not be introduced at Grade 12 level until a monitoring mechanism is in place to monitor the relationship between internally and externally derived marks (DoE, 1998a). However, this recommendation was not followed through. During this period, it was indicated that some schools, for example, record a far higher average mark for CASS than their learners obtain for the external portion. These

inequitable results lead to a situation where certain learners are advantaged and others are disadvantaged depending on the school from which they come. Learners attending a school where the CASS marks are inflated will ultimately receive better marks than those learners coming from schools where the CASS marks are closely aligned to the examination marks (DoE, 2001b).

When CASS was officially adopted as part of the Senior Certificate results in 2001, it became necessary to adopt quality assurance measures that would enhance the fairness, validity and reliability of the CASS marks, especially since CASS forms part of the assessment of a learner's achievement at the school exit level and leads to a qualification that must be credible. Although examining bodies were required to establish systems and structures for the moderation of CASS at various levels, for example, at school, cluster, district and or provincial level, it has been established that the operation of these systems and structures are not fully functional and in some cases are non - existent (DoE, 2002c). Currently, the main concern about the moderation of CASS is that it is not being effectively handled at school, district and provincial level (Oberholzer, 1999). In this regard, Umalusi (2002a) indicates that each assessment body has a moderation plan, however, they fail to effectively implement the provincial moderation plans and this is attributed mainly to a lack of human resource capacity. In addition, Umalusi (2002a) also states that the absence of constructive comment and feedback from moderators to both educators and learners suggests that moderation is not being done with a view to improving the suitability, quality and standard of the assessment. If this is the situation, how can we be certain that the marks obtained by learners for CASS are accumulated in a fair, valid and reliable manner?

To eliminate problems relating to the fairness, validity and reliability of the CASS marks, it is essential that all examining bodies ensure that they have effective moderation systems in place and that moderation is implemented according to agreed principles and criteria so that the CASS marks can be accepted as fair, valid and reliable. In addition, moderation at school, cluster/district/regional level should be carried out by suitably, skilled and qualified assessors/moderators who are also subject specialists. In this way, problems relating to the assessment of the learner or the aspect of the work can be diagnosed and rectified immediately

rather than leaving the moderation to take place at the end of the academic year as is currently the practice. A strong recommendation from concerned departmental officials is that moderation should be an ongoing exercise. This would ensure that there is ongoing external check on the standards of assessment operating at the school. Further, there must be some control mechanism in place to evaluate the manner in which CASS is being conducted. This control mechanism could entail the submission of the learner's CASS marks together with their portfolios to an external official at the end of every school term. The aim of this exercise is to determine whether educators are implementing CASS and to check on the standard and quality of the CASS tasks.

It is envisaged that the adoption of such an approach would produce the following advantages:

- it is easier to moderate small amounts of work than moderating all the work at the end of the year;
- immediate feedback can be given to educators which will assist to remedy problems areas;
- learners who are performing poorly can be attended to;
- learner absenteeism can be detected; and
- poor standard and quality of CASS can be detected and remedied.

To ensure equity of the CASS marks, face moderation should be coupled with statistical moderation. Face moderation is the term used to describe the personal interaction between the moderator and the learner whose CASS marks are being verified. It provides an opportunity for the moderator to ask questions on the activities and tasks submitted as part of the CASS requirements. Face moderation could be conducted internally by the subject head at the school level and thereafter verified by an external moderator at district/cluster/provincial level. The purpose of face moderation is to ensure that the mark allocated to a learner for a particular task is fair, valid and reliable.

This rigorous exercise of moderation is considered necessary until all educators are familiar with the practicalities of CASS implementation and the perception of

what constitutes a good and acceptable standard (DoE, 2003c). Until such time Umalusi will continue to use statistical moderation to enhance the credibility of all CASS marks so that it can be included in the final mark for national certification purposes.

Verification of the CASS mark

Verification is a process of ensuring that moderation has been carried out efficiently and effectively by the examining body (Umalusi, 2002c). This verification exercise is carried out by Umalusi who's function it is to confirm that moderation did occur and that the CASS marks awarded to learners are fair, valid and reliable.

However, CASS verification is carried out on a very small scale with Umalusi sending out teams (2 persons per team) of verifiers to examining bodies at the end of the academic year. At present only the CASS marks of the six national subjects are verified, however, this is also not happening in all the provinces. This means that Umalusi may send a team of Mathematics verifiers to a particular examining body whilst they may send another team of History verifiers to another examining body. Although the marks of all six subjects are verified, they are not verified in all provinces . The reason for this is the lack of capacity at Umalusi to deal with the challenges of CASS implementation.

Monitoring the conduct of the examination, the marking process and the auditing of the examination mark

The conduct and administration of the Senior Certificate examination is regulated by the National Education Policy on the conduct of the Senior Certificate examinations (DoE, 2001d). Since it is the Minister's prerogative to determine norms and standards for the conduct of examinations, the policy document contains vital requirements that all examining bodies (both public and private) must comply with. The policy also provides the necessary policy direction and guidance on all issues relating to the examinations, namely, the drafting of examination timetables, the planning of the examinations, the registering of learners and examination centers, the appointment of invigilators and markers, the marking procedure to be used, the capturing of marks, dealing with irregularities,

the viewing of examination scripts by learners and the issue of security and confidentiality during the examination process (DoE, 2001d).

Despite the existence of clear policy on the conduct of examinations, there is a need for examining bodies to be monitored from time to time due to the incidents of irregularities and leakages associated with the Senior Certificate examinations of the past (DoE, 1999a). Apart from examining bodies monitoring the conduct of their own examinations; at a higher level, the national department of education and Umalusi also monitors the conduct of the Senior Certificate examinations of all examining bodies.

The purpose of this exercise is to verify that the examinations are being conducted in accordance with policy, however, besides this, the regular presence of monitors during the conduct of the examinations has created an awareness amongst examining bodies and the public sector of the need to ensure an incident free examination. The incidences of irregularities, for example, has drastically decreased over the past two years with the 2003 examinations recording no significant incidences.

The monitoring exercises by the national department of education are conducted long before the start of the examinations. The purpose of these ongoing monitoring exercises is to check on the security measures adopted by the examining bodies and the state of readiness of the examining bodies to conduct examinations. Just prior to the commencement of the examinations, the monitors compile a detailed report, which informs the Minister on the readiness of the various examining bodies to conduct the Senior Certificate examination. As an independent quality assurer, Umalusi also performs a similar function.

The national monitors and Umalusi carry out similar monitoring exercises during the writing, marking and the capturing of marks. During the writing of the examinations, aspects such as the seating arrangements, the display of the examination time - table, the number of invigilators and whether they have been trained, the storage of the examination question papers, the handling of irregularities and the conditions for the writing of the examinations are checked.

During the marking of the examination scripts, the national department of education and Umalusi quality assures a sample of marked scripts to ensure that the correct marking guidelines were followed and that the moderation of the marked scripts by the chief marker/deputy chief marker has taken place. In addition, the marks of a sample of 10% of the scripts are totaled to check if the calculations have been done correctly and this is then verified against the mark sheet where the marks have been captured.

The above measures are perceived by examining bodies as a means of support. The monitors are accorded much respect and are regarded in high esteem. Their presence at examination and marking centers adds credibility to the entire examination process.

Statistical moderation of CASS

Statistical moderation refers to the process where the CASS marks are statistically adjusted so that they do not deviate drastically from the adjusted examination marks of learners (SAFCERT, 2000). This function is performed by Umalusi. The rationale for the use of statistical moderation is based on evidence which indicates that the CASS marks supplied by many schools/examination centers often differ considerably from the learner's examination mark and vary considerably among schools/examination centers (SAFCERT, 2002a). Since these unstandardised (raw) marks do not give a true reflection of the learner's achievements in terms of the national/provincial norms, they must be standardised (DoE, 2001b). The argument provided by education officials for the use of statistical moderation is the following (DoE, 2003c, p. 6):

"*we assume that our systems are not reliable enough yet to determine that assessments have been conducted and that all judgements are based on a common understanding of what constitutes a pass, a merit, a distinction and so on. Some teachers from their experience will be stricter than others, others will be more lenient, others may not have the necessary experience to know what an*

acceptable standard is and yet others may not even conduct the assessments but still provide a mark".

The above comments indicate the unrealibility and instability of CASS at operational level at present. Given the fact that CASS is still in its transitional stages, it would be dangerous to accept all the CASS marks as is especially in circumstances where there is a lack of common understanding in the implementation of CASS across provinces or where the CASS marks are faked/manipulated by educators.

According to Umalusi the use of the statistical moderation is regarded as a credible practice and are reliable, cost effective and appropriate for South African conditions (SAFCERT, 2002b). Further, the report of the Ministerial Committee on Examinations also indicate that the statistical moderation of CASS will not only serve as a tool for training, but it will also help to eliminate major discrepancies between internal and external assessment (DoE, 1998a). However, Umalusi also agrees that the use of statistical moderation for CASS is not a permanent feature of the education system. The decision to do away with statistical moderation will therefore depend on the readiness of educators to conduct CASS in the proper manner.

Statistical moderation is currently applied per institution and per subject. (Umalusi, 2002a). The following formula is used in the statistical moderation of the CASS mark (DoE, 2001b, p. 6):

$$TC = \frac{SDE}{SDC}(C - MC) + ME + TF$$

with the symbols having the following meaning:

TC = transformed (adjusted) mark for this learner
C = unadjusted mark for this learner (raw marks)
SDE = Standard deviation of the standardised examination marks for the specific subject at this specific school

SDC = standard deviation of unadjusted CASS marks for the specific subject at this school

ME = mean of standardised examination marks for the specific subject at this school

MC = mean of unadjusted CASS marks for the subject at this school

TF = tolerance factor - the gap between the standardised examination mark and the statistical moderated CASS mark. It is usually expressed as a percentage.

Below is an example of a diagrammatic graphical representation of linear transformation of the CASS mark for Biology standard Grade at a school for November 2000.

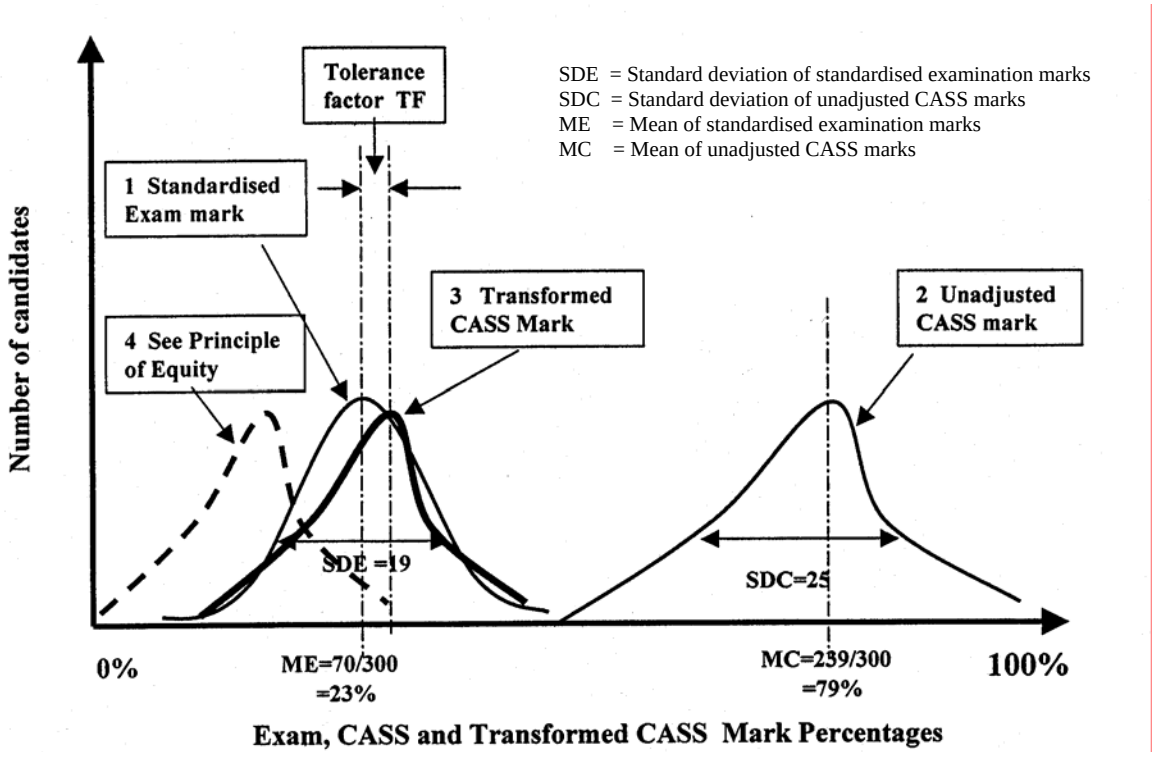


Figure 3.1 Diagrammatic graphical representation of linear transformation of the CASS mark for a specific subject at a specific school (DoE, 2001b, p. 9)

According to the Figure 3.3, the mean of the standardized (adjusted) examination score is 23%, whilst the mean of the unadjusted (raw) CASS mark is 79%. The difference between the mean of the standardised examination mark and the mean of the unadjusted CASS mark is 56% (79% less 23%). This is clearly a case where the CASS marks are too high. According to Department of Education (DoE, 2003, p.3), "*if a class worked hard through the year and realistic CASS marks are compiled, it will be reflected in a good average examination mark and a good CASS mark which will correlate with the examination mark*." Based on this reasoning, the CASS mark of 79% must be adjusted so that the mean of the CASS marks are 5% above the mean of the examination mark for every subject at every school (DoE, 2003c, p. 3).

The 5% refers to the gap (degree of acceptability) between the standardised examination mark and the statistical moderated CASS mark. It is usually expressed as a percentage. To align the CASS marks to the standardised examination mark, the CASS mark must be transformed using the prescribed formula. In this case the transformed CASS mark will be 28%, where a tolerance factor of 5% is used.

According to the Department of Education (DoE, 2003c, p. 3), "*as the assessment and moderation capacities of the examining bodies improve, the emphasis on statistical moderation of CASS will gradually be reduced*". The Department of Education and Umalusi indicates that the statistical moderation of CASS at this stage and perhaps over the next few years is absolutely essential until they are convinced that CASS can be implemented in a valid and reliable way (DoE, 2003c).

Standardisation of examination marks

The standardisation of the Grade 12 examination marks is a function of Umalusi that takes place immediately after the marking of all examination question papers. The main reason for the standardisation of results is due to the perception that the examination question papers differ in standard and quality and may produce different results across examining bodies (SAFCERT, 2002b). According to the Ministerial Committee on the Investigation into the Senior Certificate examination,

the moderation of standards across examining bodies is very limited and flawed (DoE, 1998a). If this is the perception of the Ministerial Committee, it does create a sense of unreliability in the general standard and quality of question papers.

Since the same criteria are applied to issue the Grade 12 qualification to all learners, there is a need to ensure equity and comparability in standards across examining bodies. This is then achieved through the standardisation of the examination marks to the norms of the previous five years. In effect, it means that the actual marks of learners are amended so that they are more or less consistent with the marks achieved by learners in the previous year (SAFCERT, 2002b).

According to Umalusi (2002b), the standardisation of the examination marks is based on the argument that the final results in each subject do not differ markedly from one year to the next. This is to be expected because changes in the ability of candidates or effectiveness of teaching and learning seldom result in significant changes in examination results within a short space of a year.

However, this perception of Umalusi is heavily critised by departmental officials who believe that learners are treated unfairly. The argument is why should the examination marks of learners be standardised when Umalusi has already moderated the question papers, conducted an audit of the marks and verified the CASS marks. Umalusi also recognises that there is also a danger in the changing of learner's raw marks since the Constitution makes provision for learners to access their examination question papers to verify their marks. This may aggravate issues and may lead to legal confrontations (SAFCERT, 2002b).

In the 2002 and 2003 examination, for the provincial question papers, the raw scores of each examining body were standardised against the norm for each subject for each examining body (SAFCERT, 2002b). Norms are derived from the raw examination results for the previous 5 years (SAFCERT, 2002b), however in 2002 and 2003 a three-year norm was used instead of the five-year norm.

However, in the case of the six national subjects, namely, Accounting, Biology, English Additional Language, History, Mathematics and Physical Science, the raw

scores of all provinces in each of the six subjects were standardised against a common norm, which was calculated by averaging the raw marks of the past three years of all provinces. This procedure was followed to promote the principle of equity and fairness for the national subjects at all schools (DoE, 2001b).

In this regard, Umalusi (2002a) indicates that the standardisation process is based on the principle that when the standard of examinations (from one year to the next, from one subject to another or from one examining body to another) are equivalent, there are certain statistical mark distributions that should correspond. This statement is based on the assumption that learners with equal ability, who write different examination question papers will obtain equivalent results.

Calculation of the Final Promotion Marks

The learner's final promotion marks are calculated in the ratio of 75% for the external summative assessment and 25% for CASS. In each subject, the standardised examination mark is combined with the statistically moderated CASS mark to arrive at the final promotion marks as illustrated in Figure 3.2.

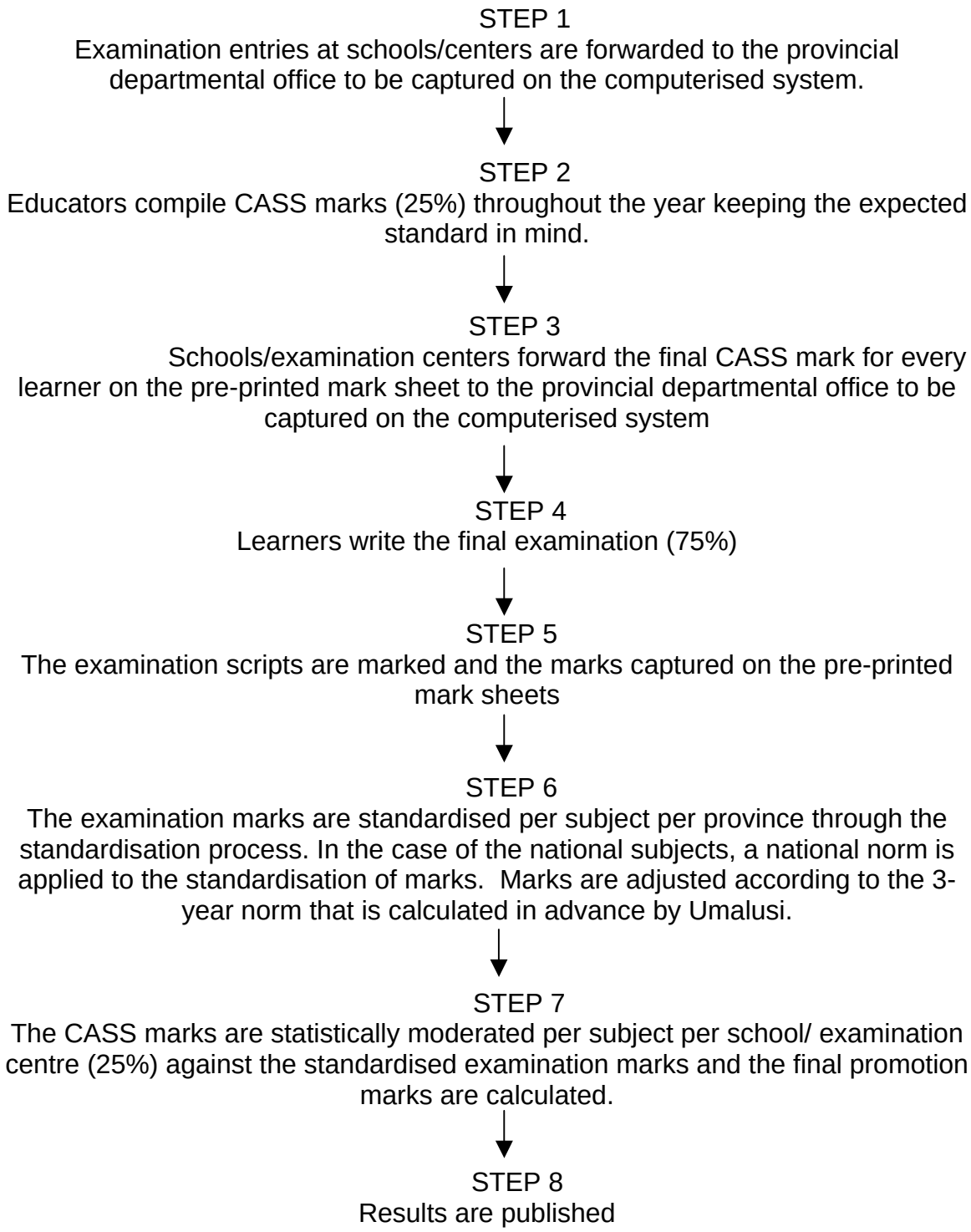


Figure 3.2 Calculation of the Grade 12 examination results (Adapted from DoE, 2001b).

3.3 Fairness, Validity and Reliability as Principles of Assessment

The practice of OBE in South Africa should be accompanied by a number of internationally recognised assessment principles that are critical to the successful implementation of CASS (DoE, 2002c). Although there are numerous principles that apply to assessment the three most important principles that will be dealt with in this section are fairness, validity and reliability. It is important that educators become familiar with these principles and are able to apply them in everyday teaching and learning so as to enhance the credibility of their assessment.

If educators are ignorant or are unable to understand, interpret and apply these principles in a meaningful and consistent way, assessment may be flawed. In the current Senior Certificate examinations, the marks obtained by learners for CASS must be fair, valid and reliable since it is used for selection into Higher education, certification, job placement and to maintain the credibility of the examinations. The following section deals with the principles of fairness, validity and reliability. Each principle will be dealt with separately.

Fairness

For assessment to be regarded as valid and reliable, it must firstly be conducted in a fair manner. According to McMillan (2001), fairness means a condition or situation in which assessments are not unduly influenced by factors unrelated to the learning objectives or standards that are being measured. From this perspective, the meaning of fairness can be illustrated by the following example. Two groups of learners were writing an examination of 3 hours duration. The temperature was 38ºc. The one group wrote the examination in a classroom that was well ventilated, and which also had ceiling fans. Fresh, cold drinking water was placed on the tables in front of the room. The second group wrote their examination in a room that looked more like a garage with only two little windows. The ventilation was poor and there was no water available for the learners.

In the above example, it is clear that the first group was placed in a more favourable position compared to the second group. Although the conditions of good ventilation and fresh, cold water vs poor ventilation and the unavailability of

water has nothing to do with the actual assessment, the conditions under which the assessment is carried out is likely to affect the performance of the learners.

The dictionary defines the concept “fairness” as “sound”. This means that assessment must be meaningful and relevant to all learners alike and educators must be able to make sound inferences about what a student knows, understands and can do (McMillan, 2001; Gipps & Murphy, 1994). To ensure fairness in assessment an educator must take into account various factors, including but not restricted to the background and interests of the learner, the relevance of the curriculum, the socio - economic background, the language used to assess and the type of illustrations used for assessment. Research indicates that learners are better motivated to learn if what they are learning is related to their background and interests (cited in Mcmillan, 2001, p. 58). According to Gipps and Murphy, if the contents of a subject are aligned to the background and interests of a group of learners, the assessment will place these learners at an advantage compared to the group that does not have an interest in the subject. Hence, the second group will experience the assessment as less meaningful and this will impact on the achievement of these learners. In this context assessment is seen as being bias or unfair.

Also of interest and importance to this study is the definition provided by Sieborger and Macintosh (1998, p. 11). They define fairness as, “treating all learners in the same way. It does not necessarily mean that all learners are treated equally, but that the conditions of assessment are the same for all”. However, in the real situation, it is impossible to indicate that conditions for assessment are the same in all schools. In fact they are not.

The report on the Quality Assurance Indicator Project (DoE, 1999c), states that the effectiveness of teaching and learning was found to be related to certain minimum inputs such as textbooks and libraries. Of the 297 schools surveyed for this project (33 schools in each province), only 62% of primary learners and 48% of secondary learners had textbooks for all subjects. This means that 52% of the secondary school learners surveyed did not have access to all their resources. The lack of resources impacts on effective teaching and learning and disadvantages those

learners who do not have the necessary material to participate meaningfully in lessons.

Sieborger and Macintosh (1998, p. 13) indicate that the following five factors should be taken into account when trying to establish fairness:

- *The importance, length, size or weight of the assessment - does it match the amount of work which has been done?*

  If an educator spends only 30 minutes of his teaching time dealing with a section of the syllabus that is very important and constitutes 40% of an examination question paper, the assessment can be regarded as unfair. The goal of assessment is not to trick learners, therefore educators must be clear about the knowledge and skills that learners need to acquire and understand so that they are able to use them in real life situations.

- *The choice of the assessment technique - does it match the way in which learners have been taught?*

  An educator who has taught a particular topic using multiple choice questions but sets essay type questions in an examination is unfair.

- *The instructions and/or questions given to learners - do all learners understand what they are expected to do or answer?*

  Instructions provided to learners must be clear, concise and unambiguous. Learners must understand what is expected of them. The language used must be easy to understand.

- *The method of administering the assessment - are the conditions appropriate; is there enough time; do learners have access to resources they need?*

  This aspect is crucial to the assessment process. It raises questions such as whether learners have proper ventilation on a hot day (as illustrated

above); are there sufficient desks on which learners are able to write; are the necessary laboratory equipment available to conduct the research; is the time sufficient to complete the assessment; is there a library at the school where learners are able to gather information for their projects?

- *The method of marking - is it as objective as possible?*

  This means that educators must be objective in their marking and free from bias. Making use of specially designed marking tools, assessment criteria or rubrics enhances objectivity. Although the use of assessment criteria or rubrics helps educators to evaluate the learner's work, they however do not guarantee that all educators will be consistent in their marking. Consistency can only be attained if there is common understanding amongst educators on the application of the criteria. Maintaining a sense of objectivity in marking is linked to educator professionalism and development. Educator professionalism can be defined as, "the capacity to make discretionary judgements in the interests of improved student outcomes and transformative educational change" (cited in Yung, 2002, p. 99). This means that educators must be able to use their knowledge and skills in the best possible way to make judgements about students learning. The opposite of objectivity is subjectivity. In this context subjectivity means that educators should not allow their own personal feelings and prejudices to get in the way of making sound judgements about student's achievements.

In addition to the above requirements, it is absolutely essential that the entire assessment process is fair. This would include aspects such as ensuring that learners are informed about the sections or topics to be covered in a particular lesson or test and that they are informed about the criteria to be used for the scoring of the assessment.

Validity

The American Educational Research Association, American Psychological Association and the National Council on Measurement in Education, defines validity as, " a unitary concept that refers to the degree to which a certain inference from a test is appropriate and meaningful" (cited in Killen, 2003, p. 25). In other words validity always refers to the degree to which evidence supports the inferences that are made. Killen justifies this definition by indicating that the inferences or value judgements that educators make about the attainment of learning outcomes by their learners is supported by the evidence (the actual work or task) completed by the learner. The evidence from which the educator makes her/his inferences is what matters the most since it reflects on student learning and performance.

However, for a more unified definition of validity, Messick indicates that the appropriateness, meaningfulness and usefulness of score - based inferences depend also on the social consequences of the testing (cited in Stobart, 2003, p. 28). He states that social values cannot be ignored in considerations of validity. A third view is that validity should be looked at, as an integrated concept (Stobart, 2003). The integration would include the entire assessment process and not just the assessment instrument or the manner in which the assessment is scored.

For a national view on validity, the new South African qualifications framework requires assessment to be valid and authentic (Pahad, 1997). Authentic assessment presents learners with real - world challenges that require them to apply their relevant skills and knowledge (Guba & Lincoln, 1989).

A much narrower definition of validity is, "the extent to which the assessment measures what it is supposed to measure (content validity), or whether it does what it is meant to do" (Sieborger & Macintosh, 1998, p. 11). The following examples help to explain this definition of validity (Sieborger & Macintosh, 1998):

- an exercise is intended to assess how learners can apply what they have been taught, but most of the learners don't understand the instructions. The assessment therefore has little validity;

- two classes have been set the same assessment activity, but they haven't covered the same work. For one class the assessment is valid, for the other it may not be; and

- learners are given a multiple - choice test, but they have not been tested in this way before and are confused. The test has not much validity as a result.

The various definitions recorded above indicate that the concept validity is much broader and includes other aspects of the assessment than just the content alone.

Reliability

Reliability refers to the consistency of the assessment and whether it will always give the same result or not. The following examples help to explain reliability in assessment (Sieborger & Macintosh, 1998, p. 12):

- a reliable assessment is one which can be repeated under the same conditions and which will give the same results. For example, if a learner gave a talk and a month later gave the same talk again in exactly the same way, he or she should receive the same result if the assessment is reliable;

- if an exercise is marked in a reliable way, it should be given the same marks, whether it is at the top of the pile or at the bottom, whether it is marked quickly or slowly, whether it is done by a girl or a boy, whether the teacher likes the learner or not, and whether or not it is marked by different markers.

Van der Horst and McDonald (1997) state that without fair, valid and reliable assessment procedures you will simply not know whether or not your learners have achieved the learning outcomes that were the focus of the programme, unit or lesson, and neither will the learners know whether they have learnt well.

3.4 Implementing CASS

To ensure that formative assessment is fair and honest the teacher and learner are required to collect work samples, records of systematic observation and tests in portfolios that can be moderated by other teachers (Pahad, 1997). The Maryland Assessment Consortium (1999, p. 1) define a portfolio as "a collection of

work, usually drawn from student's classroom work." However, in the South African context, a portfolio also includes tasks completed by learners at home. These may include amongst others, assignments, homework, projects and practical work. Portfolio's can be designed to assess student progress, effort, and/or achievement, and encourage students to reflect on their learning (Freeman & Lewis, 1998).

A portfolio becomes a portfolio assessment when (Sieborger & Macintosh, 1998):

- the assessment purpose is clearly defined;
- criteria or methods are made clear for determining what is compiled into the portfolio, by whom and when; and
- criteria for assessing either the collection or individual pieces of work are identified and used to make judgments about performance. These are made known to the learner in advance.

Sieborger and Macintosh (1998) add that in terms of evidence for assessment learners are given the responsibility of keeping a portfolio of everything that they have done in a course, learning programme or subject. In other words the portfolio is a collection of work, which serves as evidence in terms of the outcomes that the learner has achieved. The evidence is then used to make valid inferences about the assessment and provides a sound basis for the quality assurance of SBA results (Vandeyar & Killen, 2003). It forms the basis of the evidence that is used to make a decision on the results of the learner. The advantage of compiling a portfolio is that it gives learners some control over their assessment (Sieborger & Macintosh, 1998), meaning that learners are able to monitor their own progress and see how they can improve on previous performance. In the present system, it is imperative that the learner's portfolio is moderated at school, cluster/district and provincial level, with external moderation and verification being part of the process where the CASS marks are validated against the assessment criteria or rubric.

Assessment criteria can be defined as a set of performance statements against which a task may be evaluated (Freeman & Lewis, 1998). The assessment criteria make the link between the assessment and the learning outcomes-in other

words they operational the outcomes. In OBE, a learner's progress is measured against clear criteria, which have been stipulated prior to the learning process. Criterion referencing replaces norm referencing. This means that the learner's work would be measured in terms of his own progress and development and not as a norm where the learner's performance is assessed in comparison to other learners (DoE, 1995).

The use of explicit criteria is essential to both the assessor and the learner. For the learner, it assists her/him to focus time, effort and resources on what is required. For the assessor, clearly spelled out assessment criteria ensures effectiveness and efficiency, but most importantly, it improves the likelihood of reliability. Figure 3.3 illustrates the steps to be followed in assessing a portfolio.

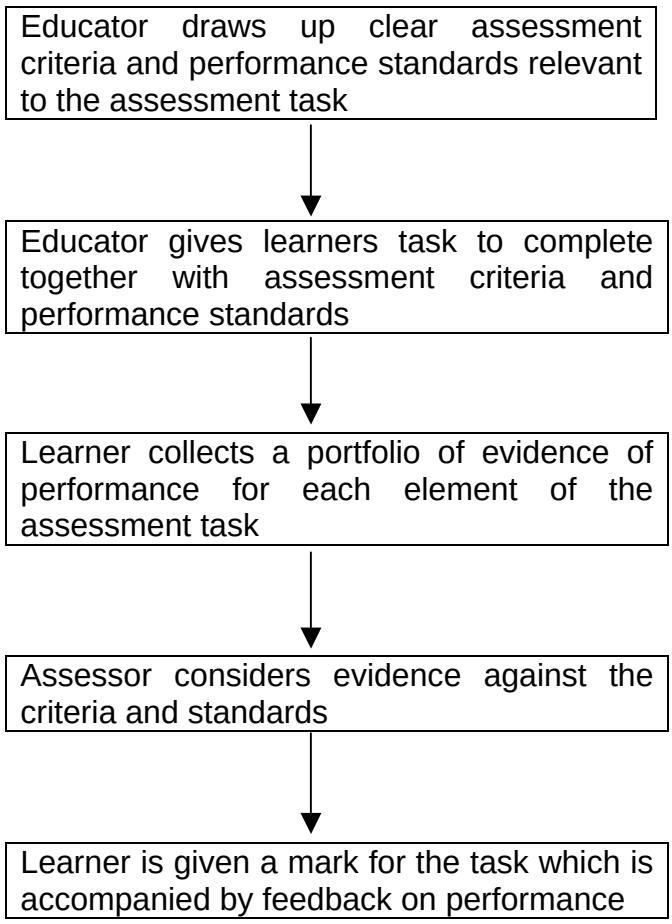


Figure 3.3 Assessing a portfolio against clear criteria and performance standards (Adapted from Freeman & Lewis, 1998)

Figure 3.3 illustrates the process of arriving at the CASS mark. When learners are given the assessment criteria and performance standards together with the CASS tasks, they are able to know what is expected of them. It is important that educators work out in advance their assessment criteria and performance standards so as to make the instructions clear to their learners.

A rubric can also be used to assess the work of a learner. A rubric is a scoring tool, which lists the criteria according to which a particular task will be assessed. They help to ensure that quality is defined and scoring is more objective. According to the Maryland Assessment Consortium (1999) a rubric consists of a fixed measurement scale (e.g., 4 point) and a list of criteria describing the characteristics of performance for each point score. Fischer & King (1995) indicate that the use of rubrics as a tool for scoring a task has the potential for placing the power and responsibility back onto the learners to help them know what is being asked of them and how to achieve it. Rubrics assist both educators and learners to know in advance what standards must be met and how it must be met.

In the South African context, the term rubric is used to illustrate the assessment criteria in table form. The advantages of using a rubric are illustrated in Table 3.1.

Table 3.1 The benefits of using rubrics in assessment for educators and learners

Teachers	Learners
• save time in providing feedback during marking	• see what is important in their learning experiences
• can evaluate individual or team work	• see how to meet the teacher's assessment expectations
• can allow co - teachers to evaluate learners' work comparably	• see what the different levels of proficiency are
• can be adapted for use in similar tasks within the same Grade or other Grades	• evaluate their own, and their peers' work
• can track performance of a learner over a period of time and determine those sections that need more work and practice	

Source: (Fischer & King, 1995)

Although the development of rubrics provide direction to educators in the assessing of the CASS tasks, many educators still need to be trained to use rubrics effectively. Subject area expertise is essential to grasp the correct interpretation of the "anchors" provided.

Despite the use of well - developed assessment criteria and rubrics to assess CASS, there is still a possibility that the assessment may be subjective. Research shows that school-based assessment can be unreliable, for example (DoE, 1999c, p. 20):

"Implementing assessment in an authentic context implies that there has to be a strong element of trust in the relationship between the learners and the system."

The above statement is supported since the educator in most instances is the sole judge of a learner's work and if the work is not moderated/verified by another person, it may be unreliable especially considering the subjective nature of the assessment. A case to be noted in this instance, is where a verifier appointed by Umalusi to verify the marks in Mathematics, in the Eastern Cape, discovered that 80% of the answers in the memorandum used by the educator to assess the learner's work was incorrect (Umalusi, 2002c). This is indeed alarming. One can only conclude that the educator concerned lacks the knowledge and skills to teach and assess any work in Mathematics. This has and will have a disastrous impact on teaching and learning and ultimately on the fairness, validity and reliability of the CASS marks.

The fairness, validity and reliability of CASS can only be improved when teachers understand what skills they are assessing (assessment objectives/outcomes) and how they should assess them in order to recognise different levels of performance by candidates. This is however only possible if educators are properly trained in the area of assessment.

3.5 Conclusion

In conclusion, it is evident that whilst some examining bodies have more experience with CASS, other examining bodies have only commenced with CASS in 2001. This would undoubtedly present certain challenges for educators at Grade 12 level, especially where they have had little or no training. Evidence shows that there is the problem of varying CASS standards across examining bodies (DoE, 2003c). This is an area in which educators across provinces need training and support so that they are able to prepare tasks that are of the correct standard and quality. Another challenge facing educators is the ability to use the correct assessment criteria to evaluate the CASS tasks.

Although research shows that there are some quality assurance measures such as the use of face moderation by provincial examining bodies to ensure the fairness, validity and reliability of the CASS marks, this is being conducted on a limited scale and is implemented inconsistently across examining bodies. For this reason Umalusi, the quality assurance council has introduced the use of statistical moderation to enhance the credibility of all CASS marks. This measure will also address the discrepancies between the marks obtained through CASS and the marks obtained in the external assessment. According to Umalusi, it would be dangerous to accept all the CASS marks as is especially in circumstances where there is a lack of common understanding in the implementation of CASS or where the CASS marks are faked/manipulated by educators. To be able to understand the complex nature of CASS, a literature review on the implementation of OBA is presented in the next chapter (Chapter 4).

CHAPTER 4

Continuous Assessment: Learning from Literature

Overview of the Chapter

This chapter presents a review of some of the literature on continuous assessment as it relates to OBE and its implementation. This is followed by a review of literature relating to the research questions underpinning this study, namely, the problems and challenges experienced by Grade 12 Biology, Mathematics and Physical Science educators in the effective implementation of CASS, the kinds of support provided to educators to strengthen and to sustain the effective implementation of CASS and literature on the extent to which the CASS marks are fair, valid and reliable.

4.1 Introduction

The aim of this chapter is to summarize what is known about continuous assessment and to address its implications for South Africa.

Most of the literature on assessment was gathered from manual searches of existing policy documents of the Department of Education, education journals and books available from South African libraries. Many articles on assessment were retrieved via the Department of Education library and from colleagues at provincial and national departments of education. Documents and articles relating to the topic were also retrieved via electronic searches and website searches.

In terms of the structure of this chapter, section 4.2 examines some of the existing literature on continuous assessment as it relates to OBE and its implementation in the international and in the South African context. This serves as a prelude to the analysis of literature on the research questions. Section 4.3 presents the literature on the problems and challenges experienced by educators in the effective implementation of CASS and this is followed by literature on the kinds of support provided to educators to strengthen and to sustain the effective implementation of CASS. Section 4.4 examines to what extent the CASS marks are fair, valid and reliable.

4.2 OBA and its Implementation

Over the past few years, new approaches to examination and assessment have emerged in a number of countries (Yung, 2002). The manner in which a country runs its examination and assessment is determined by its educational policy, which guides educational practice. The word "practice" is synonymous with the word "implementation". Implementation is defined differently by different scholars. Fullan (1994, p. 217) defines implementation as, "putting a change into practice". This is a general definition of implementation. A better definition of the word implementation in the context of education policies is provided by Fowler (2000, p. 270), who indicates that implementation can be defined as "the stage of policy process in which a policy formally adopted by a government body is put into practice." Fowler's definition will be used to elaborate on issues relating to OBA and its implementation since it is most appropriate in the context of this study and because it relates directly to the process of policy implementation by government.

Internationally, governments have begun to take a keener interest in education with the intention of changing the curriculum and assessment so that it is aligned to the needs of the country and the skills required by the labour market (Johnson, 1998). In the United Kingdom (UK) for example, the school curriculum for vocational education has reinforced the move towards a more practical, vocationally oriented curriculum and the move towards more practical, school-based assessment (Wolf, 1995). The adoption of a practical and vocationally orientated curriculum signifies a shift from the academically focused curriculum which does not satisfy the ever - changing needs of the economy. The UK is not the only country that is adopting changes to its curriculum and assessment policy and practices. Other countries include, for example, Australia, Japan, USA, New Zealand, Hong Kong and South Africa.

In this regard a number of scholars agree that the current interest in OBE is to a very large extent, the result of community pressure for accountability in education (Killen, 1996; Towers, 1992). These scholars add that OBE is often more attractive to politicians and administrators than it is to teachers who are faced with the practicalities of implementing it. The development of national profiles (descriptions

of the progression of learning typically achieved by students during the compulsory years of schooling) in Australia is an indication of the emphasis placed on accountability. This means that schools are required to produce measurable "outputs" since public monies are invested in them (Killen, 1996). Similarly, in South Africa major emphasis is placed on the results of the Senior Certificate examinations. What is not considered is the quality of results of each learner and whether a Senior Certificate pass will enable a learner to pursue her/his preferred career of choice.

Many other reasons have been cited for the introduction of curriculum reform worldwide. Fataar (1999, p. 3) in his article titled, "School Curriculum Policy and Politics in South Africa" refers to the terms "compensatory legitimation", meaning that, "the emphasis of many curriculum reforms on the symbolism of change and innovation, reflects the concerns of the decision - makers over the legitimacy of the decision making process, and is designed to contribute, in a compensatory fashion, to the restoration of that legitimacy". In this regard Weiler argues that curriculum is one of the most important policy areas used by a state to deal with its legitimacy deficit (cited in Fataar, 1999, p. 4).

In this regard, one cannot ignore the point made by Jansen (1999) when he stated that South Africa found "external legitimation" through curriculum policy borrowing from international context (cited in Fataar, 1999, p. 20). The introduction of OBE in South Africa was as a result of the strong working relations and influence of Australia and New Zealand. Disappointingly, this "policy borrowing" took place without much foresight given to its implementation process. The consequences of this are discussed later in this chapter.

In Australia, the link between schooling reform and economic reform is expressed as follows (Brady, 1996, p. 26):

"The schooling industry is to produce people with skills and qualities needed in other industries to improve their performance, to adapt flexibly to changing needs and conditions, and to significantly increase the Gross National Product and reduce the national debt."

Although this reason is acceptable, it is not holistic. Schools should offer much more than skills and qualities needed in industries. Carr and Claxton (2002), indicate that the fundamental purpose of education for the 21st century is not so much the transmission of particular bodies of knowledge, skill and understanding as facilitating the development of the capacity and the confidence to engage in lifelong learning. These scholars argue that in addition to the transmission of knowledge, skills and understanding, there is a need to facilitate the development of capacity and the confidence to engage in lifelong learning. What they mean is that the focus of education should also be on the development of aptitudes, attitudes and values that will equip young people to function well under conditions of complexity, uncertainty and individual responsibility, to help them become good real life citizens.

In the South African context, the principle of lifelong learning is embedded in the NQF. The NQF makes provision for the integration of education and training according to the principles of OBE. Contrary to the claims documented in policies and reports, much of the promises exist in theory only (DoE, 2002e). Much more attention needs to be given to the practicalities of its implementation.

The new approach to education and training demands that the schooling system must be designed in such a way that it prepares learners for integration into the world of work as well as develop their capacities to engage in lifelong learning. However, for any school to function effectively and meet the demands of a competitive and global society, its schooling system must be guided by a clear and coherent curriculum and assessment policy; the curriculum must be meaningful and appropriate to the needs of learners and the economy they serve; and the assessment methods must aim to improve the learners' understanding of the subject matter so that they are able to apply their knowledge in real life situations (DoE, 2002d). This shift however cannot be achieved without the cooperation and willingness of those in charge of the teaching and learning process, namely, the educators, subject advisors and senior education managers.

Also, for teaching and learning to be effective, educators who implement the new policy must be willing to accept change. Brady (1996) indicates that there is a

need for student and teacher involvement, and if teachers are to lead change rather than be led by it, it is important that they can commit themselves to the meaning that a particular innovation has for them and for their school. What he means is that educators and learners need to be part of the change process; they need to know the benefits of the new curriculum and assessment policy. This however can only be achieved if they have been made to feel part of the process through interaction, consultation and meaningful participation. Educators need to feel that they were consulted from the beginning and that their opinions and inputs have had some bearing to the new policy. This would, to some extent, have ensured their understanding and gained their commitment to the process.

Briscoe (1993) and Fischer (1994) (cited in Yung, 2002, p. 98) have discovered that there is growing evidence supporting the premise that teachers do have theories and belief systems, which play an important part in their cognition and behaviour in teaching. In studies of how teachers implemented new initiatives in the curriculum, it is found that when the philosophy of the curricular innovation is significantly different from the theories and beliefs held by the teachers, the challenge or demand on the teachers requires them to restructure their beliefs or to “domesticate” the curriculum in order to fit it into their belief system (cited in Yung, 2002, p. 98). Sometimes, such restructuring or domestication may be problematic or even "personally threatening". In a situation like this, educators would opt for the easy way out by not participating in the innovation. Some educators may even leave the teaching profession (Towers, 1992).

When one examines the above literature, it becomes clear that there are lessons to be learnt from the experiences of other countries. Whilst there is a need for government to make schools accountable, there is also a need to focus on the quality of education provided by educators. However, the quality of education can only be improved if proper measures are taken by governments to ensure that educators understand the curriculum and assessment system adopted so that it can be effectively implemented.

4.3 Problems and Challenges associated with the implementation of CASS

Kifer (2001, p. vii) indicates that, "*educators face a complex array of questions and concerns that little in their background or previous experience has prepared them to address*". This finding illustrates that the implementation of CASS is not without problems and challenges, especially given the fact that it is a fairly new and complex approach to education and training. Numerous studies indicate that the implementation of OBA even in well - developed countries is problematic (Towers, 1992; Steyn & Wilkinson, 1998). Towers (1992, p. 89) state that, "*some schools are well along the process, some are experimenting with it in selected classes, and others have barely begun the conversation*".

The introduction of OBE in Minnesota by the State Department of Education was met with a combination of applause, apprehension, grumbling and consternation (Towers, 1992). As one teacher indicated, "I am working to understand the concept of outcomes-based education, let alone implement it" (Evans & King, 1991, p. 73). According to Worthen (cited in Combrinck, 2003, p. 60), "for OBA to be successful, authorities should make sure that concepts, terminologies and language are clearly explained and clarified". Jansen (1997), (cited in Combrinck, 2003, p. 60), supports this view and states that the issue of language and terminology is a major problem in many countries and specifically in South Africa.

However, the implementation of OBA in Minnesota is critiqued by Horton (cited in Towers, 1992, p. 93) who indicates that OBE and OBA will require more time and effort from teachers, many of whom are stretched to the limits. He added that teachers are further required to individualize their instruction, plan for and carry out a variety of remediation and enrichment activities on a daily basis, create and administer an assortment of assessment tools, and keep extensive records of each student's progress. Horton adds further, that several principals have told him that some of their best teachers were now considering leaving the education profession because of the impeding pressures and workload that OBE carries. He adds that, "*these are the truly conscientious teachers, the teachers who could not live with doing just an adequate job and they will be able to find higher paying jobs*

in the private sector with no trouble at all" (cited in Towers, 1992, p. 93). This is unfortunate since the education system needs experienced and seasoned teachers.

Guskey (1994) reports that teachers perceive two general types of time pressures. The first being that they are required to do more and teach more, without any increase in the amount of time allowed for planning or instruction. Secondly, most teachers believe that performance - based assessment would require a lot more time to administer and score. Whilst it is agreed that OBE and OBA have increased the workload of educators, arguably educators have not been provided adequate support and training to deal with these challenges (Combrinck, 2003).

Literature also reveals that the lack of facilities and resources to conduct assessment has an influence upon the amount and range of evidence of achievement (Johnson, 1998; Guskey, 1994; Singh cited in Combrinck, 2003, p. 52). According to Johnson (1998, p. 401), "the historically white schools were clearly much better resourced than schools catering for African or Coloured learners". In a South African quality assurance study conducted by the Department of Education (1999c, p. vi), it is reported that, "the effectiveness of teaching and learning has been found to be related to certain minimum inputs such as textbooks and libraries." This means that schools that are better resourced are in a position to deliver more effective teaching and assessment activities than schools that lack resources (DoE, 2001f).

In addition to the problems and challenges mentioned above Johnson (1998) in his study of whether teachers could develop a portfolio of evidence reported that many South African teachers had no history of developing portfolios of children's work and the collection of evidence is particularly challenging. According to Baker (1994), one of the challenges facing educators in the development of portfolios is determining which forms of assessment are most useful for which educational purpose. Clearly, if educators have not been trained to implement OBA (CASS), they would certainly experience difficulty in the compilation of CASS tasks.

Another grey area in assessment and one that is related to the fairness, validity and reliability of results, is the evaluation of learner achievement. According to

Brady (1996), one of the major challenges relating to the assessment of learner achievement is that teachers need to be addressed more comprehensively on the strategies necessary to evaluate the achievement of outcomes. He adds that the link between curriculum and the assessment of outcomes is emerging as a real challenge.

Literature also shows that the implementation of CASS in large classes is a problem (Johnson, 1998; Singh cited in Combrinck, 2003, p. 52). In South Africa, the DoE reports that large class sizes are making the implementation of CASS difficult especially with respect to the assessment of projects and attending to the varying language requirements of learners (DoE, 2002a).

From the literature presented above it would seem that the implementation of CASS is not without problems and challenges. Some of the problems and challenges highlighted in the literature include the lack of understanding, knowledge and skills to undertake OBA. This is exacerbated by the perception that OBE and OBA increases the workload of educators, which places additional pressure on educators. It is also evident that the availability of resources also impacts on the effectiveness of CASS implementation. Research shows that the evaluation of learner achievement is an added challenge as was the problem of large class sizes.

The next section looks at the support provided to educators to strengthen and to sustain the effective implementation of CASS.

4.4 Support to Strengthen and to Sustain Effective Implementation

This section examines literature on the three aspects covered by the research question, “the kinds of support provided to educators to strengthen and to sustain the effective implementation of CASS” The first aspect examines literature on educators’ familiarity with the policy on CASS (OBA), the second aspect looks at the provision of training to effectively implement CASS and the third aspect examines how educators are supported to enable them to implement CASS effectively.

Educators familiarity with the policy on CASS

It must be noted that although this study refers to national and provincial subject policies on CASS, currently there are no national and provincial subject policies on CASS *per se* in South Africa; only CASS subject guideline documents. Subject guideline documents on CASS were developed by the National Department of Education in the six national subjects, namely, Accounting, Biology, English Additional Language, History, Mathematics and Physical Science. The CASS guideline documents for the other Grade 12 subjects were developed independently by each examining body. In the absence of national and provincial subject policies on CASS, the subject guidelines developed by the National Department of Education and by provincial education departments are interpreted by all examining bodies as "policy".

Much has been written about policy implementation in education, where it has been indicated that, "successful implementation of a major innovation is a complex process involving a set of inter - related circumstances" (Gross et al. cited in Brady, 1996, p. 29). This would imply that it is not easy to introduce new policies and that a number of issues and variables must be considered prior thereto, if policy implementation is to be a success. In the case of CASS the challenge would be to ensure that educators are familiar and understand the policy so that they are able to effectively implement it in their classrooms.

Research has highlighted that one of the problems facing policymakers is that, "it is incredibly hard to make something happen, most especially across layers of governments and institutions" (McLaughlin cited in Brady, 1996, p. 29). This may be true especially in instances where educators are often satisfied with the status quo and perceive the demands of the new policy as difficult (Brady, 1996). Conversely, there are many educators who would welcome change and innovations (Gross et al. cited in Brady, 1996, p. 30). A review by Yung (2002) reveals that, "some teachers adopt a more passive role regarding policy interpretation and implementation while others adopt a more critical stance in interpreting the policy requirements, demonstrating a more proactive approach in its implementation". The manner in which educators approach the new policy is fundamental to whether they will become familiar with it or not. If educators are not

familiar with the policy on CASS, then its implementation is bound to be problematic.

Research shows that for CASS to be implemented effectively, educators need to commit themselves to the policy and to its meaning in context (Brady, 1996). According to Brady if this can be achieved, half the battle is won. The next challenge would be to provide the necessary skills and training to ease the implementation of CASS. The level of educator commitment and dedication must therefore be seen as a condition that is fundamental to becoming familiar with the new policy.

Another important factor that must be considered in policy implementation is the amount of time allocated to educators to familiarise themselves with the policy. According to Towers (1992), "educators need more time and need to put in more effort." This makes sense considering that a new policy like OBE must be fully understood before it is implemented. A lack of understanding may lead to potential conflict between policy and practice. According to Kendall (1999), any change of significance must be given a period of time, this can either be given in careful preparation, discussion, pilot projects, monitoring and checking so that full implementation takes a year or more.

In addition, research also indicates that new policies often confuse educators (Black & Wiliam, 1998). This would be especially true where policy implementation is rushed or where educators are not given an opportunity to be part of the policy process (Fataar, 1999). Fataar adds further, that in the South African context educators were subjected to a "crash course" and due to time constraints the process suffered from a lack of consultation between the stakeholders (educators) and their constituencies (provinces). This would then imply that the logistics of OBA was not properly worked through with educators and that the implementation was rushed into, without any forethought.

In 1999, a report by the Cambridge team who undertook an investigation of the nine provincial examining bodies reported that the implementation of CASS was problematic in three of the nine provinces that were offering CASS at Grade 12

level (DoE, 1999a). They further added that the composition and quality of CASS varied from province to province. This meant that there was no uniformity in the implementation of CASS across the five examining bodies. This could be attributed to the lack of policy to regulate CASS. The recommendations of the Cambridge team were that detailed subject manuals should be made available to guide teachers on what work to undertake for CASS and how to assess it. They further added that teachers who would be responsible for CASS also need to know the standards of the subject examined in the external examination since the external examination is the only benchmark available at present. Despite the recommendation for detailed subject guidelines to assist educators on how to conduct CASS and how to assess it, to date (April 2004), there are still no subject policies to regulate the implementation of CASS in the various subjects. This has resulted in inconsistencies in the implementation of CASS across provinces (SAFCERT, 2002a).

In this regard, Killen (1996) elaborates on the composition of learning programmes that are essential to help educators to understand what is expected of them in terms of the new assessment policy. He indicates that each learning programme should have a rationale (to explain why the programme exists), aims (to explain what the programme will achieve), objectives (to indicate what students are to learn), content statements (to indicate what broad areas of content will be used as vehicles for student learning), teaching strategy statements (to indicate how the learning activities will be organized), and assessment guidelines (to indicate how student learning will be assessed). These will serve as a meaningful guideline to teachers and learners and will assist to ease the implementation of OBE and OBA.

The literature on the familiarity with policy indicates that the successful implementation of CASS both internationally and locally requires a great deal of commitment and dedication from educators and their senior managers (meaning subject advisors and school principals). However, in the absence of clear and coherent policy to regulate CASS, educators are experiencing and will continue to experience difficulties in its implementation. In this respect, variations in the standard and quality of CASS have been identified.

For any new policy to be successfully implemented there must be meaningful interaction between policymakers and educators, subject advisors and school principals so that there is clarity and understanding about how to effectively implement CASS. Only when educators are familiar with the contents of the policy, can training and support be provided to enhance their understanding of the policy.

Provisioning of training to effectively implement CASS

Research has shown that educators need more time and professional training on how to adapt to this new form of assessment (Klenowski, 1999; Combrinck, 2003). It is expected that the more time and training provided to educators to clearly understand the basic concepts and terminology before commencing with the actual implementation of CASS would place educators in a better position to improve the quality of their interaction in the classroom (Black & Wiliam, 1998).

Klenowski (1999, p. 41) states, "if improvement in the understanding of concepts such as criterion - referenced assessment, feedback and the practice of formative and summative assessment is to occur, pre - service teachers in particular need to be taught these concepts and the language of assessment in their initial years of teacher development". In his study of enriching pre - service teacher knowledge of assessment, Klenowski found that teachers had an impoverished understanding and practice of formative and criterion - referenced assessment, which needed to be addressed. Klenowski (1999, p. 40) states further, "to achieve high quality assessment in education, the need for high quality teachers is fundamental".

In Hong Kong for example, to strengthen the element of assessment it was proposed that in initial teacher education the teaching of assessment be emphasised and that in - service courses focus on the latest developments in assessment types and techniques. Whilst it is essential to include the teaching of assessment in initial teacher education it is also crucial that all serving educators be subject to ongoing training in assessment since the move from a quantitative to a qualitative mode of assessment is a major change (Biggs, 1996 cited in Klenowski, 1999, p. 40).

According to Guskey (1994, p. 53), "*the perception of little time coupled with lots of extra work, combined with inadequate experience, training and lack of materials appeared to keep most educators frozen in virtually the same instructional patterns they are used to*". His article refers specifically to performance - based assessment in Kentucky where he stresses that the need for training seemed especially critical since the realignment would involve an expansion both of what is taught and how it is taught. Guskey's finding was that in general, teachers were ill prepared to adapt their instructional practices to the new demands of a more authentic, performance - based assessment. He further added that, "the only training that most teachers had received was scattered, one - day staff development workshops".

In a study on assessment conducted by Combrinck (2003) involving Australia, New Zealand and America, it was found that the majority of teachers in New Zealand did not have sufficient training whilst in Australia, the teachers felt that they did not get enough training and support from the Department. In America, not all teachers received adequate training. An educator in London who has undergone professional training on formative assessment in science shares the following experiences (Black & Wiliam, 1998, p. 60):

"*actually thinking about teaching has meant that I have been able to come up with ideas and strategies to cope with whatever has arisen and has contributed greatly to my professional development. I now think more about the content of the lesson. The influence has shifted from "what am I going to teach and what are the pupils going to do?" towards "how am I going to teach this and what are the pupils going to learn*?"

According to Huberman and Miles (1984), large - scale change bearing innovations lived or died by the amount or quality of assistance that their users received once the change process was underway. The issue here is on the quality of assistance, support and training given to educators for them to be able to implement the change. Unfortunately, without the necessary training and support from subject advisors and educational managers, the implementation of CASS will

be problematic, both from a procedural perspective and from the perspective of the actual teaching and learning.

The above findings allude to the lack of skills and training in the area of assessment, which, if ignored, can result in serious setbacks in the effective implementation of CASS. On the other hand, when training is conducted in a serious manner with the aim of enhancing the professional development of educators, the rewards can be seen in the successful implementation of CASS.

How are educators supported to enable them to implement CASS effectively

According to Fischer and King (1995), a teacher's shift to OBA will not be a magical transformation that takes place overnight. They add that teachers' roles and responsibilities, moving from teacher - centered classrooms to one focused on student learning requires the integration of new instructional and assessment skills, which can best be accomplished over time. In view of this, educators would therefore need to be not only subject to ongoing training and preparation but also to continuous support to strengthen and to sustain the effective implementation of CASS in the classroom. Further, the monitoring of teachers progress, regular follow-ups and continuous support must be undertaken to weigh the effectiveness of the training programme.

From their research studies, King and Evans (1991) indicate that to ensure that the implementation of OBA in American schools is successful, extensive staff development is required, as is the ongoing monitoring of progress in the classroom. Without such efforts and support, it is likely that teachers will experience problems in the classroom (Brady, 1996). Brady states further that teachers need to be provided with ongoing support after initiation to ensure effective implementation. He suggests that this would provide a balance between the pressure to implement CASS and high quality assistance. Another interesting point made by Brady is that support to educators should be coupled with moderate pressure to enhance the implementation of CASS.

Yung (2002) in his study of teachers' professional consciousness as a determinant of teachers' practice in school - based assessment draws a distinction between technical support and professional support of educators. He argues that teachers who are expected to act according to prescriptions laid down through mandated policies would be more like "technicians", who merely need instrumental support as opposed to professionals who need a broader programme of professional development that would allow them to apply their knowledge through exercising their own judgement. In his research, Yung associates professional support with trust and empowerment, which lends itself to continuous quality improvement and professional development. According to Yung, the empowerment of teachers enables them to be regarded as professionals, exercising judgement and creativity, rather than as technicians, following directions.

Yung also argues that educators in China need more help, guidance and professional development than is currently the practice. He states that, "a major investment in the continuing professional development of teachers would be needed if demoralized teachers are to gain sufficient professional confidence to assert their professionalism in terms both of their critical reading of central policy texts and of their assumption of a more proactive role in educational reform."

In a study on assessment conducted by Combrinck (2003) involving Australia, New Zealand and America, a general finding was that teachers felt that they lacked support when implementing the new assessment policy. Combrinck (2003, p. 60) reports that, "*although Department officials in all three countries said they provided support, it seems that this was a major concern for all teachers*."

Since support has been identified by research as a crucial aspect for ensuring success in CASS implementation, Brady (1996) advances the idea of decentralized support, indicating that it might facilitate constant teacher feedback which can improve implementation. In the South African situation, the monitoring and support of schools is supposed to be conducted by the district/regional offices (Bisseker, 2003). These offices are usually located within the local municipality. Bisseker states that according to the HSRC study (2001), "districts have a paucity of professional staff and virtually no computers, and because of opposition from

unions to school monitoring are unable to carry out their role with authority". Bisseker indicates further that, "when districts don't work, teachers don't receive curriculum guidelines, textbooks and stationary. The inefficiency of the district level is the greatest obstacle to improving educational opportunities."

In a quality assurance study involving 297 schools (33 in each of the nine provinces) conducted by the Department of Education (DoE, 1999c), many educators (62%) maintained that they were hardly visited by departmental officials either for support or training purposes.

According to Wolf, Calfee and Rudner (cited in Combrinck, 2003, p. 60), the implementation of outcomes based assessment increases the workload of teachers. In this context, Brady (1996) indicates that professional support could minimize the burden of the additional demands placed on teachers and they would be better prepared to handle the additional demands made on them. The respondents in the study conducted by Combrinck (2003) were also in agreement that a good support system for teachers would alleviate the problem of the workload. Fullan (cited in Brady, 1996, p. 32) indicates, "we cannot achieve high quality learning for all or nearly all students, until quality continuous development is attained for all or nearly all teachers".

The reviewed literature shows that the ongoing high quality support of educators through advice, guidance and help is fundamental to ensuring that all educators are able to implement CASS with confidence. When ongoing support is not available to sustain what has been learnt, there is a likelihood of regression.

4.5 To what extent are the CASS marks fair, valid and reliable

This section examines literature on the third and last research question, namely, "the extent of the fairness, validity and reliability of the marks obtained through CASS"

Assessment of student learning is an essential element of OBE (Killen, 1996). Since assessment helps in decision making and to document student performance

the assessment must satisfy the principles of fairness, validity and reliability (McMillan, 2001). In the absence of fair, valid and reliable assessment, educators simply will not know whether or not their students have achieved the outcomes that were the focus of the programme and, more importantly, neither will the students (Killen, 1996).

Vandeyar and Killen (2003, p. 120), indicate that, "*when these assessment principles are understood they provide a clear framework for all major decisions that teachers need to make on assessment, however, when they are misunderstood or ignored, the resulting assessment practices are likely to result in the generation of worthless data*".

Since this study is concerned with assessment at Grade 12 that leads to a qualification which is regarded as the gateway to future employment, it is crucial that the principles of assessment are well understood by educators and that all assessment practices incorporate the principles of a good assessment. A discussion on the principles of fairness, validity and reliability is presented.

Fairness

The word "fairness" in assessment can be described as, "an equitable treatment of those being assessed" (McMillan, 2001). In other words, fairness ensures for example that, "the assessment strategies are designed to ensure equal opportunities for success regardless of the individual learner's age, gender, physical or other disability, culture, language, socio-economic background or geographic location" (Vandeyar & Killen, 2003). This implies that the performance of learners is not affected by the above factors, which are unrelated to the purpose of assessment (Mc Millan, 2001).

In practice, the principle of fairness as it relates to OBA in the Victorian curriculum (in Australia) is questionable since it is argued that, "the senior secondary curriculum has institutionalised inequality to the extent that the individual is no longer at the centre of educational outcomes; instead it is alleged that the outcomes can be accurately predicted for particular groups from year to year" (Timmins, 2003, p. 1). In South Africa, the very same sentiments are also echoed

by concerned academics such as Professor Jansen (1997) (cited in Fataar, 1999, p.2). The argument is that since outcomes are predicted in advance of the teaching and learning programme, this constitutes unfairness because not all learners are able to learn at the same pace. In this instance, learners that are slow will lag behind, whilst other learners will advance to the achievement of new outcomes.

According to Vandeyar and Killen (2003), in the pre - OBE system in South Africa, the principle of fairness in assessment was lacking since most of the examinations were conducted "once off", and for many students, assessment was conducted in a language other than their home language. They argue that assessment that is not conducted in one's own home language can result in learners achieving marks that do not reflect their true abilities. However, despite recent attempts by the Department of Education to introduce teaching and learning in the various home languages, the project has not yet been successful because of its complex nature and the logistics of re - structuring teaching and learning. One can hardly expect an English speaking Mathematics teacher to suddenly teach mathematics in Afrikaans or any African language when she/he is not proficient in the language. Besides, the difficulty is that learners are not grouped according to the type of home language they speak. If they were, the logistics of catering for the different groups would be an enormous challenge.

Literature on the practice of school - based assessment by the Victorian Curriculum and Assessment Authority (Timmins, 2003, p. 4) indicate that firstly, "a minority of educators are involved in unfair practices regarding their assessments and secondly, that some of the common assessment tasks (CATs) provide a bias in favour of students from affluent backgrounds". Regarding the first problem the Victorian Authority has identified that there are teachers who are over - assisting students. This has led to a situation where students were handing in CATs that were not entirely their own work. In this instance it also became difficult to identify how much of the final product was the student's own. The second problem concerned the social inequalities between the disadvantaged groups and the advantaged groups which favoured the advantaged groups (Timmins, 2003).

Ideally, the assessment conditions and access to test preparation and resource materials should be the same for all students (McMillan, 2001).

Kifer (2001), also points out that poor and minority students do not get comparable experiences to wealthier and majority students. He states that, it would be unfair to compare the results of, for example, the poor students to that of the wealthier students unless it can be argued that there are common opportunities, comparable resources and that learning occurs in similar contexts.

To address the problem of unfairness in assessment, the Board of Studies in Victoria (Australia) introduced stronger measures for monitoring and supervising student's work and for detecting possible breaches of authentication whereby teachers were required to see the student's work at three stages in the development process and to document and record the features of the work in progress. Given the mandate that teachers must monitor students work on a regular basis, it was expected that there should be an improvement in the assessment process and in the authenticity of the assessment results.

From the research reviewed, one can state that the importance of fairness in assessment cannot be overlooked. In terms of this principle, all learners should be treated in an equitable manner, hence, the conduct of assessment must be fair to all learners irrespective of their socio - economic background, gender or race.

Validity

A narrow definition of the term validity as it applies to assessment would be, "the extent to which a test measures what it purports to measure" (Stobart, 2001, p. 27). However, this definition is limited to the content or substance of the test instrument and in present circumstances is considered insufficient (Killen, 2003). Researchers argue that the principle of validity as it relates to assessment should also include the consequences of an assessment (Messick cited in Stobart, 2001, p.28). In other words, the focus should also be on the evidence from which valid inferences can be made about learning (Killen, 2003).

To ensure the validity of test scores, Killen (1996) reports that assessment must be made against predetermined standards (criteria), and that it should be made on an individual basis, after each student has had adequate time to learn. In the Victorian schools for example, teachers made use of "common statewide criteria" to evaluate the work of learners (Timmins, 2003). This was one of the measures taken to ensure the validity of the assessment scores since the scores of the senior exit examination was being used to determine entrance into tertiary institutions. Given the importance of the exit examination, the validity of the assessment decisions was considered essential.

The validity of examination results is always a matter of public concern (Riding, & Butterfield, 1990). In this regard Freeman and Lewis (1998) state that employers are complaining that students who leave university are unable to work in teams and use their initiative. The complaint here is about how students are assessed and whether the assessment matches with the capabilities of the learner. According to Freeman and Lewis, the employer's assumption is that a university degree should prepare students for work, but their experience is that the courses do not in fact succeed in doing this. If this assumption is true, then the validity of the assessment is questionable. In a study conducted by Entwistle and Percy (cited in Freeman & Lewis, 1998, p. 27), lecturers agreed that one of the aims of higher education was to promote higher order intellectual activity and outcomes such as critical or creative thinking and conceptual understanding. However, on analysing the assessment given to students it was found that the assessment was merely requiring a detailed and accurate reproduction of course content. The gap between the stated aims and the actual performance required of learners in the assessment was therefore inconsistent. Hence the validity of the decisions made by the lecturer is considered invalid.

In another study conducted by Norwich and Kent (2002) concerning the assessment of personal and social development of pupils with special educational needs, one of the findings was that the assessment of learner's personal and social development lacked validity. Although performance criteria was developed to produce a more valid assessment of the learners, between 25 - 35% of the sampled teachers believed that the provided descriptions missed out important

aspects of personal and social development (PSD). Hence a significant proportion of teachers did not believe that the results of the assessment provided an accurate summary of the PSD of the pupils they taught, which raised doubts about its validity. The main problem in this instance was that the descriptors used were either too broad or did not accurately represent the sequence of learning followed by the learners they taught. The study reported that validity could be improved if the descriptors used had a more sound basis.

In Kentucky (USA), the system of education was reformed by placing special emphasis on CASS through the implementation of performance-based assessment (Kifer, 2001). According to Kifer, the Kentucky government was of the opinion that the new assessment would improve learner achievement. The new assessment system was informed by the government's need to make schools accountable for their results. The law stipulated that schools were to produce improvements every two years. It was envisaged that the implementation of CASS would produce dramatic changes in curriculum and instruction in public schools and therefore to facilitate the implementation of CASS, educators were provided with exemplary assessment procedures, content standards and information about the new curricula, which would not only produce increasingly higher test scores but also drive desirable instructional practices (Kifer, 2001).

However, the weakness in the Kentucky system was that greater emphasis was placed on the accountability aspect whilst the implementation of CASS was neglected. Kifer indicates that the original intent to help teachers integrate assessment activities with instructional ones was ignored. The result was that the validity and reliability of the assessment was questionable because CASS consisted of practice tests, which were then used mainly for accountability purposes. In addition, emphasis was placed on multiple choice items whilst performance - based assessment was left out because it was considered unfit for accountability purposes.

However contrary to the beliefs of the Kentucky government, studies indicate that performance-based assessments are superior (Guskey, 1994). Guskey states that performance - based assessments are especially valuable if one wants to change

instruction in the direction of learners being able to solve problems and provide reasons. The value of performance-based assessment far exceeds the value of standardised testing.

Research on standardised tests conducted by Paris et al. in Canada on student (Grades 2 - 12) attitudes towards standardised tests used in mandated evaluations found a growing suspicion about the validity of test scores (cited in Ross et al., 1991, p. 85). Older students believed that tests did not measure the qualities of a good student. The results of the studies showed a growing conviction that parents and teachers did not care about the results. However, Lloyd - Jones et al. indicate that exams are also widely regarded as being objective and credible (cited in Freeman & Lewis, 1998, p. 178). The advantage of standardised tests (or examinations) is that the contents of the test or exam is the same for all learners and one can be sure that the results of the test or exam reflects the true ability of the learner. The use of standardised tests and examinations does have advantages especially if used to complement the internal CASS component.

According to Black and Wiliam (1998), one way to increase the validity of test scores is to involve learners in the identification of assessment goals and assessment criteria. These authors indicate that for effective learning to take place learners need to understand what is it they are trying to and want to achieve. They believe that understanding and commitment follows when learners have some part in deciding goals and identifying criteria for assessing progress. The communication of assessment criteria involves discussing them with learners using terms that they can understand, providing examples of how the criteria can be met in practice and engaging learners in peer-and self - assessment (Black & Wiliam, 1998).

By involving learners in the development of assessment goals and assessment criteria, Black and Wiliam are of the view that it gives pupils access to the big picture. In other words, learners know what is expected of them and how they are progressing in terms of achieving their goals. This increases the likelihood of the validity of the inferences made by teachers because of the active participation of learners.

It is also important that the assessment process adopted gives a clear indication of what students are learning. The more realistic the assessment procedures are, the clearer the picture teachers will have of what their students are learning. Gardner (cited in Killen, 1992, p. 7) states that traditional methods of assessment may not give students appropriate opportunities to reveal their knowledge or skills since the focus was on the reproduction of facts. However, in the context of OBE, the focus is on the acquisition of knowledge and skills that can be applied to solve problems.

Fischer and King (1995) state that authentic assessment is being implemented in response to the belief that national norm - referenced tests are invalid and /or incomplete measures by which to judge the achievement level of many students- especially minority students. The compilation of a portfolio by a learner is one way in which authentic assessment is conducted. For the portfolio system of authentic assessment to become valid, teachers, students and parents need to become familiar with the methods of assessing, evaluating, and recording data. As learners begin to share the responsibility of their own learning, they begin to understand how to help themselves learn (Fischer & King, 1995).

Fischer and King (1995) also add that the use of alternative assessment does not always guarantee the collection of accurate, unbiased data. This is especially true when the assessment content is orientated to topics and culture unfamiliar to the student or it seeks responses that are based on background knowledge achieved by those with an economic and educational advantage. Garcia and Pearson (cited in Ross et al., 2002, p. 86) argue that alternative assessment might be better for cultural minorities because they allow teachers (in portfolio assessment) to include items that reflect minority performance better and can be tailored to focus on issues that are more relevant to minority students. However, the results of formal and informal authentic assessment can be used to form a comprehensive picture of a student's overall progress.

According to Broadfoot (1996), there is a strong call for a strengthening of the validity of assessment in teaching and learning. Stobart (2001) indicates that the greatest threat to validity is inappropriate standards and poor pedagogical decisions. In terms of the former, the standards articulated in the level descriptors

should be appropriate to level of achievement. In terms of the latter, educators must be provided with sufficient information from which they are able to make decisions about learning.

The literature on the validity of assessment shows (Norwich & Kent, 2002; Kifer, 2001) that there is great concern about the validity of test and examination scores even in developing countries. It appears that the greatest challenge facing educators is the ability to make valid inferences about students' learning. Since the use of assessment criteria is vital in this regard, it is recommended that the assessment criteria used in the evaluation of tasks be of the appropriate standard and quality so that educators are able to make informed decisions about student learning that reflect their true abilities.

Reliability

McMillan (2001) defines reliability as the extent to which assessment scores are dependable and consistent. In other words, it is the extent to which any two teachers would reach the same conclusions even though they might be assessing different children in different schools and at different times (Norwick & Kent, 2002). The comparability of teacher ratings is important to ensure reliability of assessment.

The study conducted by Norwich and Kent (2002, p. 72) on "assessing of personal and social development of pupils with special educational needs", found that the reliability of the assessment was questionable. The main reasons for the inconsistencies in the reliability of the assessment was that there was the lack of guidance accompanying the PSD level descriptors to help teachers to reach a common understanding of what the descriptions meant or what to look for as evidence of a level having being achieved. This lack of guidance leads to educators using a range of different sources of evidence in making their assessments. Norwich and Kent indicate, for example, that one teacher used general experience and memory of the pupil only, while another consulted colleagues, set up specific tasks and also referred to written records. It is clear that the different procedures adopted in the assessment of a learner would provide inconsistent results.

A study on the national curriculum assessment in England revealed that there were inconsistencies in the marking of teacher assessment and tests. Although the national curriculum tests are pre - tested and the mark scheme is made public, reliability problems have emerged. Research indicates that in 1998, key stage 2 science tests marking schemes were criticised for being too analytical so that divergent (i.e., questions that illicit different correct answers), but correct answers- were not rewarded. However, when the marking scheme was later amended, the test results showed a dramatic increase in the results by as much as 9%. One of the cardinal concerns is that of the reliability in the marking of English. In 1997, over 53 000 scripts were reviewed. The main concern was in the clarity and consistency of the level descriptions.

According to Sainsbury and Sizmur (cited in Norwich & Kent, 2001, p. 36), "the level descriptors display a consistent degree of complexity, in which specific and general, concrete and abstract are always mixed." They add that in order to achieve consistency, high levels of professionalism and training will be required for educators to be able to correctly interpret the descriptors.

Research on content specific performance tasks shows that inter - rater reliability is possible (Marzano, 1999). Inter - rater reliability refers to, "the extent to which independent raters agree on the scores assigned to students on the various proficiencies measured within performance assessments" (Marzano, 1999, p. 4). Studies conducted by Shavelson (1989) (cited in Marzano, 1999, p. 44) report that performance assessments in Mathematics and science can be scored in a highly reliable fashion. However, the reliability of assessment is dependent on the manner in which the assessment criteria (rubrics) are articulated. Marzano (1999, p. 48) state that, "*tasks that have rubrics written specific to the proficiencies assessed can be scored quite reliably, whereas tasks whose rubrics are very general cannot be scored reliably*".

To improve the reliability of results Norwich & Kent (2001) emphasise that the following procedures must be instituted across schools:

Common procedures to be developed for assessing

This means that all educators should follow the same procedures in assessing their learners. Guidelines on how to assess should be formulated and given to all educators so that there is some kind of commonality in the manner in which assessment is conducted and scored.

Common understanding of terms amongst staff

Educators across schools need to be able to interpret the level descriptors uniformly so that there is common understanding of the terms used. The common interpretation and understanding will enable educators to assess the work in a consistent manner.

Joint processes of interpreting assessment evidence

To ensure that scores are consistent, it is advisable that the task be subject to more than one assessment so that the scores can be compared and verified to ensure reliability.

From the discussions above it is clear that reliability in assessment can only be achieved through the use of appropriate and specific assessment criteria (rubrics) that bears direct relevance to the task being assessed. However, what is also important is that educators across schools must be able to interpret and apply the criteria in a uniform manner thereby ensuring consistency in marking.

4.6 Conclusion

From the literature reviewed, it is evident that the implementation of OBA (CASS) even in developed countries such as Australia, New Zealand, America and Canada are problematic. The findings reveal that the main areas of concern are the inability of educators to understand the concepts and terminology associated with the new approach to assessment. This lack of understanding has impacted on

educators being unable to implement CASS effectively and efficiently in the classroom.

It comes as no surprise and the literature bears this out, that in those countries where OBA is problematic, educators have reported that they have not received sufficient training, and that support to implement CASS is lacking or not of the quality as it should be.

Literature on the fairness, validity and reliability of the marks obtained through OBA reveal that even in developed countries these principles are not fully met. As a result the validity and reliability of tests and examination results become questionable. In terms of fairness, it is suggested that all learners should be treated in an equitable and unbiased manner irrespective of their socio - economic background, race, language or gender. Where schools are not on an equal footing in terms of the facilities and resources available to conduct teaching and learning, it becomes clear that their results cannot be compared to learners in those schools where the provisioning is adequate. However, in practice in South Africa the results of schools offering Grade 12 are compared to each other. Although the provisioning of resources is an essential requirement, it is not adequately provided for in all schools.

Ensuring the validity of assessment is also problematic in certain developed countries such as Australia, Canada and Hong Kong. The literature shows that some of the main reasons for the lack of validity are that educators are unable to identify which assessment methods to use for which assessment purposes. The choice of assessment method must be linked to the outcome/s to be achieved. Another finding is that the assessment criteria are not always sound in terms of the outcome being assessed. This invariably results in invalid assessments. The challenge is for educators to be able to make valid decisions about students' learning that reflect their true abilities.

Literature reviewed on the reliability of assessment showed that there is a possibility of different markers awarding different scores to learners. This may be so where the assessment criteria are not clearly defined and interpreted in a

uniform way. To ensure consistency in marking, it is recommended that the assessment criteria must be specific to the task being assessed.

If one applies these findings from the literature to the South African context, it can be seen that much work needs to be done in South Africa to improve the implementation of CASS. The experiences of other developed countries are invaluable lessons from which we can learn. In South Africa, the introduction of CASS has been sudden rather than a gradual phased - in process, with sufficient time allocated to preparing educators, subject advisors and educational managers for the new curriculum and assessment processes (Sieborger, 1997).

The gradual phasing - in of OBE would have worked better had it been implemented as a pilot across all provinces in the first instance. Concurrently, continuous training and high quality professional development and support should have been provided to address problems and shortcomings in the delivery of learning programmes. Of paramount importance is the need to involve educators in the policy making process.

However, educators, subject advisors, senior managers and policymakers must show more commitment and dedication to the CASS process if they want to see any significant educational improvements. The fundamental concern is that if assessment is not conducted appropriately and effectively, the marks allocated to learners in their Grade 12 year may not be valid.

Given the overwhelming interest and hype about the Grade 12 results at the end of every year, and the fact that the quality assurance council has raised concerns about the validity and reliability of the Grade 12 CASS marks (Umalusi, 2002b), it is in the best interest of the Department of Education to adopt measures that would enhance the fairness, validity and reliability of the Grade 12 CASS marks. According to SAFCERT (2002a, p. 31), “educators in general are poorly trained in assessment and are thus poorly equipped to implement CASS satisfactorily”.

To be able to strengthen the fairness, validity and reliability of the CASS marks, more attention must be given to improve the development of assessment

instruments and the assessment process so that educators, subject advisors and educational managers are aware of their roles and responsibilities. Educators must also be trained on how to conduct CASS and how to assess CASS. Of particular importance is the development of suitable assessment criteria that are able to promote reliability in assessment. To improve the fairness, validity and reliability of the CASS marks across examining bodies, the promulgation of subject policy on CASS is essential. The role of high quality support and training must also be addressed without which educators will be unable to implement CASS effectively in the classroom. In the case of the Grade 12 results, if the CASS marks are not fair, valid and reliable they cannot be legitimately used for certification purposes.

Chapter 5 presents a summary of the problem statement and a discussion on the conceptual framework underpinning this study. The research design and methodology adopted in this study is discussed in detail.

CHAPTER 5

RESEARCH DESIGN

5.1 Introduction

As mentioned in Chapter 1 of this study, the implementation of CASS in South Africa is fairly new and given the complex nature of its implementation and the fact that CASS was introduced at short notice (Fataar, 1999; Kendall, 1999) the Department of Education together with its quality assurance council (Umalusi) found that there is not an acceptable standard of CASS at operational level (DoE, 1999b; DoE, 2003c; DoE, 2002c). As an interim measure, drastic measures are taken by Umalusi to reduce the impact of CASS on the examination marks of Grade 12 learners. Investigations conducted by the Department of Education also reveal that the implementation of CASS in general is problematic (DoE, 2002c). However, the literature review dealt with in Chapter 4 shows that despite the alleged limitations experienced by educators in the implementation of CASS, it is acknowledged that, "the assessment shift has been coupled with many expressions of hope that improvement in classroom assessment will make a strong contribution to the improvement of learning" (Black & Wiliam, 1998).

Since research shows that improved assessment practices can result in improved learning (Black & Wiliam, 1998), it would be wise to reflect on those variables that impact on the improvement of assessment practices in the classroom. It is also necessary to reiterate the purpose of this study so that it delineates the focus of this research and provides a conceptual framework for the understanding of the problem.

As indicated in Chapter 1, the purpose of this study is to investigate the problems and challenges experienced by Grade 12 Biology, Mathematics, Physical Science educators in the effective implementation of CASS; to determine the kinds of support provided to educators to strengthen and to sustain the effective implementation of CASS; and to examine to what extent the Grade 12 CASS marks are fair, valid and reliable. The data obtained through this study may be used to improve assessment practices in the classroom.

The purpose of this chapter is to discuss the research design used to investigate the research questions and to argue that the methodology adopted was most appropriate to the nature of the research questions.

Section 5.2 of this chapter examines the conceptual framework used in this study and is followed by a discussion on the research questions in 5.3. The research approach is discussed in 5.4, and 5.5 deals with the research methods. The conclusion to this chapter is presented in 5.6.

5.2 Conceptual Framework

The problem statement discussed in Chapter 1 of this study has been operationalised into three main research questions that form the basis of the discussions in this section. The conceptual framework, which incorporates the findings of the literature review, is meant to further address the three main research questions.

The three main research questions are:

- what are the problems and challenges experienced by Grade 12 Biology, Mathematics and Physical Science educators in the effective implementation of CASS?
- what kinds of support are provided to educators to strengthen and to sustain the effective implementation of CASS?
- the extent to which the Grade 12 CASS marks are fair, valid and reliable.

As mentioned earlier in this chapter since the effective implementation of CASS is expected to improve teaching and learning which would ultimately improve learner performance, the research questions that have emerged from the problem statement are likely to produce data that could be used to improve the effective implementation of CASS in the classroom thereby improving learner performance.

To provide the scope for further discussions and to facilitate understanding of the problem statement, a conceptual framework based on the Input - Process - Output (IPO) model has been adopted in this study. A conceptual framework can be defined as a model that allows the researcher to explore the relationships among

variables in a logical and prescribed fashion (Anderson, 1990). According to the IPO model there is a causal link between inputs, processes and outputs (Yu, 1998). This means that the variables at the input level have a direct influence on the variables at the processes level, which in turn influences the variables at the output level. As argued in Chapter 4 of this study, "to achieve high quality assessment in education, the need for high quality teachers is fundamental" (Klenowski, 1999, p. 40).

In the context of this study, the variables that influences the quality of educators are their teaching qualifications, skills, experience and development in CASS, attitude and motivation towards CASS, educational and professional support from subject advisors and support from the school principal (See figure 5.1). These variables at the input level have a direct impact and influence on the quality of teaching and learning within the classroom (classroom level). The better the qualifications of the teacher, his skills and experience in CASS and the more positive his attitude and motivation towards CASS coupled with the unconditional support of subject advisors and school principals, the better would be the quality of teaching and learning. This would then impact on the quality of the output (output level).

The input processes and output model focuses on the educator, his role and responsibilities in her/his classroom and how she/he functions within the context of the school. The context of the school refers to the school environment, for example, the culture of teaching and learning prevalent at the school, the discipline at the school, the resources available at the school, the location of the school, the support from the school principal, etc. In general, the manner in which an educator is able to perform her/his functions is peculiar to the context of his school. However, the school forms part of the much broader education system that consists of district offices, provincial education departments and the national department of education.

As indicated in Chapter 2 of this study, the role of subject advisors (subject advisors are located at district offices) is crucial to the improvement of teaching and learning. For this reason, the support of subject advisors has been highlighted

at the input level. If subject advisors are unable to support educators through, for example, the provision of CASS policy/guidelines, resources, professional development and training, it is expected that educators will not be able to meet the many challenges of classroom teaching.

Since the school cannot function in isolation and is much dependent on the support of district offices, the educator must be seen to operationalise CASS within the context of her/his school and the context of the district office that is responsible for the provision of support to the educator. Figure 5.1 is a representation of the input, process and output model which illustrates the educator's interaction with the school and the district office. This is followed by a discussion on the model.

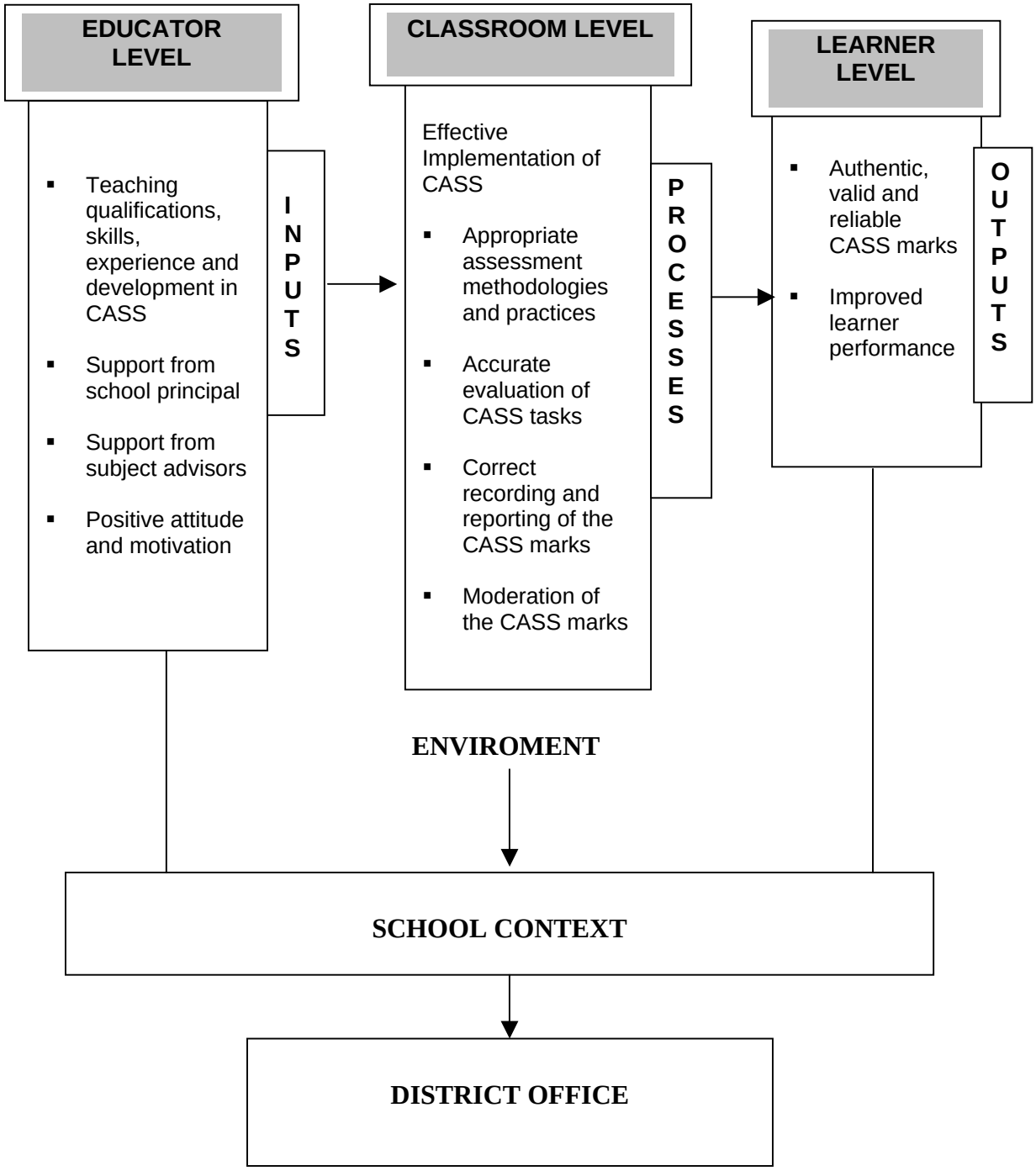


Figure 5.1 Input, Process and Output Model

Inputs

In relation to the research questions and with special focus on the educator within the school context, 'input' refers to the quality of educators that the school has been provided with to execute the schools primary function of effective teaching and learning. According to research conducted by the HSRC, "the perceived effectiveness of the educator proved to have influenced learner performance" (Kanjee et al., 2001, p.148). The better the quality of educators (teaching qualifications, skills, experience and development in CASS; support from subject advisors, support from school principal and more positive attitude and motivational levels), the better the quality of the interaction between teacher and learner in the classroom. This improved interaction between the teacher and learner then influences the quality of the outputs (authentic, valid and reliable CASS marks and improved learner performance) to be achieved at the end of the learning process.

The qualification of educators, their skills, teaching experience and development in the area of CASS are important variables at this level. Studies indicate that the qualification of educators have a significant effect on learner performance (Kanjee et al., 2001). However, apart from possessing a teaching qualification and being able to teach a subject, an educator must continually update her/his knowledge and skills in her/his subject. The experience she/he gains during the years of teaching is invaluable to her/his own development and to the development and progress of her/his learners.

Also of importance during this level is the quality of educator support provided by school principals and subject advisors in the form of classroom visits, provision of guidelines and policy documents, training programmes, workshops, professional development, skills training, physical resources and the provision of teacher and learner support materials. As indicated earlier in this section, the educator functions within the context of his school and the effectiveness of his teaching will depend to a large extent on the support he receives from her/his school principal.

Research indicates that school principals as leaders in a school have the ability to empower their educators by treating them with respect, showing support in terms

of staff development, support of teachers decisions, encouraging participatory policymaking and administration (Blasé, 1994). If the school environment is favourable and conducive to teaching and learning, this is likely to enhance the performance of educators.

The principal's interest and involvement in enhancing professional development and support within the school will influence the extent to which CASS is conducted in an appropriate manner. School principals will therefore need to understand the complex nature of CASS and provide assistance to educators to ensure that CASS is implemented in an effective manner.

However, in most instances the school principal's involvement is conditional since they are more involved in the general management and administration functions of the school than on providing professional development and support to their educators. Research shows that effective school management is linked to effective support of its educators (Kanjee et al., 2001). Without the unconditional support of the school principal especially in areas of new developments, it may become difficult for educators to meet the demands of new challenges with effectiveness. This may be the case where educators need additional physical resources, teacher and learner support materials, professional training and development, workshops, additional time with learners and administrative assistance.

Although it is recognised that the school principal plays an important role in the support of Grade 12 Biology, Physical Science and Mathematics educators, the collection of data from school principals was not necessary for the purpose of this study since the main focus of this study is on the educator and her/his subject advisor. Moreover, it was perceived that school principals are more concerned with the management and administrative functions of their schools than on the professional development and support of their educators. The collection of data from school principals would have also increased the scope of this study. It is acknowledged that this may have a limiting effect on the results of this study.

Within the context of the district office, subject advisors have an important role to play in ensuring that educators have the necessary support and the competence

to handle new challenges. Since schools are linked to district offices, there is much reliance on effective interaction between the school and the district, meaning between the teachers and their subject advisors. As indicated earlier in this chapter and as well as in chapter 2 of this study, the role of district offices (subject advisors are located at district offices) are crucial to the improvement of teaching and learning. Bisseker (2003) indicates that when districts don't work, teachers don't receive curriculum guidelines, textbooks and stationery. This he says is the greatest obstacle to improving educational opportunities.

Despite the many qualifications and years of teaching experience and the unconditional support of the school principal and the subject advisor, it may happen that educators are not interested in the effective implementation of CASS. This could be as a result of the negative attitude and low motivational levels of educators. Educators usually feel despondent and show resistance when they are confronted by challenges that they have not been prepared for. In this case the challenge of implementing CASS is expected to frustrate educators because of its complex nature and because they have not been adequately trained and prepared for it.

The literature review in Chapter 4 shows that experienced and skilled educators are prepared to quit the teaching profession because of their frustrations in implementing OBE. One of the main criticisms leveled against the introduction of CASS both nationally and internationally is that educators were not consulted before and during the policy making process. This has caused a lot of dissatisfaction amongst the teaching fraternity.

Research shows that if teachers are respected, trusted, praised and valued for the work that they do, this can have a powerful effect on the attitude and motivational levels of teachers (Blasé, 1994). The enhanced confidence that has been created through continued support and understanding from the school principal and subject advisors is essential to ensure that educators are able to implement CASS with confidence.

Since CASS is a fairly new concept in South Africa, it is essential that appropriate and continuous training and high quality support be provided by subject advisors and principals. However, in this study the focus will be on the support of subject advisors to their educators, which will serve to strengthen and to sustain the implementation of CASS. Considering the complex nature of CASS, its effective implementation is expected to be problematic unless educators are adequately trained and supported from the outset.

Processes

The term 'processes' refers to how the school seeks to achieve its goal of effective teaching and learning (DoE, 1999c). It refers to what the educators are teaching and how it is being taught, evaluated, recorded and moderated. The focus during the classroom level is on the effective implementation of the CASS policy, which simply means that educators must be able to operationalise the CASS policy in such a way that the desired subject outcomes or objectives are achieved at the end of the learning process. If educators do not have the right teaching qualifications, skills, experience, attitude, motivation and high quality support from subject advisors and school principals to implement CASS, this will have a negative impact on teaching and learning in the classroom.

Also of importance at the classroom level is the use of appropriate assessment methodologies and practices, which implies that educators need to use the correct types of assessment to suit the objectives or outcomes of the lesson. This can only be achieved if educators have a solid understanding of the subject content and types of assessments and how to implement them. Types of assessments include projects, assignments, tests, group work, practical, etc.

The ability to evaluate (make inferences) the CASS tasks are very much dependent on the educator's qualifications, experience and skills in the subject and the quality of training, skills development and support he receives from his subject advisor/s and school principal. The educator's level of competence will determine whether she/he is able to accurately interpret the assessment criteria used to evaluate the CASS task. Incorrect and inconsistent interpretation of the

assessment criteria will lead to an incorrect evaluation of the learner's work. The educator's value judgement must also be based on legitimate criteria, which will promote the validity and reliability of the CASS marks. Following the process of evaluation is the recording and reporting of the CASS marks. This requires that educators to be quite vigilant in the calculation and the transcribing of marks onto mark sheets. Lastly, it is essential that the CASS marks be moderated to ensure its validity and reliability. Moderation is a quality assurance measure used to ensure that the marks awarded to learners reflect their true capabilities. The literature reviewed shows that feedback is an essential element in the improvement of learner achievement. For this reason, if moderators are able to give feedback to educators on the standard and quality of the assessment, this information can be conveyed to the learners with the aim of improving the conduct of CASS, which will also influence learner performance.

The success of CASS implementation at the classroom level depends on the extent to which the inputs at the educator level have been complied with. Without the necessary qualifications, skills, expertise, positive attitude, motivation and high quality support from subject advisors and principals, an educator will not be able to implement CASS as effectively as she/he should.

Outputs

The term 'outputs' refers to the end result, goal or outcomes of what the educator and learner want to achieve at the end of the learning process. The output is usually an observable and /or measurable indicator. In this model, there are two main outputs, namely, authentic, valid and reliable CASS marks and improved learner performance. Both these indicators can clearly be observed and measured in the examination results of a school.

Improved learner performance is the variable, which measures the extent of success obtained through the implementation of a programme or policy (DoE, 1999c). The focus during this level is on the learner since the learner is dependent to a large extent on the professionalism and competence of the educator within the classroom. The learner's achievements will indicate whether the teaching and

learning has been effective or not. In this regard, one needs to question whether the learner has gained from for example, the high quality inputs (educator qualifications, skills and experience and support from subject advisors and principals) and the improved processes (improved classroom practices).

Studies in the UK (England) have shown that the obtaining of valid and reliable CASS marks leads to improved learner performance (Black & Wiliam, 1998). These outputs are however to a large extent dependent on whether the requirements during the input and process stage have been successfully met. The fairness, validity and reliability of the CASS marks are also discussed in the literature review presented in Chapter 4.

In sum, it can be argued that the quality of inputs at the educator level has a direct influence on the quality of interaction at the classroom level. This in turn influences the validity and reliability of the CASS marks and learner achievements at the output level. For this reason, it is critical that greater attention be given to those variables at the input level since the high quality inputs has a domino effect on the processes and the resulting outputs.

Flowing from the conceptual framework are the specific research questions that are aimed at seeking answers to the problem statement discussed in chapter 1 of this study.

5.3 Research Questions

The three main research questions that have been operationalised from the problem statement discussed in Chapter 1 and the conceptual framework discussed above are the following:

1. *What are the problems and challenges experienced by Grade 12 Mathematics, Biology and Physical Science educators in the effective implementation of CASS?*

This question seeks to provide insight on the problems and challenges facing educators in the effective implementation of CASS. Since problems and

challenges are expected to impact negatively on the implementation of CASS, it is essential that they are identified and appropriate measures taken to remedy them.

2. *What kinds of support are provided to educators to strengthen and to sustain the effective implementation of CASS?*

This question is divided into three aspects. The first aspect seeks to determine whether educators are familiar with the provincial/ or the national policy on CASS, the second aspect examines to what extent Grade 12 educators are trained to implement CASS effectively in Biology, Mathematics and Physical Science and the third aspect investigates how educators are supported to enable them to implement CASS effectively. A brief discussion on each aspect is given.

- *Are educators familiar with the provincial/or national policy on CASS?*

This question provides data on whether educators are in possession of a provincial/or national policy on the implementation of CASS and the extent to which they understand the policy so that they are able to implement it effectively in their subjects.

- *To what extent are Grade 12 educators trained to implement CASS effectively in Biology, Mathematics and Physical Science?*

This question provides data on the amount and frequency of training received by Grade 12 educators of Biology, Mathematics and Physical Science. The amount and the frequency of training provided by subject advisors will impact on the effectiveness of CASS implementation.

- *How are educators supported to enable them to implement CASS effectively?*

Apart from providing training to educators on the implementation of CASS, it is essential that educators be supported on an ongoing basis by their subject advisors and school principals. Educators must be supported in terms of classroom visits, teacher training, workshops, and professional development and

teacher and learner support materials. The need for continuous high quality support from subject advisors is paramount to the effective implementation of CASS.

3. To what extent are the Grade 12 CASS marks fair, valid and reliable?

This question seeks to determine to what extent the CASS marks provided by educators at the end of the Grade 12 - year are fair, valid and reliable.

Section 5.4 elaborates on the research design used in this study to seek answers to the research questions explained above.

5. 4 Research Design

This section presents the research approach adopted in this study to find answers to the three main research questions discussed in 5.3. Since the purpose of a research design is to provide the most valid and accurate answers possible to research questions (Wiersma, 1995), each research question will be deconstructed to highlight the variables to be investigated and the best possible way to seek information relevant to the research questions. The research questions are linked to the conceptual framework discussed in 5.2 of this chapter.

Research question 1

What are the problems and challenges experienced by Grade 12 Biology, Mathematics and Physical Science educators in the effective implementation of CASS?

The key words in the above question are “problems” and “challenges” experienced by “Grade 12 educators” in the implementation of CASS. To answer this question information is required about the possible barriers or the difficulties that Grade 12 educators experience or encounter in the practice of CASS in the classroom. These variables are seen as having a negative impact on the effective implementation of CASS, which is highlighted in the problem statement (Chapter 1).

Since this research question requires predominantly descriptive data on what Grade 12 educators perceive the barriers to be, the most suitable way to collect such data is through the use of surveys in the form of written questionnaires. The data gathered must describe what is happening at present (Anderson, 1990), so that there is a better understanding of the implementation of CASS. Further, questionnaires are also able to provide first hand (primary) information on the problem, which is not available by any other means. The use of written questionnaires also makes it possible to conduct the survey within a short period of time (mail survey), thereby saving on time and resources. Research shows that many studies in education and social sciences use surveys to collect information about attitudes, opinions and characteristics such as age and gender (Anderson, 1990). However, it must be acknowledged that the disadvantage of survey questionnaires is that it prompts respondents to provide answers that are socially desirable. This may have a limiting effect on this study.

In this question the key informant (respondent) is the educator who is involved in the implementation of CASS in the classroom. In the conceptual framework to this study, it was explained that the effective implementation of CASS depends on the educators teaching qualifications, skills and her/his development in the area of CASS. If an educator is not sufficiently qualified or competent in the implementation of CASS or if she/he does not receive adequate and continuous high quality support from subject advisors/or the school principal, it is expected that she/ he would experience problems in the practice of CASS in the classroom.

To provide for the triangulation and verification of the data received from the Grade 12 educators, it was also considered necessary to gather data from another source. An interesting option would have been to gather data from learners since they are in direct contact with their educators, however, since the collection of data from learners would have entailed direct contact with the learners so that the questionnaire could be explained, the option was ruled out due to time constraints. The next best option was the collection of data from subject advisors who are supposed to be in constant interaction with their educators and ought to be in a position to give first hand information on the implementation of CASS.

In this case the use of written questionnaires was also identified as the most suitable means to collect data due to the descriptive nature of this study. In addition, the main purpose of the data from the subject advisors was so that it could be compared and contrasted with the data from educators. As mentioned in the conceptual framework to this study, subject advisors have a vital role to play in the support of educators and as such it is expected that they would be in a good position to respond to the question on the problems and challenges (barriers) experienced by educators in the successful implementation of CASS.

To enhance the internal validity of the study further, a third data source was considered necessary since it had to verify the data collected from educators and subject advisors. Since there is a link between educators and their subject advisors, the third group was identified on the basis of their link with the district offices. This third group consisted of a group of CASS experts who are responsible for inter - alia, monitoring the implementation of CASS. Since written questionnaires were used to collect data from educators and subject advisors, the semi - structured interview was identified as a good way to collect data from a few experts because it gives first hand information.

The advantage of making use of semi - structured interviews is that it allows for the direct contact with the interviewees and the opportunity to use probing questions to obtain pertinent information on CASS. The direct face - to - face contact also facilitated the clarification of issues and responses on the spot. The semi-structured style enables the interviewer to However, to add value to the findings of this research study, the interviewees had to be carefully chosen from amongst a group of people that are able to speak with some kind of authority on CASS. For this reason officials that serve on the national CASS committee and who are involved in the monitoring and evaluation of CASS at district, provincial and national level and an official from Umalusi were identified as the most suitable participants for the interview because of their first hand knowledge on CASS.

The research design explained for research question 1 also applies to research question 2 and 3 since the nature of the research questions are most suitable for a descriptive study where the findings can be quantified using descriptive statistics.

Research question 2

2. *What kinds of support are provided to educators to strengthen and to sustain the effective implementation of CASS?*

This question examines three aspects, namely, are educators familiar with the provincial/or national policy on CASS; to what extent are Grade 12 educators trained to implement CASS effectively in Biology, Mathematics and Physical Science?, and, how are educators supported to enable them to implement CASS effectively?

The key variable in this research question is "support". The literature review in Chapter 4 shows that for any innovation to be successful, its implementation must be fully supported. In the conceptual framework discussed in 5.3, support from subject advisors and support from the school principal was highlighted at the input level. If educators are not provided with the necessary policy documents on CASS and if they do not understand the document, it would not be possible for educators to implement the policy. Further, if no training has been provided to educators the task of implementing CASS in the classroom will be made more difficult. The lack of support to implement CASS effectively can result in the CASS marks being invalid and unreliable.

To answer this research question, information on whether educators are in possession of the provincial/national policy on CASS is required. Further, educators need to indicate whether training has been offered to them and the frequency of such training. The extent of training determines whether educators are sufficiently prepared to implement CASS according to policy. It is also important that educators are provided with continuous high quality support such as in classroom visits, provision of resources, workshops, skills development, etc.

As in research question 1, this question also requires data to be collected from educators who are directly responsible for the implementation of CASS in the classroom. However, since subject advisors are responsible for supporting educators through the provision of policy documents and resources, training, skills

development programmes and workshops, it was appropriate to collect data from them as well. For this reason the same type of questions were included in the questionnaire of both the educators as well as the subject advisor. This facilitated the triangulation and verification of data.

Here too, the third data source, namely, the semi - structured individual interviews with a group of CASS experts was used to enhance the internal validity of the study. The motivation for the use of questionnaires and semi - structured interviews provided for research question 1 also applies to research question 2.

Research question 3

To what extent are the Grade 12 CASS marks fair, valid and reliable?

This question seeks to find out to what extent the Grade 12 CASS marks is true and consistent. Numerous questions come forth in this regard, such as, are the marks that are allocated to learners reflect the true abilities of the learners or are the marks simply faked by educators? Do the assessment tasks address the needs of learners? What measures are taken by examining bodies to ensure that the marks are valid? Have the marks been moderated? In the case of the reliability of the marks, are the marks consistent, have they been evaluated according to appropriate assessment criteria. Do educators have a common understanding of how to apply the assessment criteria so that marks are consistent? These are some of the answers that are sought after in this question.

As with previous research questions, this question also required as a first step a description of what is done to ensure that the CASS marks are fair, valid and reliable. In other words, educators and subject advisors had to indicate whether the CASS marks are fair and valid based on the CASS processes followed in arriving at the CASS marks. Subject advisors had to for example indicate what quality assurance measures were taken to ensure the validity and reliability of the CASS marks.

Consistent with the data collection approach adopted for question 1 and 2, this question was included in the written questionnaires of educators (people who are

responsible for CASS implementation and evaluation) and subject advisors (people who are responsible for supporting educators through the CASS implementation process). This question was repeated in the interview schedule so that a third perspective could be used to triangulate and verify the data received from educators and subject advisors.

The three different sources of data make it possible to triangulate information thereby enhancing the internal validity of this study.

Section 5.5 elaborates on the research methods adopted in this study.

5.5 Research Methods

This section expands on the research design used in this study, which incorporates a discussion on population and sampling in 5.5.1, instruments development in 5.5.2 and the data collection approach in 5.5.3. The procedures followed in the conduct of the research in presented in diagrammatic form in 5.5.4 and lastly 5.5.5 deals with the data analysis of this study.

5.5.1 Population and Sampling

This section deals with the selection of the sample of the target population for this study. As mentioned in the analysis of the research questions, the key informants (respondents) are the Grade 12 Biology, Mathematics and Physical Science educators who are directly involved in the implementation of CASS in the classroom. The target population would therefore be all Grade 12 Biology, Mathematics and Physical Science educators. However, to get good estimates, it is never necessary to include all teachers. A ‘good’ sample suffices. For practical reasons, a small sample of Grade 12 Biology, Mathematics and Physical Science educators was chosen to participate in this study.

Since questionnaire data often result in socially desirable answers, it was important to triangulate them. Subject advisors who are linked to the educators in terms of the support they are expected to provide were identified as the second

data source. This facilitated the triangulation and verification of data from the Grade 12 educators. Since convenience sampling was used as opposed to random sampling, this may be considered as a limitation to this study.

To further enhance the internal validity of the data, a third data source was identified. This involved the collection of data from a few CASS experts involved in the management/monitoring and evaluation of CASS from national, provincial and district level and from Umalusi. The third data source through a different method (namely, semi - structured individual interviews) was perceived to add credibility to the data. Hence, it is important to note that the data collected from educators were triangulated with the data from subject advisors, which was further triangulated with the data collected from the few CASS experts interviewed.

Sampling of subject advisors and educators

The Grade 12 subject advisors of Biology, Mathematics and Physical Science that participated in this study were sampled through their district offices and the educators were sampled through their schools.

Although the subject advisors in the sample are known to the educators and vice versa, the researcher is confident that the samples of subject advisors and educators have been sincere in their responses to the research questions. It is also expected that subject advisors and educators as professional people would respond in a manner that would not compromise their integrity. This assumption is based on the fact that subject advisors and educators in general are also concerned about the implementation of CASS and have shown considerable professional interest in this study. The subject advisors in the sample, who are well known to the researcher since they serve on the national panel of examiners, have been discussing their problems and the problems experienced by their educators in the implementation of CASS. As indicated in the rationale to this study in Chapter 1, there are genuine concerns amongst educationists and the public regarding the validity of the Grade 12 CASS marks and the credibility of the Grade 12 examinations as a whole. Discussions of this nature had in fact motivated the researcher to conduct research on this topic.

The subject advisors and educators were sampled from six out of nine provinces namely, Eastern Cape, Northern Cape, KwaZulu - Natal, Mpumalanga, Limpopo and Gauteng. Given the exploratory nature of the study, the choice of six provinces out of nine provinces is considered a fair sample size. Also, for practical reasons the survey could only be conducted in six provinces where the provincial infrastructure provided a platform for the smooth administration of the survey. The questionnaires were administered in fifteen (15) district offices and twenty - two (22) schools across the six provinces. The sample of subject advisors and educators that participated in this study is shown in Table 5.1.

Table 5.1 Sample of subject advisors and educators through district offices and schools across the six provinces

Province	No of Districts	No of Subject Advisors	No of Schools	No of educators
KwaZulu-Natal	2	2	4	13
Gauteng	2	2	4	11
Northern Cape	3	4	3	8
Eastern Cape	3	5	4	12
Limpopo	2	3	4	12
Mpumalanga	3	5	3	4
Total Sample	***15***	***21***	***22***	***60***

The 21 subject advisors that participated in this study were selected through convenience sampling (feasibility and access) since the subject advisors are known to the researcher. The sample of educators was also selected on the basis of convenience by the subject advisors through the schools that they are responsible for.

Although the non - random sampling method was used, attempts were made to select subject advisors and educators from different locations, namely, rural, township, urban (suburbs) and urban (centre of city) so that the various school

contexts would be represented in the study. It was also considered important to include responses from a spread of districts and schools, which is likely to produce data illustrating the different perspectives on CASS. See Table 5.2.

Table 5.2 Number of educators and subject advisors sampled according to their location across the six provinces

Respondent	Rural		Township		Urban		Mixed		Totals	
	No.	%	No.	%	No.	%	No.	%	No.	%
Educators	12	(20%)	12	(20%)	36	(60%)	0	(0%)	60	(100%)
Subject Advisors	8	(38%)	_		7	(33%)	6	(29%)	21	(100%)

Sampling of subject advisors through their district offices

Since subject advisors are located at district offices, they had to be sampled via their district offices. The questionnaires for the subject advisors were therefore sent to two - three districts/regional offices in each of the six provinces mentioned above together with a letter inviting the subject advisors to participate in the research. The subject advisors were assured that their responses would be highly confidential. See Appendix A. The subject advisors were chosen using the non-random sampling method.

Subject advisors in each of the three subjects, namely, Biology, Mathematics and Physical Science at each district office were expected to complete separate questions. If 15 districts participated in the study the number of responses from subject advisors would have been 45. However, in many district offices it was found that there was only one subject advisor for Mathematics and Science. In Limpopo, it was found that only one subject advisor was appointed for all three subjects. In this instance, the subject advisor completed only one questionnaire for all three subjects. In total, 21 questionnaires were completed by the subject advisors of Mathematics, Biology and Physical Science from the 15 districts.

Sampling of educators through their schools

The sampling of educators took place via their subject advisors and through the schools they serve. The questionnaires for the educators were sent to the subject advisors in the six provinces mentioned above together with a letter inviting the Biology, Mathematics and Physical Science educators to participate in the research. The purpose of the study was outlined in the letter and the participants were assured that all information supplied by them would be kept confidential. See Appendix B.

Subject advisors responsible for Biology, Mathematics and Physical Science handed the questionnaires to their Grade 12 educators within their districts. Since subject advisors had to work within their districts, they choose to involve educators located at schools that were convenient in terms of feasibility and access. In each of the schools identified by the subject advisors, one Grade 12 educator in each of the three subjects mentioned above was invited to participate in the research. In schools, where for example, there were two educators teaching Mathematics at Grade 12 level, two questionnaires were completed for that particular subject. However, in certain cases, not all responses were received from educators. A total of 60 responses were received from 22 schools.

Since, the samples chosen are not representative of the target population (Grade 12 educators and subject advisors of Biology, Mathematics and Physical Science), it is accepted that the results from this study cannot be generalised to the entire population of which the participants are a part. The small sample size and the convenient sampling strategy can be seen as having a limiting effect on the results of this study. However, the study must be seen as an exploratory one.

Sampling of Education Assessment Experts

To enhance the internal validity of the research results, a third source of data collection through the use of semi - structured interviews was considered necessary. This third data source provided for the triangulation and verification of the data collected from the Grade 12 educators and subject advisors of Biology,

Mathematics and Physical Science. The individual interviews also complements the small sample size used in the case of both educators (60) and subject advisors (21).

Another reason for including the individual interviews, as a third data source was to obtain data from a source that was also considered reliable and that would add credibility to the research results. To enhance the validity of the findings of this study, the interviewees had to be selected from amongst a group of people that are able to speak with some kind of authority on CASS. For this reason, 5 of 12 (42%) officials that serve on the national CASS committee and who are involved in the monitoring and evaluation of CASS at district, provincial and national level and an official from Umalusi were identified as the most suitable participants for the interview. In this regard, one can safely indicate that although only five officials were chosen, the focus was on the quality of inputs from these respondents rather than on the quantity of respondents. The selection of these officials was purposive.

The following criteria were used to select the sample of the participants for the interview:

- all five officials were selected on the basis of their knowledge, expertise and involvement in the area of CASS;
- the officials are currently representing their departments/organisation at the CASS workshops organised by the national Department of Education;
- the participants are involved in assessment at different levels, i.e., district level, provincial level, national level and at an external level (Umalusi).

The following individuals were interviewed:

- one subject advisor dealing with CASS assessment at the district level in the North West provincial Education Department;
- two Deputy Chief Education Specialists from the National Department of Education, who are involved in the monitoring and evaluation of under performing secondary schools in all provinces;

- the Director of Curriculum and Assessment in the Western Cape Department of Education who plays an important role in the management of CASS at provincial level; and

- the Director of Assessment in the FET band (Schools) from Umalusi who has the responsibility of ensuring the credibility of the Grade 12 CASS marks.

The main reason for the selection of these officials is that they are knowledgeable and currently very active in the improvement of CASS implementation across all provinces. They are also best suited to give first hand information about the operation of CASS at provincial and district level since they monitor and evaluate the implementation of CASS at schools on a regular basis.

Since the interviews allowed for the probing of responses from the interviewees, much information was collected in this way. The face - to - face interviews also created an opportunity for the clarification of issues and responses on the spot.

5.5.2 Instrument development

In this study, the need for three separate instruments to collect data was identified on the basis of the three different groups of respondents that could contribute immensely to this study. Although three different instruments were used to collect data, similar types of questions were repeated in the three different instruments so that the responses could be compared and contrasted. (See Appendix C,D and E).

In terms of the educators and subject advisors, the questionnaire was identified as the most suitable way to collect data since the study is of a descriptive nature and detail descriptive information can best be obtained through the use of written questionnaires. The third instrument was the interview schedule that was meant to collect data from the five experts selected to participate in this study.

The instruments developed for the survey administered to subject advisors and educators of Mathematics, Physical Science and Biology and the instrument for the semi - structured interviews are shown in Table 5.3.

Table 5.3 List of Instruments administered in this study

Population	Level	Instrument	Target
CASS Experts	Umalusi (External Quality Assurer)	Interview Schedule	Director of Assessment: FET Schools
	National Department of Education	Interview Schedule	DCES (2) National Forum for Learner Performance (NFLP)
	Provincial Department of Education	Interview Schedule	Director: Assessment
	District/Region	Interview Schedule	Subject Advisor: Assessment
Subject Advisors (Grade 12)	Districts/Regions 6 Provincial Education Departments	Questionnaire	Subject Advisors: Mathematics Biology Physical Science
Educators (Grade 12)	Schools 6 Provincial Education Departments	Questionnaire	Educators: Biology Mathematics Physical Science

Questionnaire for Educators

One questionnaire was developed for the Grade 12 educators of Mathematics, Biology and Physical Science. Educators were required to provide information on constructs such as their profiles (qualifications and experience as educators); whether they were familiar with the provincial/national CASS policy; the type of support and the frequency of training received from subject advisors in order that they may implement CASS efficiently and effectively as well as the problems and challenges that they are faced with in the implementation of CASS. Educators also had to indicate whether in their opinion the CASS marks obtained by their learners in their subject were fair and valid. The researcher is aware that this was a

complex question due to the limited knowledge of educators on what constitutes a fair and valid assessment. A more detailed discussion on this aspect is dealt with in chapter 6.

Many questions that were included in the questionnaire of the subject advisors were also included in the questionnaire of the educators. This made it possible to compare and contrast the data for triangulation purposes. Question types used were open - ended and closed questions and questions using Likert scales. See Appendix D.

Questionnaire for Subject Advisors

One questionnaire was developed for the Grade 12 subject advisors of Mathematics, Biology and Physical Science. The subject advisors were required to provide information on constructs such as their profiles (qualifications and experience as subject advisors); whether educators in their subject are familiar with the CASS policy; the type of support and the extent and frequency of training provided to educators in order that they may implement CASS efficiently and effectively as well as the problems and challenges facing educators in the implementation of CASS in the subject concerned. Subject advisors also had to indicate whether in their opinion the CASS marks obtained by the learners in their subject were fair and valid. As is the case with educators, subject advisors would have also experienced problems in providing an accurate response to this question due to the complex nature of the question. Chapter 6 reveals more about the fairness, validity and reliability of the CASS.

Since the information collected from the subject advisors had to be compared and contrasted with the data from the educators, the questionnaire used for the subject advisor had to include many questions that were also included in the questionnaire designed for the educators. Question types used were open-ended and closed questions and questions using Likert scales. See Appendix C.

Interview Schedule

The interview questions were designed to elicit information from various perspectives and at the various levels (national, provincial and district level) about the implementation of CASS at Grade 12 level. The interview focused on aspects such as the problems and challenges experienced by Grade 12 Biology, Mathematics and Physical Science educators in the effective implementation of CASS, the kinds of support provided to educators to strengthen and to sustain the effective implementation of CASS and to what extent the Grade 12 CASS marks are fair, valid and reliable. Open - ended and closed items were included in the interview schedule. However, there were more open - ended items than closed items, which allowed for a greater degree of communication and proved to be invaluable to this study. See Appendix E.

Piloting of Instruments

The three instruments, namely the questionnaire for the educators, subject advisors and the interview schedule were pilot tested to ensure that the wording, sequence of questions and the type of questions used in the instruments were related to the research questions and to this study as a whole. In terms of the questionnaires, the pilot test was conducted with a group of 8 subject advisors and a group of 10 educators of Biology, Mathematics and Physical Science. This process helped to re - phrase certain questions that were interpreted as ambiguous. The interview schedule was piloted with three officials within the Department of Education who serve on the national CASS committee. This process helped to clear ambiguous questions and to correct the flow of the questions.

Upon completion of the pilot test, the instruments were edited and finalised for the main study.

5.5.3 Data Collection

In the proposal to this study, it was planned that data would be collected from 10 district offices and 20 schools across five provinces. When the time arrived for the

questionnaires to be returned by the respondents to the researcher, not all questionnaires were completed and returned even though the respondents were provided with self-addressed envelopes.

Two measures were taken to ensure that sufficient responses are received in time for the analyses of the data. The one was to increase the sample size by including an additional province to the study and the other was to contact the respondents by telephone and remind them of the return by date. These measures did indeed pay dividends. Within a three - month period a total of 21 of 24 (87.5%) questionnaires were completed and returned by subject advisors and 60 of 72 (83.3%) questionnaires were completed and returned by educators from across the six provinces. The pleasing rate of response also shows the commitment of subject advisors and educators to this study. However, although the sample is not representative of the entire target population, it is nevertheless an acceptable sample size since this study can be characterised as an exploratory one where the findings from the study cannot be generalised to the entire target population.

Educators

A total of 72 educator questionnaires were sent to the district offices in the six provinces (6 x 12 questionnaires per province). The response rate was 60 of 72 (83.3%). Data on the implementation of CASS at Grade 12 levels was collected from a total of 20 Mathematics educators, 17 Biology educators and 23 Physical Science educators in the six provinces. One educator from Limpopo indicated that he was teaching all three subjects; hence he had completed one questionnaire for all three subjects. Another educator from Mpumalanga also completed one questionnaire instead of two separate questionnaires. A breakdown of data collection according to subject and provinces is provided in Table 5.4.

Table 5.4 Data collection of educators according to subject and province

Province	Mathematics	Biology	Physical Science	No. of responses per province
KwaZulu-Natal	5	3	5	13
Gauteng	4	2	5	11
Northern Cape	3	2	3	8
Eastern Cape	4	4	4	12
Limpopo	2	5	5	12
Mpumalanga	2	1	1	4
No of responses per subject per province	***20***	***17***	***23***	***60***

Subject Advisors

Table 5.5 provides a breakdown of the responses received from the subject advisors per province and per subject.

Table 5.5 Data collection of subject advisors according to subject and province

Province	Mathematics	Biology	Physical Science	No. of responses per province
KwaZulu-Natal	0	1	1	2
Gauteng	0	2	0	2
Northern Cape	1	1	2	4
Eastern Cape	2	1	2	5
Limpopo	1	1	1	3
Mpumalanga	3	0	2	5
No of responses received per subject	***7***	***6***	***8***	***21***

Assessment Experts

Individual semi - structured interviews were conducted with five experts on CASS that are involved in the management/monitoring and evaluation of CASS at Grade 12 level. The participants were consulted and appointments were made for the conducting of the interviews. The questionnaires were sent to the officials a few days prior to the interview so that the participants could become familiar with the questions. Each interview lasted approximately one hour. The responses were hand - written on the interview schedule and later captured on Microsoft word. To ensure the accuracy of the data, the information was referred back to the respondents for checking. The respondents were asked to ensure that their responses were captured accurately. The participants were thanked for their willingness to participate in the interview and for the sharing of information regarding the implementation of CASS from their respective positions.

5.5.4 Procedures followed in conducting the research

The following procedures were followed in conducting this research. See Figure 5.2.

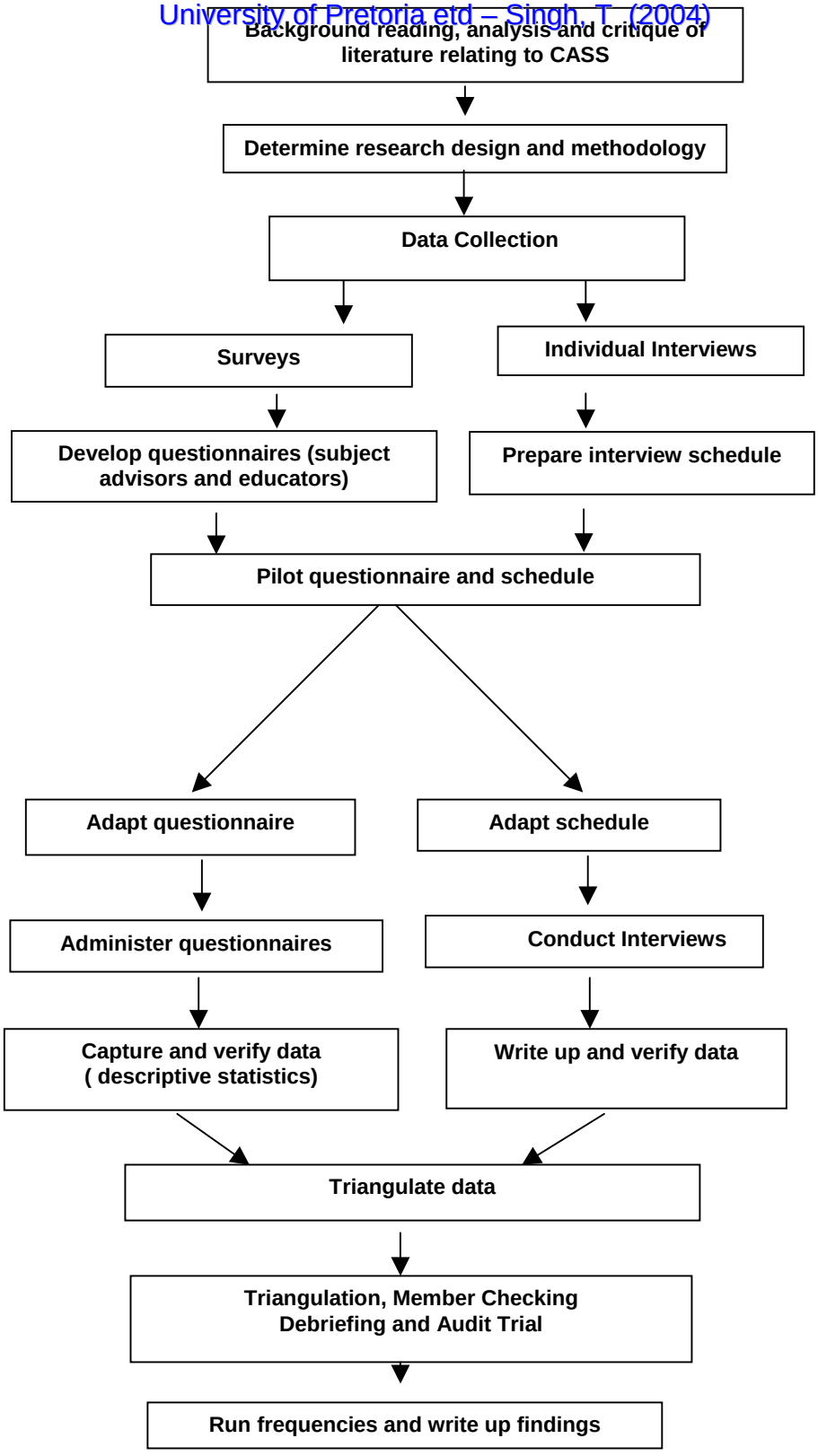


Figure 5.2 Procedures followed in conducting the research (Adapted from True, 1989, Bell, 1987 and Wiersma, 1995)

5.6 Data Analysis

Since the questionnaires of both the educators and the subject advisors consisted of open - ended, closed items and Likert scale items, a scoring procedure had to be planned to ensure consistency and accuracy during the data capturing process. All the closed items on the questionnaire were coded numerically and the responses were captured onto the computer using Microsoft Access. With the open - ended questions all the responses were recorded and a code was allocated to each type of response. In certain instances responses that were similar in nature were grouped together and allocated one numerical code. The numerical code was then captured on the system. The data was later exported to the Statistical Package for Social Sciences (SPSS). Descriptive statistics (using SPSS) are used to describe (give meaning) to the data obtained from the survey. Tables, figures and tabulations are used to summarise the data obtained from the questionnaires so that they are presented in a manner that can be easily understood. In many instances, frequencies and cross tabulations are presented to enhance and enrich the findings of this study.

5.7 Conclusion

This chapter outlined the research approach that was used to undertake this study. Data on the implementation of CASS was collected using the quantitative approach where use was made of written questionnaires and individual semi-structured interviews to gather data. The reason for adopting this data collection strategy is because it suited the exploratory nature of this study, which required descriptive information in response to certain open - ended questions. The questionnaires were completed by twenty - one (21) Grade 12 subject advisors and sixty (60) educators of Biology, Mathematics and Physical Science. The questionnaires were administered using the non - random sampling method at six provincial education departments namely, Eastern Cape, Northern Cape, Gauteng, Limpopo, KwaZulu - Natal and Mpumalanga and at various locations namely, rural, township, urban-centre of city, urban - suburbs and a mixture of schools in districts with a mix of urban, rural and township schools. The interviews were conducted with four experts from national, provincial and district levels and

an official from Umalusi. These officials were selected since they are members of the national CASS committee and because of their involvement in the monitoring/evaluation and the management of CASS.

Since the sample size was not representative of the entire target population and since questionnaire data often result in socially desirable answers, this study must be seen as an exploratory one and as such the findings from this research cannot be generalised to the entire target population.

The next chapter (Chapter 6) presents the results of this research.

CHAPTER 6

RESULTS OF THE RESEARCH

Overview of the Chapter

This chapter presents the findings of the research on continuous assessment (CASS) and is structured according to the three main research questions, namely, the problems and challenges experienced by Grade 12 Biology, Mathematics and Physical Science educators in the effective implementation of CASS; the kinds of support provided to educators to strengthen and to sustain the effective implementation of CASS, and, to what extent are the Grade 12 CASS marks fair, valid and reliable.

First the background of the respondents, namely the Grade 12 educators and subject advisors will be reported in 6.1. This is followed by a discussion on the problems and challenges experienced by Grade 12 educators in the effective implementation of CASS in 6.2. Section 6.3 examines the kinds of support provided to educators to strengthen and to sustain the effective implementation of CASS and section 6.4 examines to what extent the Grade 12 CASS marks are fair, valid and reliable.

6.1 Background of respondents

The results of this study are reported using descriptive statistics. The data gathered from the Biology, Physical Science and Mathematics educators are compared and contrasted with the data reported by their subject advisors. Although the aim of this study was to obtain much data from educators on the implementation of CASS, it was also essential to gather data from their subject advisors since subject advisors are responsible for lending curriculum and assessment support to educators. As mentioned in Chapter 4, subject advisors are meant to monitor and support schools with the aim of improving the standard and quality of teaching and learning in the classroom.

The number of subject advisors appointed by examining bodies in Biology, Mathematics and Physical Science varies according to the provincial structure.

Although the provincial structure may indicate the number of subject advisor posts that must be filled, however, not in all cases are the appointments made. This is the case in the Eastern Cape for example. The report on the CASS verification conducted by Umalusi in the Eastern Cape in Mathematics indicated that the verification panel was horrified to learn that in a province that has 24 districts and 250 highly ranked administrative posts described as Educational Development Officers and over a thousand schools offering Grade 12, there were only three Mathematics subject advisors in the entire province (Umalusi, 2002c). In this instance, the shortage of mathematics subject advisors is bound to impact negatively on the quality of support provided to the educators of Mathematics.

In particular, the subject advisors in this study are those who are directly responsible for providing support to the sample of educator respondents. The data from the interviews were used to validate the responses of the educators and the subject advisors.

The educators and subject advisors used in this study were sampled from six provinces, namely, KwaZulu - Natal, Gauteng, Northern Cape, Eastern Cape, Limpopo and Mpumalanga.

Due to the small sample size used in this study and the fact that the sample is not representative of all Grade 12 educators and subject advisors of Biology, Physical Science and Mathematics, caution should be taken when interpreting the results that emanate from this research, especially given the fact that the use of surveys may result in socially desirable responses. The results should therefore be considered as exploratory. Fifteen (15) districts and 22 schools participated in this research. In total, 21 questionnaires were completed by the Grade 12 subject advisors of Biology, Physical Science and Mathematics (through their district offices) and 60 questionnaires were completed by the Grade 12 educators of Biology, Physical Science and Mathematics (through their schools). Individual interviews were also conducted with four officials from national, provincial and district level and a representative from Umalusi. In total five individual semi - structured interviews were conducted with the experts on CASS.

To provide the context for the results of the respective research questions, a profile of the location, educational qualifications and teaching experience of the educators and subject advisory experience of subject advisors that participated in this research are presented first. The study aimed to collect data from different socio - economic backgrounds and therefore educators and subject advisors serving schools in rural, township and urban districts were sampled.

Table 6.1 Number of educators and subject advisors sampled according to their location

Respondent	Rural		Township		Urban		Mixed		Totals	
	No.	%	No.	%	No.	%	No.	%	No.	%
Educators	12	(20%)	12	(20%)	36	(60%)	0	(0%)	60	(100%)
Subject Advisors	8	(38%)	_		7	(33%)	6	(29%)	21	(100%)

Table 6.1 above shows that a larger proportion (60%) of educators were sampled in the urban districts than any other location. Schools from both urban - suburbs (29 out of 60) and urban - centre of city (7 out of 60) were sampled. The reason for this is that the questionnaires were handed to the subject advisors to administer, and it was found that the educators in the urban districts were more accessible and hence convenient for the subject advisors to sample than the educators in the rural or township areas, as the distances to the rural and township schools implied additional traveling expenses and time. However, a fair proportion of educators were sampled from the rural (20%) and the township (20%) areas.

The subject advisors that participated in this study were also located across rural (38%), urban (33%) and a mixture (29%) of rural, urban and township districts. Although subject advisors are located in urban districts they are also responsible for schools located in rural and township areas. The category "mixed" refers to schools in districts with a mix of urban, rural and township schools.

Qualifications of Educators and Subject Advisors

The highest level of qualifications obtained by the educators and the subject advisors is presented in Table 6.2.The table indicates that the vast majority of the educators have either a 3 - 4 year diploma (45%) or a 3 - 4 year Bachelors degree (38%). On the other hand, the subject advisors are on average better qualified than their educators, with the majority of subject advisors (57%) possessing a 3 - 4 year Bachelor's degree and quite a number of them (34%) possessing a Honours/or Masters degree. The fact that the subject advisors are better qualified than their educators could be as a result of them being selected from the panels of examiners and moderators that are responsible for the setting of the Grade 12 national examination question papers in Biology, Physical Science and Mathematics.

Table 6.2 Qualifications of Educators and Subject Advisors

	2 Year Teaching Certificate		3-4 Year Diploma		3-4 Year Bachelors Degree		Hons Degree		Master Degree		Totals	
Participant	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Educators	1	(2%)	27	(45%)	23	(38%)	5	(8%)	4	(7%)	60	(100%)
Subject Advisors	1	(5%)	1	(5%)	12	(57%)	2	(10%)	5	(24%)	21	(100%)

It was important to establish the level of qualification of the educators since it impacts on the effectiveness of teaching and learning, especially given the fact that research studies indicate that the results in Mathematics and Science literacy in South Africa is extremely poor in the entire schooling system (Department of Education and Labour, 2001). Further, the findings of the TIMSS - R study reports that 27% of the learners in 1998/1999 were taught Mathematics by teachers with no formal qualifications in Mathematics and 38% of pupils were taught Science by teachers with no formal qualifications in science (Howie, 2001**)**. Research conducted by the HSRC (2001) indicates that the qualification of educators have a significant effect on learner performance (Kanjee et al., 2001). In view of this it is essential that educators teaching Mathematics and Science be suitably qualified to teach their subjects so that learner performance may be improved in these subjects. However, no data were collected on the educator's subject/area of specialisation.

Teaching Experience and Subject Advisory Experience

The teaching experience of educators and the experience of subject advisors are presented in Table 6.3.The table shows that the educators and subject advisors used in this study have teaching experience and subject advisory experience that range from one year or less to eight years and more. This means that the data used in this study is not restricted to educators and subject advisors that have little or no experience. Whilst the majority of educators (62%) have more than 8 years of teaching experience, a little less than half of the subject advisors (48%) have more than 8 years of subject advisory experience. A large proportion (53%) of subject advisors have less than 5 years of subject advisory experience.

On comparing the qualifications and the experience of educators to those of subject advisors, it would seem that whilst the majority of subject advisors (91%) have a 3 - 4 year Bachelors Degree, and higher levels of qualifications than their educators, they however have less experience in their jobs than their educators. The nature of their work and the level of subject expertise required demands that subject advisors are more qualified than the educators they support.

Table 6.3 Experience of educators and subject advisors in their profession

	1 year or less		2-3 years		4-5 years		6-8 years		More than 8 years		Totals	
Participant	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Educator	4	(7%)	3	(5%)	8	(13%)	8	(13%)	37	(62%)	60	(100%)
Subject Advisors	2	(10%)	4	(19%)	5	(24%)	0	(0%)	10	(48%)	21	(100%)

The location, qualifications and experience of educators and subject advisors serves as a context for the research results presented in this chapter. Where possible, the results will be discussed reflecting on differences and similarities for the various categories of these variables.

Section 6.2 deals with the first research question, namely, the problems and challenges experienced by Grade 12 Biology, Mathematics and Physical Science educators in the effective implementation of CASS. Section 6.3 looks at the kinds of

support provided to educators to strengthen and to sustain the effective implementation of CASS and section 6.4 addresses the extent to which the Grade 12 CASS marks are fair, valid and reliable. The responses from all three sources, namely, the questionnaire responses from the educators and the subject advisors and the responses from the semi - structured individual interviews with the five officials have been used to arrive at the findings of each of the three main research questions.

6.2 Problems and Challenges experienced by Grade 12 Biology, Mathematics and Physical Science educators in the effective implementation of CASS

In this section, the results of research question 1 will be discussed, namely, the problems and challenges facing educators in the effective implementation of CASS. Table 6.4 shows that the majority (80%) of the Grade 12 educators of Biology, Physical Science and Mathematics reported experiencing problems and challenges that impact negatively on the effective implementation of CASS in the classroom. This was fully supported by all the subject advisors (100%) that participated in this study.

Table 6.4 Educators and Subject Advisors response to problems and challenges experienced by educators

Participant	Yes		No		Total	
	No.	%	No.	%	No.	%
Educator	47	(80%)	12	(20%)	59	100%
Subject Advisors	21	(100%)	0	(0%)	21	100%

Since the question on the problems and challenges was an open - ended item in the questionnaire, some of the educators and subject advisors listed more than one problem. However, the most common problems cited by both educators and subject advisors in order of prevalence are the lack of resources and equipment, an increase in the workload of educators, the negative attitude of learners towards CASS and the problem of large class sizes.

The problem of the lack of resources and equipment will be discussed in detail followed by a discussion on the other problems and challenges.

Lack of Resources and Equipment

Table 6.5 shows that 47% (28 of 60) of the educators indicated that they do not have sufficient resources to implement CASS in their subject. The table also shows that the lack of resources is evident in all areas; however, the problem is the biggest in the rural areas (75%) and the smallest in the urban - centre of city (14%).

Table 6.5 Educators with insufficient resources to implement CASS according to their location

	Rural n =12 No. %	Township n=12 No. %	Urban-suburbs n=29 No. %	Urban-centre of City n=7 No. %	Totals n=60 No. %
Insufficient Resources	9 (75%)	5 (42%)	13 (45%)	1 (14%)	28 (47%)

In this regard the five experts on CASS are also in agreement that the lack of resources is a major problem in certain districts/regions and in certain schools. The interviewees reported that in certain cases the school environment is not conducive to the implementation of CASS due to the lack of facilities, libraries and tools for experiments.

The educators were also required to list the resources that are most needed in their schools to implement CASS. The responses of the twenty - four (24) educators that responded to the question are recorded in Table 6.6. Half of these educators (12 out of 24) reported that the lack of chemicals, apparatus and laboratories for the conducting of Physical Science experiments was the biggest problem. Interestingly enough, Table 6.7 shows that half of the subject advisors (7 out of 14) also seem to agree that schools within their districts are also affected by the lack of chemicals, apparatus and laboratories.

The need for teacher and learner support materials such as textbooks, mathematical instruments and calculators (8 out of 24) appeared next on the list of the educators

followed by the need for libraries and computers (5 out of 24). However, a larger number of subject advisors (5 out of 14) felt that the schools within their districts/regions are more in need of libraries and computers than learner support materials. Another interesting observation is that whilst no educators indicated the need for more educators and classes, a significant number of subject advisors (4 out of 14) indicated that schools needed more educators and more classes.

Table 6.6 Educators response on resources needed according to the location of the school

Resources	Rural	Township	Urban	Total n=24
Chemicals, apparatus and laboratories	7	2	3	12
Teacher and learner support materials	3	1	4	8
Library and Computers	2	2	1	5
Equipment	2	1		3
More funds	1			1

Table 6.7 Subject Advisors response on resources needed according to location of district

Resources	Rural n=6	Urban n=2	Mixed n=6	Total n=14
Chemicals, apparatus and laboratories	2	2	3	7
Teacher and learner support materials (textbooks, maths sets and calculators)	2		1	3
Library and Computers	3		2	5
Equipment (photocopiers, TV & Video, scanners)	3			3
Training for teachers and principals			1	1
More educators and more classes	2		2	4

Table 6.6 shows that there is a greater shortage of chemicals, apparatus and laboratories in the rural schools than in the township and urban schools. Whilst 3 educators from the rural and township schools have mentioned the need for equipment such as photocopiers, television and videos, the educators in the urban schools do not seem to suffer from a lack of it.

Resources such as chemicals, apparatus, laboratories, learner support materials (textbooks) and libraries are basic and essential resources that schools should be provided with so that they are able to function effectively (DoE, 1999c). Without these resources, the task of teaching and learning is made more difficult. Chemicals, apparatus and laboratories are required by science teachers to carry out experiments that form 15% to 40% of the CASS component (Umalusi, 2002c). Without the provision of these resources schools are engaging their learners in theory only (DoE, 2001f) and yet the Qualification and Assessment Policy Framework for FET advocates the integration of education and training meaning that learners should be exposed to theory as well as practice to promote the development of skills (DoE, 2002d). In schools, where there is a lack of resources for experimental work, educators have no choice but to substitute the practical work for theory and award marks for theory only (Umalusi, 2001b). One of the physical science educators from Mpumalanga confirmed this by saying:

"because we have to give marks for experiments, we make use of paperwork since there are no apparatus for experiments"

One of the subject advisors from Mpumalanga also concurred with his educator by indicating that the provincial CASS policy is adjusted to accommodate the lack of chemicals and experimental equipment in certain schools. This is done by eliminating those CASS tasks that require the use of experimental equipment and chemicals. This means that all work in Physical Science is conducted in theory only.

It can therefore be argued that the lack of essential resources especially in the rural schools does impact on the effective implementation of CASS especially in subjects like Physical Science and Biology where chemicals and apparatus are needed for the

conduct of experiments. The lack of these resources has negatively affected the manner in which teaching and learning should take place.

In the questionnaire to educators, an open-ended question was included which required educators to discuss the problems and challenges facing them in the effective implementation of CASS. A similar question was included in the questionnaire to subject advisors. This resulted in the items listed in Table 6.8.

Increased workload

Table 6.8 shows that a large proportion of the educators (33%) and subject advisors (38%) from all areas reported that the introduction of CASS has led to an increased workload of educators. Research evidence also suggests that South African teachers spend more time on administrative tasks than teachers in other developing countries (Howie, 2001). Further, research indicates that a potential problem for the implementation of internal assessment at Grade 12 is that the amount of assessment in the form of written work and testing during the Grade 12 year becomes unreasonable (Oberholzer, 1998).

Below are examples of statements made by some of the educators supporting the claim that CASS has contributed to the increase in the workload of educators:

"We have a lot of administrative work, we find ourselves duplicating a lot of administrative work. The CASS requirements requested by the province sometimes differ from the provincial and national guidelines."

"The late arrival of information from district offices on how to assess learners causes duplication of work."

"CASS has resulted in a lot of marking."

The above statements seem to indicate that these educators are experiencing an increased workload in both the administrative aspect and the teaching aspect of their work. The above statements are also supported by Umalusi (2001a), who indicate that in addition to the increased administrative work that has caused an increase in the workload of educators, educators have also reported that their actual teaching load has increased. According to one of the subject advisors, "the number of CASS pieces that educators and learners have to complete seems to be too much".

Table 6.8 Problems that impact on the effective implementation of CASS as reported by educators and subject advisors

Type of Problem	RURAL		TOWNSHIP	URBAN		MIXED	TOTALS			
	E (n=12)	SA (n=8)	E (n=12)	E (n=36)	SA (n=7)	SA (n=6)	E=60 No.	%	SA=21 No.	%
Increased Workload	3	3	4	13	1	4	20	(33%)	8	(38%)
Lack of Training and Support	3		4	5			12	(20%)		
Negative Attitude of learners	2	2	2	6	1		10	(17%)	3	(14%)
Lack of Resources	4		3				7	(12%)		
Large Class Sizes	2	3			7	3	2	(3%)	13	(62%)
Lack of Commitment and Skills of Educators		2			1	2			5	(24%)
Ever-changing and Unclear Policies		1			2	1			4	(19%)
Lack of Communication	2	1	1	1			4	(7%)	1	(5%)
Poor School Management						1			1	(5%)
Language Problems						1			1	(5%)
Practical Weighed Heavily					1				1	(5%)

E = Educators
SA = Subject Advisors

However, some of the statements made by a few of the educators seems to suggest that there is also some misunderstanding amongst these educators about how CASS is incorporated into teaching and learning. Examples of such statements are:

"the syllabus is too long to complete in Biology and we have to also implement CASS".

"educators are expected to complete their work in the first semester and immediately after that implement CASS".

The perception that the syllabus must be completed and then CASS must be implemented is however contradictory to the principle of continuous assessment. According to Hattie and Jaeger (cited in Klenowski, 1999, p.40), "assessment needs to be an integral part of a model of teaching and learning if it is to change from its present status as an adjunct "to see" if learning has occurred, to a new status of being part of the teaching and learning process. "The problem is that if CASS is not implemented correctly and especially if it is not included as part of the daily teaching and learning where continuous feedback is given to learners with the aim of improving learner achievement, it will lose its significance of promoting the formative and developmental role of assessment.

With the number of CASS tasks being as many as 17 in Biology (Pierce, 2003), it would seem that the emphasis is on the number of tasks (quantity) rather than on how well the task is being performed, evaluated and feedback given to learners (quality). In reality, due to the large number of CASS tasks that is required of educators and learners, the focus is on the completion of the tasks for record purposes rather than on ensuring effective understanding of the tasks.

In this regard the interviewee from Umalusi reported, *"the spirit of CASS is lost because of the misunderstanding of CASS, educators are testing sections of the work twice and even three times"*. Hence the workload of educators is bound to increase. He went on to say that in most cases CASS is also not being conducted in a formative manner.

Another - interviewee added, *"CASS is supposed to involve learners, there is a need for learners to take responsibility for their work, but this is not happening. Teachers are compiling the files and running after the tasks."* Here again, it would seem that the educators who run after the work of their learners are in a way adding to their own workload.

In sum, it can be stated that CASS by its very nature does require additional effort by both educators and learners. However, it would seem that there is some uncertainty amongst educators about how CASS fits into teaching and learning. Further, it would also seem that the perception of implementing CASS as a separate activity would impact negatively on the formative role of CASS.

Lack of training and Support

According to Table 6.8, 20% of the educators reported that the lack of training and support impacted on the effective implementation of CASS. On the other hand, none of the subject advisors recorded this as a problem. This aspect will however be dealt with in section 6.3.

Negative attitude of learners

Table 6.8 shows that a significant proportion (10 out of 60 - 17%) of educators and subject advisors (3 out of 21 - 14%) from all areas have indicated that the negative attitude of learners is a problem. The nature of CASS requires that educators and learners work together and that feedback be given to learners on how to improve their performances. When learners are absent from school, or when discipline is poor, or when learners do not take their work seriously, this creates problems for the educator. As one educator states, "*learners do not believe that the classwork can benefit them at the end of the year*".

"If learners are not positively disposed towards learning, little learning will actually occur even though all the necessary learning skills may have been mastered" (Sadler, 2002). If learners are not willing to learn and do not co - operate with educators and participate fully in CASS, this tends to put additional pressure on educators. The consequence is that learners would obtain very low marks to no marks for CASS. Eventually, this impacts on the CASS average of the group of

learners and this is certainly problematic for educators since educators are held accountable for the results they produce.

Large Class Sizes

Table 6.8 shows that only a few educators (2 out of 60) but a large proportion of subject advisors (13 out of 21 - 62%) from all areas reported the problem of large class sizes. The main problem with large class sizes and the implementation of CASS is that educators are unable to conduct practical work in subjects like Biology and Physical Science. As one educator emphasised, "*the classes are too large, there is not enough equipment to conduct experiments"*. But there are also other problems, as is illustrated by the following remark, *"the classes are too large, it is difficult to assist slow learners"*.

The problem of large class sizes is also related to the increased workload of educators. As the interviewee from Umalusi states, "there is a lot of administration and recording, which leaves little time for individual attention and feedback to learners". According to this interviewee from Umalusi, *"CASS is an individualized approach to assessment; however, in certain instances educators are unable to implement CASS effectively because of the large class sizes*".

Research on class size conducted by the Student Teacher Achievement Ratio Study (STARS) showed higher achievement on standardised testing in reading, language, mathematics and social studies for learners in small classes (Kifer, 2001, p.90). Small classes beat both the regular classes and the classes with an aide, suggesting that it is not the ratio of adults to children that matters. Rather, it is the number of learners in the classroom that counts" (cited in Kifer, 2001).

In South Africa, the average class size for mathematics was 50 pupils and for Science 49 pupils and this is related to poor mathematics and science results (Howie, 2001).

Based on the above findings, it is reasonable to be concerned about large class sizes especially given the fact that CASS is an individualised approach to assessment and its effectiveness depends on whether educators are able to assist

all learners in the allocated teaching time. Also, where there is a lack of apparatus to conduct experiments, not all learners in the class will have an opportunity to participate in practical work. Given the logistics of operationalising CASS, one may assume that implementing CASS in large classes gives problems.

Lack of commitment and skills of educators

Whilst no educators reported that their lack of commitment and skills was a problem almost a quarter of the subject advisors (5 out of 21 - 24%) from all areas maintained that their educators lack the commitment and the skills to conduct CASS. One of the subject advisors stated, "educators do not read documents and this is a big stumbling block." The data therefore shows that there is a discrepancy between the two sets of data. It also justifies that the triangulation of the data from educators to those collected from subject advisors is an important one.

In terms of the lack of skills on the part of educators to conduct CASS, it can be assumed that since CASS is a fairly new concept in South Africa, not all educators would be completely skilled in the implementation of CASS. Therefore, subject advisors and other education managers need to ensure that educators receive the appropriate training and support to develop the skills needed to implement CASS in an effective manner.

Ever - changing and unclear national policies (guidelines)

The problem of the ever - changing and unclear national CASS guidelines was reported by a significant proportion of subject advisors (4 out of 21 - 19%) from all areas and not by any of the educator respondents. These subject advisors felt that too many changes were being made to the national CASS guidelines within a short period of time.

Given the fact that CASS is a fairly new method of assessment in South Africa, it may take educators and subject advisors a long time to grasp the skills required to implement CASS, and any changes made to the CASS guideline documents especially without consultation and discussion with educators and subject advisors may be problematic. This may lead to confusion and uncertainty amongst subject advisors and their educators.

In conclusion to the first research question, it would seem that the biggest problem facing educators is the lack of resources to implement CASS. Schools need to be adequately resourced so that they are able to function as learning institutions to facilitate the culture of teaching and learning. It is clear that many schools, especially in the rural areas lack even the basic resources and equipment such as chemicals, apparatus, learner support material (textbooks) and school libraries. Other problems of less prevalence experienced by educators across all areas include the increased workload of educators, the negative attitude of learners and the problem of large class sizes. On the other hand, subject advisors from all areas maintained that the lack of commitment & skills of educators and the ever - changing and unclear policies of the national department of education are also problematic.

6.3 The kinds of support provided to educators to strengthen and to sustain the effective implementation of CASS

This research question pertains to how educators are supported in implementing CASS. As explained in Chapter 5, this question has two prior questions, as support to strengthen and to sustain the implementation of CASS is only useful when educators know about the provincial/or national policy (guidelines) on CASS and when they have received sufficient training to implement CASS in their subjects. Both aspects will be discussed first before the data on the support of educators in implementing CASS is presented in 6.3.3.

6.3.1 Are educators familiar with the provincial/or the national CASS policy?

This question determines which CASS policy (national or provincial) is being implemented in the six provinces used in this study and is followed by a brief account of what educators understand by the term CASS and the extent of educators and subject advisors familiarity with the CASS policy (guidelines) and whether educators are able to implement the CASS policy effectively in their subjects.

It must be emphasised that although this research talks of a provincial/national policy on CASS, currently there is no national and provincial policy on CASS per se, only subject guideline documents. These subject guideline documents on CASS were developed by the National Department of Education in the six national subjects, namely, Accounting, Biology, English Additional Language, History, Mathematics and Physical Science. The CASS guideline documents for the other Grade 12 subjects were developed independently by each province. In the absence of subject policies on CASS, the subject guidelines developed by the National Department of Education are being interpreted by all public examining bodies as "policy". Recently, the only province that has promulgated policy on CASS is the North West Province through its Department of Education. However, the North West policy document on CASS is a generic document applicable to all Grade 12 subjects and does not address the CASS requirements of individual Grade 12 subjects. The provincial and national CASS policy will now be referred to as the provincial and national CASS guideline documents.

Which CASS policy (guideline document) is being implemented by the educators of Biology, Mathematics and Science across the six examining bodies?

Table 6.9 and 6.10 shows that a larger proportion of educators (55%) and a smaller proportion of subject advisors (38%) from all areas reported implementing only the national CASS guideline documents in the province. On the other hand, a smaller proportion of educators (37%) and a larger proportion of subject advisors (52%) from all areas reported implementing only the provincial CASS guideline in the province. It is disturbing to note that only 2 of the educators and 2 of the subject advisors are making use of both the provincial and the national CASS guidelines to implement CASS.

Table 6.9 Implementation of provincial/or national CASS guideline documents as reported by educators and subject advisors across the six provinces

Province	National Guideline		Provincial Guideline		Both		Not Sure	Totals	
	E	SA	E	SA	E	SA	E	E n=60	SA n=21
KwaZulu-Natal	7	1	6			1		13	2
Gauteng	7	2	2		1		1	11	2
Northern Cape	4		3	4	1			8	4
Eastern Cape	7	1	4	3		1	1	12	5
Limpopo	7	2	5	1				12	3
Mpumalanga	1	2	2	3			1	4	5
Total in No.	***33***	***8***	***22***	***11***	***2***	***2***	***3***	***60***	***21***
Total in %	***(55%)***	***(38%)***	***(37%)***	***(52%)***	***(3.3%)***	***(0%)***	***(5%)***	***(100%)***	***(100%)***

E = Educators
SA = Subject Advisors

Table 6.10 Implementation of provincial/or national CASS guideline documents as reported by educators and subject advisors according to location

Guideline	Rural		Township	Urban		Mixed	Totals E (n=60)		Totals SA (n=21	
	E n=12	SA n=8	E n=12	E n=36	SA n=7	SA n=6	No.	%	No.	%
National Guideline	3	3	5	25	2	3	33	(55%)	8	(38%)
Provincial Guideline	8	5	7	7	5	1	22	(37%)	11	(52%)
Both	1	0	0	1	0	2	2	(3%)	2	(10%)
Not Sure	0	0	0	3	0	0	3	(5%)	0	(0%)

E = Educators
SA = Subject Advisors

According to Table 6.10, the provincial guideline is being used by a greater number of educators in the rural (8 out of 12) and township schools (7 out of 12) than in the urban schools (7 out of 36). The situation is clearly the opposite in the case of the national guideline document where the majority of the educators in the urban schools (25 out of 36) seem to be using the national guideline document than the provincial guideline document.

It has been established in this research that the national guideline document stipulates only the minimum CASS requirements and does not specify the number of CASS tasks and the mark allocation for each task (see table 6.11). Hence the use of only the national CASS guideline without the provincial CASS guideline will lead to inconsistencies in the implementation of CASS within a province and this is a cause for concern.

In this regard, Umalusi has also found that in certain provinces, deviation from the minimum requirements as stipulated in the national CASS guidelines is noted in certain subjects, for example, Gauteng (Mathematics), Limpopo (Physical Science), Eastern Cape (Mathematics) and KwaZulu - Natal (Mathematics) (Umalusi, 2002a).

Further, one of the subject advisors from Mpumalanga reported that the number of CASS tasks for Physical Science has been reduced in certain schools since rural schools that do not have chemicals and apparatus are unable to carry out experiments. Hence, the reduction in the number of CASS pieces/tasks for Physical Science impacts substantially on the CASS marks achieved by learners. Many of the educators have reported that learners usually score high marks in science practical. If practical work is not being conducted in the rural schools in Mpumalanga, then it can be assumed that educators are merely conducting theory lessons, and that all CASS pieces are therefore based on theory only. This would be unfair to the learners and hence the marks allocated to learners for practical work in the rural schools would therefore be questionable.

According to the CASS verification exercise conducted by Umalusi (2002c), the provincial guideline document of the Eastern Cape in Mathematics is different from

the national guidelines in several respects. Table 6.11 shows that the most important differences are in the mark allocations of the CASS components.

Table 6.11 Variation between the national guideline and the Eastern Cape provincial guideline document for Mathematics (Umalusi, 2002c)

Guideline Document	Exams	Formal Tests	Short Tests	Classwork & Homework	Tutorial	Project
National	30%	20%	5%	15%	15%	15%
Provincial SG	25%	20%	5%	40%		10%
Provincial HG	25%	20%	5%	40%		10%

HG = Higher Grade
SG = Standard Grade

Whilst the national CASS guideline document has specified that 30% of the CASS marks must be allocated for examinations, the Eastern Cape has allocated only 25% of its CASS to examinations. However, the bigger difference between the national guideline and the provincial guideline can be seen in the allocation of marks for class work and homework. While the national guideline specifies that only 15% should be allocated for class work and homework, the provincial guideline of the Eastern Cape has allocated more than twice the specified proportion (40%). This implies that the CASS marks achieved by learners will be high since homework and class work is heavily weighted and learners usually score high marks on these tasks. The provincial and the national CASS guidelines in the case of the Eastern Cape are therefore not compatible. The Eastern Cape has deviated from the national guideline document for Mathematics to a major extent.

Another disturbing finding by Umalusi is that the trial examinations which ought to constitute part of the CASS mark are not conducted in the Eastern Cape since according to the Eastern Cape Department it is almost impossible to administer trial examinations (Umalusi, 2002d). Hence, the marks allocated for examinations are only 25% instead of 30%. This serves as an example, which shows that the

lack of a clear and coherent policy can only lead to more problems and confusion among educators (Umalusi, 2002c; DoE, 1999a).

If one applies the above findings to the statistics presented in Table 6.9 it implies that those educators (7 out of 12) from the Eastern Cape who are implementing the national CASS guideline document would have been following a different set of requirements than those educators (4 out of 12) who were making use of the provincial CASS guideline document to implement CASS. This practice will obviously lead to major inconsistencies in the implementation of CASS across all areas.

To further establish and confirm the differences between the provincial guidelines and the national guidelines, the subject advisors were asked to list the differences between the national guideline and the provincial guideline documents. Table 6.12 records the responses from some the subject advisors.

Table 6.12 Comments by some of the subject advisors on the differences between the national guidelines and the provincial guidelines on CASS

Province	Mathematics	Physics
Mpumalanga	"The provincial policy is more user-friendly."	"Some changes are made to the provincial policy to accommodate local conditions, for example the numbers of CASS tasks are adjusted."
Northern Cape	"The provincial policy is an expansion of the national policy."	"The provincial policy is more specific in terms of the number of tasks."
Eastern Cape	"I do not know."	

Most of the above responses seem to indicate that the national guidelines are used as a basis from which the provincial guidelines are developed and that the provincial guideline is more detailed than the national guideline. However, from the data reported by both the educators and subject advisors, it would seem that the provincial education departments have been more explicit in stating the provincial requirements to be met for CASS. It is also indicated that the provincial CASS guidelines are also user - friendly.

From the data reported in Table 6.9 it would seem that both the national and the provincial CASS guideline documents are being used both across and within provinces. However, the use of only the national CASS guidelines is problematic, since it does not specify the number of CASS tasks to be completed and the mark allocations for each task. These inconsistencies affect the fairness, validity and reliability of the CASS marks.

Understanding of the term Continuous Assessment

To determine the understanding that educators have of the term 'continuous assessment' (CASS), the educators were asked to explain what they understood by the term "CASS". Although, the majority of educators, 51out of 60 (85%) were able to name some characteristics of CASS, their answers were however very superficial. This clearly indicates the lack of understanding amongst educators about CASS.

Some of the responses received from the educators included:

"The use of different types of assessment done on a continuous basis."

"Assessment covering a variety of activities, not only summative."

"Ongoing everyday process that finds out about what learners know, understand and what learners can do."

"Assessment done in different forms (sic) from the beginning to the end of the year."

"The learner knows what is expected from her/him and can determine how their year - marks are going to look."

"Continuous assessment refers to the work done in the class everyday. Learners are assessed on everything they do."

From the above responses, it would seem that educators lack in - depth knowledge and the deeper understanding of the concept CASS. Besides mentioning that CASS is ongoing, from the beginning of the year to the end of the year, and the use of different types of assessment, there is little evidence that educators understand the concept completely. At least it is not shown in the responses provided.

To what extent are educators and subject advisors familiar with the provincial/ or the national policy (guideline) on CASS?

The educators and subject advisors in this study were asked to what extent they were familiar with the provincial/or the national guideline on the implementation of CASS. Table 6.13 shows that only 19 out of 60 (32%) educators from all areas indicated that they were completely familiar with the provincial/or national CASS guideline document compared to the larger proportion (62%) of subject advisors from all areas who maintained that they were completely familiar with the provincial/ or national CASS guideline in their subject. It is quite surprising that a significant proportion of educators (5 out of 12) and subject advisors (5 out of 8) from the rural schools and districts have reported that they are completely familiar with the provincial/national guideline documents. The two educators that reported that they were not familiar with the CASS policy are located in the township schools.

Table 6.13 Educator's and Subject Advisor's familiarity with the provincial/or national CASS guideline

	Rural		Township	Urban		Mixed	Totals	
	E	SA	E	E	SA	SA	E n=60 No. (%)	SA n=21 No. (%)
None of it			2		1	0	1 (3%)	1 (5%)
To some extent	3	1	4	5	0	0	14 (23%)	1 (5%)
To a large extent	1	2	2	4		0	25 (42%)	6(29%)
Totally Familiar	4	5	4	11	2	6	19(32%)	13(62%)
Totals	***12***	***8***	***12***	***7***		***6***	***60***	***21***

E = Educators
SA = Subject Advisors

Since subject advisors are responsible for supporting educators in the understanding and implementation of the CASS guidelines, it is essential that they themselves are totally familiar with the provincial/or national CASS guidelines documents before they embark on any programme to capacitate educators.

The subject advisors were also asked to indicate to what extent the majority of educators were able to understand the provincial/or national CASS guideline document in their subject. According to the responses shown in Table 6.14 only 6 out of 21 subject advisors from all districts were of the opinion that their educators understood the CASS documents totally.

Table 6.14 Subject Advisor's perception of whether educators understand the CASS guidelines in their subject

	Rural	Urban	Mixed	Totals
None of it	0	0	0	0
To some extent	2	2	0	4
To a large extent	4	5	2	11
Understood Totally	2	0	4	6
Totals	***8***	***7***	***6***	***21***

From the subject advisors responses, it can be seen that the majority of subject advisors (11 out of 21) have the perception that their educators understand the CASS guidelines to a large extent. It is also clear that the majority of these subject advisors are from the urban districts (5 out of 7) than from the rural (4 out of 8) and mixed districts (2 out of 6). On the other hand, it would seem that the majority of subject advisors (4 out of 6) from the mixed districts are of the opinion that their educators understand the CASS guidelines totally.

If the CASS documents are well understood by the majority of educators, then it is reasonable to assume that the interpretation and practical implementation of the CASS document will be less of a problem.

Effective Implementation of the CASS policy

Following the question on the extent to which the educators are able to understand the national/or provincial CASS guideline document/s in their subject, the subject advisors were asked to indicate the number of educators who in their opinion were able to implement CASS effectively in the classroom. Table 6.15 shows that a large proportion of subject advisors (15 out of 21) are of the opinion that the majority of their educators (12) and all of their educators (3) are able to implement CASS effectively in the classroom.

Table 6.15 Number of educators that are able to implement CASS effectively as reported by subject advisors

	Rural	Urban	Mixed	Totals No.	%
Few of them	3	3	0	6	(29%)
Majority of them	3	4	5	12	(57%)
All of them	2	0	1	3	(14%)
Totals	***8***	***7***	***6***	***21***	***(100%)***

Whilst 5 out of 12 educators from the rural schools have reported that they are totally familiar with the CASS guidelines (see Table 6.13), only 2 of their subject advisors as shown in Table 6.15 are of the opinion that all of their educators are able to implement CASS effectively.

However, the perception that the majority of educators are able to implement CASS effectively seems to differ from the viewpoint of the five experts interviewed. According to these experts there are mainly three levels of implementation-effectiveness in terms of CASS. They maintain that the smallest group of educators have a good understanding and grasp of CASS and are doing exceptionally well (given limitations). A second group, while willing to try, follows more of a piecemeal approach with different aspects receiving attention at different times. A third group consists of teachers who have no idea of what is to be done in CASS and could not care less about the success of CASS implementation.

The CASS experts also added that there is a big resistance by some educators in using other challenging, performance - based assessments other than the traditional tests and examinations. They maintain that the extent that educators are able to implement CASS differs according to the type of school and its socio-economic background, the availability of resources, training of educators, size of class, laboratory facilities, etc. One of the interviewees indicated that the ex-Department of Education and Training (DET) schools are grappling with CASS implementation. The reason she gave was that most of the educators in these

schools are less qualified. Further, these schools in most instances do not have the necessary resources to facilitate the implementation of CASS.

According to the interviewees, “generally the good schools are able to implement CASS effectively and rural schools are not so efficient in the implementation of CASS”. However, they stated that there are some schools that are situated in the rural areas that are able to implement CASS in the proper manner. The five experts are also of the opinion that CASS implementation also varies from province to province, district to district and from school to school within a province.” One of the interviewees stated, “one of the major problems with educators is that they create the impression that they know how to implement CASS effectively, when in fact they don't. They never admit that they don't know how to do it”. Table 6.15 also shows that a significant proportion (6 out of 21) of the subject advisors maintained that only a few educators are able to implement CASS effectively.

In conclusion to this research question, “are educators and subject advisors familiar with the provincial/or the national policy (guideline) on CASS, it was established that there are no CASS policies to regulate the implementation of CASS in Biology, Physical Science and Mathematics. The use of only the national CASS guidelines within a province is a problem since it is only a broad guideline and does not specify the allocation of marks and the number of CASS tasks to be completed by educators. The use of only the national CASS guideline by a large proportion of educators (55%), the majority of whom are from the urban areas and the use of only the provincial CASS guideline (37%) by the other educators, the majority of whom are from the rural and township areas may lead to inconsistencies in the implementation of CASS. This affects the fairness, validity and reliability of the CASS marks.

The responses of educators on their understanding of the concept “CASS” suggest that educators have a vague understanding of the concept CASS. Responses provided by educators are not entirely accurate. Only 32% of educators from all areas reported that they were totally familiar with the provincial/national CASS guideline whilst contrary to this finding just over half of

the subject advisors (57%) from all areas maintained that their educators are able to implement CASS effectively in their subject.

6.3.2 To what extent are educators trained to implement CASS?

This question provides data on the extent of training received by the educators, the duration of the training, the frequency of the training and whether the training was of assistance to educators in the implementation of CASS. The responses from the subject advisors and the five experts interviewed are also presented.

Table 6.16 reveals that the majority of educators (52%) across provinces and locations reported that they received very little training on the implementation of CASS.

In this regard, the report on the CASS verification exercise conducted in Limpopo, Free State and the Western Cape states, "school principals were trained to implement CASS at their schools, but in only one of the three provinces was there training of teachers. This is a significant weakness" (Umalusi, 2002d). The shortage of suitably qualified subject experts (subject advisors) was cited as the main reason for the non - training of teachers. The shortage of suitably qualified subject experts (subject advisors) is a reality in many provinces (Umalusi, 2001c).

The above findings have implications for the effective implementation of CASS. If school principals were trained to implement CASS, then one would assume that it is then the responsibility of the school principal to train his educators. In reality, whether the training of educators by school principals is being done is questionable since school principals are more involved in the administrative and management responsibilities of the school. In Limpopo for example 58% of the educators reported that they received very little training despite claims by Umalusi (2002d) that school principals/or educators were trained to implement CASS.

Table 6.16 Provincial analysis of training provided to educators

Province	N	No training		Very Little Training		Quite a lot of training		More than sufficient training	
		No.	%	No.	%	No.	%	No.	%
KwaZulu-Natal	13			8	(62%)	4	(31%)	1	(7%)
Gauteng	11			1	(9%)	9	(82%)	1	(9%)
Northern Cape	8			4	(50%)	4	(50%)		
Eastern Cape	12	1	(0.8%)	8	(67%)	3	(25%)		
Limpopo	12	2	(17%)	7	(58%)	3	(25%)		
Mpumalanga	4			3	(75%)	1	(25%)		
Totals	***60***	***3***	***5%***	***31***	***52%***	***24***	***40%***	***2***	***3%***

Table 6.17 Training provided to educators according to the location of schools and districts

	Rural		Township	Urban		Mixed	Totals	
	E n=12	SA n=8	E n=12	E n=7	SA n=36	SA n=6	E n=60	SA n=21
No training	2			1			3	0
Very Little Training	7	1	7	17	1		31	2
Quite a lot of Training	3	3	5	16	4	4	24	11
More than sufficient training		4		1	2	2	2	8

E = Educators
SA = Subject Advisors

Table 6.17 clearly shows that the majority of educators who are located in the rural schools (7 out of 12) and the township schools (7 out of 12) reported that they had received very little training. The 2 educators from KwaZulu - Natal and Gauteng that conceded to have received more than sufficient training are located in the urban schools (see table 6.16 and 6.17). Table 6.17 shows that the large proportion of educators who reported having received quite a lot of training (24 out of 60) are located in the urban areas (16 out of 36), township areas (5 out of 12) and rural areas (3 out of 12).

On the other hand, table 6.17 shows that the majority of subject advisors (19 of 21) from all areas reported that their educators received quite a lot of training (11) and more than sufficient training (8) in the implementation of CASS. From the statistics it is quite evident that there is a clear contradiction between the response of the educators and the response of their subject advisors on the extent of training received by educators.

Duration of the training

Table 6.18 shows that (30 out of 60) educators (50%) from across the six provinces received training in one day or less.

Table 6.18 Duration of training across the six provinces

Province	N	No Training	Less than a day	1 day	2-3 days	3 days-1 week	More than a week
KwaZulu-Natal	13		4	3	4	2	
Gauteng	11		1		2	3	5
Northern Cape	8		1	2	3	2	
Eastern Cape	12	1	5	3	3		
Limpopo	12	1	3	6	1	1	
Mpumalanga	4		1	1	2		
Totals (%)	***60***	***2 (3%)***	***15 (25%)***	***15 (25%)***	***15 (25%)***	***8 (13%)***	***5 (8%)***

Table 6.19 Cross - tabulation between the location of schools and the duration of training as reported by educators.

Location	No Training	Less than a day	1 day	2-3 days	3 days-week	More than a week	Totals n=60
Rural	1	3	5	2	1	0	12
Township	0	2	4	2	1	3	12
Urban-suburbs	1	7	5	9	5	2	29
Urban-centre of city	0	3	1	2	1	0	7
Totals(%)	***2 (3%)***	***15 (25%)***	***15 (25%)***	***15 (25%)***	***8 (13%)***	***5 (8%)***	***60(100%)***

Table 6.19 shows that the educators who received training in one day and less than a day are located in rural, township and urban schools. However, more educators from the urban suburbs (9 out of 29) received training in 2 - 3 days than the educators from the rural (2 out of 12) and township schools (2 out of 12).

On the other hand, 3 out of 12 educators located in the township schools conceded to have received training for more than a week whereas no educators from the rural and urban - centre of city schools received training for more than a week.

The question is whether a one day session or a session that lasts for less than a day is sufficient to prepare educators for an educational change that impacts on learner performance at the most important part of their careers.

Frequency of Training

On the frequency of training, Table 6.20 suggests that a significant proportion of educators (42%) from all areas received training once a year. These statistics more or less corresponded with the response of subject advisors (40%) from all areas that also conceded to the training of educators once a year. On the other hand, a significant proportion (14 out of 60) of educators maintained that the question was not applicable to them since no training was offered to them. Of particular interest is that the majority of educators (7 out of 12) from the rural

school reported that the question was not applicable to them since they received no training. One subject advisor did not respond to the question.

Table 6.20 Frequency of training as reported by educators and subject advisors according to location of schools and districts

Response	Rural		Township		Urban		Mixed	Totals			
	E	SA	E	E	SA	SA		E n=60		SA n=19	
								No.	%	No.	%
Not Applicable	7		3	4				14	(23%)	0	(0%)
Once a Month				1				1	(2%)	0	(0%)
Once a Year	4	3	6	15	3	2		25	(42%)	8	(40%)
Twice a Year	1	4	1	11	1	2		13	(22%)	7	(35%)
3-4 Times a Year	0	0	2	5	3	0		7	(12%)	3	(15%)
More Often	0	0	0	0		2				2	(10%)
Totals	***12***	***7***	***12***	***36***	***7***	***6***		***60 (101%)***		***20(100%)***	

E = Educators
SA = Subject Advisors

From the statistics shown above it would appear that only a small proportion (12%) of educators from the township and urban schools alluded to have received training 3 - 4 times a year - whilst no educators from the rural schools indicated that they had received training 3 - 4 times a year.

To explore as to whether the training was of any assistance to the educators, educators were asked to what extent the training provided to them was of assistance in the classroom. 17% of educators from all areas reported that the training was of great assistance, 50% reported that the training was of some assistance, 30% reported that the training was of very little assistance and 3% of the educators reported that the training was of no assistance.

In conclusion to the above research question, it can be stated that educators from all areas have not received sufficient training to ensure the effective implementation of CASS. However, it would seem that educators from the urban-suburbs have had more training than educators from the rural, township and urban - centre of city areas. A large proportion of educators (58%) from the rural areas reported that they have had no training. In general, the provision of training is clearly insufficient to prepare educators for the challenges of CASS implementation.

6.3.3 How are educators supported to enable them to implement CASS effectively?

Besides the provision of training to implement CASS in Biology, Mathematics and Physical Science, the educators were asked to indicate the extent of support they had received from their subject advisors to strengthen and to sustain the effective implementation of CASS in Mathematics, Biology and Physical Science. Table 6.21 shows that only 27% of the educators reported that they had received sufficient support whilst a significant proportion of educators (45%) reported receiving very little support (23%) to no support (22%).

Table 6.21 Support received by educators to implement CASS as reported by educators and subject advisors

	No Support		Very Little Support		Sporadic Support		Sufficient Support		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Educators	13	(22%)	14	(23%)	17	(28%)	16	(27%)	60	(100%)
Subject Advisors	0	(0%)	4	(19%)	7	(33%)	10	(48%)	21	(100%)

On the other hand, the response of the subject advisors contradicts the response of the educators. Nearly half of the subject advisors (48%) reported that they provided sufficient support to their educators in the implementation of CASS. These differences suggest a discrepancy between the two sets of data. The response of the majority of educators clearly indicate poor levels of support provided by subject advisors, however, a large number of subject advisors at the other hand seem to believe that the support they provide to their educators are sufficient.

Table 6.22 shows a cross - tabulation of the frequency of support provided to educators in Biology, Mathematics and Physical Science.

Table 6.22 Cross - tabulation between the frequency of support and the subjects as reported by educators

Subject	No Support		Very Little Support		Sporadic Support		Sufficient Support		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Maths	5	(25%)	5	(25%)	3	(15%)	7	(35%)	20	(100%)
Biology	5	(29%)	2	(12%)	7	(41%)	3	(18%)	17	(100%)
Physical Science	3	(13%)	6	(26%)	8	(35%)	6	(26%)	23	(100%)

From the above data it would seem that a larger number of Mathematics educators (7 out of 20) reported that they had received sufficient support compared to the educators of Physical Science (6 out of 23) and Biology (3 out of

17). However, it is disturbing to note that in Mathematics alone, 50% of the educators reported that they had received no support and very little support, and in Biology 41% of the educators reported the same. In the case of Physical Science, 39% of the educators reported having received no support to very little support. In general, it would seem that support is lacking in all three critical subjects.

One of the findings of Umalusi (2001b), is that CASS in Physical Science is problematic in certain areas due to the unsuitability of educators who need extensive ongoing and on site support and workshops to conduct CASS. Research evidence also indicates that there is still a large proportion of unqualified and under - qualified educators in the system, hence educators at all levels need sustained and systematic professional development especially as they begin to engage in the Curriculum 2005 process (DoE, 1999a).

For these reasons, the provision of ongoing and sustained support to educators to implement CASS effectively cannot be overlooked. Table 6.23 presents a cross-tabulation between the frequency of support and location where it can be clearly seen that support is insufficient in all locations.

Table 6.23 Cross - tabulation between the frequency of support and the location of schools as reported by educators

Response	Rural	Township	Urban-suburbs	Urban-centre of city	Total n=60 No. %
No Support	4	1	5	3	13 (22%)
Very Little Support	4	3	6	1	14 (23%)
Sporadic Support	2	5	9	1	17(28%)
Sufficient Support	2	3	9	2	16 (27%)
Totals	***12***	***12***	***29***	***7***	***60 (100%)***

In sum, the data indicates that professional support to educators of Mathematics, Physical Science and Biology is seriously lacking. If this is true, it would impact negatively on the effectiveness with which educators are able to implement CASS.

The most popular kinds of support received by educators according to province are shown in Table 6.24 whilst table 6.25 shows the breakdown of support according to location. The tables are followed by a discussion on the most prevalent types of support provided to educators.

Table 6.24 Types of support provided to educators according to province as reported by educators

Province	N	Cluster Meetings	Work-shops	Subject Meetings	CASS Exemplars	Contact by telephone	Workbooks
KwaZulu-Natal	13	9	10	10	7	2	6
Gauteng	11	11	10	4	5	3	4
Northern Cape	8	5	5	6	3	2	2
Eastern Cape	12	5	1	3	2	2	0
Limpopo	12	3	5	1	1	2	1
Mpumalanga	4	2	2		1		
Totals (%)	***60***	***35 (58%)***	***33 (55%)***	***24 (40%)***	***19 (32%)***	***12 (20%)***	***13 (22%)***

Table 6.25 Types of support provided to educators as reported by educators and subject advisors according to the location of schools and districts

Types of Support	Rural		Township	Urban		Mixed	Totals	
	E n=12	SA n=8	E n=12	E n=36	SA n=7	SA n=6	E n=60 No. %	SA n=21 No. %
Cluster meetings	2	4	6	27	7	6	35 (58%)	17 (81%)
Workshops	9	7	7	17	5	4	33 (55%)	16 (76%)
Subject Meetings	2	5	3	19	7	4	24 (40%)	16 (76%)
CASS Exemplars	3	6	4	12	7	5	19 (32%)	18 (86%)
Contact by telephone	3	7	5	4	6	5	12 (20%)	18 (86%)
Classroom visits		4			7	4		15 (71%)
Workbooks	0	0	2	11	2	5	13 (22%)	7 (33%)
Standardised CASS								3 (14%)
Demo Lessons								3 (14%)
Pace Setters								2 (9%)
Quarterly Moderation								1 (5%)

E = Educators
SA = Subject Advisors

Cluster Meetings

Table 6.24 shows that cluster meetings were rated as the most frequent form of support provided by subject advisors to educators. Cluster meetings are meetings held among a group of educators who are located at schools within a certain district or region or a part thereof. A large proportion of educators (58%) from all locations indicated that they attended cluster meetings where information about the implementation of CASS is shared. However, Table 6.25 clearly shows that more educators from the urban schools (27 out of 36) have been exposed to cluster meetings than educators from the township (6 out of 12) and the rural schools (2 out of 12). A large proportion of subject advisors (81%) from all locations also maintained that cluster meetings were held to provide support to educators.

Workshops

Another popular form of support is the convening of workshops. The difference between cluster meetings and workshops is that workshops usually last for more than a day whereas cluster meetings usually last a few hours to a day. The convening of workshops is an ideal way to involve educators in the practical implementation of CASS. It allows educators to exchange ideas and share skills. A large proportion of educators (55%) and even a larger proportion of subject advisors (76%) reported that workshops were held to provide support to educators. It is interesting to note that a larger proportion of educators (9 out of 12) from the rural schools have attended workshops than the educators from the township (7 out of 12) and the urban schools (17 out of 36).

Subject Meetings

Table 6.25 shows that 24 out of 60 educators reported that they had attended subject meetings hosted by their subject advisors whereas the majority (76%) of subject advisors from districts in all locations reported that subject meetings were held to disseminate information to educators on the implementation of CASS. More educators from the urban schools (19 out of 36) alluded to the attendance of subject meetings than the educators from the township (3 out of 12) and rural schools (2 out of 12).

Provision of CASS Exemplars

Whilst only 19 out of 60 (32%) educators reported that they had received CASS exemplars from their subject advisors, the majority of subject advisors (18 out of 21) (86%) indicated that they had provided support by making CASS exemplars available to educators. The two sets of data are clearly contradictory. On the basis of the responses from the educators, it would seem that the provision of CASS exemplars is inadequate across the schools in all areas or it is possible that they have not been disseminated to the educators within the school.

Other kinds of Support

Thirteen (13) out of 60 (22%) of educators reported that they also received support in terms of the provision of workbooks by subject advisors. This form of support is clearly insufficient, but is more prevalent in the urban schools (11 out of 36) than in the township schools (2 out of 12) and the rural schools (0 out of 12).

Contact by telephone was also cited as a means of support by a small proportion (20%) of educators, most of who are from the township schools (5 out of 12). At the other hand, a large majority (86%) of subject advisors from all areas reported that educators are able to contact them by telephone. There is clearly a contradiction between the two data sets.

Other forms of support that was not reported by any educators but by subject advisors include demonstration lessons, (3), provision of pace setters (2), and the implementation of quarterly moderation (1). The numbers in brackets indicates the number of responses reported by the subject advisors that participated in this study.

In conclusion to this research question on the support available to strengthen and sustain the implementation of CASS, it can be stated that the support of educators to ensure the effective implementation of CASS is clearly insufficient in all areas. However, where support is provided, the following kinds of support were most prevalent, the convening of cluster and subject meetings which seems to be taking place more in the urban areas than the rural and township areas and the convening of workshops which is more prominent in the rural areas than in any

other areas. Other types of support reported by educators include the provision of CASS exemplars, contact by telephone and provision of workbooks by subject advisors. However, it is clear that the data from subject advisors especially with regards to the support they provide to educators are clearly contradictory to the data provided by their educators.

6.4 To what extent are the Grade 12 CASS marks fair, valid and reliable?

This section presents the findings of the third and last research question, namely how fair, valid and reliable is the Grade 12 CASS marks? The principles of fairness, validity and reliability, which provide background information to the understanding of this question, were discussed in detail in Chapter 3. Chapter 4 also examined literature on fairness, validity and reliability as it is applied to OBA and to CASS in particular. This section presents a conceptual introduction of the concepts fairness, validity and reliability followed by an examination of the validity and reliability of the Grade 12 CASS marks.

McMillan (2001), indicates that the term validity is demonstrated when evidence and logic suggest that the evaluation of a task is accurate and reasonable. In other words, validity concerns the soundness, trustworthiness, or legitimacy of the inferences or claims that are made on the basis of the obtained scores. Killen (2003) also indicates that there is a shift in focus from validity being a property of a test item or assessment task to validity being a value judgement about inferences and actions made as a result of assessment. He emphasises that there is a change in focus from the question, “is my test valid?” to the question, “am I making justifiable inferences and decisions on the basis of the assessment evidence I have gathered?” Whilst valid inferences are accurate and concern the nature and meaning of the scores, reliable scores are dependable and consistent (Killen, 2003).

Since the focus in this section is on the fairness, validity and reliability of the CASS marks, it is essential to indicate that the term “fairness” in assessments is related to the concept of validity. The principle of fairness forms the basis of all assessment practices, which ensures that all learners have been treated in an

equitable manner during the assessment process (Gipps, 1994). In a fair assessment, learners have an opportunity to demonstrate their learning in a way that their scores are not affected by factors such as the lack of resources and physical facilities, gender, ethnic background and handicapped difficulties (McMillan, 2001). If assessment practices are not the same for all learners, for example, where some learners enjoy better learning conditions than others, the inferences made by the educator in the school context will impact on the validity of the CASS marks.

When reflecting on the validity of the Grade 12 CASS marks, it is essential to ascertain whether the actual CASS marks allocated to learners are indeed valid in terms of the evidence of work produced by the learner reflecting on the assessment outcomes achieved.

It is important to repeat that ensuring the fairness, validity and reliability of the Grade 12 CASS marks are important because it constitutes 25% of the Senior Certificate examination marks at the end of the schooling phase. Since the results of this assessment are often used for selection into higher education and for certification purposes, it is essential that the marks obtained by Grade 12 learners are accurate and worthwhile (Killen, 2003). Furthermore, the Senior Certificate results have a huge political, social and economic impact on our country and on its workforce as a whole. If the CASS marks are not fair, valid and reliable they cannot be legitimately used for any purposes including selection into higher education and certification purposes. The danger is that it also gives a false impression of a learner's capability and may result in the learner being unable to cope with the demands of higher education.

Educators and subject advisors that participated in this study were asked if the CASS marks obtained by their Grade 12 learners in Biology, Mathematics and Physical Science were fair and valid. This question was asked to explore the opinions of educators and subject advisors since they are involved in the implementation of CASS and ought to know whether the marks produced by their learners are fair and valid. Interestingly, Table 6.26 shows that the majority of educators (72%) and the majority of subject advisors (84%) maintained that the

Grade 12 CASS marks are indeed fair and valid. Table 6.27 shows the cross-tabulation between the location of schools and districts and the fairness and validity of the CASS marks.

Table 6.26 Responses of educators and subject advisors indicating whether the Grade 12 CASS marks are fair and valid

		No. of educator reponses			No. of subject advisor responses		
Province	**n=60**	**Yes**	**No**	**Not Sure**	**n=19**	**Yes**	**No**
KwaZulu-Natal	13	11	1	1	2	2	
Gauteng	11	7	3	1	2	2	
Northern Cape	8	5	3		4	3	1
Eastern Cape	12	9	1	2	3	3	
Limpopo	12	7	5		3	2	1
Mpumalanga	4	4			5	4	1
Total (%)	***60 (100%)***	***43(72%)***	***13 (22%)***	***4 (7%)***	***19 (100%)***	***16 (84%)***	***3 (14%)***

Table 6.27 Responses of educators and subject advisors indicating whether the Grade 12 CASS marks are fair and valid according to the location of schools and districts

Response	Rural E	Rural SA	Township E	Urban E	Urban SA	Mixed SA	Educator n=60 No. %	Subject Advisor n=19 No. %
Yes	4	6	8	31	5	5	43 (72%)	16 (84%)
No	5	2	4	4	1		13 (22%)	3 (14%)
Not Sure	3			1			4 (7%)	0 (0%)
Totals	***12***	***8***	***12***	***36***	***6***	***5***	***60 (100%)***	***19 (100%)***

E= Educators
SA = Subject Advisors

According to table 6.27, the majority of educators from the urban schools (31 out of 36) reported that their CASS marks were fair and valid, whilst a significant proportion of educators from the rural schools (5 out of 12) reported that their CASS marks were not fair and valid. On the other hand, more subject advisors located in the rural districts (6 out of 8) seem to believe that their CASS marks are fair and valid. Interestingly, the 3 educators who were not sure about the fairness and validity of the CASS marks are also located in the rural schools. However, the majority of educators from the township schools (8 out of 12) reported that their CASS marks were fair and valid.

The majority of educators (72%) who maintained that their CASS marks are fair and valid at their schools provided inter - alia the following reasons:

"Everybody works according to guidelines."

"Most of tests and practicals are done under supervision and test conditions are applied."

"The CASS marks does (sic) not differ much from the symbols the learners obtain at the end of the year."

"Worksheets are a good indication of a learner's work."

"A test or exam always reveals what a child can score (sic) or knows."

"All CASS assessments are done in class."

"Learners get the marks as marked (sic) from the memorandum."

"I have tried my best to give learners fair and credible marks for projects, practical, class work, etc."

On the other hand, some of the reasons provided by the subject advisors in support of the CASS marks being fair and valid are:

"CASS is valid because it uses established trends like the three year average."

"Teachers try their best not to let pupils down. Here and there you can see that CASS marks are artificial, (too high), but these are generally marked down with reference to previous experience."

"Educators are following policy."

"Most of the educators are trained to some extent."

When one examines the above statements made by both the educators and subject advisors supporting the fairness and validity of the CASS marks at their schools, it can be clearly seen that most of the reasons provided are not educationally sound. For example, the statement that "the CASS marks are fair and valid because everybody works according to the provincial and national guidelines" does not indicate that the CASS marks allocated to learners are based on evidence and logic or legitimate assessment criteria nor does it indicate that the assessment instrument was of an acceptable standard. These answers also tap on the reliability of the CASS marks. We can assume that if different standards of assessment are operational at different schools, the CASS marks will not be consistent.

Another example is the statement made by one of the subject advisors in this study when he indicated, "*teachers try their best not to let pupils down. Here and there you can see that CASS marks are artificial, (too high), but these are generally marked down with reference to previous experience"*. This was a statement made by a subject advisor from Mpumalanga. The fact that the CASS marks are too high seems to suggest that CASS is not being conducted properly. However, to ensure the validity of the CASS marks, the subject advisor has indicated that 10% of the learner's portfolios in each school within the district are moderated at the end of the year. He indicated that moderation is done by comparing the average CASS marks of the school to the average achievement of learners in the subject of the past three years. Adjustments are then made to the CASS marks of all the learners within the school.

The above - mentioned approach to moderation does not ensure the validity of the CASS marks. It is also improper and unfair for subject advisors to compare the learner's CASS marks to the norms of the past three years and effect adjustments to the CASS marks. The cohort of learners is also not the same. This adjustment of the learner's CASS mark is done even before the learner sits for his final examination. This process is clearly unjustified. The question is why learners should be disadvantaged when the system to implement CASS is not yet ready. However, this process of arriving at a learner's CASS marks impacts on the validity of the CASS marks.

Another educator reported that the CASS marks in Biology were valid because, "worksheets are a good indication of a learner's work." This statement however does not confirm the validity of a learner's mark since the worksheet could have been of sub - standard, the learner could have been assisted by his parents or friends, or the learner could have engaged in copying. Various possibilities exist.

According to the interviewee from Umalusi, "evidence indicates that some teachers are faking marks. This is also reiterated by a couple (2) of the sampled educators and their subject advisors.

It is sad to note that although the majority of educators and subject advisors reported that their CASS marks were fair and valid, the reasons provided by them did not adequately address the fairness and validity of CASS. Nowhere are educators and subject advisors talking about the legitimacy of their CASS tasks or how the CASS tasks are evaluated. The statements made by both educators and subject advisors supporting the claim that the CASS marks are valid are rather superficial. It also indicates that there is a lack of understanding of what constitutes validity amongst educators and subject advisors. This question however explored the many opinions, views and perceptions of educators and subject advisors on the fairness and validity of the CASS marks.

However, a significant proportion of educators (17 out of 60 - 29%) and subject advisors (3 out of 19 - 14%) indicated that the CASS marks were either not fair or

valid or that they were not sure. Some of the reasons cited by these educators and other educators include:

" Our CASS is more demanding than those of other schools."

"It is all new to me and a lot of hard work. Maybe they can standardise the content in the province and it will make it more fair."

"Teachers lack skills and there is no support to improve the implementation of CASS."

"In Physical Science, too much marks are allocated to practicals. Therefore the CASS marks are unrealistically high."

"Teachers manipulate marks."
"Practicals inflate the CASS marks too much."
"Learners achieve too many marks for too little work."

As one educator in this study reported, "in Physical science, too much marks are allocated to practical, therefore the CASS marks are unrealistically high". This can be a real problem since it impacts on the validity of the CASS marks. In this regard another educator in this study pointed out that Physical science practical constitutes 40% of the total CASS marks at Grade 12 level and since most practical are conducted in group work, the marks are unrealistically high. These marks therefore do not reflect the true abilities of the learner and are therefore not valid. Learners are also left with a false perception of their true worth.

Comments like "learners score high marks on easy tests", tells us something about the type of test given to learners. If the test were simple, the result would be that learners would score high marks. The assessment instrument is therefore flawed and the result would therefore be invalid. On the other hand, a comment like "teachers manipulate marks" must be interpreted with caution. This is a general statement but it may only apply to a certain category of educators, for example, those that set very easy tasks or those that believe that the higher the CASS mark, the better the chances that the learner will pass.

On the other hand, a small proportion (14%) of the subject advisors reported that CASS was not being conducted in a fair manner at their schools. They provided the following reasons:

"I think each school/teacher more or less does his/her own thing. Standard in this hit and run approach can be queried."

"The standard in all schools are not the same level."

"Some educators do not implement assessment continually through the year. They let learners write a high percentage of the tests during the third term."

The above reasons seem to strongly suggest that there is a degree of uncertainty and inconsistency in the assessment process leading to the allocation of marks for CASS. The manner in which CASS is conducted determines the validity and reliability of the CASS marks. If aspects of the assessment process is inconsistent as indicated by the statements, *"our CASS is more demanding than those of other schools and some educators do not implement assessment continually through the year and they let learners write a high percentage of the tests during the third term"*, then there is some doubt created about the validity and reliability of the CASS marks. The different standards of CASS operating at the different schools affects the reliability of the CASS scores since each educator determines her/his own standards and will also evaluate the task based on her/his own interpretation of the standards operating at the school.

In 2002, a CASS verification exercise for the Grade 12 Mathematics was conducted by Umalusi in the Eastern Cape (Umalusi, 2002c) and the findings of this exercise is quite disturbing. Although the verifiers indicated that the minimum requirements in terms of the national guideline were met, they made the following observations:

"We had ample reason to doubt the authenticity of some of the portfolios. We saw in some cases a flurry of short tests and class tests given just before the August moderation exercise. In one case, four tests were given on four consecutive days,

suggesting that learners were copying model answers. For the most part short tests were based on Grade 11 work. We estimate that over 60% of these tests were based on logs and indices, which cover less than 10% of the syllabus. Euclidean Geometry which comprises about 30% of the paper was hardly ever tested."

We may conclude from the data that there are many doubts about the fairness, validity and reliability of the CASS marks. Since subject advisors in all provinces play an important role in ensuring that CASS requirements are met by educators, the subject advisors that participated in this study were asked what measures were taken at district level to ensure that the CASS marks of the Grade 12 learners at the schools within their district/region are fair and valid. Table 6.28 shows that the majority of subject advisors (55%) conceded to the use of cluster moderation as a tool to ensure that the CASS marks were fair and valid. Table 6.29 shows that cluster moderation is more prevalent in mixed and urban districts than in rural districts.

Since the provincial samples used are not representative, the findings in this study are presented according to the location of educators and subject advisors. However, in certain instances the provincial data has been presented to highlight information that is both necessary and valuable to this study. The data may be used to address ways to improve the implementation of CASS in provinces.

Table 6.28 Measures taken by subject advisors to ensure the validity of CASS marks according to provinces

Province	n=21	Cluster Moderation	Std tests, exam and CASS	Monitoring and Support	Not Sure
KwaZulu - Natal	2	1		2	
Gauteng	2	2			
Northern Cape	4	1	2	1	
Eastern Cape	5	4			1
Limpopo	3	1		1	
Mpumalanga	4	2		1	1
Totals		***11 (55%)***	***2 (10%)***	***5 (25%)***	***2 (10%)***

Table 6.29 Measures taken by Subject Advisors to ensure the validity of CASS marks according to the location of the districts

Measures	Rural n=8	Urban n=7	Mixed n=5	Totals n=20 No.	%
Cluster Moderation	2	4	5	11	(55%)
Std tests, exam and CASS	2	0	0	2	(10%)
Monitoring and Support	3	2	0	5	(25%)
Not Sure	1	1		2	(10%)
Totals	***8***	***7***	***5***	***20***	***(100%)***

Although, it seems that cluster moderation is taking place in all areas as reported by 55% of the subject advisors, the manner in which the moderation takes place differs from area to area. In other words, each district has its own method of moderation, which seems to be flawed. Cluster moderation of the CASS marks seems to be a popular measure adopted by subject advisors in all provinces to ensure the validity of the CASS marks. However, cluster moderation at present only takes place at the end of the academic year, just before the marks are

submitted to the provincial departments of education for inclusion on the computer system. However, it would seem that the subject advisors from the Northern Cape have gone a step further to make available examples of tasks (standardised tests and CASS pieces) to their educators. This is indeed a good way of contributing towards the professional development of educators and is also helps educators to know the standard of work that is expected of them.

However, a rather disturbing finding is that whilst the majority of subject advisors in the Eastern Cape (4 out of 5) conceded to the use of cluster moderation to validate the CASS marks of their Grade 12 learners (see table 6.28), the following was discovered in the CASS verification report of the Mathematics marks in the Eastern Cape (Umalusi, 2002c):

"We saw little or no evidence of moderation of class and formal tests. Of great concern however, is that real moderation did not occur at the "cluster level". We learnt that cluster leaders were often not subject specific, contrary to the requirement spelt out in the provincial CASS document, which states that the subject leader (advisor) must organise the cluster of schools. Educators were found (by checking signatures) to be playing the role of moderators for their own schools. There were no moderation reports. A careful study of the provincial moderation procedures document in the Eastern Cape revealed that the aim of cluster meetings was not to moderate so as to find a common standard but to artificially adjust the marks to 10% of the predicted final average of the centre for the final examination. This is done to optimize the likelihood of the acceptance of the CASS mark by Umalusi" (Umalusi, 2001b).

The above findings are specific to parts of the Eastern Cape, however, Umalusi has also gathered evidence from other provincial education departments which indicates that the validation of some CASS marks are problematic. However, the extent of the problems relating to the validation of the CASS marks seems to differ from province to province. For example, in KwaZulu - Natal, the following statements were noted for Physical Science:

"The weighting of the CASS components were in line with the provincial and national guideline documents. However, the class tests of poorly performing schools (pass rate below 50%) were below the required standard. Assessment criteria for the evaluation of learner's CASS were not always available from educators. About 60% of the educator and learner's portfolios were disorganised."

From the above remarks on the KwaZulu - Natal verification, it can be stated that the verification of the CASS marks is problematic especially if the assessment criteria is not available. This seems to be a common problem across the provinces. For example, it has been stated that in the Eastern Cape, educators compiled their portfolios just before the CASS verification exercise and the assessment criteria in most instances were not available (Umalusi, 2002c). In one instance in the Eastern Cape, it was found that the assessment criteria used by the educator to make inferences about the learner's work was only 20% correct (Umalusi, 2002c). This implies that the marks allocated by this educator using the said assessment criteria were definitely not valid.

According to the experts on CASS, the validity and reliability of marks depends a lot on teacher competency and her/his approach to CASS. They are of the opinion that approximately 25-30% of the CASS marks are definitely not valid. If the CASS marks are being faked in certain instances, then it suggests that the CASS tasks were either not completed or if they were completed the educator did not mark them. This means that the CASS marks that are faked have no validity and hence will also not be a reliable indicator of a learner's capability.

Table 6.30 illustrates the number of schools in all provinces for 2002 that submitted CASS marks ranging from more than 5% below the adjusted examination mark to 20% and more above the adjusted examination mark. This variation across the provinces and within provinces further suggests that there are no set standards or consistency in the conduct of CASS in the various subjects. The range of CASS marks also suggests a lack of common understanding in the compilation of the CASS marks.

Table 6.30 Number of schools in each province whose raw CASS marks show significant deviation from the adjusted examination marks for the 2002 Senior Certificate examination

Province	CASS marks of more than 5% below the adjusted examination marks	%	CASS marks of 5% below to 5% above the adjusted examination marks	%	CASS marks of 5% to 10% above the adjusted examination marks	%	CASS marks of 10% to 20% above the adjusted examination marks	%	CASS marks of more than 20% above the adjusted examination marks	%	Total no. of schools with 8 or more candidates
Western Cape	447	11%	1 224	29%	872	21%	1 149	27%	517	12%	4 209
Northern Cape	101	12%	284	33%	176	21%	202	24%	89	10%	852
Free State	111	4%	570	20%	555	19%	1 013	36%	603	21%	2 852
Eastern Cape	275	4%	766	11%	827	12%	2 330	34%	2 742	40%	6 940
KwaZulu-Natal	724	7%	2 483	22%	2 008	18%	3 384	31%	2 473	22%	11 072
Mpumalanga	67	2%	493	14%	530	15%	1 289	37%	1 106	32%	3 485
Limpopo	874	9%	2 763	30%	1 852	14%	2 610	28%	1 137	12%	9 236
Gauteng	706	1%	1 666	24%	1 204	17%	2 125	30%	1 334	19%	7 035
North West	370	12%	1 210	39%	647	21%	731	23%	81	6%	3 139
Totals (%)	***3 675 (8%)***		***11 459 (23%)***		***8 671 (18%)***		***14 833 (30%)***		***100 82 (21%)***		***48 820 (100%)***

Source: (Umalusi, 2002e)

According to Table 6.30, a large proportion of schools (30%) have submitted raw CASS marks of between 10% - 20% above the adjusted examination marks and a significant proportion of schools (21%) have submitted raw CASS marks of more than 20% above the adjusted examination marks. These figures constitute 51% of the schools whose CASS marks were totally unacceptable by Umalusi, the quality assurance council responsible for the credibility of the Senior Certificate examinations. These variances in the CASS marks are problematic since the acceptable difference between the adjusted examination mark and the raw CASS mark for 2002 was pegged at 5% above the adjusted examination mark (DoE, 2003c). If 5% was the acceptable difference between the adjusted examination marks and the raw CASS mark then Table 6.30 clearly indicates that for the 2002 Senior Certificate examinations more than 60% of the schools submitted CASS marks that had to be statistically adjusted so that they are not more than 5% above the adjusted examination marks of learners. The argument provided by education officials for the use of the 5% tolerance factor is that, "if a class worked hard through the year and realistic CASS marks were compiled by educators, it will be reflected in a good average examination mark and a good CASS mark, which will correlate with the examination mark" (DoE, 2003c).

If one examines the table from a provincial perspective, it can be seen for example that in the Eastern Cape, as much as 2 742 (40%) of schools submitted raw CASS marks as high as 20% and above the adjusted examination mark whereas in the same province 275 (4%) of schools submitted raw CASS marks of below 5% of the adjusted examination marks. It is shocking to note that less than a quarter of the total number of schools would have submitted CASS marks that were accepted as is for the 2002 Senior Certificate examinations. The inconsistencies within and across provinces are quite evident.

The question arises, which category of marks is more valid? This is indeed a challenging question. Considering the nature of CASS, that CASS is conducted throughout the year in a more relaxed environment and that the CASS components usually cover a small quantity of the work, it is an accepted principle amongst the education fraternity that the CASS marks should be higher than the adjusted examination marks (DoE, 2003c). However, the question arises, how

much higher? In the case of the Eastern Cape the 40% of schools that submitted CASS marks of 20% and above the adjusted examination marks are immediately advantaging their learners compared to the 4% of schools that submitted CASS marks of more than 5% below the adjusted examination marks.

On the question of how much more than the examination mark should the CASS marks be, 3 of the 5 CASS experts agreed that it would be acceptable when the CASS marks are approximately 10% more than the examination mark. One (1) interviewed official was adamant that the CASS marks should be at least 20% more than the adjusted examination mark. The reason given by this individual is that the nature of the work undertaken for CASS differs considerably from the type of work set in an examination. He argued that CASS tasks demands more practical application and reasoning, that there are no serious time limits as experienced in examinations and that the learner is more relaxed. He added further, that CASS also comprises a number of class work, homework and practical work pieces and that learners generally score good marks in these components.

On the other hand, the official from Umalusi did not commit himself to a figure but indicated that the reasonable difference (tolerance factor) between the raw CASS mark and the examination mark needs to be investigated further. In this regard, Umalusi has planned to conduct research on the acceptable difference between the CASS marks and the examination marks by engaging in classroom observations and an analysis of the CASS tasks. The finer details of this project are not yet known.

For the 2003 Senior Certificate examination, the statistical adjustments for CASS were pegged at 10% more than the examination mark (DoE, 2003c). It is now three years since the start of the implementation of CASS and yet the education authorities are still resorting to statistical adjustments of CASS. This implies that it is acknowledged that the current CASS marks are not valid in all cases. The decision to adjust the CASS marks may be interpreted as educationally sound on the basis that the education authorities need to ensure that all learners are treated

in a fair manner. However, although the action to adjust the CASS marks may be interpreted as fair, it is nevertheless not a valid action.

According to 4 of the 5 experts on CASS “the statistical adjustment of marks is the only way to deal with inflated marks. They indicate that, “in order to set and keep good standards drastic measures have to be taken”.

However, one of the interviewees is of the opinion that the implementation of statistical moderation is unfair since educators have not been given proper guidance and clear policy on CASS implementation. He indicates that a large proportion of educators are not ready to implement CASS and that the standard of CASS has not been clearly spelt out and therefore there are problems with the CASS marks. The 4 interviewed officials added that it is good for educators to know that there is variation in the marks between CASS and the examination. They added further, “it is a good opportunity for educators to reflect. A lot of educators get defensive. The problem is that the CASS tasks are too simplistic, tests are short, little pieces of work are used for CASS and they are not Graded correctly. The work is not challenging enough. The result is that the standard of CASS is lower.” This results in the CASS marks being much higher which in turn undermines the validity of the CASS marks.

Four of the five - interviewed officials indicated that one of the responsibilities of Umalusi is to standardise the CASS marks. They indicated, “this is a reasonable step taken to ensure the validity and reliability of the CASS marks. This step will help educators to take CASS more seriously.”

Educators and learners need to know that the raw marks achieved by learners in a test, examination or for CASS are what they have actually earned and what is due to them. In the school context, learners are evaluated on an ongoing basis from Grade 0 to Grade 12. The raw marks that the learner scores in a test, examination or in oral and practical work are the mark that determines her/his achievements. If this is the case throughout a learner’s schooling career, why do the marks of learners in their final year of their schooling be subject to adjustments?

The adjustment of CASS marks is however an interim arrangement until all examining bodies are able to ensure that CASS is being conducted in a manner that will ensure the integrity and credibility of the Senior Certificate examination. It is crucial that assessment for such a high - stakes purpose as the Senior Certificate incorporate high degrees of validity and reliability. Reliability and validity can only be improved when educators understand what skills they are assessing and how they should assess them in order to recognize different levels of performance by candidates.

6.5 Conclusion

The following points are conclusively drawn from the evidence presented on each of the research questions. In terms of the first research question on the problems and challenges experienced by Grade 12 educators of Biology, Mathematics and Physical Science in the implementation of CASS, it is clear that the majority of the educators are experiencing problems that affect the practical implementation of CASS in the classroom. The main problems cited by educators include the lack of basic resources such as chemicals, apparatus and laboratories, learner support materials and the lack of libraries and computers. The lack of resources seem to be a problem in all areas, however, it is more serious in the rural areas.

Other problems of significance cited by educators from all areas are the increased workload of educators, the negative attitude of learners and the problem of large class sizes. On the other hand, a significant proportion of subject advisors from all areas were of the perception that the lack of commitment and skills of educators and the ever - changing and unclear national policies (guidelines) is a problem.

Evidence from the second research question, on the support of educators in the implementation of CASS, reveals that a larger proportion of educators from all areas are making use of only the national guideline document to implement CASS compared to a smaller proportion of their subject advisors. Conversely, a larger proportion of subject advisors from all areas and a smaller proportion of educators from all areas are making use of the provincial guidelines. The use of only the national CASS guidelines is a problem since it provides only a broad outline of the

Grade 12 CASS requirements, which provinces have used to produce more detailed guidelines.

The statistics on the training of educators reveal that the majority of educators from the rural and township schools received very little training to implement CASS. Further, it would seem that half of the educators from all areas received training within a day/or less than one day. A large proportion of educators from all areas received training once a year. It is obvious that the training of educators to implement CASS is insufficient to ensure the effective implementation of CASS.

Support from subject advisors also seems to be problematic in all three subjects, namely, Biology, Mathematics and Physical Science. The most popular kinds of support received by educators from their subject advisors included the convening of cluster and subject meetings, which seem to be more common in the urban areas than in the township and rural areas. On the other hand, the convening of workshops seems to occur more in the rural areas than in the township or urban areas. Other types of support reported by educators, although to a very limited extent include the provision of CASS exemplars, provision of workbooks and contact by telephone.

On the question of the extent to which the CASS marks are fair and valid, the majority of educators (73%) and the majority of subject advisors (81%) from all areas maintained that the CASS marks are fair and valid. However, the reasons provided by the educators and their subject advisors in support of the CASS marks being fair and valid lack meaning and authenticity.

The five experts on CASS claim that the validity of the CASS marks would for example depend on the educators level of competence, the nature, standard and quality of the CASS task, the assessment process and the accurate evaluation of the learner's work. Furthermore they have also reported that in certain cases educators are faking the CASS marks. This is even more serious than the lack of validity and meaningfulness of the CASS marks.

Although subject advisors are implementing cluster moderation to ensure the fairness and validity of the CASS marks, procedurally this is done incorrectly. The mere adjustment of marks within a 10% range of the previous three - year norms by subject advisors cannot be regarded as a sound measure of ensuring the validity and reliability of the Grade 12 CASS marks. For the 2002 Senior Certificate examinations, more than 60% of the examination centers across all provinces produced CASS marks that had to be statistically adjusted within a 5% range (5% higher) of the adjusted examination marks before they were accepted as part of the Senior Certificate results.

It is evident that there are inconsistencies in the implementation of CASS in all areas. This is not surprising given the fact that there is a lack of ongoing and sustained support, a lack of clear and coherent policy to regulate a common understanding of the implementation of CASS. This implies that there is a clear lack of common procedures/processes for the assessing of CASS tasks; a lack of understanding of how to implement CASS and the lack of uniformity in the development and the interpretation of the assessment evidence.

It can therefore be stated that there is no evidence that CASS marks are fair, valid and reliable. The validity of the CASS marks would depend on a large extent on the educators understanding of the CASS process, his knowledge and skills on how to implement CASS, the standard and quality of the CASS tasks, the accuracy of the assessment criteria/rubrics used by educators and the educators ability to make valid inferences of learner's work.

Since the design of this research did not allow for an in - depth investigation into the CASS process, a conclusive statement cannot be made on the fairness, validity and reliability of the CASS marks. One of the things that this research makes clear is that more research is needed on the fairness, validity and reliability of CASS.

CHAPTER 7

CONCLUSIONS, DISCUSSION AND RECOMMENDATIONS

Overview of the Chapter

This chapter presents a summary of the main findings of the research. The summary is dealt with according to the three main research questions that emerged from the problem statement discussed in chapter 1. This is followed by a discussion on the lessons that can be learnt from the research design adopted in this study and lastly, the recommendations for further research, recommendations for educational policies relating to CASS and the recommendations for educational practice at district and school level.

It is important to reiterate that this study focuses mainly on Grade 12 educators of Biology, Mathematics and Physical Science who are the key respondents in this study and who comprise the sample of the target population. Since it is acknowledged that questionnaire data often result in socially desirable answers, it was necessary to triangulate the responses from the sample of 60 educators to another data source that would enhance the internal validity of the research. As subject advisors are linked to educators in terms of the professional support they are expected to provide, they were identified as the second data source.

To further enhance the internal validity of the data from the sample of educators (60) and subject advisors (21), a third data source was identified on the basis of their link to district offices. This involved the collection of data from a few (5) CASS experts involved in the management/monitoring and evaluation of CASS from national, provincial and district level and from Umalusi. The third data source through a different method (namely, semi-structured individual interviews) was perceived to provide a different perspective to the implementation of CASS (from a management point of view) that would add credibility to the results of the study.

The individual interviews also complement the small sample size used in the case of both educators and subject advisors. However, although the sample is not representative of the entire target population, it is nevertheless an acceptable sample size. Further, this study can be characterised as an exploratory one where the findings cannot be generalised to the entire target population.

7.1 Summary of Findings

The purpose of this section is to highlight the main findings of the research in relation to the problem statement, the rationale for the research as discussed in chapter 1, the literature review presented in Chapter 4 and the conceptual framework dealt with in Chapter 5.

As mentioned, the findings are presented according to the three main research questions, namely, (1) what are the problems and challenges experienced by Grade 12 Biology, Mathematics and Physical Science educators in the effective implementation of CASS; (2) what kinds of support are provided to educators to strengthen and to sustain the effective implementation of CASS; and (3) to what extent are the Grade 12 CASS marks fair, valid and reliable.

Research question 1

What are the problems and challenges experienced by Grade 12 Biology, Mathematics and Physical Science educators in the effective implementation of CASS?

In the problem statement discussed in Chapter 1, the central concern raised was that the implementation of CASS in South Africa proved to be problematic (DoE, 1999b; DoE, 2003c). Research studies conducted in the UK also shows that the implementation of OBA (CASS) even in well-developed countries is problematic (Towers, 1992; Guskey, 1994; Kendall, 1999; Combrinck, 2003). According to Towers (1992, p. 89) "some schools are well along the process, some are experimenting with it in selected classes, and others have barely begun the conversation".

Further, evidence also shows that, "the effectiveness of teaching and learning has been found to be related to certain minimum inputs such as textbooks and libraries" (DoE, 1999c, p. vi). This means that schools that are better resourced are better able to deliver more effective teaching and assessment activities than schools that lack resources. As indicated in the conceptual framework to this study, apart from the management and administrative role of school principals, it is essential that they provide ongoing support to their educators. Since the educator functions within the context of the school, the quality of education she/he delivers is largely influenced by the school environment, which includes the availability of resources. As head of the school, it is the role of the school principal to ensure that his educators have all the necessary material to deliver quality education.

As indicated in Chapter 5, the support of the subject advisor is crucial to the effective implementation of CASS. Subject advisors need to ensure that their educators have the necessary resources to implement CASS. The literature reviewed also shows that when districts don't work, teachers don't receive curriculum guidelines, textbooks and stationery (Bisseker, 2003, p. 26). This affects the delivery of quality education and in particular it would impact on the effective implementation of CASS.

The result of the first research question shows that the extent of the problems and challenges experienced by educators seem to vary from area to area. Before reporting on the actual problems, it is important to indicate that the majority of educators (80%) from rural, township and urban areas reported experiencing problems and challenges that impact on the effective implementation of CASS in their subjects.

This research shows that the main problems and challenges experienced by a significant proportion (47%) of educators across all areas is the lack of basic resources and equipment such as chemicals, apparatuses and laboratories for conducting practical work, the lack of teacher and learner support material (textbooks, mathematical instruments and calculators) libraries, computers, photocopiers, scanners, television and videos. Of particular interest, this research reveals that the problem of lack of resources is the biggest in the rural areas (75%) and the smallest in the urban - centre of city (14%).

If one applies the above findings to the findings reported by the Department of Education (2002a) where it was indicated that CASS implementation is especially problematic in poorly resourced schools, then it becomes clear that the majority of schools located in the rural areas would be affected. This also implies that the educators in these schools would apply and implement CASS differently compared to those educators in areas where the provision of resources are adequate. As indicated in Chapter 6, where schools experience the lack of resources to implement CASS, they have no alternative but to adjust their teaching and learning by omitting all practical work in subjects like Physical Science and Biology.

Undoubtedly, resources are essential to the effective functioning of any educational institution. If educators have not been supplied with the appropriate resources, the consequence is that effective teaching and learning is compromised. This is so, notwithstanding that educators may be suitably qualified and have the necessary expertise to implement CASS.

A matter for concern is that despite the Department of Education's promise to ensure equity of resources across schools, many schools located in the rural and township areas still remain under - resourced.

Other problems of significance cited by educators and subject advisors from all areas include an increased workload, a negative attitude among learners, large class sizes, lack of commitment and skills of educators and the ever-changing and unclear policies of the Department of Education.

The problem of increased workload was reported by a significant proportion of educators (20 out of 60 - 33%) and subject advisors (8 out of 21 - 38%). A review of literature also suggests that South African teachers spend more time on administrative tasks than teachers in other developing countries (Howie, 2001) and that a potential problem for the implementation of internal assessment at Grade 12 is that the amount of assessment in the form of written work and testing during the Grade 12 year becomes unreasonable (Oberholzer, 1998). The literature reviewed also shows that performance - based assessment would require a lot more time to administer and score (Guskey, 1994).

Whilst research suggests that OBE and OBA have increased the workload of educators, it also shows that educators have not been provided adequate support and training to deal with these challenges (Combrinck, 2003). Of greater concern are the research findings which illustrate that OBA imposes enormous demands on teachers to further individualise instruction, plan remediation and enrichment, administer diagnostic assessment, and keep extensive records (Towers, 1992).

The data in this study also suggests that the problem of increased workload is caused by the fact that educators have not had sufficient training on the implementation of CASS. Hence, educators are unable to properly organise and manage their teaching and learning according to the new approach to assessment.

The problem of the negative attitude among learners was reported by a significant proportion of educators (10 out of 60 - 17%) and subject advisors (3 out of 21 - 14%). Here too, the literature reviewed indicates that if learners are not positively disposed towards learning, little learning will actually occur despite the necessary learning skills that may have been mastered (Sadler, 2002).

The problem of large class sizes was reported by a few educators (2 out of 60 - 3%) and subject advisors (13 out of 60 - 62%) from all areas. This problem is linked to the problem of an increased workload. If classes are larger, it is expected that there will be more work for educators; however, the ability of the teacher to deal with larger class sizes is important. A review of literature indicates that large class sizes are making the implementation of CASS difficult especially with respect to individualising instructions to suit the diverse language needs of learners (Johnson, 1998).

The lack of commitment and skills of educators was reported by 5 out of 21 - 24% of the subject advisors and the problem of ever - changing and unclear policies of the Department of Education was reported by 4 out of 21 - 19% of the subject advisors from all areas. It is not surprising that none of the educators reported that they lack the commitment and skills to conduct CASS. In terms of the lack of commitment of educators, the conceptual framework adopted in this study emphasised the need for educators to show commitment to the implementation of CASS. Sadly, if the level of commitment and motivation is low, not much success will be achieved. The literature reviewed indicates that if teachers are to lead change, it is important that they commit themselves to the meaning that a particular innovation has for them and for their school (Brady, 1996).

Furthermore, the need for educators to have appropriate skills needed for the effective implementation of CASS was also highlighted at the input level of the conceptual framework. The lack of skills to implement CASS does have an adverse effect on its implementation.

The problem of ever - changing and unclear policies, although reported by a small proportion (19%) of subject advisors is a cause for concern. Literature shows that the lack of proper planning and the absence of clear curriculum and assessment policies can cause confusion amongst subject advisors and educators (Black & Wiliam, 1998). In South African, the absence of clear and coherent policy on CASS is causing a great deal of uncertainty and dissatisfaction amongst subject advisors and educators (Umalusi, 2002c).

In sum therefore, it can be argued that the problems and challenges mentioned above are serious enough to impact negatively on the effective implementation of CASS. The fundamental concern is that if assessment is not conducted appropriately and effectively due to, for example, the lack of resources or the problem of large class sizes, the marks allocated to learners for CASS in their Grade 12 year may not be fair, valid and reliable. This is especially true in the case where practical CASS tasks are replaced by theory due to the lack of chemicals and equipment to carry out practical work.

Research Question 2

What kinds of support are provided to educators to strengthen and to sustain the effective implementation of CASS?

This research question investigates three aspects relating to CASS implementation, the first aspect seeks to determine to what extent educators are familiar with the provincial/ or the national policy (guidelines) on CASS. The second aspects examines to what extent Grade 12 educators are trained to implement CASS effectively in Biology, Mathematics and Physical Science. The third aspect examines how educators are supported to enable them to implement CASS effectively. A summary of the findings on each of the three aspects is presented in the next section.

To what extent educators are familiar with the provincial/ or the national policy (guidelines) on CASS

The success of any project or business depends on how well it is run. However, if proper rules and procedures are not in place the project is doomed to be a failure. By a similar analogy, the success of CASS is largely dependent on how well the policy is written and understood by those who are implementing it. In the problem statement discussed in Chapter 1, it was indicated that the composition and quality of CASS varied from province to province and this was solely attributed to the lack of policy to regulate the implementation of CASS (Umalusi, 2002b). An investigation carried out by the Department of Education (1999a) showed that the implementation of CASS was problematic in three out of the nine provinces that were offering CASS at Grade 12 level (Chapter 4). Other literature reviewed in Chapter 4 highlighted the need for clear curriculum and assessment policies.

In Chapter 5 and 6 of this study, it was indicated that there are no national or provincial policies to regulate the implementation of CASS in Biology, Physical Science and Mathematics. However, national guidelines have been developed in these subjects since they are examined externally at national level**.** Provinces have however elaborated on the national guidelines in each subject to suit their own context. It is important to repeat that the subject guidelines developed by the National Department of Education and the provincial guidelines developed by provincial examining bodies are currently being interpreted as “policy”.

It has been established in this research that the national guideline document stipulates only the minimum CASS requirements and does not specify the number of CASS tasks and the mark allocation for each task. As is evident from the findings presented in Chapter 6, there are major variations in terms of mark allocations and CASS requirements between the national and provincial CASS guidelines in subjects like Mathematics and Physical Science. Therefore, the use of only the national CASS guideline without the

provincial CASS guideline will lead to inconsistencies in the implementation of CASS both within and across provinces. This is a cause for concern.

In this context, the result of the research shows that a larger proportion of educators (55%) and a smaller proportion of subject advisors (38%) from all areas are implementing the national CASS guideline document compared to a smaller proportion of educators (37%) and a larger proportion of subject advisors (52%) from all areas that are implementing the provincial CASS guideline document. An analysis in relation to the location of educators shows that the provincial guideline is being used by a greater number of educators in the rural (8 out of 12) and township schools (7 out of 12) than in the urban schools (7 out of 36). The scenario is clearly the opposite for the national guideline where the majority of the educators in the urban schools (25 out of 36 - 69%) seem to be using the national guideline rather than the provincial guideline.

The results of this research also show that 32% of educators from all areas are totally familiar with the provincial/or national guideline on CASS. It is of interest to note that, as much as 42% of the educators from the rural areas reported that they were familiar with the provincial/or national guideline on CASS. On the other hand, only 29% of subject advisors from both rural and mixed districts are of the opinion that their educators understood the CASS documents totally. The data on the familiarity of the CASS policy from educators and their subject advisors seem to be contradictory.

In sum, it can be stated that the use of only the national CASS guideline without the provincial CASS guideline will lead to inconsistencies in the standard and quality of CASS both across and within provinces. The fact that only 32% of educators from all areas are totally familiar with the CASS guidelines (both the national and the provincial) used by them indicates that the majority of educators that are not familiar with the CASS guidelines will experience problems in the implementation of CASS.

To what extent are Grade 12 educators trained to implement CASS effectively in Biology, Mathematics and Physical Science?

In the rationale to this study it was indicated that the nature of CASS demanded a dramatic shift from the assessment practices of the past and as such sufficient preparation had to be made to ensure that the CASS system and structures were in place to deal with this challenge. This also meant that educators should also have undergone proper training to familiarise themselves with this new approach to assessment. This would have improved their levels of competence and skills so that they would be able to effectively implement CASS with ease and confidence.

To assist educators in becoming competent, the conceptual framework used in this study stressed the need for high quality professional support from subject advisors as one of the key variables at the input level. As indicated in Chapter 2 and in Chapter 6 of this study, the role of district offices (subject advisors are located at district offices) are crucial to the improvement of the standard and quality of teaching and learning. The literature reviewed indicates that when districts don't work, teachers don't receive curriculum guidelines, textbooks and stationery and this is problematic for educators (Bisseker, 2003).

The literature review also argues that educators need sufficient time and professional training on how to adapt to this new form of assessment (Klenowski, 1999; Combrinck, 2003). It is expected that the more time and training provided to educators to clearly understand the basic concepts and terminology before commencing with the actual implementation of CASS would place educators in a better position to improve the quality of their interaction in the classroom (Black & Wiliam, 1998).

The research evidence in this study shows that the majority of educators (52%) from all areas state that they have not received sufficient training to ensure the effective implementation of CASS. This data is seemingly contrary to the data provided by subject advisors who reported that 52% of their

educators from all areas had received quite a lot of training. These findings illustrate the different perspectives of educators and subject advisors. However, it would seem that educators from the urban - suburbs have had more training than educators from the rural, township and urban - centre of city areas. Of particular interest, the majority of educators (58%) from the rural areas reported that they have had no training. In general, the provision of training is clearly insufficient across all areas and in all subjects namely, Biology, Mathematics and Physical Science. Further, most of the educators from the rural and township schools seemed to have received training in one day or less than a day. Only 17% of the educators from all areas reported that the training was of great assistance.

Clearly, the amount of training offered to educators in Biology, Mathematics and Physical Science is insufficient to guarantee that educators will be competent or sufficiently equipped to implement CASS effectively in their subjects. Certainly, a one - day training session, or a training session that lasts for less than a day, is inadequate to prepare educators for educational changes that impact on the validity and reliability of learner achievement at the end of Grade 12 level.

How are educators supported to enable them to implement CASS effectively

As mentioned in the summary to the previous question, support from subject advisors is a necessary element in the grooming of educators to effectively operationalise CASS. One of the findings of Umalusi (2001b) is that CASS in Physical Science is problematic in certain areas due to the unsuitability of educators who need extensive, ongoing and on site support and workshops to conduct CASS. Research evidence also indicates that there is still a large proportion of unqualified and under - qualified educators in the system, hence educators at all levels need sustained and systematic professional development especially as they begin to engage in the Curriculum 2005 process (DoE, 1999c).

Further, the literature reviewed shows that high quality professional support to educators is associated with trust and empowerment that lends itself to continuous quality improvement and professional development (Yung, 2002). According to Yung, the empowerment of teachers enables them to be regarded as professionals, exercising judgement and creativity.

Against the literature on the educators' need for high quality support, the results of this research question shows that only 27% of the Biology, Physical Science and Mathematics educators from all areas reported having received sufficient support from their subject advisors whilst a large proportion of educators (45%) reported to have received very little support to no support. In contrast to this data nearly half (48%) of subject advisors indicated that they had provided sufficient support to their educators.

Where support is provided, educators conceded to having received the following kind of support from their subject advisors; namely the attendance of cluster and subject meetings. This seems to be taking place more in the urban areas than in the rural and township areas. On the other hand, the attendance of workshops is more prominent in the rural areas than in any other areas. Other kinds of support received by educators include the provision of CASS exemplars, contact by telephone and the provision of workbooks by subject advisors.

Although the data in this research shows that there is some support from subject advisors, this is very limited and in some instances there is no support at all. In this regard, the official interviewed from Umalusi is of the opinion that subject advisors themselves are not totally competent in the understanding of CASS. He indicates that this is the very reason why some subject advisors are unable to detect that some educators are not competent to deal with CASS in an effective manner. This may be the reason for the discrepancy between the data from educators and the data from subject advisors.

It can therefore be stated that high quality professional support to educators of Biology, Mathematics and Physical Science in all areas is seriously lacking.

Regrettably, if educators are not fully supported through this new and complex process, it is expected that they will not have the expertise and professionalism to engage in the effective implementation of CASS.

Research Question 3

To what extent are the Grade 12 CASS marks fair, valid and reliable?

In terms of this research question, it is important to repeat that in the problem statement discussed in Chapter 1, it was mentioned that CASS has been introduced as an essential component of the final exit examination of the schooling phase (NQF level 4). Due to the importance of the Grade 12 examination and the fact that the fairness and appropriateness of examination results are always a matter of public concern (Riding & Butterfield, 1990), it is important that the CASS marks awarded to learners are fair, valid and reliable so that they can be legitimately included as part of the final achievement at the end of the schooling phase.

The literature reviewed in Chapter 4 suggests that when the assessment principles (meaning fairness, validity and reliability in the context of this study) are understood they provide a clear framework for all major decisions that teachers need to make on assessment. However, when they are misunderstood or ignored, the resulting assessment practices are likely to result in the generation of worthless data (Vandeyar & Killen, 2003).

Data from this research question shows that although the majority of educators (73%) and subject advisors (81%) indicated that the CASS marks in their subjects are both fair and valid, the reasons provided by them in support of their answers are not educationally sound. The superficial nature of their answers seem to suggest a lack of understanding amongst both educators and subject advisors on what constitutes a fair and valid mark. The different standards of CASS operational at schools and the lack of expertise and knowledge of educators in the area of compiling assessment criteria (SAFCERT, 2002a) also affect the reliability of the CASS marks.

It would seem that since educators and subject advisors are not totally familiar with what constitutes a fair, valid and reliable mark, not all CASS marks could be accepted as fair, valid and reliable. According to the CASS experts interviewed, the validity of the CASS marks would depend on the educators level of competence, the nature, standard and quality of the CASS task, the assessment process and the assessment criteria, the inferences made by the educator based on evidence of the learner's work and whether the CASS marks reflect the true abilities of the learner. Where educators are faking CASS marks and when marks are given to learners for practical work where no such practical work was conducted, the marks are definitely not fair, valid or reliable.

7.2 Discussion

This section examines the lessons that can be learnt from this research in terms of its methodology and the literature reviewed.

Methodological Reflection

This research is based predominately on the quantitative research design where use was made of surveys (written questionnaires) to collect data from a sample of educators and subject advisors. However, the use of the semi-structured interviews from the CASS experts required a qualitative analysis of data. Therefore, it can be indicated that this study is a mixture of both the quantitative and qualitative methods of data collection and analysis.

The surveys were administered to a sample of 60 Grade 12 educators and 21 subject advisors of Biology, Mathematics and Physical Science across six provinces, namely, Gauteng, Eastern Cape, Mpumalanga, KwaZulu - Natal, Northern Cape and Limpopo and across all areas, namely, rural, township, urban - suburbs and urban - centre of city. The methodological approach adopted in this study has had the following influence on the research results:

- firstly, the fact that a small but acceptable sample was used that is not representative of the entire target population, implies that the results

from this research cannot be generalised to the entire target population which would be all the Grade 12 educators teaching Biology, Mathematics and Physical Science. In the case of the subject advisors, the same principle would apply. Therefore the results from the study must be seen as exploratory;

- secondly, the use of surveys often leads to respondents giving answers that are socially desirable. Since written questionnaires were used to collect data from the sample of educators and subject advisors, the socially desirable answers may influence the internal validity of the data;

- thirdly, it would have been beneficial if data were also collected from Grade 12 learners of Biology, Mathematics, and Physical Science. Since CASS is characterised by transparency and openness, the additional data from learners would have added a different perspective to the implementation of CASS in the classroom. Since learners are directly involved in the practice of CASS, they are in the best position to evaluate the CASS processes that take place within the classroom. They are also in the best position to evaluate the work of the educator; and

- as indicated in Chapter 5, the role of school principals in the provision of professional support to educators is important, since without their support, the goals of teaching and learning cannot be fully achieved. The fact that no data was collected from school principals on the implementation of CASS has left a gap in this research. Nevertheless, since this study focuses on the educator, it was considered sufficient to collect data from the educators and their subject advisors for the purposes of this study.

However, in the context of this study it must be stated that the use of surveys to collect data from educators and subject advisors was the best option since this research was mainly interested in the collection of first hand information of a descriptive nature from educators and subject advisors. Furthermore, since questionnaires can be specially designed to focus on a particular area of study or topic, it was therefore considered appropriate to use surveys.

Also, the collection of data from a large number of participants, 60 in the case of the educators and 21 in the case of the subject advisors could best be accomplished through the use of written questionnaires. Any other method of data collection, for example, the use of telephonic interviews would have consumed a lot of time, energy and financial resources. Educators and subject advisors would also have been reluctant to participate in this study due to time constraints.

However, in order to enhance the internal validity of the research results, the responses of the educators were considered in relation to the data collected from subject advisors. The data from the two sources were compared and contrasted and triangulated with the data gathered through the individual interviews conducted with the group of CASS experts.

Substantive Reflection

Since CASS is a fairly new approach to assessment in South Africa, not much research has been conducted on the actual implementation of CASS at Grade 12 level. However, the literature used in this study is from studies conducted both nationally and internationally and are related to the implementation of OBA within OBE.

In the literature reviewed in Chapter 4, the results of research studies show that the implementation of OBA is generally problematic (Towers, 1992; Guskey, 1994). The results of this research, especially regarding the problems and challenges experienced by Grade 12 Biology, Mathematics and Physical Science educators in the effective implementation of CASS are closely related to the results of research studies conducted even in well - developed

countries. However, in addition to the problems and challenges noted in other research studies, this study has revealed new problems and challenges such as the lack of chemicals, apparatuses and laboratories needed for the conduct of science experiments, without which practical work in CASS cannot be done. Further, this research has shown that the ever - changing and unclear national policies are also a problem. However, a fundamental finding of this research is that although the majority of educators (78%) are experiencing problems and challenges in the implementation of CASS, the problems are most evident in the rural and township areas than in the suburban areas.

In terms of the second research question on the support of educators, the literature reviewed in Chapter 4 shows that support to educators is clearly insufficient to adequately prepare educators for a fundamental change such as the implementation of CASS. The results of this research also shows that support from subject advisors also seems to be insufficient in all three subjects, namely, Biology, Mathematics and Physical Science at Grade 12 level. For example, in a subject as important as Mathematics where the pass rate in South Africa is clearly unsatisfactory, as much as 10 out of 20 (50%) of educators reported that they had received no support or very little support to assist them with the practicalities of CASS. In general, it would seem that support is lacking in all three critical subjects.

Statistics on the training of educators reveal that the majority of educators from the rural and township schools received very little training to implement CASS. Further, it would seem that half of the educators from all areas received training within a day/ or less than one day. A large proportion of educators from all areas received training once a year. It is obvious that the training of educators to implement CASS is insufficient to ensure the effective implementation of CASS.

In terms of the third research question on the fairness, validity and reliability of the CASS marks, the literature reviewed in Chapter 4 showed that there are concerns by Higher Education Institutions on how students are evaluated and the reliability and validity of their results were doubted (Freeman & Lewis,

1998, p. 27). According to Freeman and Lewis, "the employer's assumption is that a university degree should prepare students for work, but their experience is that the courses do not in fact succeed in doing this". If this assumption is true, then the validity of the assessment is questionable. In a study conducted by Entwistle and Percy (cited in Freeman & Lewis, 1998, p. 27), lecturers agreed that one of the aims of higher education was to promote higher order intellectual activity and outcomes such as critical or creative thinking and conceptual understanding. However, on analysing the assessment given to students it was found that the assessment was merely requiring a detailed and accurate reproduction of course content. The gap between the stated aims and the actual performance required of learners in the assessment was therefore inconsistent. Hence the validity of the decisions made by the lecturer is considered invalid.

In the South African context, similar sentiments are expressed regarding the reliability and validity of the Grade 12 results since these results are used for selection into Higher Education (Jansen, 2003). The results on the fairness and validity of the CASS marks shows that the majority of educators (73%) and the majority of subject advisors (81%) from all areas maintained that the CASS marks are fair and valid. However, the reasons provided by the educators and their subject advisors in support of the statement that the CASS marks are fair and valid are not educationally sound.

It can therefore be stated that there is no evidence that the CASS marks are fair, valid and reliable. The validity of the CASS marks would depend to a large extent on the educators' understanding of the CASS process, their knowledge and skills on how to implement CASS, the standard and quality of the CASS tasks, the accuracy of the assessment criteria/rubrics used by educators and the educators' ability to make valid inferences of the learner's work.

Since the design of this research did not allow for an in - depth investigation into the CASS process, a conclusive statement cannot be made on the fairness, validity and reliability of the CASS marks. However, if the CASS

marks are not valid, they are therefore not dependable; hence they are not a reliable indicator of a learner's worth. This would apply to all learners in all Grades in the education system.

One of the things that this research makes clear is that more research is needed on the fairness, validity and reliability of CASS.

7.3 Recommendations

This section presents the recommendations of this research. The recommendations are dealt with under the following sub - headings; recommendations for educational policies and practice relating to CASS; recommendations for educational practice at district and school level; recommendations for further research, and recommendations for development work.

Recommendations for educational policies and practice relating to CASS

This research shows that the implementation of CASS is inconsistent across examining bodies. This is largely due to the fact that there is a lack of clear and coherent policy on CASS to regulate the conduct thereof in the various Grade 12 subjects. If government is serious about improving the quality of academic performance of learners, then policies need to be promulgated that would give direction and guidance to educators and learners on the effective implementation of CASS. This would also help to standardise assessment practices across the different examining bodies. The following recommendations are made in this regard:

- firstly, a national CASS policy should be developed and promulgated so that educators and other stakeholders know what is expected of them. The national policy would for example indicate the role of the educator in implementing CASS, the number of CASS components for each of the Grade 12 subjects and the composition of the CASS marks; and

- secondly, there should be a clear and coherent subject policy or subject manual that articulates the specific CASS requirements to be met in each of the Grade 12 subjects. The details of this would include for example:

  - the mark allocation for the different CASS components, namely, practical or orals, assessment of classroom - based work and controlled tests/examinations; and

  - a detailed breakdown of each assessment component, the skills to be assessed, the methodology to be used for the assessment and the criteria to be used to evaluate the task.

This document should be developed at national level, with the expertise drawn from other examining bodies and other key stakeholders. It is imperative that subject specialists are involved in the drafting of these documents since the nature and requirements of subjects are different. Each subject must have its own CASS policy document and provinces should not be allowed to deviate from the policy document. However, it would be essential to conduct high quality and continuous training with the educators (implementers) on the interpretation and common understanding of the policy documents. Ongoing support from subject advisors and school principals is a necessity.

- The third recommendation involves the establishment of moderation systems and structures at provincial and district level to ensure the fairness, reliability and validity of the CASS marks.

It has been established that the moderation of the CASS marks is not being addressed sufficiently by provincial education departments at present. Although it is claimed that moderation is being done in certain districts within certain provinces, the moderation process and procedures are inconsistent and flawed (DoE, 2002c). Whilst certain provincial education departments/districts are using their previous experience to 'moderate' the CASS marks, other provinces and districts are applying the norms of the

previous year's CASS marks to 'moderate' the CASS marks and there are yet other provincial education departments/districts that are using the marks achieved by learners in the preparatory examination to 'moderate' the final CASS marks. To avoid these inconsistencies, a standard policy of moderating CASS across all examining bodies should be promulgated.

- Fourthly, professionally qualified subject specialists with in - depth knowledge, skills and understanding of CASS should undertake moderation. Moderation practices should reflect on current teaching and assessment practices, the development of formative performance-based assessment tasks and scoring tools (criteria) with clear identification of 'anchors' for the scoring system.

Particular attention should be paid to the nature, quality and standard of the CASS tasks, the assessment criteria used; the educator's evaluation of the evidence of work submitted by the learner and the inferences made by educator in terms of the criteria used. Moderation should be undertaken at school level on an ongoing basis by the subject head and at district or regional level by the subject advisor. Moderation at district level should be done at least once a school term. This should be followed by some kind of moderation by national officials (subject specialists) at least once a year and verified by Umalusi.

Recommendations for educational practice at district and school level

- At district level, it is recommended that sufficient subject advisors be appointed to ensure that all schools within the district/region are visited and supported on a regular basis.

- Of particular importance is that all subject advisors should be professionally trained to deal with the implementation of CASS in their subject.

- Subject committee meetings and cluster meetings should be held on a more regular basis than indicated by the sample of educators.

- Subject advisors should conduct regular classroom visits. High quality classroom support is essential for subject advisors to know and understand what is happening in the classroom so that they may be able to conduct follow – up visits and provide additional support to educators when necessary.

- All practical and oral CASS marks must be face moderated. Subject advisors may undertake this task once during each school term. Of particular importance is that feedback should be given to educators on the fairness, validity and reliability of the CASS marks.

- Educators need to keep continuous and accurate records on the progress of each learner as well as the evidence of feedback given to learners with the aim of improving learner achievement. This record must be made available to the subject head, the subject advisor, parents and to the provincial and national officials.

- Through training and "hands on" practice in classroom assessment, educators will be better able to understand and promote learning, and increase their ability to help learners to become more effective, self assessing and self directed learners. The purpose of this exercise is to empower educators who then pass on the improved quality of teaching, learning and assessment to their learners with the ultimate aim of improving the quality of learning in the classroom. All educators should be part of a training programme that arms them with the necessary skills and competences in CASS so that they are able to implement CASS effectively.

Recommendations for further research

In terms of further study, it is recommended that this study be taken a step further by investigating the acceptable difference between the raw CASS marks and the adjusted examination marks of Grade 12 learners. At present the statistical adjustment to the CASS marks, although accepted in practice, is not a valid action.

Recommendations for further development work

It is recommended that an investigation into the fairness, validity and reliability of the Grade 12 CASS marks be conducted by analysing samples of teachers' and learners' CASS portfolios from different schools/socio - economic backgrounds/areas.

7.4 Conclusion

The main reason for embarking on this study was to identify the problems and challenges experienced by Grade 12 Biology, Mathematics and Physical Science educators in the effective implementation of CASS, determine the kinds of support provided to educators to strengthen and to sustain the effective implementation of CASS and to examine to what extent the Grade 12 CASS marks are fair, valid and reliable.

Having presented the research findings in Chapter 6, the results of the research suggest that although there is evidence that some measures are being taken by provincial education departments to implement CASS, the efforts are minimal. The lack of a clear and coherent policy further exacerbates the issue of ensuring consistency in CASS implementation across all provincial examining bodies. If South Africa is serious about raising the standard and quality of the Senior Certificate examination, and in particular improve the results in Mathematics and Sciences, then it ought to take drastic measures to improve the current assessment practices in the classroom.

According to Black and Wiliam (1998), there is a firm body of evidence, which indicates that the use of CASS in a formative manner could improve standards of learning. However, this fundamental educational change can only be achieved slowly through programmes of professional development that build on existing good practice (Black & Wiliam, 1998). The plea is that national policy will grasp this opportunity and give a lead in this direction.

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Appendix A: Letter to Subject Advisors

T Singh
P.O Box 39142
Garsfontein
PRETORIA
0060

Tel: (012) 998 9793
Fax: (012) 323 8070

TO THE SUBJECT ADVISORS OF MATHEMATICS, BIOLOGY AND PHYSICAL SCIENCE

SURVEY ON CONTINUOUS ASSESSMENT "CASS"

Continuous Assessment (CASS) at Grade 12 level became policy in 2001.This aspect of assessment is still in its developmental stages.

As part of my Masters Degree at the University of Pretoria, I am conducting research on the implementation of CASS in Mathematics, Biology and Physical Science at Grade 12 level. Research in this area is essential to ensure that all educators in all provinces implement CASS correctly and consistently.

First hand information on the implementation of CASS will be useful in understanding how educators are coping with the new approach to assessment. Your inputs from the perspective of subject advisor will add value to this research.

All information supplied will be highly confidential. Your time and co-operation is appreciated.

Yours sincerely

T Singh

Appendix B

Letter to Educators of Mathematics, Biology and Physical Science

Grade 12

T Singh
P.O Box 39142
Garsfontein
PRETORIA
0060

Tel: (012) 998 9793
Fax: (012) 323 8070

TO GRADE 12 EDUCATORS OF MATHEMATICS, BIOLOGY AND PHYSICAL SCIENCE

SURVEY ON CONTINUOUS ASSESSMENT "CASS"

Continuous Assessment (CASS) at Grade 12 level became policy in 2001. This aspect of assessment is still in its developmental stages.

As part of my Masters Degree at the University of Pretoria, I am conducting research on the implementation of CASS in Mathematics, Biology and Physical Science at Grade 12 level. Research in this area is essential to ensure that all educators across all provinces implement CASS correctly and consistently.

First hand information on the implementation of CASS will be useful in understanding how educators are coping with the new approach to assessment.

All information supplied will be highly confidential. Your time and co-operation is appreciated.

Yours sincerely

T Singh

School - Based Assessment: the interface between Continuous Assessment (CASS) and the external summative examination at Grade 12 level with special focus on Mathematics and Science.

QUESTIONAIRE FOR SUBJECT ADVISORS: MATHEMATICS AND SCIENCE

Continuous Assessment (CASS) at Grade 12 level became policy in 2001.This aspect of assessment is still in its developmental stages. Research in this area is essential to ensure that all educators across all provinces implement CASS correctly and consistently.

First hand information on the implementation of CASS will be useful in understanding how educators are coping with the new approach to assessment.

Your time and co-operation will be much appreciated.

PLEASE ANSWER ALL QUESTIONS

Where alternate answers are provided place a cross in the appropriate block.

1. Name of Province:_____

2. Name of District/Region: _____

3. Is your district/region largely Urban or Rural? Explain.

_____

_____

_____

4. To what extent do the schools in your district/region have sufficient resources to implement CASS? Explain.

_____

_____

_____

_____

_____

_____

5. **Indicate what additional resources, if any, are needed by the schools in your district/region in order to be able to implement CASS effectively.**

_____

_____

_____

_____

_____

6. **Please indicate the subject/s for which you are responsible at district/regional level. *(Please place a cross in the appropriate block)***

Maths	Physical Science	Biology

7. **What is your highest qualification in the subject mentioned above?**
(Please place a cross in the appropriate block)

No Post-Matric Qualification
2 year Teaching Certificate
3-4 year Diploma
3-4 year Bachelors Degree
Hons Degree
Masters Degree
Doctorate

8. **How many years of experience as a subject advisor do you have at Grade 12 level in the subject mentioned in question 6. *(Please place a cross in the appropriate block)***

1 year or less	2 - 3 years	4 - 5 years	6 – 8 years	More than 8 years

9. Which CASS policy is being implemented in your province?
(Please place a cross in the appropriate block)

Not Sure	No CASS Policy	National CASS Policy	Provincial CASS Policy

10. Are you aware of a national policy on CASS for your subject?
(Please place a cross in the appropriate block)

No	Yes

11. If you answered "yes" to the above question, and if you do have a provincial policy, what is the difference between the provincial policy and the national policy on CASS in your subject? Explain.

_____

_____

_____

_____

12. To what extent are you familiar with the policy mentioned in question 9?
(Please place a cross in the appropriate block)

Not familiar	To some extent	To a large extent	Totally familiar

13. Have educators been given a copy of the policy mentioned in question 9?
(Please place a cross in the appropriate block)

No	Yes

14. To what extent do the majority of educators understand the provincial/national policy on CASS for your subject? ***(Please place a cross in the appropriate block)***

None of it	To some extent	To a large extent	Totally Familiar

15. What do you understand by the term "Continuous Assessment" (CASS)?

_____

_____

_____

_____

16. Have educators been trained to implement CASS in your subject?
(Please place a cross in the appropriate block)

No training	Very Little training	Quite a lot of training	More than sufficient training

17. What was the duration of their training?
(Please place a cross in the appropriate block)

None	Less than a day	1 day	2 - 3 days	1 week	More than 1 week

18. How often is training conducted?
(Please place a cross in the appropriate block)

None given	Once a month	Once a year	Twice a year	Three-four times a year	More often

19. How many educators are able to implement CASS effectively?
(Please place a cross in the appropriate block)

None of them	Few of them	Majority of them	All of them

20. To what extent do you provide support to your educators in the implementation of CASS? ***(Please place a cross in the appropriate block)***

No Support	Very Little Support	Sporadic Support	Sufficient Support

21. Indicate the type of support you are providing.
(Please place a cross in the appropriate block)

Classroom Visits	
Training	
Workshops	
Subject meetings	
Cluster meeting support	
Assessment exemplars	
Prepared Workbooks	
Contact by telephone	
Other	

List any other kind of support that you may be providing.

_____

_____

_____

22. What kinds of problems/challenges face educators in the implementation of CASS. Explain.

_____

_____

_____

_____

23. How can these problems/challenges be addressed at the various levels mentioned below in order to improve the manner in which CASS is being implemented?

District/Regional Level_____

_____

_____

Provincial Level_____

_____

_____

National Level_____

_____

24. **Do you think that CASS is being implemented in a fair manner at the schools in your district/region? (*Please place a cross in the appropriate block)***

No	Yes

25. **Explain your answer to the above question.**

_____

_____

_____

_____

_____

26. **Would you say that the CASS marks obtained by the learners in the majority of schools in your district/region are fair and valid?**
(Please place a cross in the appropriate block)

No	Yes

27. **What measures are in place to ensure that the CASS marks obtained by the learners are fair and valid?**

_____

_____

_____

_____

_____

_____

_____

28. **Are the CASS marks obtained by the learners moderated at the various levels mentioned below. *(Please place a cross in the appropriate block)***

School level

No	Yes

District/Regional Level

No	Yes

Provincial level

No	Yes

29. Where CASS is moderated, explain how it is done.

_____

_____

_____

_____

_____

_____

Thank you for your time and co-operation.

Appendix C

Questionnaire for Subject Advisors of Mathematics, Biology and Physical Science

Grade 12

School - Based Assessment: the interface between Continuous Assessment (CASS) and the external summative examination at Grade 12 level with special focus on Mathematics and Science.

QUESTIONAIRE FOR SUBJECT ADVISORS: MATHEMATICS AND SCIENCE

Continuous Assessment (CASS) at Grade 12 level became policy in 2001.This aspect of assessment is still in its developmental stages. Research in this area is essential to ensure that all educators across all provinces implement CASS correctly and consistently.

First hand information on the implementation of CASS will be useful in understanding how educators are coping with the new approach to assessment.

Your time and co-operation will be much appreciated.

PLEASE ANSWER ALL QUESTIONS

Where alternate answers are provided place a cross in the appropriate block.

1. Name of Province:_____

2. Name of District/Region: _____

3. Is your district/region largely Urban or Rural? Explain.

_____

_____

_____

4. To what extent do the schools in your district/region have sufficient resources to implement CASS? Explain.

_____

_____

_____

_____

_____

_____

5. **Indicate what additional resources, if any, are needed by the schools in your district/region in order to be able to implement CASS effectively.**

_____

_____

_____

_____

_____

6. **Please indicate the subject/s for which you are responsible at district/regional level. *(Please place a cross in the appropriate block)***

Maths	Physical Science	Biology

7. **What is your highest qualification in the subject mentioned above?**
(Please place a cross in the appropriate block)

No Post-Matric Qualification
2 year Teaching Certificate
3-4 year Diploma
3-4 year Bachelors Degree
Hons Degree
Masters Degree
Doctorate

8. **How many years of experience as a subject advisor do you have at Grade 12 level in the subject mentioned in question 6. *(Please place a cross in the appropriate block)***

1 year or less	2 - 3 years	4 - 5 years	6 – 8 years	More than 8 years

9. Which CASS policy is being implemented in your province?
(Please place a cross in the appropriate block)

Not Sure	No CASS Policy	National CASS Policy	Provincial CASS Policy

10. Are you aware of a national policy on CASS for your subject?
(Please place a cross in the appropriate block)

No	Yes

11. If you answered "yes" to the above question, and if you do have a provincial policy, what is the difference between the provincial policy and the national policy on CASS in your subject? Explain.

_____

_____

_____

_____

12. To what extent are you familiar with the policy mentioned in question 9?
(Please place a cross in the appropriate block)

Not familiar	To some extent	To a large extent	Totally familiar

13. Have educators been given a copy of the policy mentioned in question 9?
(Please place a cross in the appropriate block)

No	Yes

14. To what extent do the majority of educators understand the provincial/national policy on CASS for your subject? ***(Please place a cross in the appropriate block)***

None of it	To some extent	To a large extent	Totally Familiar

15. What do you understand by the term "Continuous Assessment" (CASS)?

_____

_____

_____

_____

16. Have educators been trained to implement CASS in your subject?
(Please place a cross in the appropriate block)

No training	Very Little training	Quite a lot of training	More than sufficient training

17. What was the duration of their training?
(Please place a cross in the appropriate block)

None	Less than a day	1 day	2 - 3 days	1 week	More than 1 week

18. How often is training conducted?
(Please place a cross in the appropriate block)

None given	Once a month	Once a year	Twice a year	Three-four times a year	More often

19. How many educators are able to implement CASS effectively?
(Please place a cross in the appropriate block)

None of them	Few of them	Majority of them	All of them

20. To what extent do you provide support to your educators in the implementation of CASS? ***(Please place a cross in the appropriate block)***

No Support	Very Little Support	Sporadic Support	Sufficient Support

21. Indicate the type of support you are providing.
(Please place a cross in the appropriate block)

Classroom Visits	
Training	
Workshops	
Subject meetings	
Cluster meeting support	
Assessment exemplars	
Prepared Workbooks	
Contact by telephone	
Other	

List any other kind of support that you may be providing.

_____

_____

_____

22. What kinds of problems/challenges face educators in the implementation of CASS. Explain.

_____

_____

_____

_____

23. How can these problems/challenges be addressed at the various levels mentioned below in order to improve the manner in which CASS is being implemented?

District/Regional Level_____

_____

_____

Provincial Level_____

_____

_____

National Level_____

_____

24. **Do you think that CASS is being implemented in a fair manner at the schools in your district/region? (*Please place a cross in the appropriate block)***

No	Yes

25. **Explain your answer to the above question.**

_____

_____

_____

_____

_____

26. **Would you say that the CASS marks obtained by the learners in the majority of schools in your district/region are fair and valid?**
(Please place a cross in the appropriate block)

No	Yes

27. **What measures are in place to ensure that the CASS marks obtained by the learners are fair and valid?**

_____

_____

_____

_____

_____

_____

_____

28. **Are the CASS marks obtained by the learners moderated at the various levels mentioned below. *(Please place a cross in the appropriate block)***

School level

No	Yes

District/Regional Level

No	Yes

Provincial level

No	Yes

29. Where CASS is moderated, explain how it is done.

_____

_____

_____

_____

_____

_____

Thank you for your time and co-operation.

Appendix D

Questionnaire for Educators of Mathematics, Biology and Physical Science

Grade 12

School - Based Assessment: the interface between continuous assessment (CASS) and the external summative examination at Grade 12 level with special focus on Mathematics and Science.

QUESTIONAIRE FOR GRADE 12 EDUCATORS: MATHS AND SCIENCE

Continuous Assessment (CASS) at Grade 12 level became policy in 2001.This aspect of assessment is still in its developmental stages.

Research in this area is essential to ensure that all educators across all provinces implement CASS correctly and consistently. First hand information on the implementation of CASS will be useful in understanding how educators are coping with the new approach to assessment.

Your answers to the questions below will assist in identifying the issues that need attention in the effective implementation of CASS.

Your time and co-operation is much appreciated.

PLEASE ANSWER ALL QUESTIONS

Where alternate answers are provided place a cross in the appropriate block.

1. Name of Province: _____

2. School EMIS No.: _____

3. Details of School:

Location of School *(Place a cross in the appropriate block)*

Rural
Township
Urban-suburbs
Urban-centre of City

4. Does your school have ALL the necessary resources to implement CASS effectively? ***(Place a cross in the appropriate block)***

No	**Yes**

5. If your answer is "no" to the above question, then indicate what resources are needed by your school in order to be able to implement CASS effectively.

_____

_____

_____

_____

_____

_____

6. What subject/s are you currently teaching at Grade 12 level?

Math's	Physical Science	Biology

7. What is your highest qualifications obtained in the subject mentioned above? *(Place a cross in the appropriate block)*

No Post-Matric Qualification
2 year Teaching Certificate
3-4 year Diploma
3-4 year Bachelors Degree
Hons Degree
Master's Degree
Doctorate

8. How many years of teaching experience do you have at Grade 12 level in the subject mentioned in question 6. *(Place a cross in the appropriate block)*

1 year or less	2 - 3 years	4 - 5 years	6 – 8 years	More than 8 years

9. Which CASS policy are you implementing in your subject?
(Place a cross in the appropriate block)

Not Sure	National CASS Policy	Provincial CASS Policy

10. Do you have a copy of the policy mentioned in question 9?
(Place a cross in the appropriate block)

No	Yes

11. To what extent do you understand the policy mentioned in question 9? ***(Place a cross in the appropriate block)***

None of it	To some extent	To a large extent	Totally Familiar

12. What do you understand by the term "Continuous Assessment" (CASS)?

_____

_____

_____

_____

_____

13. Have you received training to implement CASS in your subject? ***(Place a cross in the appropriate block)***

No training	Very Little training	Quite a lot of training	More than sufficient training

14. If you have received training, how long did the training last? ***(Place a cross in the appropriate block)***

No training	Less than a day	1 day	2 - 3 days	3 days - 1 week	More than 1 week

15. How often is training conducted? ***(Place a cross in the appropriate block)***

Not applicable	Once a month	Three - Four times a year	Twice a year	Once a year

16. To what extent was the training of assistance to you in the implementation of CASS for your subject? ***(Place a cross in the appropriate block)***

No assistance	Very little assistance	Some assistance	Great assistance

17. Do you receive any support from your subject advisor regarding the implementation of CASS? *(Place a cross in the appropriate block)*

No Support	Very Little Support	Sporadic Support	Sufficient Support

18. If you are receiving support, what kind of support are you receiving? *(Place a cross in the appropriate block)*

Classroom visits	
Workshops	
Training	
Cluster meeting support	
Subject meetings	
Prepared workbooks	
Assessment exemplars	
Contact by telephone	
Other	

Name any other form of support that you may be receiving.

_____

_____

_____

_____

_____

19. What problems/challenges do you face if any, with the implementation of CASS.

_____

_____

_____

_____

_____

_____

_____

20. Do you think that CASS is being implemented in a fair manner at your school? ***(Place a cross in the appropriate block)***

No	Yes

21. Explain your answer to the above question.

_____

_____

_____

_____

_____

_____

22. Do you think that the marks obtained by your learners for CASS are fair and valid?

No	Yes

23. Explain your answer to the above question.

_____

_____

_____

_____

Thank you for your time and co-operation.

Appendix E

Interview Schedule for Assessment Experts at National, Provincial and District level and Umalusi

School-Based Assessment: the interface between Continuous Assessment (CASS) and the external summative examination at Grade 12 level with special focus on Mathematics and Science.

INTERVIEW SCHEDULE

Interview schedule for district, provincial and national officials involved in the monitoring and management of assessment at Grade 12 level.

Time of interview: _____

Date: _____

Place: _____

Name of Interviewee: _____

Continuous Assessment (CASS) at Grade 12 level became policy in 2001.This aspect of assessment is still in its developmental stages. Your observations and comments on the current assessment practices of educators at Grade 12 level will assist in identifying the needs of educators and how they can be assisted to improve the implementation of CASS.

Your contribution from an Inter-Provincial Examinations Committee (IPEC) perspective will add value to this research.

Your time and co-operation is much appreciated.

PLEASE ANSWER THE FOLLOWING QUESTIONS

1. To what extent do you think that educators at Grade 12 level are able to implement CASS effectively?

_____

_____

_____

_____

2. What do you think are some of the major problems/challenges facing educators in the implementation of CASS?

_____

_____

_____

_____

3. What measures can be taken at district and provincial level to support educators in the implementation of CASS?

_____

_____

_____

4. An educator in Biology is required to assess a learner in 16 different aspects for CASS. Apart from evaluating the learner in different contexts, the educator has to compile his own portfolio and keep records of the learner's marks. In addition, the educator is required to complete the syllabus and carry on with the normal classroom activities, such as tests, practical work, examinations, etc.

   4.1 How do you think educators are coping with the current workload?

_____

_____

4.2 How do you think educators perceive CASS?

_____

_____

4.3 Why do you think such perception exists?

_____

_____

5. Do you think educators have been given sufficient training to implement CASS effectively?

_____

6. By whom is the training provided?

_____

_____

7. What type of training is provided to them?

_____

_____

8. How often is the training conducted? _____

9. During the Standardisation meeting at the end of 2001 and 2002, it was discovered that a number of schools have submitted CASS marks as much as 20% or more higher than the examination marks achieved by learners. This situation was viewed as unacceptable by Umalusi and letters were sent by the provincial education departments to the schools concerned, requesting an explanation as to why the CASS marks were substantially higher than the exam marks.

9.1 What do you think of the action taken by Umalusi and the provincial education departments?

_____

_____

_____

_____

9.2 Do you think that the CASS marks of a learner should be higher, lower or the same as the marks achieved by the learner in the examination.

_____

9.3 How much higher or lower than the exam mark, should the CASS mark be?

_____

10. To what extent do you think that the CASS marks submitted by educators for the final examination are fair, valid and reliable?

_____

_____

_____

_____

_____

Thank you for your time and co-operation