

**A Case Study of the Implementation of Continuous  
Assessment in Grades 11 and 12 Physical Science Classrooms  
in three Secondary Schools**

**by**

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## ABSTRACT

The Department of Education has introduced a policy of Continuous Assessment (CASS) in grades 11 and 12. This, however, does not mean that the current policies such as senior certificate examinations will immediately change. It appears that the old and the new practices will co-exist. This implementation of CASS took place in some environments characterised by enormous infra-structural backlogs, resource limitations, inadequate supply of quality learning support materials and absence of common national standards for learning and assessments. Consequently, the purpose of this interpretive research is to investigate how CASS has been implemented in grades 11 and 12 Physical Science classrooms in three disadvantaged secondary schools. This research study is a qualitative case study of three secondary schools in a school circuit. The three secondary schools were chosen on the basis of their varying socio-economic backgrounds and history related to quality of work and innovation. The research study examines the contexts and processes that took place during the implementation of CASS in these schools.

The principal theories underpinning this study are those supporting educational change and curriculum innovation. The argument is that different understandings of the nature of the curriculum have important implications for the implementation of curriculum change. The literature was reviewed to expand the argument that curriculum change has different meanings and is dependent on the context. In this research study, curriculum changes in South Africa, the meaning of curriculum changes, CASS and CASS policy are discussed. The research methods used to gather data are semi-structured interviews, document analysis and questionnaires. The participants in this study were grade 11 and 12 Physical Science teachers, the Science Head of Departments (HOD) and grade 11

and 12 Physical Science learners from each school. The three schools were visited in the second half of 2002. This research study considered the roles and importance of learners, teachers, school management team, community and external inputs for the successful implementation of CASS.

The feedback from teachers, HOD's, and learners were analysed and discussed. The schools were found to have profiles and strategies that were unique, but also some principles, practices and characteristics were common. The overall findings show that CASS has been implemented in these classrooms, but the strategies that are mostly used are those which were used in a content –based curriculum. For example, tests, classwork and homework were common in these schools. This study therefore suggests that more thorough and different support and developmental programmes be put in place so as to equip teachers with the skills necessary to implement CASS. This study also suggests that further research in schools be conducted, so that the best procedures are used to ensure the effective implementation of curriculum innovation in South Africa.

## PREFACE

The work described in this thesis was carried out in the School of Education, Durban, University of Natal, from July 2002 to December 2003 under the supervision of Prof Paul Hobden (Supervisor).

This study represents original work by the author and has not otherwise been submitted in any form for any degree or diploma to any tertiary institution. Where use has been made of the work of others, it is duly acknowledged in the text.

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## **DEDICATION**

This thesis is dedicated to the teachers and students who helped me carry out the study.

## CHAPTER 1 INTRODUCTION

### 1.1 The education context

The formal decision to replace the content-based curriculum by an outcomes-based curriculum in the General Education and Training (GET) and Further Education Training (FET) bands was taken by the Council of Education Ministers (CEM) on 26 February 1997. This decision envisaged the phasing in of Curriculum 2005 into both GET and FET bands by 2005. In the interim period before the new curriculum was implemented, the National Department of Education (NDE) in South Africa began implementing some changes to the existing assessment framework in grade 11 and 12, including Physical Science classrooms. In particular, during 2000, changes were made to bring assessment practices in line with Curriculum 2005's principle of Continuous Assessment (CASS). However, no changes were made to the existing syllabus, i.e. the content and final examination remained the same.

The implementations of Curriculum 2005 and CASS took place in environments characterized by enormous infrastructural backlogs, resource limitations and inadequate understanding of common national standards for learning and assessment (National Department of Education, 2001). Continuous Assessment policy suggests that the assessment should be integrated in teaching and learning. This change calls for a shift from the present type of lesson planning to a new type where learning, teaching and assessment are done simultaneously in a single lesson. This is not what is currently happening in many classrooms. Continuous Assessment requires a range of new strategies because it is outcomes-based and has to be transparent (National Department of Education, 1997); therefore detailed planning seems to be an obvious pre-requisite. Kyriacou (1995) identifies planning as one of the classroom teaching tasks. Planning involves the teacher's decisions about the outcomes of a lesson, its content, and the learning activities that will effectively achieve the stated outcomes. The researcher's experience as a grade 12 science teacher and HOD (sciences) suggest that many educators struggle to understand this outcomes-based formative assessment and the implications for planning as required by CASS.

Since Continuous Assessment was implemented in grade 11 and 12 two years ago, the researcher has noticed that educators and learners are uncomfortable with it. Most of them say that they are not clear about assessment procedures and they do not have the necessary skills of using the different assessment methods. There is a general outcry amongst my colleagues from neighbouring schools that CASS has increased their administrative work, that is, recording and continuously assessing the learners. The teachers require further training and there is a need for teacher development. In grade 11 and 12, the type of learning is still content-based and the sudden change to CASS appears to have caused confusion among teachers and learners. This was not unexpected. For example, Black (1998) warned about following this path "It is hardly possible to implant formative assessment into an existing teaching programme without changing the programme" (p.817). Given the above problems with the implementation of this new CASS policy the researcher felt that an investigation to explore the nature of the mismatch, if any, between current classroom practices and what the Department of Education's CASS policy hoped to achieve, was essential.

## **1.2 The research method**

The key question that this research initiative addressed was: How successfully has the new departmental policy of CASS been implemented? The following sub-questions guided my inquiry:

1. How did the schools and teachers prepare for the implementation of continuous assessment?
2. What impact has the implementation of CASS had on the science teachers' assessment practices and lesson planning?
3. What are science teachers' understanding of and reasons for their current assessment practices?

This study was conducted using the case study method; the three secondary schools chosen were the cases to be examined. The three secondary schools chosen were given fictitious names to protect them from easy identification. These were School A, School

B and School C. They were visited during 2002. The schools were chosen based on the socio-economic factors of the schools, their surroundings and their geographical area. The sample of schools was also chosen because of convenience. They are close to where the researcher is working. The type of research was a qualitative one with an interpretive approach. The case study approach was employed because of the need to understand the complex social phenomena surrounding the implementation of CASS. All the schools chosen belong to the same cluster in a school Circuit which is part of the Empangeni educational region in KwaZulu-Natal. This cluster has six schools in all. These three schools were chosen because the researcher was interested in focusing on disadvantaged schools, because she is also from a disadvantaged school. Moreover, the researcher was interested in how disadvantaged schools with, a minimum of resources, implemented CASS.

### **1.3 An overview of the dissertation**

This dissertation consists of six chapters. The first chapter is the introduction. It sets out an overview of the study and of the context which motivated the researcher to undertake this research. The second chapter sets out a theoretical analysis of curriculum practices with a focus on assessment in science education. This is achieved through the comparative examination of 'current' curriculum practice and the 'Curriculum 2005' type; and the implications of the differences found for the implementation of curriculum innovation. Types of assessments and their techniques are examined, and an in-depth discussion of CASS, which is part of policy of Curriculum 2005, is presented in this section. The documentation describing CASS is then examined to establish the meaning that this change has for the implementers of the new curriculum. The description establishes the context in which the implementation took place and describes the meanings that the participants had formed regarding the proposed changes.

The third chapter describes and accounts for the research methods employed in this study. The case study approach used at the three schools enabled the researcher to gain insights into some of the complex social phenomena surrounding the implementation of CASS. The different methods used to gather data are described and accounted for. The limitations of this qualitative method are described and addressed; and the necessary

precautions are taken, to minimize these limitations. The fourth chapter sets out the results and in particular provides a description of the current assessment practices in each case. The fifth chapter sets out the connection of this study's finding to previous research or theory as well as to current policies and an interpretation of the combined data collected during the course of the research to establish the common problems encountered during the implementation process. The discussion is based on the nature and impacts of change regarding CASS. The last chapter presents the researcher's conclusions of the data interpretation and relates these findings to the theoretical analysis presented in Chapter 2. Implications and limitations of this research are also discussed.

The following chapter discusses the theoretical analysis of curriculum practices focussing mainly on implementation of Continuous Assessment in Science Education.

## CHAPTER 2 THEORETICAL FRAMEWORK

### 2.1 Introduction

This chapter is divided into three parts. The first part examines the curriculum and assessment changes in South Africa, which is the local context of curriculum innovation and implementation. The second part examines the meaning of curriculum change for teachers. The third part discusses Continuous Assessment and its implementation in grades 11 and 12 Physical Science classrooms.

This chapter sets out a theoretical analysis of curriculum changes and assessment practices in South Africa. I argue that different theories of the nature of the curriculum have important implications for the implementation of curriculum change. This argument emerges from the view that the curriculum is not contained and determined by policy documents, but is a “multifaceted concept, constructed, negotiated and renegotiated at a variety of arenas” (Goodson, 1994, p.111). Therefore, the implementation of an innovation such as Continuous Assessment needs to be discussed at all levels by all stakeholders. This argument that curriculum is contextually shaped is further supported by Grundy (1987), who considers curriculum practice as a social process that develops through the dynamic interaction of action and reflection. That is, the curriculum is not simply a set of plans to be implemented, but rather is constituted through an active process in which planning, acting and evaluating are all reciprocally related and integrated into the process (Grundy, 1987, p.115). The implication is that the implementation of the CASS initiative should be discussed by those who will have to implement it before the actual implementation takes place.

### 2.2 Curriculum changes in South Africa

Resistance to the previous education system was so visible in schools that there was urgent need for a new vision. The summary of the background of educational transition in South Africa over the last eight years provides the context for implementation of the Curriculum 2005 initiative, in which Continuous Assessment is the type of assessment

to be used. There is thus a need to examine some of the South African reformers' perceptions of the existing educational programme. An examination of various South African Education and Training discussions and policy documents reveals some of these perceptions. A summary in the form of table 2.1 examining the proposals put forward in two main documents that were guiding the implementation of Curriculum 2005 has been attempted. These documents are:

- The discussion document developed by the consultative forum on curriculum (CFC) issued by the National Department of Education in December 1995.
- Discussion document – lifelong learning through a National Qualifications Framework, a report of the Ministerial Committee for the development of the NQF produced in February 1996.

Table 2.1 Comparison table of different educational philosophies

	Old Educational Philosophy & Practice	New Philosophy & Practice of Curriculum 2005
A. Curriculum	<ul style="list-style-type: none"> <li>• Core-syllabi developed at national level, with provincially adapted syllabi</li> <li>• Content-based (factual)</li> <li>• Long prescribed content to be mastered by all. Rigid approach</li> <li>• Fragmented, discrete, discipline-based content</li> <li>• Content to be mastered in fixed time periods</li> </ul>	<ul style="list-style-type: none"> <li>• Curriculum framework National guidelines and learning areas. Learning programmes to be developed</li> <li>• Outcomes-based (skills, processes, attitudes and values)</li> <li>• Modular, flexible, relevant approach</li> <li>• Integrated content and skills</li> <li>• Time periods to be negotiated i.e. not fixed</li> </ul>
B. Assessment	<ul style="list-style-type: none"> <li>• Testing memorized content. Norm-referenced only</li> <li>• Mostly summative</li> <li>• Accent on certification at key stages only</li> <li>• Restricted access points to higher education</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrating outcomes criterion-referenced with norms applied during moderation</li> <li>• Mostly formative and continuous</li> <li>• Accent on building up credits in flexible ways</li> <li>• Allows many access points to higher education</li> </ul>

*Shift from Content-based Curriculum to Outcomes-based Education.*

Table 2.1 above is a comparison table showing the perceived paradigm shift in educational philosophy and practices involved in changing from the existing educational practice to one based on outcomes.

The aim of this table is to show where the changes in Education come from and where it is hoped they will go to. Only issues that directly impact on curriculum and assessment will be dealt with.

Considering the present curriculum, there has been a shift from fragmented, discrete, discipline-based content to integrated system of content and skills. That is the division of subjects such as Biology, Mathematics, and Geography etc. has been blurred and grouped into different learning areas such as Natural Sciences, Human Social Sciences etc., and integrated into context, skills, attitudes and values. At the moment this applies to grades 0-9 (GET) only. The large amount of content that had to be mastered in fixed time periods, prescribed and rigid, is gradually converted to a modular, flexible, relevant approach. Time-periods are not fixed, they are to be negotiated. Teachers are now empowered to develop learning programmes using the National Curriculum framework guidelines and learning areas, unlike before, where core-syllabi were developed at National level and syllabi adopted provincially. For example, the Mathematics core syllabus was developed and given to provinces to use as it was. No changes were to be made in the syllabi.

The assessment was mostly summative, norm-referenced and testing of memorized content. There has been a shift in policy to the type of assessment which is mostly formative and continuous (National Department of Education, 1997). The assessment is now based on outcomes and is criterion-referenced with norms applied during moderation. There has been a shift from restricted access points to higher education to a more flexible way which allows many access points. The assessment techniques in the previous system were perceived to be entirely examination-driven. The description of the new curriculum system made no mention of the fact that the exit examinations would remain a characteristic of the assessment practice. It only emphasizes that assessment should be mostly formative and continuous, with the inclusion of summative assessment where necessary. This, however, does not mean that the current policies

such as the use of the senior certificate examination will immediately change. Only the methods and procedures that the educators use to assess, record and report on performance of learners, will change. The implementation of C 2005 with Continuous Assessment (CASS), took place in environments characterized by enormous infra-structural backlogs, resource limitations, inadequate supply of quality learning support materials and absence of common national standards for learning and assessments. It appears that the 'new' and the 'old' practices will continue to coexist. The expected phasing in of Curriculum 2005 and CASS into the FET band by 2005 as was originally suggested has been delayed. Therefore, the current policy is that FET educators use the intervening time available to familiarize themselves with the kinds of assessment methods and strategies that are used in an Outcomes Based Education (OBE) environment before the new FET curriculum is implemented.

So with these changes in curriculum, there have been a number of changes in emphasis. This should have a major impact on the school-based assessment practices of teachers. If there is a gulf of perceived differences, it will impede the establishment of clear meanings and direction necessary for successful change.

#### *Some problems with initial implementation*

As is usual with the implementation of any change, one can expect assumptions to be made and for problems to arise. Continuous assessment adopts a holistic approach to assessment. It combines outcomes-based, formative, criterion-referenced assessment with summative, norm-referenced assessment and advocates that no single assessment technique can be used as the sole tool to assess learners.

However, Jansen (1997) has voiced a powerful critique of the notion of OBE that will affect continuous assessment and its application in the South African educational context. His arguments do not deal merely with technical issues such as the speed of the process, but with concerns regarding the impact of outcomes-based education, which will automatically affect assessment. This research initiative seeks to test some of these concerns against the reality of implementation in three case studies. Only his criticisms, which directly impact on assessment will be mentioned:

- Assumptions have been made by the developers of Curriculum 2005 about how schools and classrooms operate. He argues that the policy reforms have been made in isolation from the real context of the education system of South Africa. He makes the claim that if transformation to Curriculum 2005 and OBE is to succeed it will require highly qualified teachers to make sense of the challenge to existing practice. His concern is that there are insufficient human and physical resources present and in that context a mechanical model of behaviourism will evolve in the majority of South African classrooms.
- Curriculum 2005 will place additional administrative burdens on already overburdened teachers. The system of CASS will increase the teachers' load. He claims that Curriculum 2005 will fail in the absence of adequate teacher support. The current policy of teacher rationalization and the subsequent increase in class size will militate against successful implementation.
- For such an implementation to succeed much teacher training will be required. He contends that for successful implementation; teachers, management, parent bodies and in short the entire educational human resource base will need to be trained.
- There is a need for new assessment procedures. He observes that a change in assessment practices is the key to successful educational innovations. He notes with caution that the Matriculation Examination has not been withdrawn from the system and feels that the powerful effects of this exit examination will continue to determine educational practice.

An analysis of the literature suggests that the implementation of Curriculum 2005 with CASS in South Africa is based on certain underlying assumptions about OBE:

- The assumption that the skills developed in one context will be transferable to another different context.
- The further assumption that these transferred skills will then be able to be reliably and validly assessed in the new context.
- The assumption that all students will want to and will be able to gain these competencies.
- The assumption that all teachers will be able to foster the acquisition of these competencies and then be able to assess them in a valid and uniform way. This Curriculum 2005 educational reform espouses a view of knowledge as always open

to question and different interpretations. This has significant implications for the teacher. It also implies that the very act of teaching create new condition for knowledge to be constructed. Thus teachers are called to become facilitators of experimental learning situations in which the teachers' role is one of interpretation with no 'right' or 'wrong' judgements.

- The assumption that all schools are able to introduce the perceived paradigm shift as indicated by table 2.1 above. This assumption is practically not the case. Jansen (1997) acknowledges that the old educational curriculum requires a radical reconstruction. He cautions, however, that "such innovations must take account of the resources status of schools and classrooms in South Africa" (p.9).

This critique of South African Curriculum 2005 has examined the perceptions held and assumptions made by the planners of this curriculum innovation. Many of the same issues raised by Jansen (1997) were identified and confirmed as obstacles to implementation in the "Report of the Review Committee on Curriculum 2005". The report concludes that Curriculum 2005 is both over designed and under specified (Chisholm et al., 2000)

### **2.3 The meaning of curriculum change**

If the change is to happen, it will require teachers to change in a variety of ways. In particular, they must make meaning of the new initiative, they must implement the change, and they must alter their beliefs about and be involved in the process of negotiation about the new initiative.

#### *The meaning of change to educators*

"New experiences are always initially reacted to in the context of some 'familiar, reliable construction of reality' in which people must be able to attach personal meaning to the experiences regardless of how meaningful they might be to others" (Fullan, 1991, p.31).

No one can resolve the crisis of change on behalf of another. The policy-makers have had more time to make sense of the proposed change and must allow others the same

chance if change is to take place. According to Fullan (1991) all real change involves “passing through zones of uncertainty..... The situation of being at sea, of being lost, of confronting more information than you can handle” (p.32). Haney and Lumpe (1995) support this view by saying: “Many schools are faced with arduous task of completely restructuring the curriculum, adopting new materials, implementing new assessment strategies, and retraining teachers without much implementation assistance from policy makers” (p.188).

Real change involves a serious personal experience and a willingness to participate in the new initiative. This personal growth pattern is central to successful educational reform as it brings meaning to the change initiative. Therefore, real change represents a serious personal experience that is characterized by willingness to learn and be part of the system or the innovation. Thus teachers need to be given plenty of time to experience real personal change and make meaning of the required change.

Meaning is central to making sense of the educational change. These meanings must be shared by curriculum planners, teachers, parents and all stake holders who are involved in both design and implementation of the proposed change if the change is to be successful. In the past, teachers have used aims, goals and objectives to describe what learning they want to achieve. These curricular aims, goals and objectives have been heavily weighted in favour of subject knowledge (National Department of Education, 1997). On the other hand, in the new curriculum, outcomes describe the eventual results of the learning process without prescribing how these results are achieved. This allows learners to achieve the outcomes in various ways and at various paces. Curriculum 2005 also recognizes the need to develop knowledge, skills attitudes and values as a balanced curriculum. It is obvious that the implementation of the new curriculum will involve new understandings of curriculum and will require teachers to act in responsive ways to the demands of the new curriculum. Therefore, lots of training and retraining is needed on the part of teachers whilst learners need to change their attitudes and be active participants in the classroom. In particular in order to introduce CASS effectively, teachers will need to act as professionals and acquire new roles.

The Norms and Standards of Teacher Education (National Department of Education, 2000) define professional teachers as leaders who can express practical foundational

and reflexive competence in seven roles such as; mediator of learning; designer and interpreter of learning programmes and materials; and scholar, researcher and lifelong learner. The Norms and Standards document has drawn heavily on international research, and the demands of outcomes-based, learner-centred education. These demands are much broader than in traditional curriculum and assessments, including the current matriculation programmes in South Africa. South Africa's Norms and Standards of Teacher Education and the USA National Standards for Teaching explore further the nature of the 'professional' teacher. The wish to have teachers as professionals has its roots in two considerations. One is based on school practice and effective learning. The other one is concerned with the public recognition and the status that teachers enjoy. These two considerations are compatible. Therefore, the teachers need to acquire these roles in order to deal with the change required by this new curriculum.

Fullan (1991) identifies three critical aspects of change. The first aspect is that change has to be conceived of as multidimensional. Different dimensions of change must be catered for. In this case, the policy needs to be defined and discussed, workshops need to be conducted, different activities need to be learnt, changes of attitude must be accommodated and support in the form of human and physical resources must be offered. Ignorance of all the possible dimensions can help to explain why some aspects of change are implemented and others are not. The second aspect is that educational change impacts on the individual teacher's basic conceptions of their self competence, Dalton (1988) states that one of the burdens that teachers take on in the process of change is the "burden of incompetence" (p.8). This burden would have different meanings for the teacher in the classroom and the external implementer. Innovations can involve teachers in skills that they do not currently possess. Therefore, teachers find change difficult. These situations create a crisis as they put the identity and professional skills of the teachers at stake: a crisis that the external implementer does not have to face.

The third aspect involves a dynamic interrelation of three related dimensions of change;

- The use of new materials
- The use of new teaching approaches and
- Alterations of beliefs.

“Innovations are often based on sets of assumptions about the nature of the child and the learning process that differ from those held by most teachers” (Dalton, 1988, p.12).

Haney and Lumpe (1995) support this view and suggest that a staff development model that includes training, continuous support and implementation assistance can alter attitudes and change the behaviours. It is therefore important that a relationship be fostered between the intended new educational program and the subjective realities of the individuals involved, for real change to be effectively implemented. Thus, there must be changes in what people think, if the intended outcome is to be achieved. In addition, Fullan (1991) identifies six themes that are required in concert for substantial change to occur. Examples are: initiative taking and empowerment; staff development and assistance; and monitoring and problem coping. Teachers who are to implement change and curriculum planners must be aware of these themes.

All the above tells us that in order for curriculum changes to be successful, educators need to be given plenty of time to experience real personal change and make sense of the meaning of that curriculum change. In order for curriculum change to be successful, teachers must acquire new roles so that they can be competent. Lots of training and retraining is needed so that educators are ready to implement change. Teachers as agents of change need to be involved in the whole process of implementing change and they must be given time to respond to the new initiative.

### *Implementing change*

Ultimately, educational change depends on what the teacher does in the classroom. It is therefore essential that teachers be educated to reconstruct the curriculum to be most appropriate for their own classroom. According to Fullan (1991), there are four issues which are fundamental to implementation. These are:

- Pressure and support
- Active initiation and participation
- Changes in behaviours and beliefs
- And the overriding problem of ownership (p. 91).

Curriculum workers often forget that curriculum changes do not take place in a vacuum. Thus curriculum change must be viewed as more than an adding, deleting or just

altering of content. The plan for bringing about successful change must view schools as cultural systems and must include continual dialogue among all persons at all levels of decision making: "There needs to be recognition that change involves both the intellect and affective personal values and in addition the norms of the institution" (Dalton, 1988, p.225). Teachers also need to understand the culture of the schools in which the curriculum is implemented. In his study of developing countries, Fuller (1987) showed that students' achievements were correlated positively with the provision of instructional materials and negatively with class sizes. In addition, Kanniepan, Moodley and Pillai (1997) found that, in their sample of former DET South African schools, higher performing schools were better equipped than lower performing schools, with laboratories and text books for students. Curriculum theorists such as Grundy (1987) emphasize that a curriculum is embedded in culture. It is argued that the structures and routines of the school workplace act as a powerful source of help or hindrance to the teacher in the process of change. Accordingly, a curriculum consists of learning activities that occur in a school.

The principal and his/her style of leadership are crucial for real change to happen. In developing countries, Fuller (1987) found that a 'quality principal' is the main factor in good management. In KwaZulu Natal, Kanniepan et al. (1997) similarly cited good management, mainly by the principal, as an important enabling factor. They report that a good management team in a science and mathematics department plays a role in enhancing learner achievements. HOD's in high performing schools had good working relationships with the teachers in their departments. Fullan (1998), add that, in effective school management, support and pressure are both necessary. Moreover, caring, shared vision and internal motivations need to be balanced by clear expectations, targets, rewards and sanctions. Change fails if it fails to impact on the entire culture of the school. Therefore school- based assistance for teachers is essential. Tobin, Dans, Shaw and Jakubowski (1991) agree with this view by saying that providing learning experiences for teachers on site will enable them to construct images and metaphors that are grounded in the contexts in which innovations are to be implemented.

As noted by Goodson (1994), "A set of educational ideas cannot be developed and packaged for use at will" (p.38). Goodson (1994) negates the underlying assumption of the prescriptive mode that bureaucratic accountability and central power can result in a

successful implementation. This is owing to the fact that this mode ignores the meaning of existing practice and structures. Goodson (1994) further confirms this view by saying: "Although pluralistic decentralization decision - making has become a fashionable focus in educational thinking, the true meaning of this theme is unclear and curriculum initiatives remain centrally and politically defined" (p.11). This tension is illustrated in a fact that although, in theory, the school curriculum is recognized as being socially constructed the written curriculum is often presented as a 'given'. This is the same as the assessment policy which was also presented as a 'given' document to schools. The term, change, needs to be differentiated from improvement as there is often an assumption that the values of a curriculum development programmes are intrinsically good and therefore equal an improvement. The teachers are then allocated the critical task of making the new programme succeed, which becomes impossible.

In conclusion, it is argued that innovations cannot be viewed as 'reified entities' with an independent existence (Dalton, 1988, p.235). Therefore the implementation process has to be negotiated through human interaction and it is these shared meanings that sustain the process. If change is to be successful, our teachers should be able to alter their behaviours and beliefs. They must take the initiative and participate fully in implementing the change. There are so many pressures that teachers encounter in their classrooms; amongst others, these are: lack of physical resources like books, laboratories etc.; lack of necessary skills to implement change; lack of external support from curriculum planners and attitudes of learners they are supposed to teach. The school management such as the principal and HOD's must be able to offer assistance and support to teachers when necessary. The teachers must be involved in the implementation process and this process must be negotiated at all levels. Teachers also need to understand the culture of schools in which the curriculum is implemented. As already stated in the previous paragraphs, the teachers must be able to use new materials, use new teaching approaches and alter beliefs. This means that teachers must acquire new roles if change is to be successful.

## 2.4 Continuous Assessment

Assessment is a way of collecting evidence of what is happening in the classroom, in districts, in the nation and in the system as a whole using different techniques.

According to Doran, Helgeson and Lawrenz (1994), "Assessment can be defined as the collection of information, both qualitative and quantitative, obtained through various tests, observations, and many other techniques (e.g. checklists, inventories), that is used to determine individual, groups, or programmes performance" ( p. 388). Assessment is one of the most important educational processes. Firstly, assessment helps learners to change the value of their learning. Secondly, it gives them information about their progress and enables them to take control and thirdly it makes decisions about learning. In the outgoing curriculum learners were not given this opportunity. As noted by Doran et al. (1994) "Often students have not been made aware of how they think or feel about the given topic" (p. 394).

In Curriculum 2005, a new way of assessment is used, it is known as Continuous Assessment (CASS). CASS incorporates both types of assessments i.e. formative and summative assessments. CASS marries outcomes-based, formative, criterion-referenced assessments with summative, norm-referenced assessments and advocates that no single assessment technique can be used as a sole tool to assess learners. In the next section I will then discuss briefly what CASS entails, purposes and techniques that are used.

### *Overview of Continuous Assessment*

Continuous Assessment is an assessment strategy that bases decisions about learning in a range of different assessment activities and events that happen at different times throughout the learning process. CASS involves assessment activities that are spread throughout the year, using various kinds of assessment techniques such as tests, exams, projects, assignments, class work, homework and practical work. The different pieces of evidence that learners produce as part of CASS are collected into a portfolio. Different subjects have different requirements for what should be collected into a portfolio. In high schools. CASS has been introduced as part of Curriculum 2005 in grades 8 and 9. At the same time; CASS is being introduced in grade 11 and 12 (even though the new curriculum has not started to be implemented). by which it is hoped to improve the

grade 12 pass rate. CASS forms 25% of the pass mark and the written examination forms 75%. CASS is infused in the Interim Content-syllabus. This means that the assessment is new but is being used in the old curriculum. This requires more training and a change of attitudes on the part of teachers who are experiencing this sudden change.

Continuous assessment focuses on the ongoing manner in which assessment is integrated into the process of teaching and learning. Educators get to know about learners in an informal way through their day-to-day teaching, through questioning and observing learners interact with each other. However, most teachers and learners share the same long term aim at school, that is, a good matric pass. Everything depends on this result, and it is for this reason that a large amount of effort goes into practising and coaching for this examination. Lubisi, Parker and Wedekind (1998) state that the matriculation examination that has been used in South Africa over many years is modelled along the lines of standardized tests. Currently, assessment practices are geared towards this final exam, and the ongoing assessment, for the most part, takes a back seat. Thus distorting the way in which the learners are taught and also narrowing the methods of teaching and assessing.

#### *Purposes of Continuous Assessment*

CASS is based on the view that the main purposes of assessment are to provide regular feedback and provide sufficient information for certification. "Assessment can also be used for a variety of reasons such as individual growth, development and promotion" (National Department of Education, 1997, p.6). These can be achieved by both formative and summative assessments. Summative assessment as it has been used in the past entails the writing of a single exam at the end of the year that will determine whether or not the learner passes or fails. Formative assessment rests on principles of continuous assessment, which ensure that the promotion of a learner does not rest on a single exam or test, but rather on an ongoing assessment. Formal assessment such as tests and exams are part of continuous assessment and they are good at assessing learner's abilities to recall information and perhaps to understand and analyse this information (National Department. 2001; Doran et al., 1994). There has been a tendency in the past to use norm-referenced assessment, which compares learners' performances

with that of other learners. Continuous assessment, however, emphasises criterion-referenced assessment, which assesses learners' performances against an agreed set of criteria. This seems to be an important principle because learners are being assessed according to the set criteria and not against each other. The important principle with continuous assessment is that the criteria should always be clearly set out and agreed upon by teachers and learners beforehand. This helps make the assessment process transparent and facilitates formative assessment.

### *Continuous Assessment Techniques*

Summative assessment takes place at a given point in time e.g. at the end of the term, as it is aimed at evaluating students' achievements. Summative assessments also provide information about learners' level of competence at a particular point in time. Marks obtained on written tests and examinations are used for selection purpose e. g. streaming. It can also be used to decide whether a learner can be accepted at a particular institution. That is why the education system in South Africa relies so heavily on matric examinations. Summative assessments are bad in a sense that learners' initial performances throughout the year are not considered, which is unfair to the learner. This is one reason for the policy of integrated continuous assessment into the existing content based FET syllabus. The CASS policy document (2001) recommends both summative and formative assessment techniques so that the summative assessment will only form a portion of the whole assessment.

The formative assessment is used to support learners developmentally. It guides the learners in the learning process and helps the teacher with future teaching. It serves the interests of the learners in that it continually provides feedback to the learners, which will then influence their future learning. This idea is supported by Black (1998) who says: "The distinctive feature of formative assessment is that the information is used to notify the learning programme in order to make it more effective" (p.118). Continuous assessment is done on an ongoing basis and is aimed at the enhancement of teaching and learning process. Some of the results can only be recorded in words describing the extent to which a learner has progressed towards the achievement of a learning outcome. It includes self-assessment, peer-assessment, achievement-based assessment and assessment of prior learning. This technique is good in that it allows learners to

continuously assess their own progress. According to Black (1998), “The capacity of students to judge their own work is more than a bonus in good formative assessment” (p.818). It is, however, more demanding on educators, they have to spend time on orientating learners on the assessment criteria so that learners know exactly what to do, so that situations such as “Pass one pass all” can be avoided at all costs. CASS adopts a holistic approach to assessment.

It can be seen that CASS is significantly different from the traditional assessment policy. It requires that different techniques will need to be used by teachers and new procedures need to be implemented. These new techniques will be used simultaneously with the old assessment techniques. All these perceived changes suggest that educators need to be retrained so that they can cope with change.

#### 2.4.1 The expected roles of educators and learners in Continuous Assessment

The educational change being introduced aims at empowerment of both teachers and learners. However, an analysis of the relationship between policy and practice reveals tension and challenges to this empowerment. The policy for the Norms and Standards for Education (National Department of Education, 2000) describes seven new roles which teachers must adopt to become professionals in the education system. They are:

- learning mediator, interpreter and designer of learning programmes and materials
- leader
- administrator and manager
- scholar
- researcher and life-long learner
- community, citizenship and pastoral role
- assessor and learning area specialist.

Each of these roles is significantly different to the roles adopted by teachers in the previous curriculum. For example, the role of the teacher as conveyor of knowledge implies a different set of beliefs about how learning takes place to that of the teacher as a learning mediator. The norms and standards have drawn heavily on international research, and the demands of outcomes based, learner- centred education. These

demands are much broader than in traditional curriculum and assessment, including the current matriculation programmes in South Africa. In the previous curriculum, teachers were expected to 'pass on' or 'deliver' the curriculum. The new roles require teachers to 'design original learning programmes, identify the requirements for a specific context of learning and select and prepare suitable textual and visual resources for learning' (National Department of Education, 2000, p. 13).

The role of learners is that of active participation and not of being the passive recipients of knowledge. They must be able to assess themselves and also other learners. "To encourage self and peer appraisal amongst students, a cooperative style is needed in the classroom, and the teacher has to be a model for this style", (Black, 1998, p.818). He further confirms this idea by saying, "Teachers have to do more than merely correcting errors; they have to try and understand, and deal with their causes, a task which would tax the best of learning experts. For the student, the main resource for achieving self-adjustment is the model provided by the teacher" (p.818).

Research in science education over the last two decades in Australia, Europe and North America has shifted attention to constructivist learning theories and teaching strategies. Consistent with this research, CASS have been introduced in South Africa. There have been corresponding shifts in assessments, including such techniques as:

- learning through work/projects
- assessment of complex performances
- self/peer assessment
- and the use of scales and rubrics rather than marks and marks memorandum  
(Black, 1998; Doran et al., 1994; National Department of Education, 1998).

Research has made a strong case for such learning and assessment strategies, especially when the desired outcomes are not simply 'knowledge' but competence, and the competencies include creative problem-solving, team work and communication in a variety of modes.

Learners' expectations are set not only by teachers' views, but also by themselves, their peers, their family and the culture of the school. Much research has been done around the world on the match and mismatch that arises between the cultures of the students

and the ways in which curriculum and assessment advantage some cultures. In South Africa, students' beliefs and backgrounds are readily ignored in the old curriculum, but are central to a constructivist view underlying OBE. As Hewson, Beeth and Thorley (1998) observe, the important single input to effective learning is what students already know including their life experiences, values and learning strategies. Therefore the roles of students in the learning process, their attitudes and beliefs must be considered in the classroom. In order to be successful with implementation of CASS, teachers and learners have to change their roles, which is difficult. In the old curriculum students' beliefs and attitudes were ignored, now it is hoped that they will be considered.

#### 2.4.2 The CASS policy for grade 11 and 12 Physical Science

##### *Overview*

The National Department of Education has recently introduced Continuous Assessment (CASS) in grades 11 and 12. CASS forms 25% and the National Senior Certificate Examination forms 75% of the senior certificate pass requirement. A policy of CASS has been infused into the current curriculum that is operating in grades 11 and 12, which is *A Resume of Instructional Programmes in Public schools, Report 550, (97/06)*. This means two different types of curriculum policies are in operation in grades 11 and 12 classes simultaneously, the "OBE" type and the traditional "content" type. CASS has encountered lots of criticisms from teachers, learners and other educationalists. This mix is criticised by Black (1998) who says, "It is hardly possible to implant formative assessment into an existing teaching program without changing the program" (p. 817). This practice is further criticised by Doran et al. (1994) who says; "Altering assessment practices is likely to affect the meaning of their work" (p.392). The implementation of CASS has not been fully accepted by teachers and learners because according to my experience both teachers and learners are not familiar with the practices of CASS.

##### *Rationale*

The CASS policy put forward the rationale for introduction of CASS in grade 12 on the grounds that it will benefit the learners, because up until now the performance of a learner has only been based on the outcome of a written examination. National

Department of Education cites six reasons for introducing CASS in these grades (2001, p.3). Some of them are:

- Assessment is ongoing and learners are therefore compelled to work consistently, thus contributing to the culture of teaching and learning.
- Learners will be assessed using different and appropriate assessment methodologies/techniques and this will provide a more valid assessment of the learners' performances.
- Assessment of learners' performance will now also be carried out by the educator who works closely with the learner, and will contribute to the final mark.

### *The CASS Framework*

According to the CASS policy (National Department of Education, 2001), the assessment consists of two parts, that is, summative (examination and formal tests) and formative (Informal Assessment: practical work and other activities). The CASS framework consisting of components (context, number and weighting) on which this assessment can be conducted is provided (See Appendix A). I consider the CASS framework to be flexible enough for any school situation because it caters for the non availability of resources, especially on the "practical experiment work" to be conducted, by providing the alternatives of Model A or Model B. Schools can be guided to use either Model A or Model B. Model A represents the minimum requirement that can be fulfilled in order to produce the CASS mark. It is also noted from the CASS framework that projects and assignments are not included in the compulsory section of CASS. This addresses the problem of poverty where learners and parents do not have money to buy equipment to make projects. There are many reasons for the introduction of both models. Some are mentioned in the policy document are (National Department of Education, 2001, p.6):

- The restricted time available in grade 12 for CASS
- The Physical Science syllabus is very long and complex and teachers generally experience difficulty in completing it adequately
- The nature of the subject is such that many of the skills which can be developed in these other types of activities can be successfully undertaken in the course of any good teaching and learning practice in physical science.

### *Practical work*

The CASS policy also addresses the problem faced by many science teachers, that of practical work. The suggestion is that: ‘all practical experimental work can be divided into three categories, these are:

- Theoretical practical work-ideal results are provided to learners and they are involved in the total process except the collection of the data e.g. Boyle’s law, constant velocity or acceleration.
- Practical work with improvised apparatus.
- Practical work with specialized equipment or chemicals, such as titration.

(National Department of Education, 2001, p.13).

It will then be up to the individual schools or teachers whether they like to implement these changes or not. The type of practical work that is conducted in each school will favour the type of resources that are found in that particular school. Although, all the components are clearly indicated in the CASS document, this does not solve the problem of the increased amount of work. As noted by Doran et al. (1994), “most of the alternative approaches to assessment have been found to be more time consuming than traditional testing”( p.416).

The grade 12 Physical Science CASS document (National Department of Education, 2001, p.12) lists seven skill areas for Continuous Assessments, some of them are:

- Groupwork – include skills like listening, communicating, cooperating, accountability and tolerance.
- Observation / Measuring – involves one’s sense and description of changes. Accuracy is implied.
- Investigating – involves designing experiments
- Recording – record information in a suitable, organized way.

All these skills cannot be assessed in a single practical experiment, they can be assessed at different times using different activities with a certain aim in mind at that particular time. As Doran et al. (1994 ) put it, “The areas of science to be assessed are generally considered to include knowledge of facts and concepts, science process skills, science thinking and problem solving skills, skills needed to manipulate laboratory equipment, and the disposition to apply science knowledge and skills”(p.395). It is therefore advisable to use practical experiments to assess different skills at different times.

All the above mentioned ideas can be successful if teachers and learners are to assume new roles as far as assessment is concerned. Since assessment is now an integral part of the teaching and learning process, learners can assume active roles in assessment like self and peer-assessment and have the power to judge their own learning. There is a need for professional development and change of attitude for teachers as well. As Gitomer and Duschl (1994) remarked, "There are regular calls for improved 'accountability', 'authentic assessments' and blurring the distinction between assessment and instruction and standard based assessment" (p. 179). Therefore assessment and instruction must be done simultaneously in Curriculum 2005 environments. There is a need for professional development and change of attitude for teachers and change of roles for both teachers and learners.

#### *Problems encountered in the CASS policy*

The CASS document has covered some of the problem areas teachers used to encounter in schools, one of them being learners absenting themselves from schools. It suggests that learners must be given an opportunity to make up a missed portfolio exercise and, an authentic reason in writing should be produced if a learner missed a portfolio exercise. This practice further increases teacher burdens. The CASS document fails to suggest what can be done to lessen the teacher's increased task and to state what extra time can be used. To ensure the validity of the CASS marks, the CASS document suggests the process of moderation. The first phase of moderation must be done internally by principals of the schools and Head of Department and it must be a continuous process. The second phase of moderation is an external moderation conducted by external moderators. These are conducted by formation of clusters of schools where a subject expert discusses the CASS mark with a group of teachers from different schools, thus providing constructive feedback at all levels. The learners' portfolios and teachers' portfolios or master files are carefully examined at these meetings, and the problems that arise are discussed. The CASS document suggests that 10% or a minimum of five portfolios in each grade i.e. HG or SG must be moderated at school level, and that different CASS components must be moderated in different learner's portfolios to ensure that there is moderation done in every aspect of learners' portfolios.

Although the guideline document for CASS in Physical Science HG and SG tries to give answers to some of the problem areas encountered by educators, there are still issues which are outstanding. Firstly, the CASS document is silent about how the teacher can successfully conduct the different types of assessment activities in large classes. Suggestions are given in the literature. For example, a planning matrix called a test grid or table of specifications was suggested by Doran et al. (1994), in order to minimise the testing burden (see appendix B). In this way, a wide selection of cognitive and skill outcomes for the administration of these tests could be obtained. This grid could also be used to compensate for large numbers of learners in the classrooms. Secondly, the CASS document is silent about some teachers and schools that do not get involved in the moderation process such as coming for cluster moderation. In these cases the subject advisor might instruct teachers who did not attend cluster meetings to submit their CASS mark at regional office for checking and approval. However, this does not allow peer reflection on the process of continuous assessment to occur. Thirdly, teachers are not used to recording the CASS mark and how to interpret them. This calls for retraining and a change of attitudes of both learners and educators, and there is a need for professional development. The document is silent on when and how this professional development will occur. Lastly, another factor that impacts negatively on CASS is the complexity of the syllabi for physical science. This complexity restricts the time available for CASS in grades 11 and 12. Although the CASS documents suggest that other activities be done in lower grades, this does not solve the problem of a long and complex Physical Science syllabus leaving little time for new types of assessment activities.

## **2.5 Conclusion**

There has been a change from a content-based curriculum to an outcomes-based curriculum. This change has resulted in the change of assessment procedures from summative towards continuous assessment. This change does not occur in a vacuum. There are educators who are involved in the process, and they are supposed to implement this change. This implies that teachers must change their roles, their attitudes, their beliefs and their ways of doing things i.e. their practices in classrooms.

If all goes well with the new curriculum, this is what the research is indicating should be happening in schools for successful change to occur. The teachers should be involved in the process of negotiation and change, and they must make meaning of the new initiative. Teachers need to be given plenty of time to experience real personal change. Lots of training and retraining is needed i.e. a professional development programme must be put in place. Educators need continuous support and implementation assistance which can alter beliefs, attitudes and change behaviours. This support must come from their superiors such as school management, subject advisors, policy-makers and mutual support from cluster meetings, is essential. This implies that support can be in the form of physical resources such as laboratory equipment, books, etc. and intellectual resources such as guidance from the subject expert, from the principal, and from the HODs. Teachers must be given time to familiarize themselves with the assessment strategies and methods that are used in Curriculum 2005 environments.

Researchers have argued that in order for real change to occur teachers need to overcome some pressures and problems. Haney and Lumpe (1995) cite barriers such as lack of effective professional development, lack of resources and lack of administrative support, which may impede teachers' ability to implement reform strands. Innovations such as CASS can involve teachers in skills that they do not possess. Dalton (1988) states that one of the burdens that teachers take on; in the process of change is the 'burden of incompetence'. These situations create a crisis as they put the identity and professional skills of the teachers at stake. Effective professional development, supply of resources, administrative support and continual dialogue concerning the implementation of CASS must be put in place to properly sustain the successful implementation of CASS.

Again, research suggests that the policy documents must not be presented as a 'given' document to schools. It must involve negotiations at all levels by all stakeholders. Goodson (1994) warns by saying: "A set of educational ideas cannot be developed and packaged for use at will" (p.38). Teachers need to be part of the decision-making process because they are the implementers of change. If they are not involved in the initial process, they always react negatively or resist the implementation process.

What appears to have happened in many schools according to the researcher's personal experience is that, the implementation of CASS has occurred in environments, which are characterised by lack of resources, lack of professional development, and lack of support for the implementation process. There were no workshops for educators before implementation in some districts. The teachers have been attending one-day CASS workshops during the implementation process meaning that were developed whilst at the same time implementing the change. This seems to have resulted in teachers not being given time to familiarize themselves with new assessment strategies and procedures. What is most likely is that teachers have not changed their practices. They are most probably still using the same procedures as before. Professional development programmes to alter their beliefs and attitudes were not offered in time. The literature has warned that educators will resist the change if they are not involved in the decision-making to implement change.

Implementing CASS needs teachers who are competent and satisfy all the requirements mentioned earlier in this chapter. CASS appears to be the link between teaching and learning, and assessment in Curriculum 2005 with its underlying principle of outcomes-based education. CASS appears to be that link between intentions and results. As Killian (1996) remarked, "Outcomes focus on the purpose of instruction rather than the content or learning experiences" (p.1). Community pressure for accountability in education systems as well as political pressure for community participation in education has created interest in OBE and CASS. It would appear that OBE and CASS are often more attractive to politicians, administrators, the business community and parents than they are to teachers. The focus area for my research study is the implementation of CASS in grades 11 and 12 Physical Science classrooms in three secondary schools. My research study will then investigate how successful the implementation of CASS has been in three schools.

This chapter set out to review some different theories of the nature of the curriculum changes in South Africa, the nature of educational change and the nature of Continuous Assessment to create a better understanding of the change process observed in three secondary schools. The following chapter describes and accounts for the research methods and approach employed in this study.

## CHAPTER 3 RESEARCH APPROACH AND METHODS

This chapter describes and accounts for the research methods and approach employed in this study. The qualitative study was the chosen method because it enabled the researcher to gain insights into the process generated by the implementation of CASS in three secondary schools in a school circuit in the Empangeni region in KZN. The names of the schools have been changed to protect them from easy identification. A case study of each of the three schools was carried out because of researcher's need to understand in detail the complex social phenomena surrounding the implementation of CASS in these schools. Semi-structured interviews, questionnaires and document analysis were used as methods of gathering data. The different methods used to gather data are described and accounted for. The limitations of this qualitative method are also described and addressed, and necessary precautions were taken to minimize these limitations.

### 3.1 Research design

This research study is based on case studies of the implementation of Continuous Assessment in grades 11 and 12 Physical Science classrooms in the selected schools. The case study is the chosen research method because it enables the researcher to gain insights into the processes generated by the implementation of CASS, and the researcher hoped this method would provide the best possible answers to the research questions provided in Chapter One. The question is: How successfully has the departmental policy of Continuous assessment been implemented? The following sub-questions guided my inquiry:

1. How did the schools and teachers prepare for the implementation of Continuous Assessment?
2. What impact has the implementation of Continuous Assessment had on the science teachers' assessment practices and lesson planning?
3. What are science teachers' understanding of and reasons for their current assessment practices?

Cohen, Marion and Morison (2000) support the case study approach by saying: "It provides a unique example of real people in real situations, enabling readers to

understand ideas more clearly than simply by representing them with abstract theories or principles” (p.181). Thus the findings will be contextualised within the social, cultural and historical framework of the chosen schools.

The case study approach was employed because it allows an investigation to retain holistic and meaningful characteristics of real life events. It is also appropriate when examining contemporary events and is related to the way the initial research questions have been defined. Moreover, case studies focus on a specific situation, they are descriptive and heuristic, and they offer insights and understanding of the cases being studied. The ‘how’ questions that form the basis of this research study favour case studies. One of the unique strengths of this approach is its ability to deal with the full variety of evidence (Cohen et al., 2000) that is generated by the research questions. In this initiative, the phenomenon under study is the implementation of Continuous Assessment in the three schools visited by the researcher.

In this research study, I have attempted, as an interpretive researcher (Candy, 1989) to understand the world around me. Interpretive research, according to Schaller and Tobin (1998), is a term used to describe an investigation designed to capture the essence of the participants’ experience. In this instance, the Physical Science teachers and learners’ experience of Continuous Assessment. This process involved a number of research strategies including questionnaires, semi - structured interviews and document analysis to collect data. My intention was to investigate the actions and interactions of the participants (teachers and learners) within their educational environments (which are the three schools) and also to understand their behaviours and interactions. Each case was examined individually and as a whole for themes and patterns and also for differences and commonalities between the cases. The principal theories underpinning the research study are those supporting educational change and curriculum innovation.

### **3.2 Research sample and participants**

Data was collected from three secondary schools in a school Circuit. The schools were selected because:

- They have implemented Continuous Assessment in grade 11 and 12 science classrooms as required by Department of Education.
- These schools belong to the same cluster as the researcher's school and other schools in the same district.
- These schools were chosen looking at their socio-economic factors, their surroundings, their geographical area and their pass rate performance as far as grade 12 results are concerned.
- These schools were also chosen because of convenience. They are close to where the researcher is working.

All the chosen schools belong to the same cluster in the school circuit. This cluster has six schools in all. The researcher was interested more in focusing on disadvantaged schools, because she is also from a disadvantaged school. Moreover, the researcher was interested in how disadvantaged schools with minimum resources implemented CASS. The teachers from this cluster always come together once a term to discuss issues concerning the official tests from the Education department, which are written once a term. During these cluster meetings also issues concerning CASS activities are discussed.

Cohen et al. (2000) argue that small scale research efforts often resort to the use of non-probability samples because they are less complicated to set up, less expensive and can prove adequate if the researcher does not intend to generalize the findings beyond the sample in question. Two forms of non probability sampling used are convenience sampling, which involves choosing the nearest individuals to serve as respondents and purposive sampling in which the researchers' hand-pick the cases to be included on the basis of their judgment or their topicality. In this manner the researchers build up a sample that is suitable to their specific needs. This study used a combination of convenience and purposive sampling techniques. All three schools are in very close proximity to each other and to the location of the researcher's place of work. Despite this close physical proximity the schools were chosen first because they were historically disadvantaged, originally being set aside for the education of black learners only and secondly because each had different histories and different levels of resources.

Thus, this sample allowed the researcher to study the process of implementation in very different resource contexts.

The three schools were visited on a regular basis just for informal discussions with the Science Teachers of grade 11 and 12, the HODs for science and some of the learners from grade 11 and 12. This was done to get overview of their feelings about CASS. Thus, the events relating to implementation of CASS were observed over a 10 month period in the three secondary schools, school A, school B, and school C. The KwaZulu-Natal Education Department administers all three schools. School A is newer than the other two schools. It was selected because it has a history of innovations and excellence in the academic sphere. It has a record of 100% matric pass rate for the past five years. The school draws pupils from a comparatively wealthy feeder area and the school has been levying school fees for a number of years. The school has a minimum of resources and employs well qualified teachers. The Governing Body uses the monies collected from the parents to employ additional teachers and two security guards.

School B was selected because the learners are drawn from a nearby informal settlement situated next to industries. The school has the least resources and caters for learners from a very disadvantaged background. The Matric results are not as good as of the previously mentioned school, they fluctuate year by year. There are fees levied but these are insufficient to employ any additional teachers. School C was selected because it is situated in a rural area on the outskirts of a town. It has virtually no resources and caters for learners from disadvantaged background. The community is struggling to make ends meet. School fees are levied but these are insufficient to employ additional teachers.

The three schools chosen are not representative of the whole sample of schools in this area. The researcher wanted to compare what is happening in these particular three schools as far as CASS is concerned. Although, I had hoped to interview two teachers, one from grade 12 and another one from grade 11, I found that only one teacher teaches Physical Science in both grades. I, therefore, requested the HOD (Science) to take part in the research study. Grade 11 and 12 Physical Science learners also took part by completing the questionnaire. They were 191 in all, and I was fortunate enough to be present when learners were responding to questions. I also explained some of the questions to them using their home language.

### 3.3 Methods employed in the study

The preliminary stage of this study consisted of a documentary analysis of CASS. The document policies, teachers' workbooks, mark books and learners exercise books, were collected and analysed. This was done by the researcher during the schools' cluster meetings for CASS moderation. For ethical reasons a letter was written to the participants requesting them to take part in the research study. In order to promote truthful answers anonymity was guaranteed in the questionnaires and interview schedules, it was also indicated that any answer is accepted.

Soon after permission was obtained from the principals of these three schools, learners from grade 11 and 12 science classrooms were asked to fill in the questionnaires. The aim was to find out what they knew about CASS and which CASS activities they are familiar with. Different methods of data collection were used, namely:

- Questionnaires
- Interviews
- Document analysis.

#### *Questionnaires*

One questionnaire was administered to science learners in grade 11 and 12 classrooms. This was done to find out whether they knew anything about Continuous Assessment, what activities they were familiar with, which of the activities they liked least or most (See appendix D). The researcher was present during the administration of the questionnaire in the classrooms and explained the questions to the learners. The answering of questionnaires took about 20 to 30 minutes per class.

#### *Interviews*

Rather than only using a questionnaire, direct contact with science teachers and HODs (sciences) in three schools was considered necessary. Consequently, interviews were used to collect more information from these schools after analyzing data from the questionnaires and documents. Moreover, interviews were also used to elucidate unclear responses and to gather further information on the responses. The HOD and the science teachers were interviewed at different stages as shown in the research schedule provided later in this chapter. The interviews lasted 15 – 20 minutes depending on the

participant's responses. According to Merriam (1988), "Interviewing is necessary when we cannot observe behaviour, feelings, or how people interpret the world around them" (p.72). The interview schedule (Appendix C) was given to teachers a few days before the actual interview. This was done to give the respondents time to consider questions asked and formulate their answers in their own time. In addition, the interviews would determine the extent of the participants' knowledge and readiness for CASS implementation. These interviews were tape recorded and later transcribed.

### *Document analysis*

Documents supplied to the schools by the education department and other agencies to inform and implement Continuous Assessment were analysed. These documents were the Physical Science syllabus and CASS document for grade 11 and 12. These documents were collected earlier so that the researcher could analyse and interpret them. This was done to give a clear picture of the intentions those producing the documents had about implementing CASS. Also, the documents produced by the schools gave additional information of the meaning that change has for the HODs and the science teachers. These documents are teachers' master files, learners' portfolios, and learners' tests and exercise- books. This was done in order to check whether the information gathered in all types of documents is consistent. Meriam (1988) supports document analysis, "Documents of all types can help the researcher uncover meaning, develop understanding, and discover insights relevant to the research problem" (p. 18). Therefore, the analysis and interpretation of these documents enabled the researcher to gain insights into the processes that influenced the implementation of CASS.

An indication of how each of these methods of data collection was matched to the research questions is presented in table 3.1. In order to provide a measure of validity to the descriptions and interpretations, the data that was collected by the methods described above were triangulated. Triangulation required the use of two or more methods of data collection. Meriam (1988) agrees, "Methodological triangulation combines dissimilar methods such as interviews, observations and physical evidence to study the same unit", (p.69). This enables the researcher to study the variety of data from one standpoint using different methods.

Table 3.1 Relationships between research questions and type of data collected.

	Question 1 Schools and teachers preparation of <i>CASS</i>	Question 2 What impact had <i>CASS</i> on practices	Question 3 Teachers' understanding of current practices
Semi structured interviews (teachers)	7 teachers  (15 – 20 min each)	7 teachers  (15 – 20 min each)	7 teachers  (15 – 20 min each)
Questionnaires with learners	191 learners	191 learners	
Documents analysis	<ul style="list-style-type: none"> <li>• Teachers' master files</li> <li>• Physical Science CASS Document</li> </ul>	<ul style="list-style-type: none"> <li>• Teachers' master files</li> <li>• Learners' Portfolio</li> <li>• Students' tests and exercise books</li> <li>• Physical Science Documents.</li> </ul>	<ul style="list-style-type: none"> <li>• Teachers' files</li> <li>• Physical Science syllabus</li> </ul>

Research methods act as filters through which the researcher experiences the data collected. The use of contrasting methods reduces the chance that consistent findings are a result of the methods used. That is, if different methods yield the same result, the researcher can be confident that the results are valid, the greater the difference in methods used, the greater the researcher's confidence. In this way triangulation strengthens the validity of research findings, as bias, which can distort interpretations can be minimized.

#### *Analysis of data collection*

The data collection process took a period of five months: from July 2002 to November 2002. The research schedule in table 3.2 below illustrates this process. Although Physical Science teachers in this cluster meet quarterly to discuss *CASS* activities, three extensive site visits took place in each school for the purpose of research study. Each visit lasted about two to three days depending on the type of data collected and the availability of participants. Each day at the school site that involved data collection began and ended with the normal school schedule.

Table 3.2 Research schedule for 2002.

Month / Year	Description
July , August	<ul style="list-style-type: none"> <li>• Initial visit to each of three schools.</li> <li>• Formulation of interview schedule.</li> </ul>
September, October	<ul style="list-style-type: none"> <li>• Second visit to schools, give interview schedule to participants (educators).</li> </ul>
October, November	<ul style="list-style-type: none"> <li>• Collect documents and analyse them.</li> <li>• Third visit to the school to interview teacher.</li> <li>• Give learners the questionnaires.</li> </ul>

The interviews were conducted on two different days. When the researcher had compiled and produced the list of questions using categories like attitude, previous knowledge, understanding, etc., she gave teachers these questions on the first day of interview which was two days before the actual interview took place. The researcher asked the teachers to answer these questions in writing in their own time. This enabled teachers to think carefully about these questions and answer them at their own pace. In this way most of the data was already written up, thus saving time. On the second day of the interview, the researcher collected the responses and requested the participants to discuss their answers with her. This provided her with extra information and clarification. The participants' responses were tape-recorded and later transcribed. Each of the seven participants was interviewed twice. Each interview lasted about 15 to 20 minutes. The participants did not enjoy being tape-recorded; they preferred to write the responses.

In the beginning the interviews were open-ended. The researcher began each interview with a question and left the direction of the discussion to the interviewee. As the study progressed, the interviews were more directed. In some cases they were more confrontational in nature. For example, an interview began with the researcher citing contradictions from the interviewee's previous response, with a request for further understanding and clarity. The researcher listened to the tapes again and again until interpretation came out. Interviewees were given an opportunity to read the transcribed interviews. Fortunately, they did not make any changes to these responses. The tapes will be destroyed upon completion of the study.

Questionnaires were issued to 191 learners who were doing Physical Science in grades 11 and 12 in three schools. It took about 30 minutes to complete the questionnaires. This was done to find out what learners know about CASS, what activities they were familiar with, and which of them they liked least or most. The researcher was present during completion; she explained some terms that were unfamiliar like journals, portfolios and investigations. The instruments were first piloted to the sample of learners.

Document analysis was the third method used for data collection. These documents were: teachers' master files, learners' portfolios, learners' test exercise-books, learners' classwork, the Physical Science CASS document and Physical Science syllabus. The researcher looked for common activities and themes in all these documents.

Other means of data collection were informal discussions with learners and educators, countless telephone conversations, talking with teachers in other grade levels and visiting sample schools for guidance.

### **3.4 Reflections on the chosen methods**

Qualitative research methods raise questions of reliability, as it is often difficult to repeat the research in exactly the same way. Any method that involves a single researcher observing and interpreting data could be considered unreliable. Thus as a researcher I need to be aware of my own position and world view. Theoretical and ethical issues can and do influence the selection, analysis and interpretation of the data. In addition there are problems of validity. This is a problem if the data collected is influenced by the research methods used. The following precautions were taken to help overcome the stated limitations.

- i) The methods used were described so that inferences can be tested.
- ii) A natural history of the research was included to make it clear where and when the data was collected.
- iii) Values were made explicit so that the researcher can be aware of bias. In this study I have included actual quotations from the data gathered to help validate my interpretations.

The strength of this chosen mode of inquiry (qualitative case study) is that the research is conducted within the social reality of the participants. This approach allows the researcher to interpret the findings within the framework. It is therefore important that the researcher examines and reports on related issues within the social context in which the curriculum innovations are taking place. I, therefore, consider this study as limited because interpretations based on this method are determined by the context and will not necessarily reflect what is taking place at other schools. Although the information gathered may be valuable, there is always a danger of generalizing from unique school situations. A major limitation of this study is its focus on data obtained from grades 11 and 12 science educators and learners only in each school. It would be better if all science educators and all science learners in each school were involved. In other words a more multi focus study would provide evidence and more conclusive results.

In the following chapter the researcher sets out the results and in particular provides a description of the current practices in each case. Each school is described, to clarify the real context for implementation of CASS.

## CHAPTER 4 THREE CASES OF IMPLEMENTATION OF CASS

### 4.1 Introduction

This chapter establishes the context in which the implementation of CASS took place in each of the three schools. The meanings of this curriculum innovation and CASS implementation for the participants are determined. The three case studies are the three schools that were visited by the researcher.

In all there were 197 science learners who were issued with questionnaires to find out what they know about CASS. 96 learners were from grade 12 and 101 learners were from grade 11. In the three schools selected, seven teachers were interviewed, four science teachers and three heads of department (Science). Two questionnaires were also issued to teachers to find out what they understood about CASS. Documents such as scheme books, learners' exercise books and portfolios as well as CASS documents from the department of Education were analysed. Informal discussions with learners and educators were held in each school during cluster meetings. These informal discussions, and being present in these schools for a long period, enabled the researcher to pick up on the day-to-day issues that teachers hardly talk about in a formal situations. Table 4.1 that follows shows the overall summary of the participants in this research initiative.

Table 4.1 Participants in the research study

Name of school	Science Educators	Grade 12 learners	Grade 11 learners
SCHOOL A	3	41	42
SCHOOL B	2	30	22
SCHOOL C	2	25	37
TOTAL	7	96	101

The description of each school follows which is the context on which innovation took place.

## 4.2 School A

### 4.2.1 School context

School A is a new school compared to the other two schools. It is a ten-year old school, which has continuously produced a 100% matric pass rate for the past five years. It is administered by the KwaZulu-Natal Education department, therefore all the curriculum changes and innovation programmes suggested by the Education Department affect the school. The school is a double-storey, face-brick building, which is unfamiliar in this area. It is situated next to shops in the little town, thus transport to this school is not a problem. This school was selected because it has a history of innovation and excellence in the academic sphere. The community from which it draws students is predominantly black. The school accepts all children considered to be within an area whose boundaries have been established over a number of years. There are feeder primary schools whose learners have traditionally been accepted at the school. Those not in the area are accepted if they are able to pay the fees and are considered ready by the school and do not have discipline problems as stated in the school's admission policy. The school has been levying school fees for a number of years. Thus the school has a minimum of resources and employs well-qualified teachers. The governing body uses the monies collected from the parents to employ three additional teachers to minimize the teachers' work loads and two security guards to ensure safety within school premises. The parents show a high level of concern for their children's education and have high expectations of the school. The parents sign children's homework books every week, if there is a problem with learners' work they communicate with teachers through homework books.

Language is not a problem as all learners and educators are homogeneously black and Zulu-speaking, middle-class and hard-working. One of the parents said: "I work overtime every weekend because I want my child to get proper education. Learners are encouraged to use English and Afrikaans within the school premises to increase their communication skills. There are strict rules that bind everyone together. The learners are motivated, as are the teachers. Grade 12 learners usually study until late in the afternoon and teachers are always there to supervise and guide them. Teachers and learners work as a team and all have one goal in their minds that of maintaining the record of their matric pass rate. "We work as a team in order to maintain our previous examination record." (Teacher, School C). There are minimal problems of absenteeism and discipline.

The teachers are used to holding workshops and meetings within the school to discuss new programmes and how they can implement change. The atmosphere in the school is conducive to implementing change. At the end of each term, the results are issued and parents are invited to the school to discuss their children's performances. Therefore parents are part of the school and the principal has good relationships with teachers and community. That is why everybody in the school is prepared and motivated to work e.g. the teachers arrive at school one hour before the school begins and leave one hour after school closes. In order to succeed, they network with other neighbouring schools, catering for learners of different races, to obtain help and thus, reducing CASS implementation problems. "We network with neighbouring schools for help,"(HOD, School C).

The principal often encourages learners and teachers using the parable of baking a cake. One morning during assembly he said that learners are all the ingredients used to bake a cake and teachers are the bakers. The teachers measure all the ingredients needed according to the required dosage and it is the teachers' duty to mix the dough thoroughly. Therefore the learners must be prepared thoroughly, in order to make a good delicious cake. The enrolment in this school is  $\pm$  1200 learners and  $\pm$ 30 teachers in all. There are 40 classrooms in all, a library; two well equipped laboratories and a small room which serves as a cafeteria. All the teachers who are employed in this school are qualified, ranging from a diploma to a degree qualification. Three teachers are employed on a temporary basis and twenty seven teachers are permanent. Parents, learners and teachers like the school and it has a good reputation.

In this school, two science teachers and an HOD were interviewed. The following table profiles each teacher's general educational background and experience, at the time of the school visits by the researcher in 2002. Furthermore it tells us that science teachers that were interviewed in this school are qualified and their teaching experience ranges from three to fifteen years.

Table 4.2 Teacher profiles and experience

Activity	HOD	Teacher 1	Teacher 2
Grade taught	8 & 12	11 & 12	8 & 12
Total years teaching	15	08	03
Years in School A	10	05	02
STD	Maths & Science	Maths & Science	Maths & Science
FDE	Management	Science	Maths
B.Ed (Hons)	School management	Science education	None

#### 4.2.2 The teachers

##### *The Head of the Department (HOD):*

The Head of Department in this school is teaching Natural Science in grade 8 and Organic Chemistry in grade 12. The total teaching experience is 15 years and she has been in this school for 10 years. She has a Secondary Teachers Diploma (STD) with majors in maths and science. In addition she obtained Further Diploma in Education (FDE) and BEd (Hons) in school management. She says she encountered CASS when she was studying towards a teaching diploma at the university. She agrees there is a change in teaching and there is now lot of paper work and more time is required. "I attended a one day workshop about CASS. I do not like OBE, it has lot of confusion. I like CASS because it will advantage the learners" (HOD, School A). She emphasizes that she is positive about CASS because it would advantage grade 12 learners but she is negative about OBE.

##### *Teacher 1*

This teacher is currently teaching grade 11 and 12 physical science classes. Her total experience in teaching is 08 years but she has been at this school for the past five years. She encountered CASS in 2000 for the first time when she was teaching grade 12, she never heard about CASS during tertiary years. "I do not remember being taught how it is implemented. but the only fact which was emphasized was that testing the work which has been covered is important." She admits that there are changes in the way she is now doing her work. She attached a lesson plan to show these changes. She takes OBE as the challenge to face and her attitude towards CASS is positive. She claims that learner attitudes towards CASS depend much on the attitude of the teacher and thus says: "If the educator is positive, his/her learners will be positive as well. When done properly with positive attitude, good results can come out of it, since it equip the

learners with necessary skills, even though there are learners who are less motivated and lazy, who do not do their work no matter what, whether it is groupwork or not.” She indicated that she has attended a one-day workshop on CASS and OBE.

#### *Teacher 2*

This teacher is currently teaching grade 8 Natural Science and Physical Science in grade 12. She studied CASS at the college. She is new in the field with the total teaching experience of 3 years. She attended a one-day CASS workshop when she started teaching and has been at this school for the past 2 years. She could not identify any changes in teaching because she started using CASS when she started teaching in 2000. She admits that she has not experienced any additional administrative demands, maybe because she was not practically exposed to traditional testing. “I have not used any old methods”. She likes CASS and feels that students also like CASS.

#### 4.2.3 Learners

This school has a total of 83 learners who are doing physical science both in grade 11 and 12. There are 42 learners in grade 11 and 41 in grade 12. The questionnaire to find out what learners know about CASS was administered to science learners. Table 4.3 summarizes the information supplied by learners regarding their knowledge about CASS and the activities involved.

Table 4.3 Learners’ responses about CASS activities.

Questions :What type of work does your teacher use to assess you?	No.	Sometimes	Often	Never
1. Some of your classwork	83	0	83	0
2. Groupwork	83	26	43	14
3. A portfolio	83	13	55	15
4. Practical / Investigations	83	31	46	6
5. Projects	83	38	23	22
6. A journal	83	0	0	83
7. Tests	83	37	46	0

The results in this school reveals that most CASS activities are experienced by the learners, especially groupwork, classwork, tests and portfolios. Out of 83 learners, the majority of learners i.e. 76% (61) agreed that they do projects while 27% (22) have

never done the projects. Most of them did only one project. In addition, learners confirmed that they do not write journals and they rarely do projects. One of the boys said: *I do not know what a journal is; can you explain?* My understanding is that these last two activities are not compulsory for their year end CASS marks. Therefore there is a tendency by the teacher to neglect these activities. In contrast, all learners agreed that they all write tests. The reason is that these tests belong to the matric intervention programme for improving grade 12 results offered by the Provincial Education department. Therefore they are compulsory. 55% (46) of learners said they do write tests monthly while the other 45% (37) said they write them quarterly. 93% (77) of learners agreed that they do practical work, although it was the demonstration of Inorganic Chemistry by the educator, the other 7% (06) denied doing any practical work. The majority of the learners were positive about CASS and they enjoyed doing these activities. In contrast, the teachers indicated that learners do not actively involve themselves in CASS activities. Some teachers also indicated that they are unfamiliar with activities like journals and investigations. Therefore they choose to do classwork and tests. The results in Table 4.3 show that the most popular activities in this school are still class work and tests.

#### 4.2.4 Summary

It seems as if this school (including management staff, the educators, parents and learners ) has taken seriously the need to change and the infra structure and training is available for CASS to be implemented. Although the teachers interviewed claimed to have changed, practically no real change was observed. According to the data collected, the researcher found that the same system as in the old curriculum was operating in the classrooms, and as for the learners nothing has changed. The most popular activities in this school are still classwork and tests, and sometimes groupwork. Although the school does have a well-equipped laboratory, the practical work is mostly demonstrated by the educator. The majority of learners have done one project with the exception of a few learners who have done two to three projects. The learners are positive about CASS and they enjoyed doing these activities, but they have not done several activities like journals, investigations, and some of them did not do the projects. One teacher said: "We do not have enough time to complete all the activities; we need to finish the content syllabus." This indicates that they feel they do not have enough time for projects.

### 4.3 School B

#### 4.3.1 The school context

School B is the oldest school in the area. It is about thirty years old. The school is situated in the informal settlement, which means the community is struggling to make ends meet by working at neighbouring industries. The school caters for learners from disadvantaged backgrounds. The matric results are not as good as the previously mentioned school, they fluctuate year by year. In 1999 the pass rate was 30%, in 2000 the pass rate was 60% and in 2001 the pass rate was 40%. There is a shortage of teachers, which means that teachers have large duty loads which end up impacting negatively on their school-work. Although fees are levied, they are insufficient to employ additional teachers. Learners do work cooperatively with their teachers, but the problem is that they often absent themselves from school. The reason is that parents leave very early for work and come home very late, not knowing whether the child has gone to school or not. One of the parents who was invited to school to explain why her child was absent said: "I leave home for work at 6 a.m. and I come back home at 8 p.m." In addition, parents are not involved in the education of their children, which makes it difficult for the school to maintain discipline and control. The language that is supposed to be used in school premises is English, but learners deliberately use Zulu which is their mother tongue, refusing to speak English. In that way English as a language is unfamiliar. The parents' meeting is convened only once a year when there is a need to increase school fees. The principal indicated that parents work until late everyday and during weekends they work overtime, so they usually do not attend meetings. According to the HOD of the school, discipline, absenteeism and lack of motivation are the main factors that affect the performance of the school negatively.

Teachers do attend workshops and they have introduced CASS, but they are negatively affected by learners' absenteeism. When I visited the school for the first time one quarter of the class was absent. On the second day of the visit half of the class was absent. But surprisingly they were almost all present on the day when they were given questionnaires. Therefore, implementation of CASS adds an extra burden on top of problems they already have. The enrolment in this school is  $\pm 800$  learners and  $\pm 26$  teachers in all. The population in this school is black. There are 40 classrooms in all, a library and a laboratory, which is seldom used. Although all teachers are qualified, ten

teachers are employed on temporary basis and the other 16 are permanent teachers. The motto of the school is “education is worth mental liberation”, but it does not seem as if learners understand this saying. The principal and the teachers have a hard time controlling discipline within the school. The school is found close to the squatter camps and it is next to the main road. The school management team has to work hard to control and motivate teachers as well as learners. The teachers do sometimes lack motivation. Few parents are interested in what is happening at school, though they come and congratulate the school when the matric results are good.

In this school, one science teacher and an HOD were interviewed. The reason was that only one teacher teaches physical science in both grades 11 and 12. The HOD only helps with those sections which are problematic for the teacher. The following table is the profile of the science teacher and the HOD (science). It shows the teachers’ general educational background and teaching experience, at the time of the school visits by the researcher in 2002.

Table 4.4 Teachers’ profiles and experience.

Activity	HOD	Teacher
Grade taught	10 & 8	11 & 12
Total years teaching	12	08
Years in School B	02	06
STD	Maths & Science	Maths & Science
FDE	Management	None
B.Ed (Hons)	None	None

### 3.3.2 The teachers

#### *The Head of the Department (HOD)*

The HOD in this school is teaching Natural Sciences in grade 8 and physical science in grade 10. The total teaching experience is 12 years and she has been in this school for two years. She has a STD in Maths and Science and FDE which she obtained at Springfield College. She has many challenges to face because she is of Indian origin in a black school. She has to understand the culture of a Black school at the same time control school work. She has heard about CASS, but she has not studied it at a tertiary level. She says: “I first encountered CASS in 1996 when I was teaching grade 5.” She

attended workshops whilst she was in the profession. She is positive about CASS but would like the Education Department to provide a specific basic knowledge a learner needs to acquire in a particular grade in Curriculum 2005 for all learning areas and a teachers' guide for CASS in grade 11 and 12. "I would provide a syllabus for OBE and a teachers' guide for CASS in grades 11 and 12. Teachers will know how to teach and which aspects are relevant for a particular grade." She says this will help teachers in their classrooms. But she complains that teachers, sometimes, are not willing to submit their work. She says: "I am positive about CASS, but sometimes negative because educators are not teaching as much as they are supposed to. I mean that they are not committed to their work, they keep on complaining about CASS and OBE". This makes the control of work difficult for her.

#### *Teacher 1*

This teacher is currently teaching Physical Science in grades 11 and 12. His total teaching experience is 8 years and he has been in this school for the last 6 years. He was exposed to CASS in 1997 long before it was introduced in grade 12 in 2000. He says: "I studied CASS at University of Natal (Pietermaritzburg Campus)." He clearly understands what CASS is, which I could tell from the confidence he had during the interviews. He says: "CASS can be identified as a substitution mechanism of the traditional testing and exams which was so judgemental, and not the actual representation of the learners' capabilities. Whereas CASS takes into account all the work done and activities performed throughout the year." He confirms that there are changes in teaching, because he started teaching using old methods. "Traditional assessment used to measure learners' abilities by writing tests and exams only but CASS take into consideration all tasks and activities about what the learners can do, this is done continuously" Now he does integrate teaching and assessment during his lesson. He says: "Yes, I do integrate. Example: When a group of learners make presentations in the form of demonstration they get credits for working together as a unit; marks for correct handling of apparatus- which are skills and not knowledge only as in the past. This was not catered for." He is positive about OBE and he wished that this Curriculum 2005 was introduced during his time of schooling. He suggests that parental involvement in learners' learning must be strengthened so that there is a triangle of involvement i.e. the learner, the teacher, and a parent. He finally suggests that the education authorities must provide some sort of incentives for teachers who are willing

to implement change or a new programme. He says: “Let the Education Department and curriculum planners plan the new activities with teachers say four years before implementation. This will allow educators to get used to the new initiative. I also recommend a whole week workshop or in service training and not a one-day workshop, this is not working.”

#### 4.3.3 The learners

This school has a total of 52 learners who are doing Physical Science in both grades 11 and 12. There are 22 in grade 11 and 30 in grade 12. The questionnaire to find out what learners know about CASS was administered to Science learners. All learners agree that they do write tests quarterly which is the requirement from the provincial Education ministry. The majority of learners, 58% (30), said they have done one project while 42% (22) of them denied doing any project. The majority of learners, 94% (49), said they do practical work in the form of demonstrations by the teacher. The educator demonstrated an electro-chemical cell. One boy asked the researcher: “What is the use of CASS if pupil like Themba failed in the presence of CASS? Another girl also asked: What does the education department say or do about educators who do not teach us the content and only do CASS activities?” The researcher explained that she has come to see if CASS is implemented or not so that the Department of Education can be informed. Table 4.5 summarizes the information supplied by learners regarding their knowledge about CASS and the activities involved.

Table 4.5 Learners’ responses about CASS activities.

Questions: What type of work does your teacher use to assess you?	No.	Sometimes	Often	Never
1. Some of your classwork	52	19	33	0
2. Groupwork	52	49	03	0
3. A portfolio	52	49	03	0
4. Practical / Investigations	52	49	03	0
5. Projects	52	27	03	22
6. A journal	52	00	00	52
7. Tests	49	22	27	0

The results in this school reveal that most of the CASS activities are ‘sometimes’ done with the exception of classwork, which is done on a daily basis. Again, in this school,

learners have not written journals and they rarely do projects. Some learners did not respond to some questions, so the number is less than the expected total. The learners themselves were not convinced as to whether this CASS will help them pass matric better, they were referring to the previous clever learners who did not make it in grade 12.

#### 4.3.4 Summary

What I have found out from learners' responses is that the science teachers as well as learners do not appear to fully commit themselves to CASS activities. This contradicts the science teacher's responses that seemed to be very dynamic and positive about CASS. Although the teachers did attend a one-day workshop, the school, educators, and its community are not yet ready for implementation of CASS. I have seen that the school is struggling to maintain discipline and learners do not see the need for being at school. The socio-economic background of the community impacts negatively on the effective running of the school. The HOD also complained about teachers who do not want to submit their work. There is basically no culture of learning. The parents are not actively involved in the learning of their children mainly because they are out at work, so learners are out of control and they do as they wish. Therefore it becomes difficult for the school to maintain discipline and control absenteeism. Although the teachers interviewed claimed to have changed, the researcher found that the same old methods from the old curriculum were operating in the classrooms, except that more tests and class work were given to learners.

## 4.4 School C

### 4.4.1 The school context

School C was selected because it is situated in the most rural outskirts of the town. It is a twenty year old school. It is not resourced and caters for learners from disadvantaged rural backgrounds. The community is struggling to make ends meet and they do not see the advantage of sending children to school. One of the parents indicated to the HOD: "I am very busy in the fields, I cannot come to school, you can expel the child if he misbehaves." This school needs renovations; windows, doors, and fencing need to be replaced. School fees are levied but these are insufficient to employ additional teachers, to buy the required resources and to make the needed repairs to the school premises. The principal and the teachers are trying to maintain discipline, but it is difficult because the majority of parents do not support them. "Most parents do not support us, we invite them to school, they do not come." Ill-discipline and absenteeism affects the tone of the school. The implementation of CASS has increased the amount of work that teachers must do. According to the data collected, although teachers do attend workshops about CASS, they are still unfamiliar with the activities and they seldom use them. "Teachers are not used to these activities" ( Teacher, School C).

The language that is supposed to be used in the school is English, but learners speak Zulu. Most of the parents are illiterate; therefore, they cannot follow up on their children's work. When learners come home in the afternoon, they are assigned household duties which they must fulfil before they do their homework. One learner said: "When I come home every day, there are duties that I must first do like cooking. I get tired and I am unable to do homework." This has a negative impact on their performance. The enrolment in this school is  $\pm$  600 learners and  $\pm$  20 teachers who are employed by the department; some of them are employed on a temporary basis and others are permanent. In all, there are 20 classrooms; no library; no laboratory, the science students use a school hall as the place where they can learn physical science. The school is far away from the town Centre and the transport to the school is not frequent. This school is situated near the main road, in a place where faction fights are frequent. The parents would come to school if they are invited for some reasons, otherwise they do not see any reason why they should.

In this school, one HOD and one science teacher were interviewed. The reason is that only one teacher is teaching Physical Science in both grades 11 and 12. The Head of Department (HOD) cannot help the teacher as far as Physical Science is concerned because his major subjects are Maths and Biology. If the Science teacher is stuck, he would go and seek help from neighbouring schools. The following table profiles the work experience and educational backgrounds for both the HOD and a Science teacher.

Table 4.6 Teachers' profiles and experience

Activity	HOD	Teacher
Grade taught	8 & 9	11 & 12
Total years teaching	15	10
Years in School C	02	02
STD	Maths & Biology	Maths & Science
FDE	Maths	Science
B.Ed (Hons)	None	None

#### 4.4.2 The teachers

##### *The Head of Department (HOD)*

The HOD in this school teaches Natural Science in grades 8 & 9 and also Mathematics in grade 12. The total teaching experience is 15 years and he has been in this school for the past two years. He has STD and FDE, which he obtained, at Springfield College. He has to face many challenges trying to get used to the school. He says: "I first encountered CASS when I was teaching grade 8." He has never encountered CASS while he was at tertiary level; he only attended a one-day workshop. He confirms that there are lots of changes in teaching. "Yes, a lot has changed. I have just introduced a project." He likes OBE and CASS, he says: "I like OBE and CASS because learners learn different skills from each other and it gives us a chance of assessing our learners continuously thus getting to know them very well." He suggests that all schools follow the same pattern as far as CASS is concerned, so as to be on the required level of assessment. About learners he says: "I think they like CASS, but I am not sure whether they like OBE, I use to hear them complaining about teachers who shift their work to be done by students".

### *Teacher 1*

The science teacher in this school has a teaching experience of 10 years and he has been in this school for the past two years. He has FDE and STD in Maths and Science, which he obtained, at Springfield College. The teacher had heard about CASS before it was implemented in 2000. He attended one-day workshops for OBE and CASS. He agrees that lots of changes have occurred. He said: "I have learnt to moderate CASS activities because I am a cluster coordinator." He admits that he does not like OBE. He said: "It is time-wasting and learners do not like to actively involve themselves in it." But he admits that CASS is good because it will advantage grade 12 learners. He insisted: "Learners are negative towards OBE and positive about CASS." He suggests that OBE and CASS must be introduced at the tertiary level so that it makes sense to teachers. He further suggested: "These one-day workshops does not serve the purpose, alternatively a whole week in service training would be better. "

#### 4.4.3 The learners

This school has 62 learners in all who are doing Physical Science in both grades 11 and 12. There are 37 in grade 11 and 25 in grade 12. The questionnaire to find out what learners know about CASS was administered to Science learners. All learners agreed that they have heard about CASS. All learners in this school, 100% (62) have never done practical work and investigation, and journals. The majority of learners 57% (34) have never done projects while 17 learners have done only one project with the exception of 9 learners who did two projects. The majority of learners, 60% (37), indicated that they do groupwork while 40% (25) denied doing any groupwork. Table 4.7 summarizes the information supplied by learners regarding their knowledge about CASS and the activities involved.

Table 4.7 Learners' responses about CASS activities.

Questions	No.	Sometimes	Often	Never
What type of work does your teacher use to assess you?				
1. Some of your classwork	62	18	44	0
2. Groupwork	62	23	14	25
3. A portfolio	62	37	25	0
4. Practical / Investigations	60	0	0	60
5. Projects	60	17	9	34
6. A journal	60	0	0	60
7. Tests	60	25	35	0

The results show that learners know about CASS activities. All learners confirmed that they often do class work, tests and sometimes groupwork. They never wrote a journal and they sometimes do projects and portfolios. Two learners did not respond to some of the questions. When analysing the questionnaire responses, the result proved that grade 11 learners did more CASS activities than grade 12, which is a contradiction. Although grade 11 needs the activities, the situation should be that grade 12 learners must do more activities than grade 11 learners, because they need the CASS activities for year-end matric examination purpose. The issue of ill-discipline also came out in grade 11 classrooms where a learner was busy listening to his walkman (radio) while the researcher was busy with questionnaires. When the researcher had finished, one learner asked: "Is there any help that would come to our school as far as the resources are concerned?" The researcher explained that she wanted to know if CASS is implemented in schools, since it is a requirement for the matric results.

#### 4.4.4 Summary

Although educators attended a one-day workshop, the lack of resources hindered the successful implementation of CASS. The researcher noticed that some of the factors that hindered their implementation of the programme were ill-discipline, absenteeism and lack of cooperation. Lack of motivation to implement change on the part of the management staff and educators also impacted negatively on the process of implementation. The socio-economic background of the school and of learners did impact negatively on the implementation process. Although the teachers interviewed did see the need for implementing CASS, the researcher could see that the old type of curriculum was operating in the classrooms, except that more tests and class work were given to learners because it is required for the year-end matric results. "More tests and classwork are given to learners; we want them to perform better in year-end matric results." (Teacher, School C).

In the following chapter the researcher will focus on how these cases helped her answer the research questions.

## CHAPTER 5 FINDINGS AND DISCUSSIONS

This chapter focuses on providing answers to the research questions through analysis and interpretation of the cases described in chapter four. Various approaches were used to gather information, and most of them focused on the capacity to implement CASS. Informal discussions, and being present in these schools for a long period, enabled the researcher to pick up on the day-to-day issues that teachers rarely talk about in a formal situation. These case studies gave the researcher a rich experience of the reality of what goes on in a school, its ecology, ethos, classroom practices and teachers' activities. As a way of organising data and analysing the rich data that was collected, a few assertions have been formulated across the three sub-questions. These assertions relate both to the teachers' beliefs, values and attitudes together with their classroom practices regarding the implementation of CASS, and to learners' responses about CASS activities. Each assertion is presented along with examples of data on which it is based and the inferences drawn from them.

### 5.1 Preparation for CASS

The question I was trying to answer was: *How did the schools and teachers prepare for the implementation of CASS?*

**It appears that there was no training and preparation before the implementation of CASS. However, the teachers had heard about CASS and they understood some of the activities which were involved.**

In 1999 there were no workshops for the principals and HOD's whose role was to set the implementation process into action. The policy documents were sent to schools in 2000 the year in which CASS was to be introduced in grade 11 and 12. Thus the process was mainly driven by the documentation that was sent to schools and the participants were left to interpret these instructions on their own. To put it more simply, they had to learn while they implemented. Once implementation had started, there were some one-day workshops. The teachers were introduced to the new initiative through these one-

day workshops that were short and took place outside the school context. One-day workshops were conducted to explain CASS documents in some schools and other schools did not receive the invitation to work-shops, therefore they did not attend these work-shops. However, despite a lack of training the teachers had heard about CASS and they understood some of the activities which are involved. Out of seven teachers that were interviewed, three teachers encountered CASS whilst they were studying at universities and colleges. The other four teachers encountered CASS while they were already teaching either grade 8 or 12 in 2000.

The educators indicated that they were not satisfied about the manner in which CASS has been introduced. "They just supply us with documents and expect the CASS to materialise out of documents. How can that happen? How can a one-day workshop equip teachers with a year's work; with so many CASS activities to be familiar with?" (Educator, School C). Teachers lamented lack of consultation during the process of developing and implementing the policy and thus felt marginalized. "The teachers have certain expectations according to the old summative assessments. They found this new continuous assessment threatening" (HOD, School B).

In addition, the participants were not included in the production of any of the elements of CASS materials nor were they asked to contribute any feedback into the process. This process was centrally driven which marginalized the main participants. This is exemplified by quotes from two participants: "This top-down approach has spoilt the game. The teachers have been left out. The teachers should have been made part of the process" (HOD, School B) and 'The education department must introduce the initiative at least two years before it is implemented so that educators can be familiar with the change.' (Educator, School B,). The teachers were not included in the production of the published materials nor does it appear that the contexts of the schools were taken into account. Thus these implementation plans were as authoritarian as the previous curriculum system that the policy makers were trying to replace. It is clear from the research data that the schools did not thoroughly prepare for implementation of CASS.

## 5.2 The impact of CASS

The question I was trying to answer was: *What impact has the implementation of CASS had on Physical Science teachers' assessment practices and lesson planning?*

**In general, it appears that similar assessment activities to those used by teachers with the previous curriculum dominated.**

The implementation of CASS has not had a drastic impact on teacher assessment practices. Document analysis conducted established the extent to which different CASS activities are used in classrooms. The finding was that in all three schools, the most popular CASS activities were still classwork, tests and sometimes groupwork. Other assessment activities required by CASS like keeping journals, investigations, projects and practical work were not common in these schools. This confirmed the fact that not too much change has occurred. The methods of teaching were still “old” with limited pupil participation. There was little or no evidence of peer- and self- assessment, only the educator assessment was visible. No emphasis on learner-centred activities was evident.

Five of the teachers interviewed agreed that there are some changes that they have introduced in their Science classrooms, like changes in lesson planning, introducing projects allowing learners to work in groups etc. “In my scheme of work and daily preparation, I include speeches, interviewing prominent people and doing projects.” (HOD, School A). A new teacher has not used the old methods because she started teaching in 2000 when the change was introduced. She says: “I am using the same method since I started teaching in 2000. I am using CASS. I have not used the traditional method at all. (Educator, School A). Another one is an experienced teacher. She does not see any changes, and teachers including her still use old methods. “There are no changes in teaching. The teachers and I still use old methods most of the times.” (HOD, School B).

They agree that the administrative burdens have increased, because now they need to continuously assess the learners. They indicated that more time is needed so that a teacher can continuously assess a learner, e.g. “Yes, more time is needed because now a

teacher has to continuously assess the learner. Again all activities have to be recorded and analysed in order to give a relevant feedback to a learner” [Science teacher, School A].

Some changes in classroom practice do seem to be occurring across the board. It is now standard practice in these schools to push desks or tables together, so as to group learners. This is not to say that genuine groupwork is done, but it seems to be generally accepted that learners should sit in groups and not in rows. This is evidenced by the comment from one educator in school B “the learners like to sit in groups and I allow them to discuss”. Unfortunately, there is no mention of self-assessment or peer-assessment; it is always the teacher who assesses. There is an exception of one teacher who showed the researcher her lesson preparation plan which shows the lesson developing through activities that learners are engaged in, and are assessed through peer-assessment.

At each school, the principal and teachers arranged their own meetings and activities to create shared understandings of the new initiative. “We normally discuss the problems we encounter in CASS during cluster meetings and sometimes after school” (HOD, School A). The teachers were involved in continual evaluation of their effort during cluster meetings. This, I feel would be what the CASS policy designers and implementers would have hoped for. Each teacher interviewed described plans that they and the other teachers had put into action to cope with difficulties and ensure that the process will be smooth in 2003. There was a clear realization that they would need extra time for both teachers and learners to be familiar with all activities of CASS. “I think the Department of Education need to provide a teacher’s guide for CASS in grades 11 and 12” (HOD, School B). Overall it appeared that the educators’ practices in School A were in line with what officials would expect while School B and School C were not in line most likely because the teachers had a negative attitude towards Curriculum 2005.

### 5.3 Teachers' understanding and current practices

The question I was trying to answer was: *What are science teachers' understandings of and reasons for their current assessment practices?*

**A lack of skills and support from the subject advisors are seen as the major reasons for the lack of substantial changes. The overall reason for educators' current practices is that they are comfortable with the old methods which are familiar to them, and which they understand better.**

The results from the teachers' interviews shows that overall the teachers have the same views of CASS as departmental officials. The researcher found that all teachers in these three schools claimed that they understood the concepts of CASS and they have undergone a one-day workshop. For example this was evidenced by the definition of CASS provided by a teacher during interviews:

“Continuous assessment is allowing your learners to demonstrate their understanding of the subject matter as well as exploring their abilities and capabilities. Integrating the knowledge that already exists in them with the new one and recording all the marks about the learner. Through CASS we are able to check performance of the learner and be able to offer help where necessary.”  
(HOD, School A).

In general the participants viewed CASS as an active process which involved planning, acting and evaluating.

The reasons the teachers put forward in the interviews for not changing their practices despite understanding the requirements of CASS was that they lack necessary skills and support to affect these new activities. The teachers mentioned the fact that they have attended more than enough training workshops on OBE, but little effort has been made as far as CASS is concerned. For example, one difficulty was that they are not sure whether the activities they use in their classrooms meet the demands of CASS because not a single advisor came to their schools to show them how CASS activities can be implemented in a class of 45 or more learners. “Teachers lack support from the subject advisors.” (HOD, School B).

Where advisors had been present, the teachers also mentioned the fact that even advisors themselves had different ideas on OBE, and this leads to confusion as to which idea to implement. “It is better to do what you know than what you don’t know, as long as something is happening” (Educator, School C). If there is confusion in OBE, it is likely that confusion will also arise in CASS. The teachers said that they felt comfortable doing things and using methods they are familiar with because, “OBE is time consuming”. There is also a concern about learner absenteeism which is a drawback in keeping accurate records. The morale in some of the schools is very low. In these situations, teachers spend lots of time in the staffroom while learners absent themselves from schools.

Another possible reason for not changing their practices was that teachers associated CASS with OBE which they did not support. For example four teachers who were interviewed do not like OBE, they say it is time-wasting. In contrast they like CASS because they believe that it will advantage the grade 12 learners who always struggle to get a good pass. “I do not like OBE, because it is time-wasting and learners do not like to actively involve themselves in it, they think teachers are lazy to teach and shift the responsibility to them, but I like CASS because it will advantage our learners”. [Science teacher, School C] and “I am positive about CASS, because it advantages our grade 12 learners” [HOD, School C]. The teachers and learners of these schools were positive about CASS with a hope that it will improve grade 12 results. The teachers also mentioned that although CASS is time consuming, it will soon pay the learner at the end of the year. Overall teachers were positive about CASS but negative with OBE. Given the positive attitude to CASS it can only be assumed that the lack of skills and support prevented its implementation.

Overall it can be said that most of the teachers did not introduce all the required CASS activities in their classrooms as expected by the policy document because they lacked knowledge of how to implement some of the new assessment activities and did not receive the required support to implement change. The nature of the policy and its demands regarding financial, material and human resources requires paradigm shifts which, unfortunately, some of the schools as elements of the education system are not ready for. This resulted in teachers essentially continuing with their old practices.

## CHAPTER 6 CONCLUSION

The conclusions are presented in three parts. The first part deals with the dimensions of change that were observed. The second part relates this observed change to the CASS initiative being implemented. The third part forms the final conclusion of the research initiative.

### 6.1. Dimensions of change

The research study has shown that the implementation of CASS involved a dynamic interrelationship of three related dimensions of change. These are:

- the use of new materials
- the use of new teaching approaches and
- the alteration of beliefs.

Therefore, it is important that a relationship be fostered between the intended new educational program and the realities of the individuals involved for real change to be effectively implemented. It is argued that the policy makers driving the educational change viewed curriculum as a set of plans to be implemented. This was indicated by the mechanisms put in place by the implementers. Although all the implementation documents stated that the process was based on participatory, decentralised decision-making, the reality was that this curriculum initiative was driven by documents and was politically defined. This tension is illustrated in the fact that although, in theory, the school curriculum was recognised as being socially constructed, the written curriculum was presented as a 'given'.

This research study has revealed that in 1999 there appear to have been no workshops for the principals, HOD's and teachers whose role was to set the implementation process in action in this district. The teachers were introduced to the new concepts through workshops in 2000, the year of implementation. The workshops were short and took place outside the school context. Tobin et al. (1991) negates this practice by suggesting that providing learning experiences for teachers on site will enable them to construct images and metaphors that are grounded in the contexts in which innovations are to be implemented. Thus the process was mainly driven by documentation that was sent to schools and the participants were left to interpret these instructions on their own.

In addition, the participants were not included in the production of any of the elements of the CASS initiative nor were they asked to contribute any feedback into the process. Thus the process was centrally driven, which marginalized the main participants.

The results from the research study shows that the teachers were not included in the production of the published materials nor were the contexts of the schools taken into account. Thus, the implementation plans were as authoritarian as the previous curriculum system that the policy makers were trying to replace. The innovators needed to be open to ideas from those who were involved in the process. Fullan (1982), in describing examples of innovations similar to this one, that included educational outcomes that were thoroughly prescribed, but without feasible plans of how they could be implemented, warned that this lack of clarity could become a source of frustration and confusion for those carrying out the process.

In contrast to this approach of implementation of CASS, the participants viewed CASS as an active process which involved planning, acting and evaluating. At each of these schools, the HOD's and the teachers arranged their own meetings and activities to create shared understandings of the new initiative. The teachers were involved in continual evaluation of their efforts by CASS conveners. Each teacher interviewed described plans that they and other teachers had put into action to cope with the difficulties and ensure that the process went smoothly in 2003. There was a clear realisation that they would need extra time for concepts and different CASS activities to become meaningful to both teachers and learners.

The research results have confirmed that educational change involves people's basic conceptions of self and competence, and thus presents difficulties for the individual to develop a sense of meaning. Dalton's (1988) burden of incompetence was clearly evident in teachers' interviews. The expected innovations involved teachers in skills that they did not possess. These situations created a crisis as they put the identity and professional skills of the principal, the HOD's and teachers at stake. The external implementers did not have to face the same crisis as the school based implementers. To bring about successful change, as was discussed in Chapter 2, continual dialogue amongst all persons at all levels of decision making must take place.

The research study has shown that the diverse contexts of human and physical resources impacted negatively on the successful implementation process of CASS. There needs to be recognition that change involves the structures and routines of the work place. These structures act as powerful source of help or hindrance to the teacher in the process of change. Change has failed if it fails to impact on the entire culture of the school. This can help to explain why some of aspects of CASS like tests, groupwork and few projects were implemented, while others like journals, practical work and investigations were not. It was clearly apparent from teachers' responses that the CASS policy and policy reforms had been made in isolation from the real context of the education system of South Africa.

## **6.2. Dimensions of Continuous Assessment**

The teachers' interviews and learners' responses indicated that the participants were aware of the main aspects of CASS initiative, but they did not do it in practice. No deep changes were observed from the old system to the new system that is suggested by CASS policy. The teachers continued to foster competition between groups. The teachers still emphasized the need for the tasks to be accomplished by all learners within a set period of time. These observed facts indicated that the statements of the teachers were not always consistent with their actions. This indicates that the changes required of the teachers were far-reaching and possibly not fully understood by them.

This research study has confirmed that innovations such as CASS can constitute threats to the normal systems of organisation in a school. Thus any plans for change at the classroom level need to face the problem of control. Most of the teachers interviewed indicated that they experienced problems with control in their classrooms. These problems were huge class-sizes, absenteeism and lack of participation by some learners. As I have discussed in chapter two, Fuller's (1987) study of developing countries showed that students' achievements were correlated positively with the provision of instructional materials and negatively with class sizes. Most of the teachers interviewed indicated that they experienced problems of control in their classrooms because of large number of learners. However, the CASS policy is silent about the class sizes and how to exercise control in the classroom.

The research study revealed that the introduction of CASS involved a change in the nature of educational knowledge that threatened the teachers' control and order of the educational environment. This threat is posed when the teachers' professional skills are undermined by the changes in subject content and method. Dalton (1988) stated that the most fundamental form of innovation is the transformation of the values and beliefs of teachers. The teachers indicated that they were aware of the basic conceptual changes that are expected of them. They were also aware of their expected roles in OBE and CASS environments, as discussed in Chapter 2. They were also aware that they needed more time to come to terms with the expected changes and roles. It is argued that the policy-makers were ignorant of all the possible dimensions of this change process. It is also possible that the policy-makers knew the dimensions but chose to ignore them for economic, logistical or political reasons.

The CASS policy has put forward the rationale for the introduction of CASS in grades 11 and 12 that will benefit the learners. It says: "The introduction of CASS will ensure that assessment is ongoing and learners are therefore all compelled to work consistently, thus contributing to the culture of teaching and learning" (National Department of Education, 2001). This research study has shown that the type of assessment that is actually implemented at the schools is more like continuous testing and not continuous assessment. The only CASS activities which are implemented in these schools are tests, class work, groupwork, sometimes projects and practical work. There is no convincing evidence that all CASS activities were introduced as required by CASS policy.

### **6.3. Research Conclusions**

This research study was conducted using a case study method with the three secondary schools chosen being the cases to be examined. This research initiative attempted to examine the process of change within the local setting, thus examining the implementation of CASS in three secondary schools. One of the main objectives was to investigate how disadvantaged schools implemented CASS in grades 11 and 12 Physical Science classrooms. A qualitative approach was adopted because of the need to understand the different meanings generated by the process of implementation of CASS. I would argue that this approach was an appropriate one as the data generated in

the three contexts gave an indication of the different meanings. Although the information gathered is valuable, there is always a danger of generalising from unique schools' situations. A major limitation of this study was its focus on data obtained from grade 11 and 12 Physical Science teachers only in each school. It would have been better if all science educators in each school had been involved. I also suggest that for future research, the whole school be involved so that all learning areas are dealt with. This would enable a more coherent picture to be constructed of the implementation of CASS in the school. A more multi-focus study would provide better evidence and more conclusive findings. The researcher does recognise that a larger sample of both contexts and participants would have provided more reliable data. In addition, this study could be viewed as premature. An argument could be made that implementation of CASS may be on its way to substantial change, and that it was studied at its infancy. With more time, it could be argued, that substantial changes in teachers' classroom practices and attitudes would have changed.

I would contend that CASS as visualised by the central planners had failed to materialise during the first years of implementation. The data presented in Chapter 4 does clearly indicate the issues that acted as barriers to implementation of CASS. The study has shown that the overall implementation of CASS was not rigorous enough and did not carry any authority from which teachers could derive support, guidance and with which they could proceed to change their classroom practices. The unchanged classroom teaching strategies and interaction patterns are a possible reflection of a break-up in the top-down change implementation, as it overlooks teachers' concerns, experiences and wisdom on teaching. I would argue, however, that some elements of the implementation process were successful as in all three schools studied the HODs and grade 11 and 12 teachers were actively engaged in the process of implementing CASS, in one way or another. No doubt, this struggle viewed from the distance of the centrally placed planners will be classified as a failure.

On analysing the data obtained from these three schools, the researcher has noticed that there are factors that are able to support or hinder the implementation of new ideas and practices in systems such as schools. These factors are:

- physical and human resources
- beliefs and attitudes of teachers and learners

- the school ecology and management
- external support and socio-economic backgrounds of the schools.

The research study has shown that not all schools have a capacity to implement a given innovation such as CASS, to the same extent. Classroom transactions show that teachers have continued uninfluenced in their practices by the exposure to knowledge of CASS. As the literature on change management says: 'only systemic changes enables teachers to change' (Loucks-Horsely, 1995, p.50) and that change in curriculum materials and education policy is inadequate to bring about the desired curriculum change as noted by Fullan (1982). Notwithstanding the above, it is clear from numerous studies over the past 30 years that teacher change is difficult to achieve. It is clear that change occurs gradually in one teacher at a time. Undoubtedly, teachers have their own reasons of choice of content to teach, methodology and assessment techniques that they use in their classrooms, based on their set of beliefs.

The research results have revealed that teachers need to merge their old, traditional ideals with the new beliefs in order to have something of value for their own professional development. The results have shown that one-day workshops did not help the teachers in implementing CASS.

This research study therefore suggests that more INSET programmes and longer workshops are conducted to equip teachers with the required skills and knowledge of CASS and CASS activities. It is also obvious that further research is required in particular:

- research which will involve all science teachers in each school, so that there is a true and convincing picture of what is happening in science education as far as CASS is concerned.
- research which involves the whole school so that all learning areas are dealt with giving a picture of how different discipline teachers implement the policy and the total experience of the learners with CASS activities.

There are three points that have come out from this research study that the researcher believes are central to curriculum change of the kind being introduced. These are:

- There is a big difference between curriculum as a given policy document and a curriculum as a negotiated concept.
- Implementation of curriculum change including CASS and OBE must have necessary support from the system in one way or another.
- Change of curriculum of the major kind dealt with, will require change in the underlying schools and departmental structures and routines.

Ignoring these points is setting up the change for failure.

In conclusion I would argue that the reality that educational planners and innovators pay only lip service to the concept of curriculum as process, negatively impacts on the successful translation of CASS policy into practice. The gulf between the meanings generated during conception and those that are negotiated during the realities of execution creates a context of misunderstanding. I would contend that for a successful implementation process, the curriculum planners need to nurture their badly sown seeds of innovation so that they flourish into a fully grown curriculum that is deeply rooted in the South African context.

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## APPENDICES

- A CASS framework for Physical Science in grades 11 and 12.
- B Planning matrix or test grid for assessment in science education.
- C Interview schedule for teachers in 2002
- D Questionnaire for learners in 2002.

**APPENDIX A: CASS FRAMEWORK FOR PHYSICAL SCIENCE ON GRADES 11 AND 12**

Components	SUMMATIVE		FORMATIVE		
	Examinations	Formal tests	Informal assessment	Practical work	Other activities
Context	Examinations must reflect the same format as the National examination paper. (Guideline document to be considered)	Controlled (e.g. controlled and moderated by the subject head). Standardized (e.g. all grade 12 classes need to write it). Written according to the school's test time table. Marked by teachers according to a Marking memorandum. These tests should reflect the same Format and standard as per the National Examination Guidelines. (i.e. must include multiple choice questions and problem-centred (structured) questions	Informal tests; Homework; Class work; Tutorials. Assessment here could be self/peer/group/ educator/community assessment. It need not include all of the above activities, and does not include practical work.	Includes Grade 11 and 12 experiments. There must be a balance between Physics and Chemistry. This can include a practical examination or test if desired.	Projects, Assignments; Science Expo (projects not specifically done as classroom activity), Science competitions Models; Group activities; Interviews; etc.
Number	At least one. This will depend on what the moderation time frames allow.	At least three formal tests in the Grade 12 year. 0	At least twice a term. Learners must not spend more than 30 minutes on these activities. A variety of activities must be used to compile this mark. Not all the above components need necessarily be done.	A minimum of four experiments in 2001, six by 2002 and eight by 2003. This may only include grade 11 topics, which are examinable in the external grade 12 examination. Experiments done in grade 11 may not exceed 50% of the total weighting .	
Weighting MODEL A	20%	20%	10%	50%	0%
Weighting MODEL B If other activities' are included, the weighting changes	20%	20%	10%	40%	0%

**APPENDIX B: PLANNING MATRIX / TEST GRID FOR ASSESSMENT IN  
SCIENCE EDUCATION**

True-False Item	Tests	Measurement	Recognition	Traditional
Multiple-Choice Item			Reproduction	
Completion Item				
Short Answer Item				
Essay Item				
Practical Examination				
Papers				
Questionnaires				
Inventories			Production	Alternative
Checklists				
Peer Rating				
Self Rating				
Portfolios				
Observation				
Discussion				
Interview				

Methods and Types of Assessment (Doran et al.1994)

## **APPENDIX C: INTERVIEW SCHEDULE FOR TEACHERS 2002**

### Instructions

- Answers all questions honestly and openly.
- Your responses will remain anonymous and strictly confidential.
- No individuals or schools will be identified when the research is written.
- This is part of the requirement for my studies; therefore it is only for my own use.

### Your previous experience of CASS

1. Have you heard about Continuous Assessment before 2000, that is, before it was implemented in Grades 11 and 12?
2. Did you study it at the University or College when doing your initial training?
3. Did you go for a workshop or a course?

### Your understanding now

4. When did you first encounter Continuous Assessment?
5. What do you understand by Continuous Assessment (CASS)?
6. In what way is it different to traditional assessment you have been using?

### Change in teaching

7. Have there been changes in the way you plan your lessons now, compared to say three years ago?
8. Describe any new activities you have introduced?
9. Do you integrate assessment into teaching or is it still separate? If integrated, how do you do this? Please give an example?
10. In what way have the administrative demands changed?
11. Does assessment require more time to administer than traditional tests?

### Attitude

12. What is your attitude towards OBE?
13. What has been your attitude and feelings towards CASS?
14. What do you think is students' attitude?
15. If you were in control, what would you change?

