
**A CONCEPTUAL MODEL FOR THE MANAGEMENT OF
THE IMPLEMENTATION OF A CONTINUOUS
ASSESSMENT PLAN AT A UNIVERSITY OF
TECHNOLOGY**

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**M Dip. Tech. (Metallurgical Engineering),
M.Sc. (Material Science)**

Thesis submitted in fulfilment of the requirements for the degree

PHILOSOPHIAE DOCTOR

in

Teaching and Learning

**NORTH-WEST UNIVERSITY
(VAAL TRIANGLE CAMPUS)**

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Vanderbijlpark

2008

ACKNOWLEDGEMENTS

To my family, my wife, children and my mother in law for their encouragement and unwavering support.

To my promoter, Dr Elsa Fourie, for the expert advice she has given me and her support and motivation throughout this study.

To Mrs A. Oosthuizen of the Department of Statistical Consultancy Services at North-West University (Vaal Triangle Campus) for professional assistance and guidance.

To all the participating Higher Education Institutions for their contribution in this study.

Above all, to my Lord Jesus Christ, for through Him, I can do all things.



SUMMARY

A CONCEPTUAL MODEL FOR THE MANAGEMENT OF THE IMPLEMENTATION OF A CONTINUOUS ASSESSMENT PLAN AT A UNIVERSITY OF TECHNOLOGY

KEY WORDS: Outcome based education, Continuous assessment, Student assessment, Assessment policy, Outcomes assessment, Student-centred assessment, Ongoing assessment, Assessment plans, Conceptual management models, Management of assessment.

In South Africa today, the challenge is to redress past inequalities and to transform the higher education system. This transformation of the higher education system is necessary in order to serve a new social order. The introduction of outcomes-based education and training requires a new approach to education, including the process of assessment. An outcomes-based approach to education and training focuses on continuous assessment through the use of a range of assessment methods.

The Ministry of Education tasked the National Department of Education to embark on a review of their academic programmes. This review has been in response to register programmes on the National Qualifications Framework. This review has also been part of an attempt to improve the quality of qualifications.

In most learning organisations, assessment and learning have always been closely related. If assessment has not simply been seen as the end point in learning but has been an important component in the design of the learning process itself, this statement will be severely tested by the movement towards an outcomes model for education and training.

The primary aim of the study was to develop a conceptual model for the management of the implementation of a continuous assessment plan in a university of technology by means of a literature study and an empirical investigation. Currently, information regarding the conceptualisation of this topic is inadequate and vague. If the nature of the complexities involved in the management and implementation of CASS at universities of technology are known, a conceptualised model can be developed for the effective management of the implementation thereof.

The implementation of an integrated model of assessment requires the creation of an enabling environment in which the model can be implemented. This study has found that this is not true for many universities of technology, as:

- programme design still rests on subjects that are not aimed at outcome-based models;
- administrative systems are not designed to accommodate the recording of continuous assessments;
- students, lecturers and other stakeholders have not undergone the necessary training regarding the change in paradigm from content-based to outcome-based education; and
- policy regarding modularisation and continuous assessment has not yet been defined and implemented.

The study serves to present a useable model for the management of the implementation of continuous assessment at universities of technology. The study is based on a balanced opinion as the experiences of both lecturers and students were investigated by means of structured questionnaires. The findings were verified by means of a focus group interview with administrative staff involved with continuous assessment.

The model that was developed is a usable model as it was subjected to a number of verification tests.

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CHAPTER 1

INTRODUCTION AND PROBLEM STATEMENT

1.1 INTRODUCTION

In South Africa today, the challenge is to redress past inequalities and to transform the higher education system. This transformation of the higher education system is necessary in order to serve a new social order, to meet pressing national needs and to respond to new realities and opportunities. The introduction of outcomes-based education and training (OBET) requires a different approach to education, including the process of assessment. One of the most important aims of an OBET curriculum is to "*lay the foundations for the development of a learning society*" which can stimulate, direct and mobilise the creative and intellectual energies of all the people towards meeting the challenge of reconstruction and development (Department of Education, 1997b:3). An outcomes-based approach to education and training focuses on continuous assessment through the use of a range of assessment methods. This will have a major impact on students' perception of their role in the teaching and learning context (Sutherland & Peckham, 1998:100).

In traditional education and training, assessment is often the 'tail that wags the dog' (Smith *et al.*, 1997:78; Sutherland & Peckham, 1998:98). For many students, the **real** curriculum has been "*what they have to study for the test/examination/assignment*" (Madaus, 1997:29-32). Sutherland and Peckham (1998:98) formulate this as follows: "*Assessment tasks define the curriculum in the sense that students often focus on topics that are to be assessed in the hope of getting good marks*".

The Ministry of Education tasked the National Department of Education to embark on a review of their academic programmes. This review has often been in response to the need to define outcomes of programmes for registration on the National Qualifications Framework (NQF) by the South African Qualifications Authority (SAQA) and the accreditation of the programmes by the Council on Higher Education

(CHE). This review has also often been part of an attempt to improve the quality of qualifications by ensuring that all the parts of the curriculum form a coherent whole. This should be an ongoing process to ensure that the quality of qualifications is improved in line with international best practices, as well as to ensure that the nature of knowledge is updated continually (Department of Education, 2001).

1.2. REVIEW OF RELEVANT LITERATURE

In general, assessment in education and training is about collecting evidence of students' work so that judgments about students' achievements or non-achievements can be made, and, consequently, so that qualifications may be awarded.

In most learning organisations, assessment and learning have always been closely related. Assessment has not simply been the end point in learning but has been an important component in the design of the learning process itself - an essential tool in facilitating learning. The foundation of this relationship is now being severely tested by the movement towards an outcomes model for education and training.

1.2.1 Definition of the concept of assessment

Despite the plethora of definitions of assessment, misconceptions about assessment in the OBET context abound, and for that reason the definition of the concept is explored here.

SAQA views assessment as a structured process for gathering evidence and making judgments about an individual's performance in relation to registered national standards and qualifications (SAQA Guidelines, 1999:6). Withers (1994:13) defines **assessment** as making a decision about something; to examine or test the performance of individuals; to evaluate or judge on the basis of criteria such as correctness, validity and empirical evidence; the process and outcome of assessing - an assessment.

McMillan (1997:5) uses a similar definition: *"In the classroom context, then, assessment is the gathering, interpretation, and use of information to aid lecturer decision making"*. Even older definitions are based on these two notions. Ward

(1980:3) defines a scheme of assessment as all those methods of assessment and their subdivisions which, together, make up the assessment for the programme/module and on which the decision concerning the certificate or other award is based.

It is important to clarify the concept of **assessment** versus the concept of **evaluation**. Scholars agree that **evaluation** involves more than testing and measuring (UNESCO, 1999:126; McMillan, 1997:10). In the Conceptual dictionary, evaluation is defined as follows: *"To put value to something, to assess its worth; to analyse and assess the role or function of something"* (Withers, 1994:79). The notions of judgment and quality are introduced. According to McMillan (1997:10), evaluation entails the making of judgments about quality - how good the behaviour or performance is. Evaluation involves an interpretation of what has been gathered through measurement.

On the other hand, there is the idea that **assessment** is an umbrella term that encompasses testing, measuring and evaluation, and that assessment leads to decision making. The prevailing notions involved in definitions of assessment include the following:

- Assessment is a process (Ward, 1980:3) that encompasses testing, measurement and evaluation.
- Assessment leads to decision making.

More recent definitions of assessment also focus on the idea that assessment leads to decision making and that it is a continuous process. Salvia and Ysseldyke (1995:title page) state that assessment, in all its forms, is viewed through the lens of its purpose: namely, making informed decisions about students.

A distinction is made between formative and summative assessment. According to McMillan (1997:106-107), **formative assessment** occurs during a lesson or study unit and serves to provide ongoing feedback from the student to the lecturer. The purpose of formative assessment is to provide corrective actions as instruction occurs in order to enhance student learning. **Summative assessment** takes place at the end of a unit of study. Its primary purpose is to document student performance after

instruction is completed.

While this distinction underscores the idea that assessment is a continuous process that could take many forms, it also conceptualises assessment as an integral part of the teaching and learning process on which the students' and the lecturers' decisions about the effectiveness of the teaching and learning process can be based.

1.2.2 The implementation of continuous assessment

SAQA proposes an integrated model of assessment, including continuous assessment, which includes a variety of assessment methods, including a balance of formative, diagnostic and summative assessments (SAQA, 1999:28-29).

The principle of expanded opportunity underlying OBET requires that a variety of assessment methods are used and that feedback from one assessment informs the design of the next assessment in order to support the notion that different students learn in different ways (Spady, 1994:12). Some students excel at writing their thoughts down; others prefer responding to questions verbally or being assessed through presentations. The application of the principle of expanded opportunity requires that lecturers implement an assessment strategy that introduces different types of assessments throughout the presentation of a module. This constitutes CASS. Lecturers also need to provide students with constructive feedback when performing formative or diagnostic assessment.

1.2.3 Designing an assessment plan

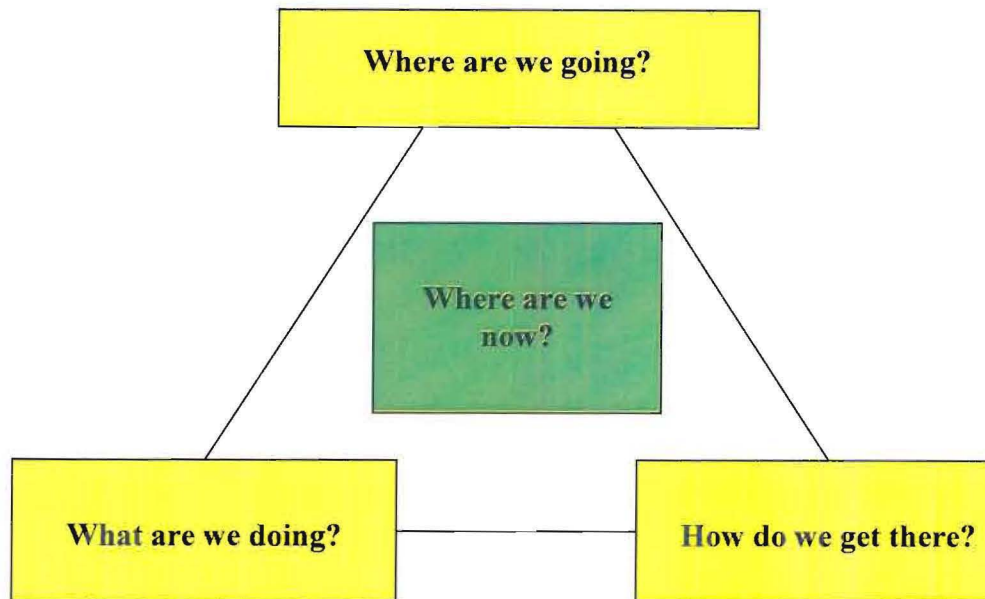
An initial task when designing an assessment plan is to identify the academic department's assessment needs. The following guidelines are designed to give each instructional programme within an academic department sufficient flexibility to conduct the assessment activities in a manner that is appropriate to the specific programme or department. The following guidelines should provide answers to some basic questions about designing and implementing an assessment plan:

- Each instructional programme should determine and articulate the specific student learning outcomes and how those outcomes fit into the mission of the university.
- Each instructional programme should examine the role that individual modules play in meeting the exit level outcomes and the methods used to accomplish those outcomes.
- Each instructional programme should satisfy processes for assessing student progress in meeting the educational outcomes.
- Each instructional programme should specify how the results of the assessment will be utilised for curricular improvement.

1.2.4 Conceptual modelling

The essential characteristics of any change may be illustrated by the use of a model that depicts the difference between where an organisation is at present and where it would like to be in the future. The model also offers the possibility of designing suitable developmental processes by which the university may move in the direction of the desired goals (Goddard & Leask, 1992:74-77; Education Commission of the States, 1993:6). This model is depicted in Figure 1.1.

Figure 1.1: A model to direct the organisational processes



This model affects the management of assessment in the following way:

- **Where are we going?** This question is connected to the aims of this study and refers to where the university foresees itself to be in the future. These aims of the university form the basis and point of departure for the management plan of assessment at the university.
- **What are we doing?** This question requires serious consideration of the fundamentals of the university. It is related to the university's reason for being. Why do we exist? What are we actually doing here? What is required from us? What is our core mission?
- **Where are we now?** This question is linked to the evaluation of the existing practice of evaluation at the university. What gaps are there in the management system of assessment between the existing and the foreseen future? Which processes should be changed? How can we improve the management of assessment?
- **How do we get there?** This question is concerned with all the developmental processes that may be applied towards reaching the identified goals. What work is needed to be done to create action? Who does what by when? Which

plans and policies must be developed? How should the process be managed?
How will progress be monitored?

The conceptual model developed in this study aims at the phasing in of this process of organisational change in order to avoid the need for crisis management, as was recommended by the task team on Educational Management Development in its report to the then Minister of Education (RSA, 1996:40-41).

Conceptual models are a convenient mechanism for allowing the structure of a database to evolve over time as the environment being modelled, user needs and information requirements change. Conceptual models provide a framework for developing a database structure or schema from the top down (Brown, 2001).

1.3. PROBLEM STATEMENT

This study aims to investigate the effective management of the implementation of continuous assessment (CASS) at a university of technology. Currently, information regarding the conceptualisation of this topic is inadequate and vague. If the nature of the complexities involved in the management and implementation of CASS at universities of technology are known, a conceptualised model can be developed for the effective management of the implementation thereof.

The implementation of an integrated model of assessment requires the creation of an enabling environment - one in which integrated assessment is made possible. This is not true for many universities of technology, as:

- programme design still rests on subjects that are not aimed at OBET;
- administrative systems are not designed to accommodate the recording of assessments that are performed using different assessment methods;
- students, lecturers and other stakeholders, such as parents, have not undergone the necessary training regarding the change in paradigm from

content-based to outcome-based education; and

- policy regarding modularisation and level descriptors has not yet been defined and implemented.

1.4. RESEARCH AIMS AND OBJECTIVES

In this section the broad aims and objectives of the study are discussed.

1.4.1 Aim

The aim of this research is to place the process of CASS within the context of higher education and to develop a conceptual model for the management of the implementation of a CASS plan at a university of technology.

The following questions arise that should be answered through the research undertaken in this study:

- What is continuous assessment?
- What are the key issues involved in the planning for the implementation of CASS?
- How can the process of implementation of CASS be successfully managed?
- Can a conceptual model be designed for the management of the implementation of a CASS plan at a university of technology?

When contemplating the preceding discussion and questions that arise, it becomes apparent that the implementation of a truly outcomes-based system would require drastic changes to current practices of universities of technology in order to create an enabling environment for the implementation of OBET and CASS. It would, therefore, be unreasonable to even suggest that the current practice should change with immediate effect. A more realistic approach would be that a gradual process be introduced to provide for the training and sensitisation of lecturers and students.

1.4.2 General objectives

The above mentioned aim of this research can be made operational through the attainment of the following objectives:

- Determine the key issues involved in the planning for the implementation of CASS.
- Determine how the process can be successfully managed.
- Design a conceptual model for the management of the implementation of a CASS plan at a university of technology.

1.5. METHOD OF RESEARCH

The research is qualitative and quantitative in essence, as both focus group interviews and a survey were used. A literature review and an empirical research study have been undertaken to gather information about assessment, continuous assessment, assessment of student outcomes, assessment plan design, conceptual modelling and management of assessment at institutions of higher learning.

1.5.1 Literature review

The literature review uses both primary and secondary literature sources to gather the required information. The major online database sources used in this study are:

- EBSCO HOST
- NEXUS
- SABINET
- Swets Wise
- Ingenta

The keywords include the following:

- outcomes-based education
- continuous assessment
- student assessment
- assessment policy

- outcomes assessment
- student-centred assessment
- ongoing assessment
- assessment plans
- conceptual management models
- management of assessment

1.5.2 Empirical research

The empirical research undertaken in this study is of an analytical nature. The analytical research seeks to find relationships. These relationships between the traditional way of evaluation and CASS are established. The research then shifts to factors that can be changed (variables) in order to influence the chain of events of assessment.

The method used in this analytical research is based on a case study that will be conducted according to the model depicted in Figure 1.1.

The research is initiated by using general data gathering techniques, such as attitude surveys (questionnaires), in order to determine whether there are any recurrent patterns in the attitudes of students and staff towards the traditional evaluation methods and the proposed CASS method. Discovering such patterns leads to a more focussed research question. This will be seen as the exploratory research section of the project.

1.5.2.1 Population and sample

Within a quantitative survey design, determining sample size and dealing with non-response bias is essential. Holton and Burnett (1997:135) state that “*..one of the real advantages of quantitative methods is their ability to use smaller groups of people to make inferences about larger groups that would be prohibitively expensive to study*”.

The question then is, how large a sample is required to infer research findings back to a population?

According to De Vos (quoted by Vermeulen, 1998:50), a population is the totality of the persons, events, organisation units, case records or other sampling units with which the research problem is concerned.

The population or target group is that group which the researcher is interested in, in gaining information and used in drawing conclusions. The definition of the target population in a study is largely determined by the independent and control variables in the study design along with practical considerations such as availability of subjects or respondents (Vermeulen, 1998:51). The population for this study consists of respondents from different South African universities of technology that are involved in CASS. This includes both lecturers (N=130) and students (N=1200) involved in CASS, as well as members of the administrative staff (N=30) concerned with the management and record-keeping aspects of the continuous assessment task at the universities of technology.

Leedy and Ormrod (2005:207) state that the generalised rule to identify a sufficient sample size, namely that *the larger the sample, the better*, is not too helpful to a researcher who has a particular decision to make about a specific research situation. The following guidelines have been suggested for selecting a sample size:

- With a small population, fewer than 100 people or units, the entire population should be used.
- If the population is about 500, 50 percent of the population should be used as a sample.
- If the population is about 1500, 20 percent of the population should be used.
- If the population is more than 5000, then a sample of 400 should suffice.

However, according to Seaberg (quoted by Vermeulen, 1998:56) in most cases a 10 percent sample should be sufficient for the control of sampling errors.

For the purpose of this study, lecturers at all the universities of technology were contacted through a systematic sampling process. This sampling entailed selecting individuals according to a predetermined sequence. The sequence must originate by chance. For example, a list of units might be scrambled and then every 10th unit on the list is selected (Leedy & Ormrod, 2005:203). Only the first case is selected randomly, preferably from a random Table and all subsequent cases are selected according to a particular interval (Vermeulen, 1998:54). A sample size of $n = 65$ was drawn for the lecturers from the population of size $N = 130$. This means that one element in every 2 ($N/n = 2$) had to be selected. In the case of the students a sample size of $n = 240$ was drawn from the population of size $N = 1200$. This means that one student in every 5 ($N/n = 5$) was drawn. For the administrative staff involved in CASS at the different institutions a sample size of $n = 10$ was drawn from the population of size $N = 30$. This means that one element in every 3 ($N/n = 3$) was drawn.

1.5.2.2 Measuring instrument

A structured questionnaire, based on information gleaned from the literature study, was developed to gather information from lecturers and students regarding their perceptions on both the historical method of evaluation and the future method of continuous assessment.

As a process of triangulation, focus group interviews were conducted with administrative staff members to verify the information gained through the questionnaires and to gain qualitative information on certain aspects contained in the questionnaires. Both the aforementioned processes were treated as an attitude survey, informing the future process of the management and implementation of CASS at a university of technology.

1.5.2.3 Pilot survey

The questionnaire was pre-tested on a selected number of respondents from the target population regarding its qualities of measurement, appropriateness and clarity.

1.5.2.4 Statistical techniques

The collected data was analysed and interpreted through employing the SAS-program with the help of a statistician associated with the North-West University.

1.5.2.5 Ethical aspects

The study was conducted after permission had been obtained from the relevant role players. This included the management of the participating universities of technology. The data, as well as the names of the participants that took part in the completion of the questionnaires, are treated as confidential.

1.5.2.6 Procedure

The study was conducted at those institutions previously known as technikons that have embarked on the process of CASS.

A literature study was done to clarify definitions and philosophies regarding CASS and the management of the process, as well as on the designing of an assessment plan for the implementation thereof.

The management of the aforementioned institutions were contacted to obtain permission to conduct the survey at their institutions. Assurances of confidentiality were given to respondents and the aims and objectives of the research were explained to them before they were asked to complete the questionnaires.

1.6. PROVISIONAL CHAPTER DIVISION

The purpose of Chapter 2 is to provide an overview of perspectives on assessment in an outcomes-based context as well as to look at the role players and processes involved in the planning for implementation of continuous assessment. The chapter will reflect on international and national assessment plans and how these were

developed to ascertain a smooth transition from the traditional assessment (evaluation) paradigm to a continuous assessment paradigm.

Chapter 3 investigates possible models for the management of educational processes together with possible general management models. This is in accordance with the aim of the study, which is to eventually develop a model for the management of the implementation of a continuous assessment plan for a department or programme at a university of technology. An assessment strategy for a university of technology will also be developed.

Chapter 4 outlines the design and methodology of the research regarding the management of the implementation of continuous assessment (CASS) at a university of technology. The literature study in the first three chapters formed the framework for the empirical research.

The statistical findings and analysis of the data are reflected in Chapter 5. The interpretation of the data will also be reflected in this chapter. These findings will indicate the main factors that should be considered in the development of a continuous assessment plan for a department as well as for the development of a continuous assessment (CASS) strategy for a university of technology.

In Chapter 6 a conceptual model for the management of the implementation of a CASS-plan and a CASS-strategy will be developed based on the findings in Chapter 5.

Chapter 7 reviews the study as a whole and provides the conclusions drawn from the study. Contributions of the study, findings, recommendations and implications for future research are presented in this chapter.

1.7. CONTRIBUTION OF THE STUDY

This study will contribute to the management of the implementation of a continuous assessment plan at universities of technology as is recommended in the White Paper on Higher Education and as is expected by the CHE in their criteria for institutional accreditation and programme accreditation.

1.8 CONCLUSION

An overview of what this study entails has been elucidated in this chapter. Chapter 2 will deal with the literature survey regarding assessment and particularly CASS, as well as the construction of a CASS plan.

CHAPTER 2

PLANNING FOR CONTINUOUS ASSESSMENT

2.1 INTRODUCTION

The purpose of this chapter is to provide an overview of perspectives on assessment in an outcomes-based context, as well as to look at the role players and processes involved in planning for the implementation of continuous assessment. The chapter will reflect on international and national assessment plans, and how these were developed to ascertain a smooth transition from the traditional-assessment (evaluation) paradigm to a continuous assessment paradigm. Since this study focuses on the management of a continuous assessment plan, aspects like recognition of prior learning falls outside the scope of this study and will not be included in the framework.

2.2 BACKGROUND

Outcomes-based assessment (OBA) involves a paradigm shift from the traditional- to a constructive- assessment approach. The focus of assessment therefore changes from assessment, which occurs at the end of the learning event to continuous assessment (CASS) which occurs throughout the learning experience, including aspects such as formative and summative assessment, and self- and peer assessment, which is criterion referenced (Janse van Rensburg, 1998:82-83). In criterion-referenced assessment, pre-determined or pre-stipulated criteria or standards are used for the judgement of a student's performance (CHE, 2003:112-113). Criterion-referenced assessment tends to be more transparent due to its explicitly stated criteria. Luckett and Sutherland (2000:127-129) indicate that the focus in CASS shifts from pure testing to assessment as a learning experience. The two paradigms, as the two extremes of a continuum, are reflected in Table 2.1.

Table 2.1: Assessment paradigms

	Traditional testing	Alternative assessment
Theoretical assumptions	Psychometric measurement, a 'scientific' paradigm, intelligence is a fixed; measurable entity that develops in a predictable way; test instruments should measure human intelligence accurately, objectively and reliably; testing should be context-free; norm-referenced assessment, knowledge is 'out there', given.	Assessment based on human interaction and professional judgement, based on evidence, a 'legal' paradigm; 'capability' is a shifting social construct and contextually dependent; there are multiple intelligences; context should be built into assessment; concern for validity and comparability; criterion-referenced assessment knowledge is socially constructed.
Purpose (why)	Summative: grading, ranking, selection, prediction.	Formative: diagnostic and summative - provision of feedback for teaching and learning.
Focus (what)	A limited range of competences that are easy to test, for example content knowledge, discrete facts and skills - the products of learning in familiar educational contexts.	Integrated knowledge, skills, attitudes and values, the products and processes of learning; the use and application of knowledge and skills in real-world contexts.
Methods (how)	Formal, added-on after learning, separate from teaching, external, once off, convergent, design for mass delivery, for example tests, exams.	Continuous; internal and external; integral part of teaching-learning process; opportunities for divergence; authentic, meaningful contexts, for example case studies, projects, portfolios and self- and peer assessment.
Response to students	Does not necessarily take student needs into account; minimal response; results quantified; usually a score; unhelpful for further learning.	Respect student needs; detailed, individualised and relevant feedback; helpful for further learning.

Table 2.1: Assessment paradigms (continued)

Effects on students	Disempowering, 'victims' of assessment, high levels of anxiety; encourages competition and surface or strategic approaches to learning, students learn to test; emphasises a limited range of competences; exams drive the curriculum; secrecy surrounds the assessment process.	Empowering, active participants in the assessment process, encourages self-assessment, self-reflection, student autonomy and deep approaches to learning; may encourage student cooperation; emphasises higher-order educational outcomes; encourages student choice and, therefore, motivation ; greater transparency in the assessment process.
Interpretation	Quantitative; concern for generalisability, objectivity, reliability; norm-referenced, criteria often implicit; statistical, summative moderation.	Qualitative and quantitative; criterion-referenced; use of graded-assessment criteria (level descriptors); possibilities for formative, qualitative moderation, based on peer review.

Luckett & Sutherland (2000:127-129)

The new constructivist approach to assessment thus moves away from testing as the only way of assessing student performance to a variety of assessment **methods** used to assess student performance and competence. Assessment is, furthermore, viewed as a tool for learning through well-constructed assessment practices, **events** and tasks. Well-prepared assessment practices can also include traditional assessment as part of the assessment process, together with alternative and innovative assessment, which forms part of the learning process.

2.3 PRINCIPLES OF ASSESSMENT

Before any further **investigation** can be done, a thorough investigation of assessment *per se* should be done.

2.3.1 Assessment and learning are integrated

Boud (1990:103) suggests that students' perceptions of the assessment procedures in a course are *the single most important influence on student learning*. Students deem that which is required of them in assignments, tests and examinations as the *"true curriculum"*, and therefore they focus their learning to comply with the assessment requirements that they anticipate (Boud, 1990:103). According to Brown and Knight (1994:12) assessment plays such a significant role in the academic life of students *"... that it is not the curriculum which shapes assessment, but assessment which shapes the curriculum and embodies the purposes of higher education."* The National Plan for Higher Education in South Africa emphasizes an educational reform of assessment:

" ... new trends in higher education demand that generic and applied competences as well as traditional knowledge bases are assessed in higher education. Clearly, conventional ways of assessing students, such as the unseen three-hour exam, are no longer adequate to meet these demands".

Should it be attempted to capture the essence of assessment in one paragraph, it should be noted that there can be assessment for different purposes, i.e. to evaluate the course, the institution, or the student. This study, however, focuses on student assessment.

Assessment is an ongoing process aimed at understanding and improving student learning. It involves making expectations explicit and public; setting appropriate criteria and high standards for learning quality; systematically gathering, analyzing, and interpreting evidence to determine how well performance matches those expectations and standards; and using the resulting information to document, explain, and improve performance. When it is embedded effectively within larger institutional systems, assessment can help us focus our collective attention, examine our assumptions, and create a shared academic culture dedicated to assuring and improving the quality of higher education (Angelo, 1995:7).

"Assessment is defined as the systematic basis for making inferences about the learning and development of students. More specifically, assessment is the process of defining, selecting, designing, collecting, analyzing, interpreting, and using information to increase students' learning and development" (Erwin, 1991:16).

Boud (1995:35) states that students can, with difficulty, escape from poor teaching, but they cannot escape from poor assessment. The assessment strategies of the lecturers influence the way in which the students approach learning. Students often second-guess the assessment that will be employed and use this as their syllabus. They will under-appraise requirements if the assessment tasks allow them to do so ('backwash'). In this sense, Brown and Knight (1994:12) conclude that "... it is not the curriculum which shapes assessment, but assessment which shapes the curriculum...". This implies that lecturers should ensure that the 'true' curriculum is reflected in the assessment tasks (Gravett, 1995:3). If teaching is aligned with assessment, assessment intensifies learning and becomes a senior partner in learning and teaching. Brown and Knight (1994:155) state the following: "Assessment is at the heart of learning. Assessment is for learning. Assessment is learning". Biggs (2000:160) cautions about assessment when he says: "Get it wrong and the rest collapses".

Learning takes place through a deep, surface or strategic approach to learning. In deep learning, the intention is to understand. The students relate ideas and apply abstract and higher-order thinking skills. **Deep learning** is required for the realisation of meaningful learning and critical thought. Deep active learning concentrates on, for example, understanding an author's meaning and showing how an argument is supported by evidence (Entwistle, 1981:85).

Surface learning is aimed at completion of the task requirements. Fear of failure motivates these passive students and they apply low-level cognitive skills and memorise discrete items of information (Entwistle & Ramsden, 1983:16-22).

Strategic students differentiate between desired outcomes and employ either a deep or a surface approach, depending upon their estimation of the situation. These students' approach to a particular learning task is determined mostly by their perceptions of the lecturer's expectations and assessment demands.

The deep, surface and strategic approaches, which are not mutually exclusive, have implications for course design, assessment and feedback. For instance, a surface approach to learning is encouraged by an overload of assessment tasks and assessment methods, which focus on recall and create stress, a lack of sufficient feedback and a lack of interest in and background knowledge of the subject matter (Ramsden, 1992:81; Entwistle & Ramsden, 1983:21). According to Rhem (1995:4), features that incline the students towards a surface approach to learning include an exorbitant amount of material in the curriculum as well as in the course, relatively many class contact hours, a lack of choice over subjects and the method of study, and a lack of opportunities to study subjects in depth.

2.3.2 Assessment forms an integral part of the programme and module design and development process

In order to assist students to master the learning outcomes of a module or programme, the lecturer should make sure that there is an alignment between the assessment tasks, the criteria and the feedback. In the planning of programmes and modules it should be ensured that the assessment tasks fit the learning outcomes (Brown, 2001:4; Dunn, Morgan, Parry & O'Reilly, 2004:214). This implies that assessment should not be viewed as an 'add on'.

From the above discussion, it is clear that assessment is linked to the learning programme. All stakeholders need to provide their input into the design of assessment and the planning of the implementation of CASS.

2.3.3 Assessment needs to be authentic and contextualised

Assessment is judged to be authentic when it requires students to execute real-life tasks. The students, therefore, need to provide an active demonstration of the knowledge in comparison to merely talking or writing about it (Biggs, 2000:151). In this manner it can be ensured that students perceive tasks as worthwhile and relevant.

Sutherland and Peckham (1998:102-103) state that authentic assessment moves the focus of assessment to learning itself. Therefore, the assessors need to consider assessment contexts that the students are likely to come across in real-life situations. For example, open-book examinations offer students the opportunity to analyse and synthesise information under 'real-world' conditions (Candy, Grebert & O' Leary, 1994:151). Other examples of authentic assessment include portfolios, simulations and *in situ* work-place assessments (Sutherland & Peckham, 1998:102). These types of assessment can be documented through observation, anecdotal records, journals, logs, work samples, exhibits and projects (Vinograd & Perkins, 1996:2).

Authentic assessment is contextualised. Biggs (2000:152) states that contextualised assessments like practicums and solving case studies are appropriate to assess functioning or operative knowledge. De-contextualised assessments, on the other hand, are used to assess declarative knowledge, for example a written examination or a term paper. Although both forms of assessment have a place, de-contextualised assessments have been over-accentuated in relation to their role in the curriculum. Functional knowledge is endorsed by declarative knowledge and both should be assessed: the general understanding of how the students use their prior knowledge in real-world challenges. A common error is to assess only the declarative knowledge where students say or write what they have learned, instead of demonstrating it in their performance.

2.3.4 Assessment should be continuous

The distinction between continual assessment and CASS is important. The traditional or continual approach to assessment, also called intermittent assessment, operates traditionally, with the lecturer as the only judge of quality (Luckett & Sutherland, 2000:111; Sutherland & Peckham, 1998:101). It concerns repeated assessments of students at short intervals by using the same or similar techniques, often for summative purposes. Each assessment is viewed independently of other assessments and students receive limited feedback. By implication, continual assessment should be avoided since OBA advocates a variety of assessment methods and multiple assessors. The focus is less on summative assessment and more on formative assessment.

Feedback from each assessment should enhance learning.

CASS is described by The Department of Education (1998(a):9) as an 'ongoing process that measures a student's achievement during the course of a grade or level, providing information that is used to support a student's development and enable improvements to be made in the learning and teaching process'. One of the difficulties involved in implementing CASS is the amount of time spent on keeping a record of every little thing that is noticed. In view of time constraints, lecturers may assess continually rather than continuously. Applying continual assessment enables lecturers to keep a progress record without sacrificing too much time.

CASS implies a cyclical process which contributes to the development of a multi-faceted, holistic understanding of the student rather than a repeated process. Continuous summative assessment is based on integrated assessment. When applying CASS in a summative manner, it should summarise the evidence about students by exercising professional judgement. This does not imply the addition of a series of test marks which are all of an equal weight (Luckett & Sutherland, 2000:111).

2.3.5 The multiplicity of purposes of assessment

The three purposes of assessment will be briefly discussed.

2.3.5.1 Diagnostic assessment

Diagnostic assessment is used to diagnose or determine the strengths and weaknesses of students:

- The student's prior knowledge to plan learning experiences based on existing knowledge.
- Whether the students have the potential to gain access to a specific learning programme.
- The required remedial action to enable the progress of the students (Luckett & Sutherland, 2000:101).

The data obtained from diagnostic assessment should be used in the planning process of a programme or module and to provide student support where necessary.

2.3.5.2 Formative assessment

Formative assessment occurs on a daily basis during the process of teaching and learning (SAQA, 2001:26). It informs the teaching-learning process and concentrates on learning from assessment. The methods used in formative assessment can be timesaving because methods such as peer, self and group assessments can be employed (Baume, 2001:8).

2.3.5.3 Summative assessment

Summative assessment is used to make judgements about student achievement. This takes place when the student is ready to undergo assessment at the end of a learning experience in order to determine whether the student has mastered the learning and can be judged to be either competent or not yet competent (SAQA, 2001:26).

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Assessment should comply with the following principles:

2.3.6 Assessment should be criterion referenced

In criterion-referenced assessment, pre-determined or pre-stipulated criteria or standards are used for the judgement of a student's performance. In norm-referenced assessment the students' performances are compared with that of their peers (CHE, 2003:112-113). Criterion-referenced assessment tends to be more transparent due to its explicitly stated criteria.

2.3.7 Assessment should be reliable

Consistency in assessment, including the administration of the assessment processes, indicates that the assessor makes the same judgement in the same or similar contexts

when assessment is conducted (SAQA, 2001:18). Reliability in assessment also refers to a situation where a different assessor would make the same judgement for the same assessment task.

2.3.8 Assessment should be valid

The CHE (2003:113) states that the validity of assessment is concerned with the appropriateness, usefulness and meaningfulness of the deductions made from the assessment results. In other words, it needs to be ascertained that what is intended to be assessed is assessed and that the intentions are justifiable.

2.3.9 Assessment should be fair

Fairness in assessment indicates that no student is in any way impeded or advantaged in the assessment process. Issues such as inequality of opportunities, resources ethnicity, gender, age, disability, race and social class should have no influence on the judgement made of the student's performance in the assessment task (SAQA, 2001:16).

2.3.10 Assessment should include a wide range of methods, techniques and tools

Ramsden (1988:24), Biggs (1993:80) and Boud (1990:103) argue that students' perception of the assessment procedures in a programme is the one most important influence on their learning. Brown, Bull and Pendlebury (1997:6) support this view and argue that "if you want to change student learning, then change the methods of assessment". Different outcomes should be assessed by different methods. Different methods are used to assess process and product. The effectiveness of an assessment method relies not upon the method *per se*, but upon the learning outcomes to be assessed (Brown, 2001:10). Self assessment and peer assessment can be used with any method or instrument (tool). By implication, the lecturers need to be informed about

the different methods so that they do not keep to a single traditional-assessment method.

2.3.11 Assessment should provide communication and feedback to support the learning process

The communication and feedback that are provided throughout the assessment process enable the students to perform to the best of their abilities. Dunn *et al.* (2004:250) recommend that the rationale of the assessment task should be explained. The lecturers must inform the students about the required resources, library procedures, duration of the assessment session, venue, time and assessment methods. The more clarity that is provided on assessments, the less likely it is that appeals against assessment decisions will be lodged by the student (SAQA, 2001:52).

The purpose of feedback is to motivate the students and inform them on how well they have done and how to improve (Brown, 2001:17). Rowntree (1987:24) regards feedback to be so indispensable that he calls it "the life-blood of learning". However, some students who receive feedback that their progress is not at the same rate as their peers may feel demotivated (Kyriacou, 1995:108). Therefore, the manner in which feedback is provided will influence what the students will gain from it.

Feedback is the most effective if it is timely, seen as relevant and meaningful, and if it presents improvement strategies that are within the student's grasp (Brown, 2001:17). Feedback should relate to the learning. Assessment requires sufficient formative feedback in order for students to remedy deficiencies. Other requirements are that feedback should be positive, detailed, participative, honest and fair, descriptive, understandable and specific (Brown, Race & Smith, 1996:31-32; Wiggins, 1998:46). The assessors ought to provide detailed feedback depending on the time limits and should consider instantaneous feedback.

Feedback on self assessment can be very powerful. Feedback does not only involve the students' work, but also their thinking (reflection). When students have over-estimated their own work, Brown (2001:14) suggests that the feedback from lecturers needs to be relatively gentle and explanatory rather than accusatory. This will help

students to keep faith in the value of self-assessment. On the other hand, students gain confidence when they have underestimated their worth and the lecturer's feedback encourages them.

The different forms of feedback should match the different purposes of assessment. These purposes need to be placed within the context of the learning outcomes and the assessment criteria that are applied. For example, the assessors provide "feedout" (Baume, 2001:3, 7) in the shape of a grade (summative purpose), justify the grade (summative and formative purposes) and then assist students to learn further (formative purpose). Formative assessment aims to provide constructive and developmental feedback to improve learning.

Although students, unfortunately, do not always read, let alone use the feedback provided, Brown (2001:18) and Gibbs (1999:46) argue that they do tend to pay more attention to feedback that has a social dimension, such as having a face-to-face meeting with the lecturers about their work or conducting peer assessments. Returning assessed work with comments but no grades, and asking the students to work out what their score should be, will induce them to read the comments (Brown, Race & Smith, 1996:18).

Feedback should at all times be communicated in a way that will enhance learning. Lecturers need to teach the students how to give, receive and use the feedback, and check afterwards that they have done it. Management and quality assurance bodies should devise ways as to how students can gain access to their assessments so that the feedback is available when they need it.

2.3.12 Quality assurance should be an integral part of assessment

Assessment should at all times adhere to the quality assurance criteria for assessment, as set out by the Higher Education Quality Committee HEQC (CHE, 2003:25-26) in the following criteria for programme accreditation:

- Assessment is recognised and used as a key motivator of learning and as an

integral part of the teaching and learning process, to inform teaching practice and to improve the curriculum.

- The students' learning achievements are internally assessed by the lecturers responsible for teaching a course/module in terms of a system that includes internal moderation.
- Appropriately qualified people, who have been appointed in terms of clear criteria, externally examine the students' learning achievements on the exit level of a qualification and conduct their responsibilities in terms of clear guidelines.
- The assessment system is rigorous and secure.

The quality of assessment can be assured by monitoring the following:

- Sufficient diversity of assessment methods applied.
- The encouragement of deep, active and reflective learning via assessment.
- The provision of opportunities for students to apply their knowledge and understanding to different problems and contexts.

It is clear from the preceding that lecturers, as programme designers, should understand the fundamentals of assessment in order to address the demands of quality assessment for a student population which has grown considerably in numbers and is more diverse than in the past. The criteria of the CHE will assist lecturers to identify and disseminate good practices of assessment in their programmes.

As continuous assessment forms an integral part of programme and module design and involves a wide range of methods, techniques and tools, it needs to be planned and managed at different levels: institutional, faculty, programme and learning unit/module. In the next section, the implementation of continuous assessment will be discussed.

2.4 THE IMPLEMENTATION OF CONTINUOUS ASSESSMENT

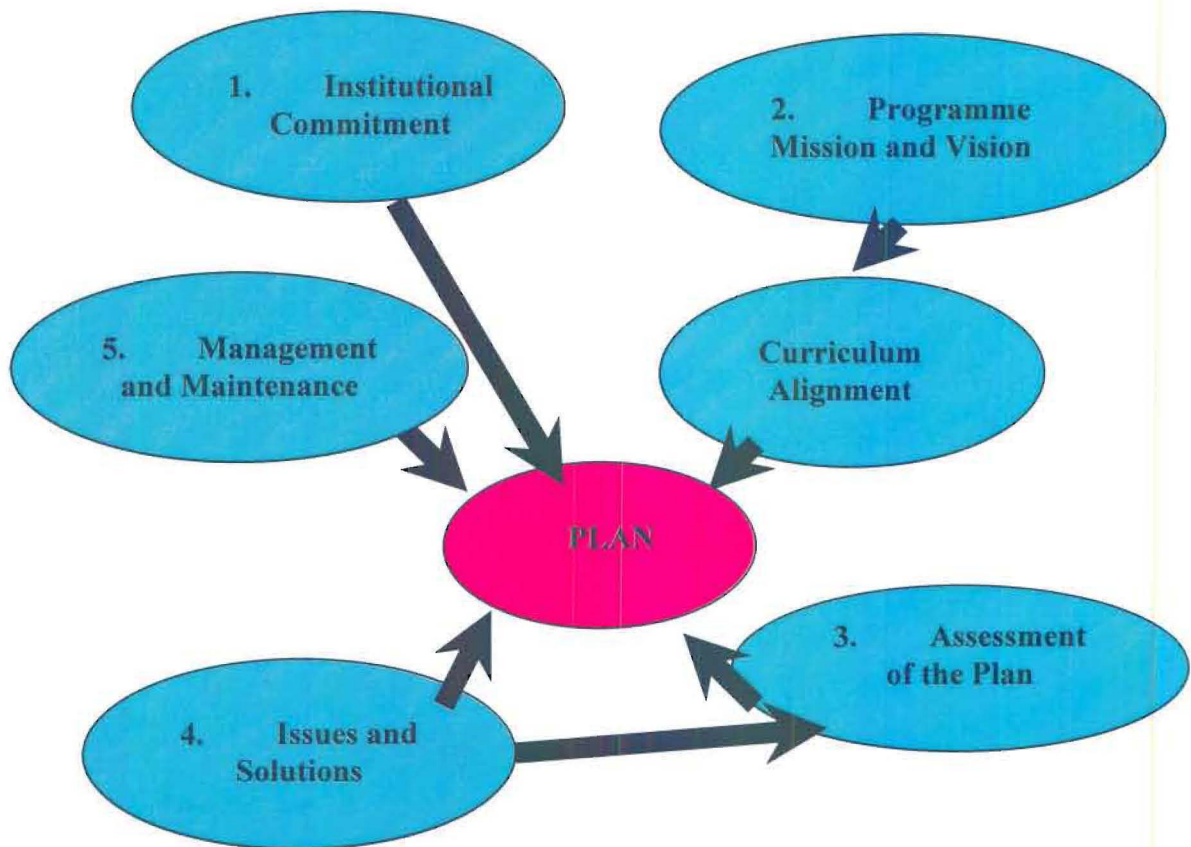
In order to implement CASS, both an assessment plan (per subject/ module/ department) and an assessment strategy for the faculty and institution need to be put in place.

In the event of planning to implement an assessment plan based on the theoretical expositions given in the foregoing discussions, certain strategies need to be considered and implemented to ensure the smooth working of the assessment event in the programme. The most important aspects that should be considered are:

- institutional commitment;
- programme mission and vision and alignment of the curriculum;
- evaluation/assessment of the assessment plan;
- issues and solutions; and
- management and maintenance of the assessment plan.

In Figure 2.1 these aspects are represented diagrammatically in a conceptual model:

Figure 2.1: A conceptual model of aspects influencing the CASS-plan



2.4.1 Institutional commitment

According to Sell (1989:22), individuals with recognised authority, leadership and expertise must firstly be involved in the process of assessment. Institutionalising the assessment function helps to legitimatise its authority. Secondly, the costs incurred by assessment can better be demonstrated if the effect thereof is understood right from the outset by the authorities.

Apart from the involvement of the university authority, the satisfaction and buy-in of staff are very important factors to consider. The proposed conceptual model, depicted in Figure 2.2, was developed from a literature review that identified factors associated with lecturers' involvement in and satisfaction with student assessment. The model, borrowing from a prior literature review done by Peterson and Einarson (2000) and Peterson, *et. al.*, (2000), identifies institutional factors that may be related to lecturer involvement in and satisfaction with institutional- and classroom-based student assessment.

Figure 2.2: A conceptual model of factors influencing staff involvement in continuous assessment

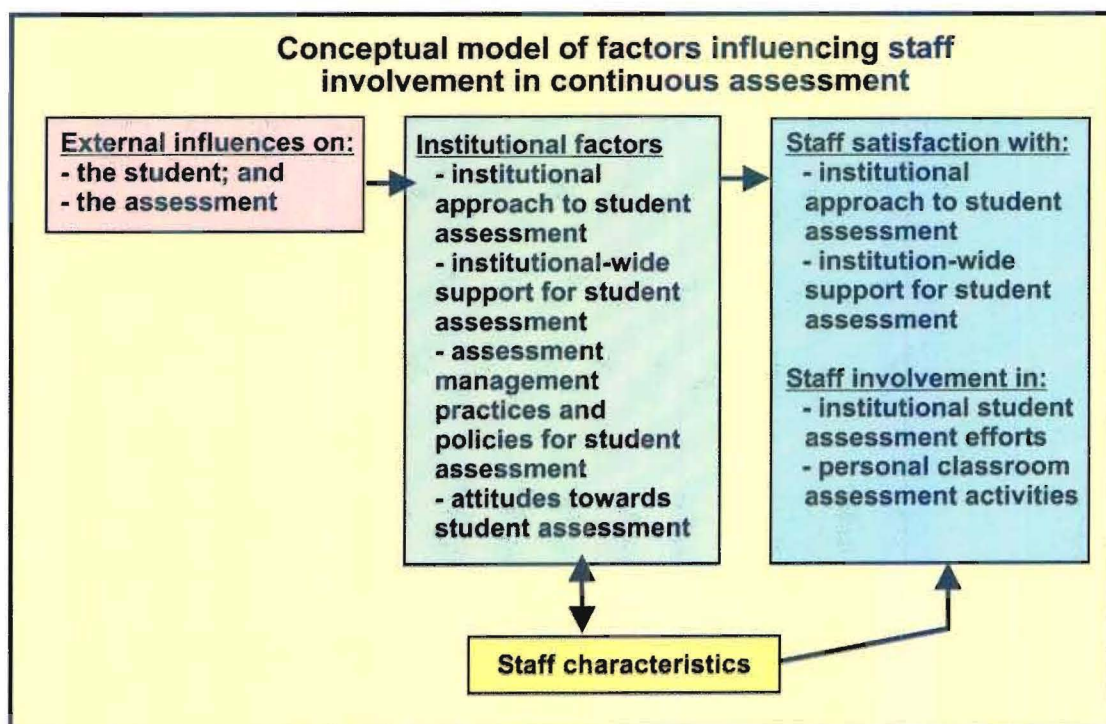


Figure 2.2 indicates which external influences, institutional factors, staff characteristics, together with satisfaction and involvement in their institution's and their own classroom assessment of students, will support assessment efforts (Peterson & Grunwald, 2002:4).

In the light of the above, it becomes clear that the institution should give attention to:

- acceptance of the principles of OBE and CASS;
- the training of staff in assessment approaches;
- training of staff in the writing of student learning outcomes, as well as the associated assessment criteria; and
- development of an assessment policy.

The level of attention given to the above issues would indicate the involvement in and acceptance of the implementation of CASS as a viable method of evaluation of student performance and using the results for promotional purposes.

2.4.2 Programme mission and vision and alignment of the curriculum

All programmes offered within an institution need to be aligned to the mission and vision of the institution and is reflected in the institutional programme and qualification mix (PQM) as accredited by the DoE.

2.4.2.1 Programme mission and vision

According to the resource document Improving Teaching and Learning Number 5 of the CHE (2004:4), high quality conceptualisation and design of a programme and its qualification are the first steps towards achieving high quality educational provision. Academics need to deliberate and decide on the following:

- How to meet the needs of their target student population.
- The *vision, mission* and *plans* of their institutions.
- The demands of their discipline(s).
- The various external stakeholders to whom they are accountable.

The clear definition of the purpose of a programme, its knowledge base, the exit-level learning outcomes of its qualification and the associated assessment criteria, provide key reference points to be used in the alignment of a programme.

In order to align the programme curriculum, curriculum design also needs to be informed by *explicit* learning theory, in the sense that higher education should plan to teach according to the way(s) in which it is known that students learn. Learning can be defined as conceptual change – change in the way the student sees the world and change in the student's cognitive structure (ANON, CHE Resource No 1, 2004:8). Such a definition draws on a 'constructivist' view of learning. A constructivist approach posits students as innovative thinkers and emphasises that meaning is created by the student, through the student's learning activities (active learning). To facilitate this meaning-making by students, lecturers need to make the purpose and outcomes of learning tasks clear, motivate students to achieve these and provide a sound content and conceptual base. Academics also need to make learning activities and opportunities available so that students may interact with others regarding the learning tasks. According to the constructivist conception of learning, the emphasis of teaching should always be on developing student understanding. The associated curriculum challenge is, therefore, to determine what selection of content and kinds of teaching-learning activities are required in order for students to attain the kinds of understandings intended (ANON, CHE Resource No 1, 2004:8).

2.4.2.2 Alignment of the curriculum

A key principle underpinning a constructivist approach to curriculum design is that of curriculum alignment (Biggs, 1999:75). This means that content, teaching-learning activities and assessment methods should all support students in the attainment of the specified learning outcomes. In other words, all four dimensions of the curriculum, that is content, learning outcomes, teaching-learning activities and assessment, should be mutually supportive.

According to CHE Resource No 5 (ANON, 2004(b):6), an emphasis on assessment, reinforced by the modularisation of the curriculum, can lead to *over*-assessment and the consequent over-burdening of staff and students alike. This tendency can be countered by a judicious and strategic use of assessment for clearly defined purposes. For example, summative assessment can be spread across a module using a range of methods, such as projects and assignments, to alleviate the heavy weighting and high stakes traditionally attached to examinations at the end of the module. The use of structured and supported peer and self assessment for formative purposes lightens the marking burden on staff and enables students to gain a better grasp of the meaning of the assessment criteria. 'Good fit' usually requires a diversification of assessment methods and practices within a course, which, in turn, can alleviate the burden of over-assessment and accommodate a wider range of learning and teaching styles (ANON, CHE Resource No 5, 2004(b):6).

The emphasis on the principle of curriculum alignment suggests that assessment methods and tasks should be aligned with the content and skills taught in the module. In other words, care should be taken to ensure that assessment tasks do indeed test for the attainment of learning outcomes that were specified for the module. This involves making explicit the learning outcomes and levels of knowledge, understanding and skills one intends students to achieve and then designing assessment instruments that will effectively test students' attainment of these outcomes. More specific 'assessment criteria' can be designed for each assessment task (ANON, CHE Resource No 5, 2004(b):7).

Alignment of the curriculum and the implementation of CASS necessitate the implementation of an outcome-based education strategy.

2.4.2.2 Outcome-based education

Higher education can play a pivotal role in the political, economic and cultural reconstruction and development of South Africa (Department of Education, 1997:5; NCHE, 1996:7). In order to do so, a process of review and renewal began in August 1995. From the outset, emphasis was placed on a shift from the traditional content-driven approach to OBE. The NQF is used as an instrument to achieve the following requirements pertaining to programmes (the sequential learning activities leading to the award of particular qualifications) (SAUVCA, 1999:4):

- be planned, coherent and integrated;
- add value to and build contextually on students' existing frames of reference;
- be student-centred, experiential and outcomes-oriented;
- develop attitudes of critical inquiry and powers of analysis; and
- prepare students for continued learning in a world of technological and cultural change.

Although various implementation strategies of OBE in higher education exist, the unique situation of each higher education institution (HEI) must be acknowledged. None of the OBE implementation strategies can categorically be implemented at universities of technology. Owing to a potential problem of incommensurability, a conglomerate of parts of these strategies is also not advisable. Therefore, universities of technology have to develop their own OBE implementation strategies. However, being informed by these other strategies, the universities of technology do not have to reinvent the wheel. For the sake of clarity, the concept of OBE will first be analysed. Instead of discussing existing strategies, a possible implementation strategy of OBE at a university of technology will be outlined.

Outcomes in OBE can be defined as follows:

- Outcomes are the contextually demonstrated end-products of the learning process and, therefore, demonstrably assessable, in context, to qualify students (often a balanced and judicious use is made of an acceptable number of outcomes as proxies for the others).
- Critical outcomes are generic outcomes which inform all teaching and learning and should inform all education and training.

- Learning outcomes are contextually demonstrated knowledge, skills and values which support one or more critical outcomes.
- Exit level outcomes are achieved by a qualifying student at the point at which he or she leaves the programme leading to a qualification (SAUVCA, 1999:8).

In order to obtain a qualification, students must show evidence that they have achieved the stated outcomes. The NQF refers to the concept of applied competence, namely the ability to put into practice, in the relevant context, the learning outcomes acquired in order to obtain a qualification (SAUVCA, 1999:9). This involves three inter-connected kinds of competence:

- **Reflexive competence** is the demonstrated ability to integrate or connect the student's performances and decision-making with his/her understanding so that he/she learns from his/her actions and is able to adapt to change and unforeseen circumstances.
- **Foundational competence** is demonstrated understanding of what the student or others are doing and why.
- **Practical competence** is the demonstrated ability to consider a range of options and make decisions about practise grounded in foundational competence.

As set out in the preamble of the Higher Education Act, 1997, the implementation strategy of OBE at universities of technology must adhere to certain requirements. It is stated that institutions providing higher education should:

- redress past discrimination and be representative;
- provide optimal opportunities for learning and the creation of knowledge;
- promote the values which underlie an open and democratic society, based on human dignity, equality and freedom;
- respect freedom of religion, belief and opinion;
- respect and encourage democracy, academic freedom, freedom of speech and expression, creativity, scholarship and research;
- pursue excellence, promote the full realisation of the potential of every student and employee, tolerance of ideas and appreciation of diversity;

- respond to the developmental needs of the country and of the communities served by the institutions;
- contribute to the advancement of all forms of knowledge and scholarship, in keeping with international standards of academic quality; and
- enjoy freedom and autonomy in their relationship with the state within the context of public accountability and the national need for advanced skills and scientific knowledge.

The above requirements imply first of all that a culture susceptible to OBE must be cultivated. Commitment to such a process should be reflected in the acceptance of the Transformation Charter and the Mission Statement of a university. The Total Quality Management Office and the Unit for Lifelong Learning *inter alia* should advance such a culture by promoting the achievement of excellence, instead of adhering to minimum standards, and encouraging continuous improvement. All efforts in all departments to cultivate a susceptible culture should be recorded, coordinated and supported. Where lack of support exists, processes should be facilitated to improve the situation.

The above requirements, furthermore, imply a systems approach, which entails consultation with the wider community served by the university.

As demonstrated by the above requirements, lecturers should be involved in formulating task descriptions of typical processes, content, products and the like, which they would employ to achieve outcomes, the compilation of concept programmes to guide teaching and learning, as well as the design of learning and supporting material. These task descriptions should be continuously evaluated and adjusted as needed. A survey should be launched to determine where OBE is already practiced and pilot projects should be identified, conducted and published. In this sense, the university's library has an important enlightening role to play. Similarly, the university's Department of Community Service can raise the consciousness to practical problems existing in the community, its Department of Teaching Development can expose lecturers to creating alternative learning experiences, and its Examination Office can facilitate alternative assessment methods, and so forth. Where

OBE is not implemented yet, lecturers should be empowered in order to take responsibility for these processes through training sessions. These sessions should also be conducted for all new lecturers at the university.

While certain requirements are set nationally, the implementation of OBE at a specific university of technology could become very expensive in terms of effort, time and money (SAUVCA, 1999:4). Therefore, it must be managed well in terms of quality, time, costs and other resources. The process of continuous improvement, even after all programmes have been registered on the NQF, necessitates the centralisation of these processes. A curriculum framework that expresses the outcomes that students must demonstrate in the various programmes, the criteria for assessment and a description of scope should, therefore, be developed. This process could be located within a Department of Curriculum Development.

2.4.3 Evaluation/assessment of the assessment plan

In order to manage the CASS-process at a university of technology, in terms of quality, time, costs and other resources, a CASS-policy, as part of the overall assessment policy, should be put in place. This should, furthermore, be supported by an assessment strategy.

Assessment plays a key role in helping a university to improve its processes and to achieve its mission. During the past decade both state legislature and accrediting bodies, like the HEQC, have begun to require of universities to provide evidence that they are fulfilling their stated mission. Demonstrating that the goals of educational programmes are met is usually linked to the assessment of outcomes.

Banta (1997:80) summarises an assessment programme into nine principles of good practice. If a programme's assessment plan adheres to these principles it is deemed to be good practice:

- **Principle 1: The assessment of student learning begins with educational values.** Assessment is not an end in itself but a vehicle for educational improvement. Its effective practice, then, begins with and enacts a vision of the kinds of learning most valued for students and how they will be assisted to achieve it. Educational values should drive not only **what** is chosen to assess but also **how** it is done. Where questions about educational mission and values are not asked, assessment threatens to be an exercise in measuring what is easy, rather than being a process of improving what we really care about (Banta, 1997:80).
- **Principle 2: Assessment is most effective when it reflects an understanding of learning as multidimensional, integrated and revealed in performance over time.** Learning is a complex process. It entails not only what students know but what they can do with what they know; it involves not only knowledge and abilities but values, attitudes and habits of mind that affect both academic success and performance beyond the classroom. Assessment should reflect these understandings by employing a diverse array of methods, including those that call for actual performance, using them over time so as to reveal change, growth and increasing degrees of integration. Such an approach aims for a more complete and accurate picture of learning and, therefore, firmer bases for improving students' educational experience (Banta, 1997:80).
- **Principle 3: Assessment works best when the programmes it seeks to improve have clear, explicitly-stated purposes.** Assessment is a goal-oriented process. It entails comparing educational performance with educational purposes and expectations (outcomes), which are derived from the institution's mission, from lecturers' intentions in programme and course design, and from knowledge of students' own goals. Where programme purposes lack specificity or agreement, assessment as a process pushes a campus towards clarity about where to aim and what standards to apply, and prompts attention to where and how programme goals will be taught and learned. Clear, shared goals that are possible to implement are the cornerstone for assessment that is focused and useful (Banta, 1997:81).

- **Principle 4: Assessment requires attention to outcomes, but also and equally to the experiences that lead to those outcomes.** Information about outcomes is of high importance; where students 'end up' matters greatly. But to improve outcomes, we need to know about student experience along the way; that is, about the curricula, teaching and kind of student effort that leads to particular outcomes. Assessment helps in understanding which students learn best under what conditions, and with such knowledge comes the capacity to improve the whole of their learning (Banta, 1997:81).
- **Principle 5: Assessment works best when it is ongoing and not episodic.** Although isolated, 'one-shot' assessment can be better than none, assessment is a process which power is cumulative. However, improvement over time is best fostered when assessment entails a linked series of cohorts of students. This might mean collecting the same examples of student performance or using the same instrument semester after semester. The point is to monitor progress towards intended goals in a spirit of continuous improvement. Along the way, the assessment process itself should be evaluated and refined in light of emerging insights (Banta, 1997:81).
- **Principle 6: Assessment fosters wider improvement when representatives from across the educational community are involved.** Student learning is a campus-wide responsibility, and assessment is a way of enacting that responsibility. Thus, while assessment efforts may start small, the aim over time is to involve people from across the educational community. Lecturers play an especially important role, but assessment's questions can not be fully addressed without participation by lecturers, librarians, administrators and students. Assessment may also involve individuals from beyond the campus (alumni, trustees, employers) whose experience can enrich the sense of appropriate aims and standards for learning. Thus understood, assessment is not a task for small groups of experts but a collaborative activity (Banta, 1997:81).
- **Principle 7: Assessment makes a difference when it begins with issues of use and illuminates questions that people really care about.** Assessment recognises the value of information in the process of improvement. But to be useful, information must be connected to issues or questions that people really

care about. This implies assessment approaches that produce evidence that relevant parties will find credible, suggestive and applicable to decisions that need to be made. It means thinking in advance about how the information will be used, and by whom. The point of assessment is not to gather data and return 'results'; it is a process that starts with the questions of decision-makers, which involves them in the gathering and interpreting of data, and that informs and helps to guide continuous improvement (Banta, 1997:82).

- **Principle 8: Assessment is most likely to lead to improvement when it is part of a larger set of conditions that promote change.** Assessment alone changes little. Its greatest contribution comes on those campuses where the quality of teaching and learning is visibly valued and worked at. On such campuses, the push to improve educational performance is a visible and primary goal of leadership, and improving the quality of education is central to the institution's planning, budgeting and personnel decisions. On such campuses, information about learning outcomes is seen as an integral part of decision-making and avidly sought (Banta, 1997:82).
- **Principle 9: Through assessment, lecturers meet responsibilities to the students and to the public.** There is a compelling public stake in education. Lecturers have a responsibility to the public that supports or depends on them to provide information about the ways in which students meet goals and expectations. Those to whom lecturers are accountable have a corresponding obligation to support such attempts at improvement (Banta, 1997:82).

2.4.4 Issues and solutions

Even when institutions attempt to implement the nine principles of good practice in assessment and the suggestions above, stumbling blocks are sure to arise. According to Banta (1997:88), the most significant barrier to implementing effective assessment is the lack of lecturer support. It is stated that if lecturers are to be involved in assessment, they must believe in the usefulness of the process and understand the theoretical bases of its activities. Without this understanding staff will not appreciate the role of assessment in achieving their goals and that of the university. The

usefulness of the process will be reduced because some staff will only do routine-assessment activities that actually waste their time and effort. Thus, lecturers should be trained and developed to become assessors in the true sense of the word.

Banta (1997:88) also infers that changes in leadership and staff may make it difficult to sustain assessment efforts and, therefore, assessment plans must be well documented. It is stated that new staff members come from different countries and backgrounds and bring different understandings, beliefs and experiences to outcomes assessment and, thus, also to CASS.

In order to overcome this difficulty, it is proposed that the following methods be used:

- Workshops on selected issues.
- Meetings and discussions on assessment issues.
- Forming assessment committees at university and departmental levels.
- Distributing relevant materials that address outcomes and CASS assessment issues.
- Providing staff with detailed guidelines on how to conduct CASS, fill in reports and analyse data.

Another barrier mentioned by Banta (1997:89) is the serious limitation of assessment tools and methods. According to Banta, no instrument is perfectly reliable or valid; however, instead of seeing this as a barrier, lecturers should rather attempt to make use of multiple measures.

Involvement and student support and acceptance of the assessment process could also be a stumbling block. Students must be convinced of the value of CASS and the use of assessment data to improve learning and programme design. The educational outcomes assessment plan includes many activities that need full student participation. According to Banta (1997:89) a lack of motivation has been observed among students if they are not familiar with such activities or if they feel that there is no direct benefit to them. To overcome this, it should be ensured that the time of assessment is selected in such a way that it is acceptable to all participants and to make sure that the students understand clearly what the outcomes of the activity are

before it is started.

2.4.5. Management and maintenance of the programme, assessment plan and assessment strategy

The planning, management and resourcing of academic programmes and the assessment of these programmes are key focus areas for managing quality at any higher education institution (HEI). Without sound planning and adequate resourcing, programmes will fail to meet the needs of students and other stakeholders, and without good management the implementation and ongoing improvement of programmes are impaired. Furthermore, the review of programmes becomes very difficult if adequate planning and design of the programmes have not been done beforehand. The quality of the planning, design and management of academic programmes, including assessment, is thus an important indicator of the effectiveness of educational provision (CHE. 2004:4).

According to Argyris (1999:12), the monitoring of the assessment plan is the point where leadership in assessment merges into management of assessment. 'Doing things right' takes over the priority from 'doing the right things'.

This involvement of management in the assessment task leads to the creation of a total culture of assessment and is permeated through the establishment of an assessment strategy for the whole institution.

The assessment strategy should indicate the roles and responsibilities of the people and committees involved in implementing and monitoring the strategy. The task of the Head of the Department is then to ensure that the strategy is working through reports, meetings and discussions of all the involved parties. Existing reporting arrangements may be suitable but it should be checked and, if necessary, new ones should be created. A common weakness here is the failure to close the feedback loop. External examiners and students may have commented on an aspect of assessment, it

may have been considered and even acted upon, but the stakeholders are not informed (Argyris, 1999:13).

According to Rowntree (1987:24), evaluation provides a measure of the match between the 'espoused' assessment strategy and 'the strategy in action'. The evaluation may be based upon the analyses of student achievements, students' views and the views of other stakeholders, such as external examiners, members of the department and, perhaps, employers. This evaluation is primarily concerned with the following questions:

- Is the assessment strategy working?
- How has it made a difference to the quality of assessment in the department?
- Does it need improving?
- What support is needed to improve it?

The evaluation should lead to consequential actions. These are usually concerned with changing the assessment strategy in action but, *in extremis*, one might need to change the espoused assessment strategy *per se* (Rowntree, 1987:24).

In order to try and conceptualise the total process of CASS implementation, it is of importance to set up a conceptual framework for the assessment and CASS-process so as to understand all the implications thereof.

2.5 CONCEPTUAL FRAMEWORK

The aforementioned assessment strategy can now be reflected in a conceptual framework of guidelines as to how the process should be managed.

The conceptual framework describes the purpose and scope, rationale, key concepts, nonnegotiable principles, and practical implications and procedures emanating from those principles followed by the prerequisites or parameters or conditions. Some principles that do not form the core of this study have been omitted.

2.5.1 Purpose and scope

The conceptual framework aims at informing policy makers that formulate the current teaching and assessment policy at universities of technology. It further aims to inform lecturers and departmental heads involved in assessment practices. The framework will be applied to undergraduate students, involved in CASS, at universities of technology.

2.5.2 Rationale

Within the OBET paradigm, assessment is viewed as a means to an end, and is integrated into the teaching and learning process rather than being affixed to it as a subsidiary addition. In doing so, assessment should enhance learning. Massification in higher education influences the framework, as different target groups bring different perspectives to the fore.

2.6 CONCLUSION

In conclusion, both the maintenance of a good CASS plan and the CASS strategy will depend on the answers to the following questions that are based on the self-evaluation process prescribed by the CHE (CHE. 2004(b):8-9). These questions should be used in the self-evaluation of the quality of an institution, faculty or programme's assessment plan for student learning:

- Does the institution have an assessment policy and effective procedures for guaranteeing its implementation? To what extent do the policy and procedures ensure academic and professional standards in the design, approval, implementation and review of assessment strategies for subject/courses/programmes and for the qualifications awarded?
- How does the institution moderate and validate its assessment procedures and results in order to ensure their validity and reliability, and the integrity of the qualifications it awards? To what extent are the views of the students and other key stakeholders solicited?

- To what extent are the lecturers who are responsible for official decisions on assessment appropriately trained, experienced and competent to assess? What staff-development opportunities does the institution offer its teaching staff in order to improve assessment and make it a professional practice?
- To what extent are institutional/faculty/professional rules and regulations governing the assessment adhered to? To what extent is assessment conducted securely and with rigour and fairness?
- To what extent are the principles, procedures and practices of assessment explicit, valid and reliable?
- To what extent are assessment decisions recorded and documented securely, accurately and systematically over time?
- To what extent are the assessment methods and tasks aligned to the learning outcomes, content and teaching–learning activities of the programme/subject/course/ module?
- To what extent are the purposes for which assessment is used explicit and appropriate? To what extent are assessment data and results used for developmental purposes – to adjust teaching and assessment practices and to improve the curriculum?

In this chapter the various theories pertaining to assessment and CASS were discussed. A conceptual framework, based on the theoretical discussion, consisting of the purpose and scope and rationale was described.

Chapter 3 focuses on models for the management of the implementation of a continuous assessment plan. A brief overview of national and international trends in managing assessment and CASS in particular will be given.

CHAPTER 3

MODELS FOR THE MANAGEMENT OF THE IMPLEMENTATION OF A CONTINUOUS ASSESSMENT PLAN

3.1 INTRODUCTION

As stated in Chapter 2, the following are the essential steps for an institution that wishes to embark on a process of continuous assessment and the development of an assessment plan:

- acceptance of the principles of OBE and CASS;
- training of staff in assessment approaches;
- training of staff in the writing of student learning outcomes, as well as the associated assessment criteria (assessment standards);
- development of an assessment policy;
- development of an assessment plan for each of the programmes involved; and
- development of an assessment strategy for the university.

In order for a continuous assessment plan to be developed, a choice of a suitable model for the management of the process of assessment needs to be constructed.

In this chapter different models that could possibly be used in the management of the implementation of a continuous assessment plan for a department or programme within a university of technology will be explored and discussed. In accordance with the aim of this study, this chapter strives to investigate possible models for the management of educational processes, together with, in a broader sense, possible management models, for the purpose of developing a model for the management of

the implementation of a continuous assessment plan for a department or programme within a university of technology

3.2 AN OVERVIEW OF DIFFERENT MODELS AND TYPES OF MODELS FOR THE MANAGEMENT OF EDUCATIONAL PROCESSES

As assessment and, therefore, CASS is an essential and integrated part of the teaching-learning process, some models for the management of the teaching-learning processes should also be considered.

3.2.1 Transactional models for the management of the *teaching/learning* process

Many researchers have tried to put together classroom- or school-based models that describe the teaching-learning process. A model is a visual aid or picture which highlights the main ideas and variables in a process or a system. The models presented in this study - models for the *management* of assessment and the *implementation* thereof as integrated part of the teaching-learning process - include words or diagrams intended to give an understanding of the variables associated with learning, especially as measured by scores on standardised tests of basic skills. The main models that will be discussed and compared are the models of Carroll (1963:723), Proctor (1984:469), Cruickshank (1985:91) and Huitt (1995:34).

3.2.1.1 Carroll's Model

Most current models that categorise the variables or explanations of the many influences on educational processes today stem from Carroll's (1963:723) seminal article defining the major variables related to learning. Carroll specialised in language

and learning, relating words and their meanings to the cognitive concepts and constructs which they create (Klausmeier & Goodwin, 1971:41). According to Carroll's model, time is the most important variable to learning. A simple equation for Carroll's model is:

Learning = f(time spent/time needed).

Carroll (1963:725) explains that **time spent** is the result of **opportunity** and **perseverance**. **Opportunity**, in Carroll's model, is determined by the classroom lecturer; the specific measure is called **allotted** or **allocated time** (time allocated for learning by classroom lecturers). **Perseverance** is the student's involvement with academic content during that allocated time. Carroll proposes that perseverance should be measured as the percentage of the allocated time that students are actually involved in the learning process and is labelled **engagement rate**. **Allocated time multiplied by engagement rate** produces the variable Carroll proposes as a measure of time spent, which came to be called **engaged time** or **time-on-task**.

Carroll (1963:728) proposes that the **time needed** by students to learn academic content is contingent upon **aptitude** (the most often used measure is IQ), **ability to understand** the instruction presented (the extent to which they possess **prerequisite knowledge**) and the **quality of instruction** students receive in the process of learning. According to Carroll, these specific lecturer and student behaviours and student characteristics are the only variables needed to predict learning; he does not include the influences of family, community, society and the world that other authors, discussed below, have included.

The principles of this model can be seen in Bloom's (1971:23-28) Mastery Learning model. Bloom, a colleague of Carroll's, observed that in traditional schooling a student's aptitude for learning academic material (IQ) is one of the best predictors of school achievement. His research demonstrated that if time is not held constant for all students (as it is in traditional schooling), then a student's mastery of the prerequisite skills, rather than aptitude, is a better predictor of school learning. Mastery Learning's basic principle is that almost all students can earn A's if:

- students are given enough time to learn **normal** information taught in school; and
- students are provided quality instruction.

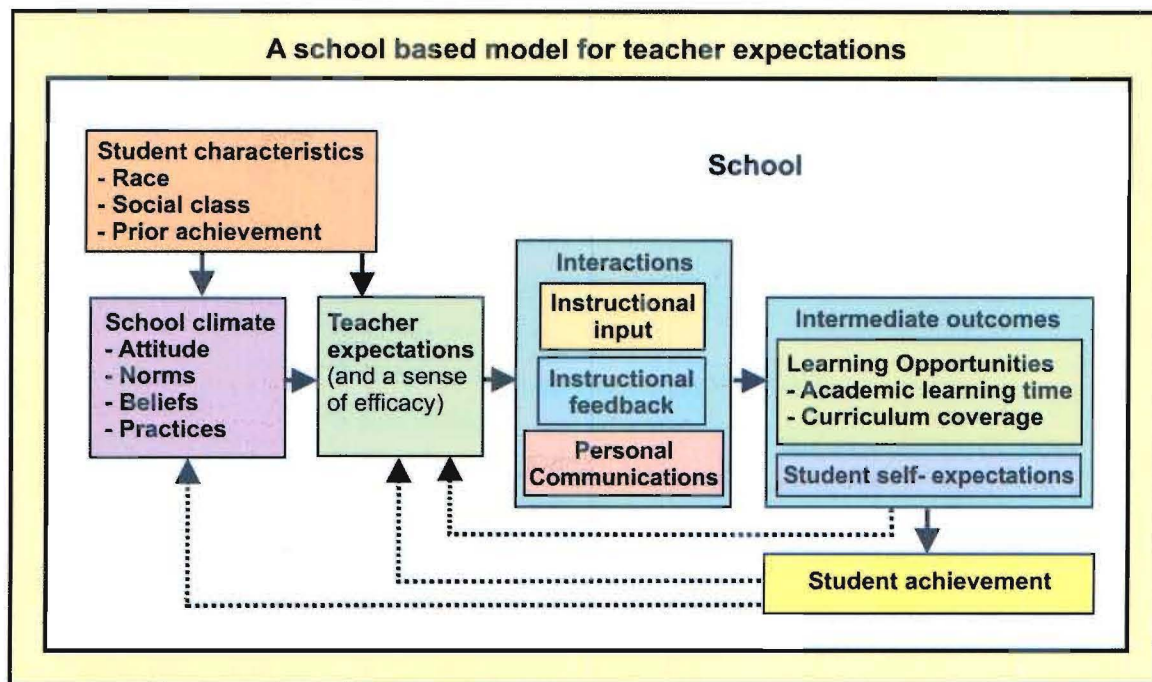
Carroll's model thus stresses the necessity to **manage time**. The time needed and the time engaged in the process of learning both have an influence on the achievement of optimal learning by the student and, therefore, **impact** on the assessment of that student.

3.2.1.2 **Proctor's Model**

Prior to the 1960s, the research on important school- and classroom-related variables was directed towards the best traits or characteristics of lecturers and, therefore, also lecturers, in an attempt to identify 'good teaching', and the important characteristics of schools and institutions of learning and communities that support good teaching. Proctor (1984:469) provides a model that **updates** this view by including important lecturer (lecturer) and student behaviours as predictors of student achievement. Although this model is derived from other lecturer- and classroom-based models, it is redesigned to **emphasise** lecturer expectations.

Proctor states that it is possible for a **self-fulfilling** prophecy (as researched by Rosenthal & Jacobson, 1968:54) to be an institutional phenomenon, and **that** the climate of an institution of learning can **have** an effect on the achievement of its students. The attitudes, norms and values of an **educational** faculty and staff **can** make a difference in achieving high assessment scores. The paradigm most influencing Proctor's model is of a social nature **and** not of a lecturer/student one-on-one relationship. The other models discussed in this **chapter** include the variables that provide the focus for this model, but show these **variables** in a more subordinate manner. The expectations of lecturers/lecturers are **depicted** in Figure 3.1.

Figure 3.1: Lecturer Expectations: A model for school improvement



Adapted from Proctor (1984:471)

Proctor's (1984:471) model begins with the factor of **student characteristics**, which influence the **school's social climate**, including variables such as attitudes, norms, beliefs, and practices. The school's social climate is, furthermore, influenced by a number of factors, including **student characteristics** such as race, gender, economic level and past academic performance.

Student characteristics also influence **lecturer expectations** and, therefore, also **lecturer attitudes** and **lecturer efficacy**. More recent studies support Proctor's (1984:473) position that student self-image and behaviour are affected by lecturer efficacy (Ashton, 1984:29; Woolfolk & Hoy, 1990:83).

The next category of variables is the **interaction** among the individuals involved in the schooling process. This includes the input of administrators, as well as that of lecturers and students. If expectations of learning are high (i.e., the school has good,

qualified lecturers and students who can learn) and there is high quality instructional input, corrective feedback and good communication among students, parents, and lecturers, then the intermediate outcomes of student learning and student self-expectation increase. On the other hand, adverse or negative attitudes on the part of instructors and administrators will cause student self-esteem and, consequently, student achievement to spiral downwards.

The interactions in Proctor's (1984:473) model include the school's overall policy on allowing time for children to learn, or promoting other forms of student-based help when needed. This could include **quality of instruction** or **lecturer classroom behaviours** (as in Cruickshank's (1985:91) model below). These behaviours have an effect on student classroom performance (especially academic learning time and curriculum coverage) and self-expectations.

Finally, the **student's achievement level** in Proctor's (1984:473) model is an outcome of all previous factors and variables. It is hypothesised that there is a cyclical relationship among the variables. In Proctor's model, the main concept is that achievement in a specific classroom during a particular school year is not an end in itself. It is re-filtered into the social climate of the school image and causes the entire process to begin all over again. Proctor's model implies that changes can be made at any point along the way. These changes will affect school achievement, which will continue to affect the social climate of the school.

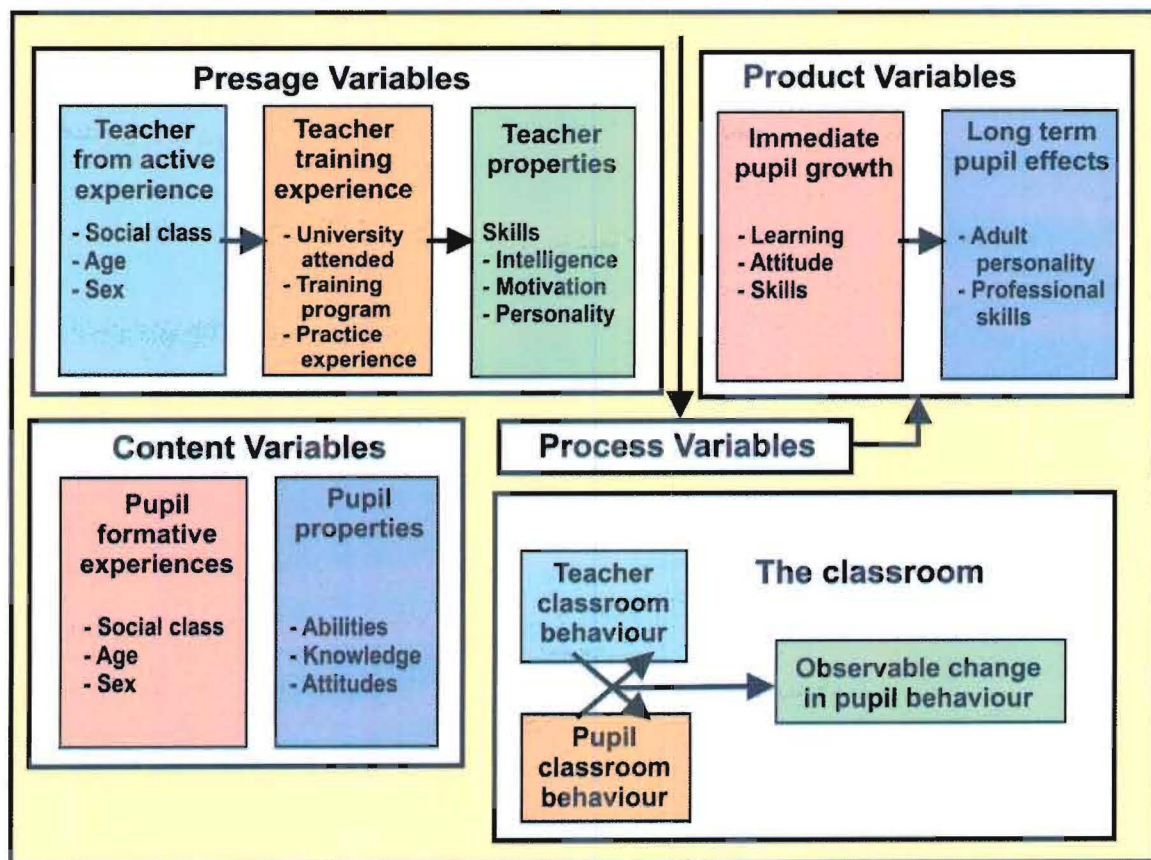
It is thus clear that Proctor's model focuses on the **management of social influences and attitudes** within the learning environment to achieve the optimal outcome in the teaching/learning process.

The management of the social influences and attitudes also impact directly on the management of assessment as the same attitudes need to be addressed in the approach to assessment and CASS as an integrated part of the teaching-learning process.

3.2.1.3 Cruickshank's Model

The **presage variables** model by Cruickshank (1985:90) is more classroom- and lecturer-based as he heavily relies on the concept of classifying variables as "product, process, or presage". **Product** refers to learning on the part of the student (change in behaviour or behaviour potential), while **process** involves interaction between student and lecturer. **Presage** points to the lecturer's intelligence, level of experience, success and other lecturer characteristics. Presage is supposed to affect the process and then, of course, the process will affect the product.

Figure 3.2: The presage variables model



Adapted from Cruickshank (1985:91)

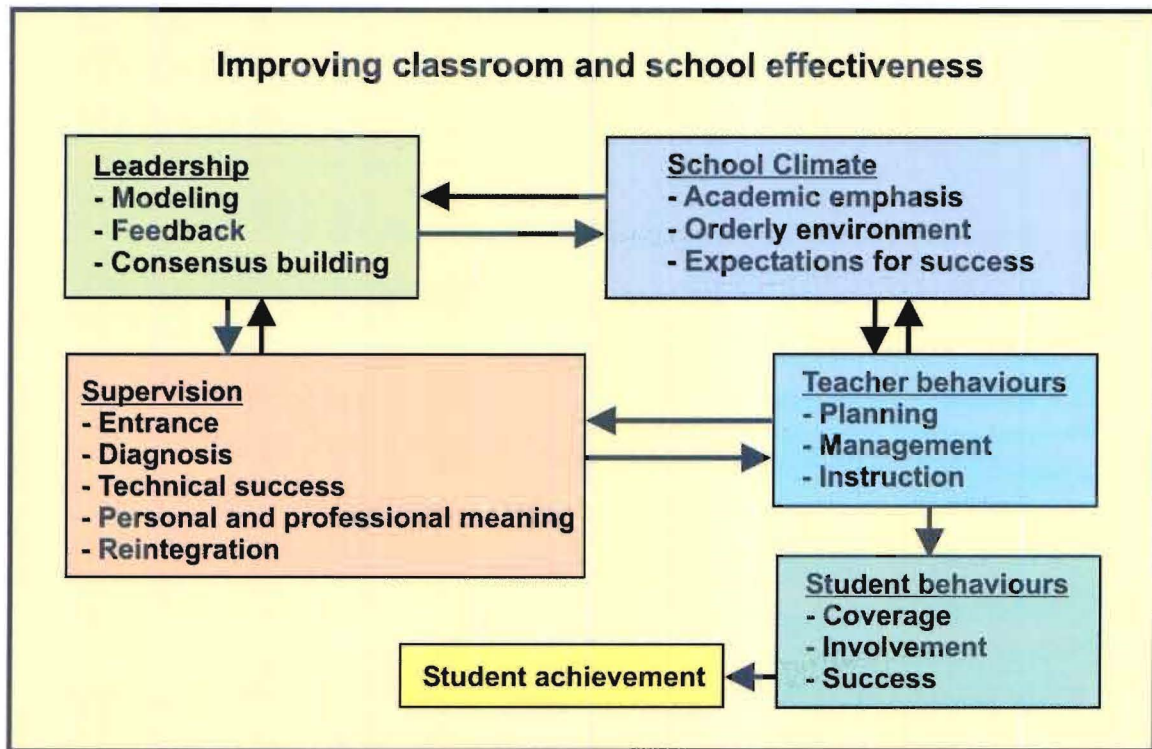
The Cruickshank model focuses on the **management of learning** through the process and presage characteristics of the lecturer. These variables change the students' behaviour, which, in turn, will have an impact on the assessment of the students. The implementation of CASS as an assessment strategy will, as a lecturer presage, form part of the lecturer properties which influence the process (teaching, learning and assessment) and, therefore, the student performance in the classroom and under assessment conditions.

3.2.1.4 Huitt's Model

The most recently developed model to be discussed here is that of Huitt (1995:34), which identifies the major categories of variables that have been related to achievement. The model is not only institution-, classroom-, lecturer-, and student-based, but includes additional contextual influences. Huitt's model attempts to categorise and organise all the variables that might be used to answer the question: "Why do some students learn more than other students?" This model represents a revision of a model by Squires, Huitt and Segars (1983:78) (see Figure 3.3), which focused only on those variables thought to be under the control of lecturers. This earlier model focused on school- and classroom-level processes that predicted school learning, as measured on standardised tests of basic skills. One important addition in the revised model is the redefinition of academic learning time. It had long been recognised that Carroll's conceptualisation that time spent was a measurement of the quantity of time engaged in academic work. However, this model was lacking in terms of the quality of such time. Proctor (1984:479) also added the concept of success as an important component of quality of time spent and coined the term academic learning time (ALT), which he defined as "engaged in academic learning at a high success rate." He further added a quality component, namely the extent to which content covered in the classroom overlaps with content tested, "content overlap". Squires *et al.* (1983:79) used a more inclusive definition of ALT namely "the amount of time students are successfully engaged with content that will be tested."

Figure 3.3 depicts the strategy for improving student achievement (assessment outcomes) through better school effectiveness.

Figure 3.3: Improving classroom and school effectiveness (The Squires, Huitt and Segers model)



Adapted from Squires, Huitt and Segers (1983:79).

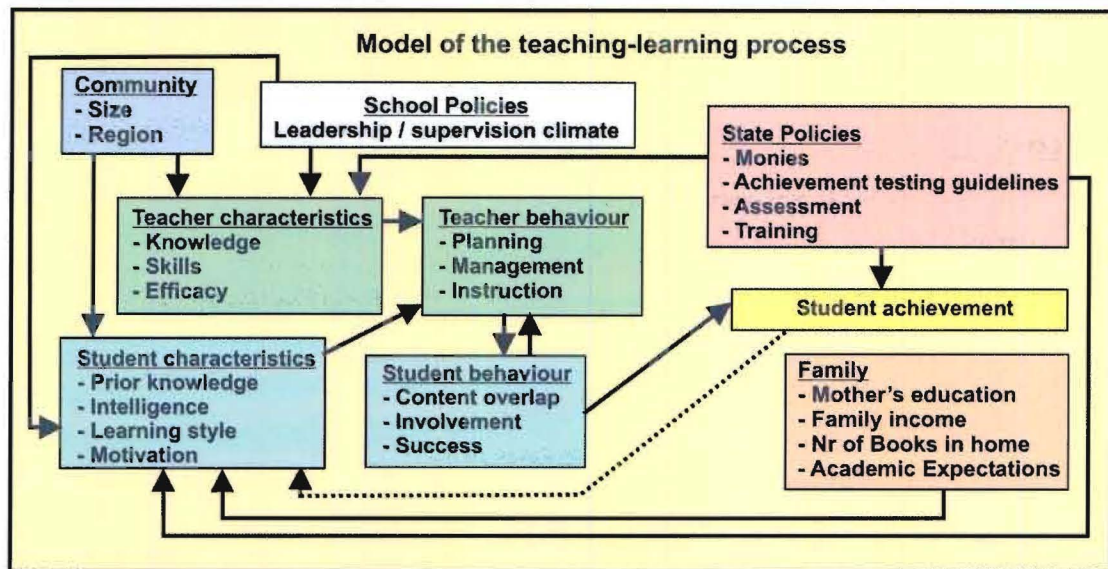
In the revised model Huitt (1995:34) adds variables related to **context** and **student and lecturer characteristics**, some of which were the focus of the models by Proctor (1984:471) and Cruickshank (1985:91). This model is an interactive model based on the reasoning of Biddle and Ellena (1964:67).

Huitt (1995:34) includes in his model the category of **context** that includes such sub-categories as **school processes and characteristics, family, community, state and federal government, television/movies** and the **global environment**. For example, research shows that student achievement is impacted by class size (Bracey, 1995:90)

and school size (Fowler, 1995:14; Howley, 1996). While all of the variables in these sub-categories are important and influence variables in the other three major categories, probably the two most important are family and the global environment. The family's level of education and the family's expectations for student achievement (Campbell, 1991:171; Voelkl, 1993:48; Zill, 1992:3), as well as the amount of technology in the home (Perelman, 1992:45) have been shown to be excellent predictors of student achievement. Perhaps even more significant is the movement from the industrial age to the information age (Toffler & Toffler, 1995:32), which redefines the outcomes that ought to be the focus of schooling and provides new technologies that can radically alter the teaching/learning process.

A simple example of how some of these variables might interact is shown in Figure 3.4. The size and region of the community combine with family characteristics and processes to impact on lecturer and student characteristics. School and state policies combine with lecturer and student characteristics to impact on lecturer behaviour, while student characteristics and lecturer behaviour influence student behaviour. Student classroom behaviour then influences lecturer classroom behaviour in an interactive pattern that eventually results in student achievement, as measured by instruments influenced by state policies. Student achievement at the end of one school year then becomes a student characteristic at the beginning of the next.

Figure 3.4: Model showing the influence of external role players on the teaching-learning process



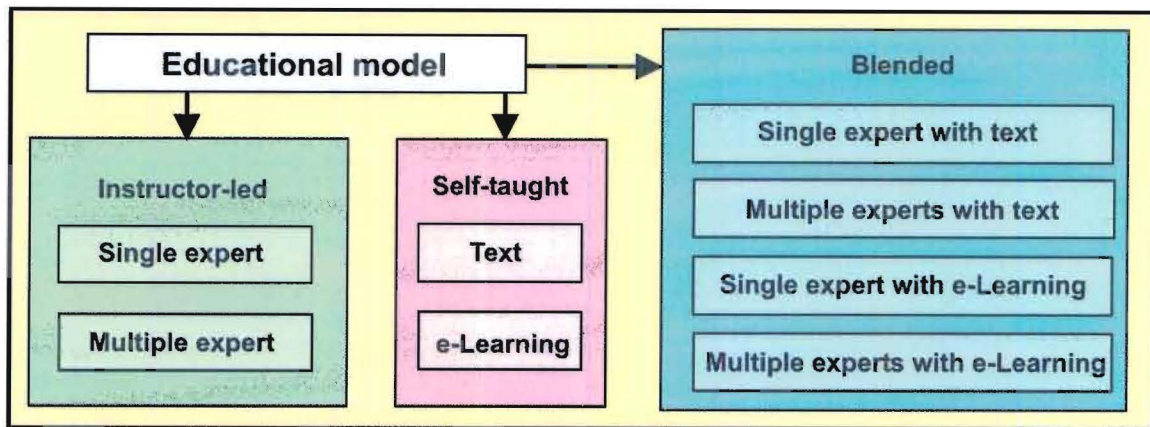
Adapted from Huitt (1995:34)

The **management focus** of the Huitt model is on managing the external influences on the learning process so as to improve student achievement. This would include the family, as well as the global environment within which learning has to take place.

3.2.2 Educational Models

There are essentially three basic educational models, each with a variety of approaches that are prevalent in training a group of adult students. Figure 3.5 represents an overview of these models and the associated approaches.

Figure 3.5: An overview of the different educational models and associated approaches



Adapted from Huitt, 1999

The different educational models as illustrated in Figure 3.5 are:

- **Instructor-Led Training (ILT)** which is mediated by a live instructor, such as classroom training or live classes delivered over a Web-based conference system.
- **Self-Taught** which indicates the use of media or text to learn by one's own effort.
- **Blended Learning** which uses a structured combination of media to present, practice and evaluate instruction. This model can include on-line instruction, mentoring-/instructor-led support, and various sources of information and practice from text and electronic media (Huitt, 1999).

The educational models focus on the management of the total learning environment, including the assessment aimed at the improvement of adult learner achievement.

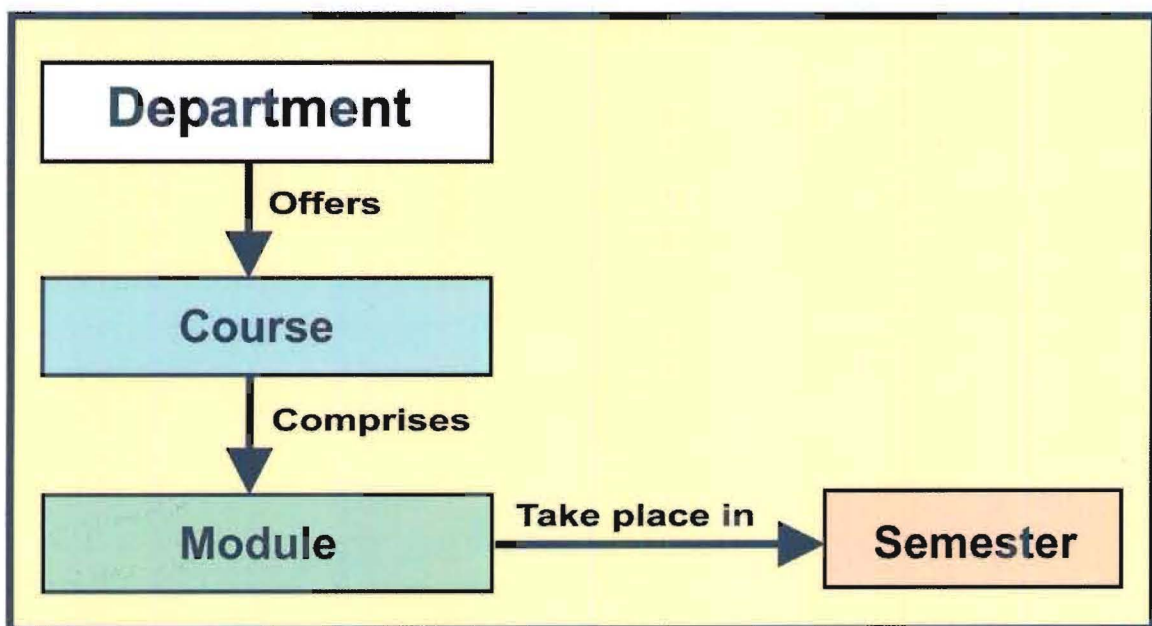
3.2.3 Domain models

According to Oldfield (2002), domain models bridge the gap between the analysis of process requirements and the production of design specifications. A domain model represents the common understanding of a key concept in an organisation. In higher education, these may include the structure of courses, the process of enrolment and the structure of assessments. Creating domain models allows the user to analyse the

requirement that needs to be embedded into processes and formal structures so as to facilitate the implementation and management of these processes. The management of these processes needs to be assigned to a coordinator to communicate about and coordinate the processes within a programme.

Domain models differ, depending on whether the target of concern is primarily structural or process-driven; however, a recommended technique is to use a fairly basic diagram. Figure 3.6 depicts a domain model for processes (Oldfield, 2002).

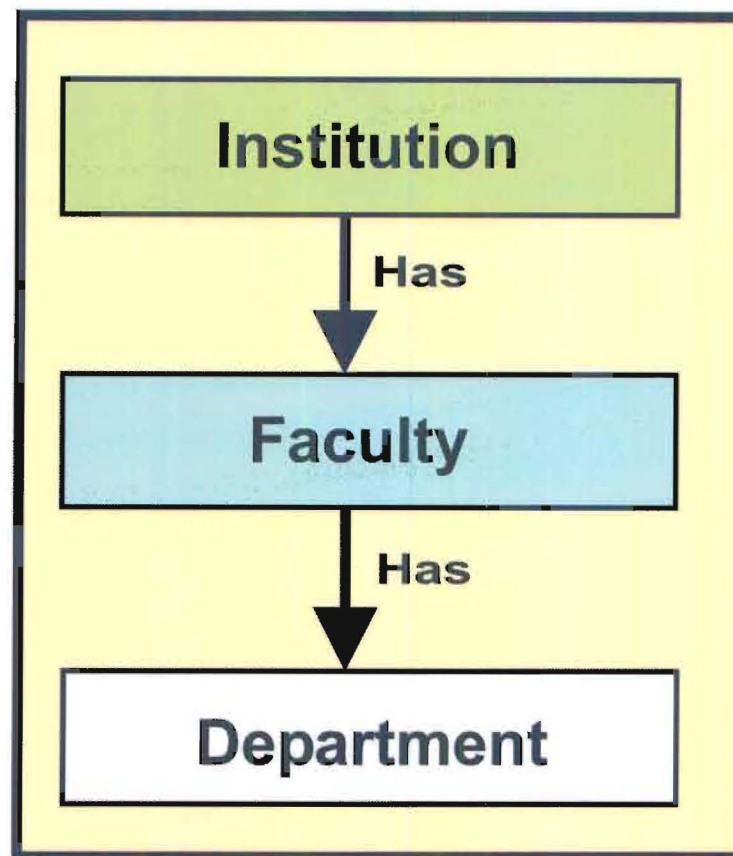
Figure 3.6: A domain model for a course structure in higher education



Adapted from Oldfield (2002)

When creating domain models, one common pitfall is to create a model that, while fine for representing the current situation, is not adaptable or flexible enough to deal with change (see Figure 3.7). Analysis patterns, which attempt to be generic, usually have more flexibility built into the design.

Figure 3.7: Models of organisation which consist of a fixed hierarchy



Adapted from Oldfield (2002)

The model illustrated in Figure 3.7 works well until the organisational structure is changed or merged with an institution that does not work in the same way. At this point, if the models used are as concrete as the one in Figure 3.7, a great deal of re-development and redesign will need to be done. A better approach is to define more flexible models that can accommodate both the present and the set of likely future possibilities.

Domain models aim at simplifying the management of systems and organisations so as to facilitate the implementation of processes. In the educational arena, domain models can be used to analyse the implementation of processes such as teaching/learning and assessment.

3.2.4 Management models

A number of management models exist from which a selection will be discussed in this chapter. The selection of models is aimed at finding a model that suits the aim of this study.

3.2.4.1 PEST or PESTLE Analysis

The PEST or PESTLE analysis is a useful starting point for the analysis of an organisation's external environment. PESTLE stands for **p**olitical, **e**conomical, **s**ocio-cultural, **t**echnological, **l**egal and **e**cological factors. Literature provides different opinions regarding the inclusion of legal and ecological factors as their importance doubtlessly differs from organisation to organisation. According to Recklies (2006), when legal and ecological factors are of high relevance to an organisation, they should be analysed separately. In organisations that are less influenced by legal and ecological factors, they could be allocated to the other categories, for example legislation as a political factor and ecological awareness as a socio-cultural factor. It, however, is important to include only external factors which an organisation cannot influence by itself (Recklies , 2006).

Regarding the subject of analysis, the PEST-tool can be used to analyse business segments, industries, particular markets or whole economies. Thus, the PEST-tool provides a summary of the driving forces in the macro environment of an institution.

The **application of the PEST-tool** (division of external factors into its four categories or factors, namely **p**olitical, **e**conomical, **s**ocio-cultural, **t**echnological) has proven useful in practice in two ways (Recklies , 2006):

(i) Compiling and structuring of information

Normally, huge amounts of information are compiled in early stages of the analysis of new markets or business segments. Pre-sorting this information into the four PEST-categories can help gain the general idea of the functioning of the organisation and will serve as a starting point for further structuring of the relevant pieces of information. Used in this way, the PEST will naturally comprise comprehensive and detailed lists of the items in the different processes within the organisation (Recklies , 2006).

(ii) A means of presentation

The PEST-scheme is a helpful structure for presentations, for example presenting the results of market analyses, where it can serve as an executive summary. The first slide would cover the most important findings under the four PEST-headlines. At this stage, no category should comprise more than two to four distinct findings. The following slides would present these findings in more detail: political, economical, socio-cultural and technological issues on one or two slides each. The PEST offers an easily comprehensible presentation structure since it is widely known and easy to understand (Recklies , 2006).

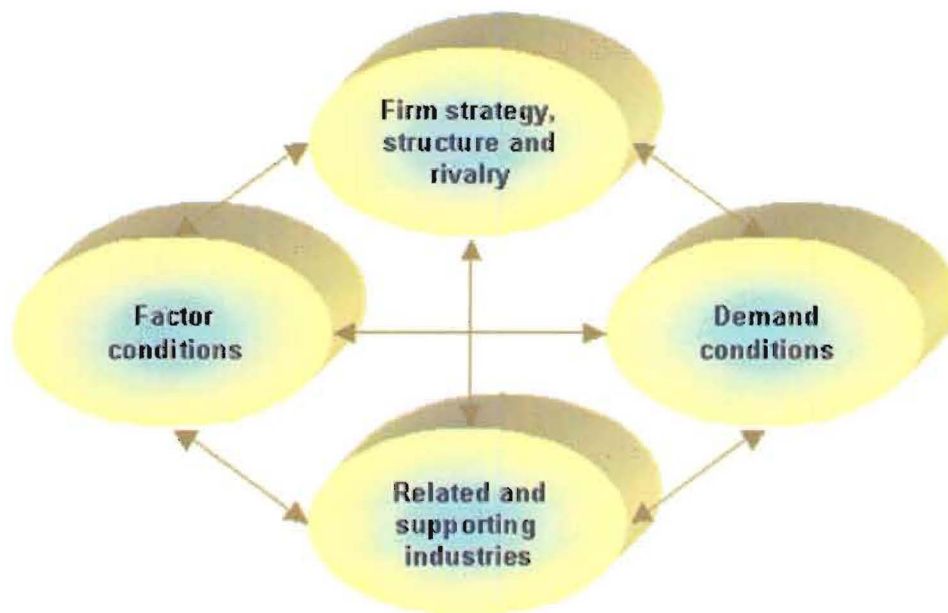
The PEST-tool can be used in analysing the external factors influencing the management of the implementation of a CASS plan in an institution.

3.2.4.2 Porter's Diamond

Increasingly, corporate strategies have to be seen in a global context. Even if an organisation does not plan to import or export directly, management still has to consider the international business environment, in which the actions of competitors, buyers, sellers, new entrants and providers of substitutes may influence the domestic market. Information technology is reinforcing this trend (Porter, 2001).

Porter (2001) introduced a model that allows for the analysis of why some nations are more competitive than others, and why some organisations within nations are more competitive than others. This model of determining factors of national advantage has become known as Porter's Diamond. The model suggests that the national home base of an organisation plays an important role in shaping the extent to which it is likely to achieve advantage on a global scale. This home base provides basic factors which support or hinder organisations from building advantages in global competition. Porter distinguishes four determinants, as indicated in Figure 3.8.

Figure 3.8: Porter's Diamond of Determining Factors



Adapted from Porter (2001)

Porter's (2001) Diamond has been used in various ways. Organisations may use the model to identify the extent to which they can build on home-based advantages to create competitive advantage in relation to others on a global front.

On a national level, governments can (and should) consider the policies that should be followed to establish national advantages, which will enable organisations in that country to develop a strong competitive position globally. According to Porter, governments can foster such advantages by ensuring high expectations of product

performance, safety or environmental standards, or encouraging vertical cooperation between suppliers and buyers on a domestic level, and so forth (Porter, 2001).

The Porter-Diamond can be used to determine the universities' advantage that can be obtained if the implementation of CASS is managed properly. The principle of CASS is becoming more and more prevalent in all universities on a global front. Managing it correctly could afford the university an advantage over other universities in that the products (students) of the university will be able to compete more favourable in the global market than the products of other universities where CASS is not yet implemented or is not managed properly.

3.2.4.3 The 7-S-Model

The 7-S-Model is better known as McKinsey 7-S because the two persons who developed it, Tom Peters and Robert Waterman, were consultants at McKinsey & Co at that time. They published the 7-S-Model in an article called "Structure Is Not Organization" in 1980 and in two books entitled "The Art of Japanese Management" in 1981 and "In Search of Excellence" in 1982.

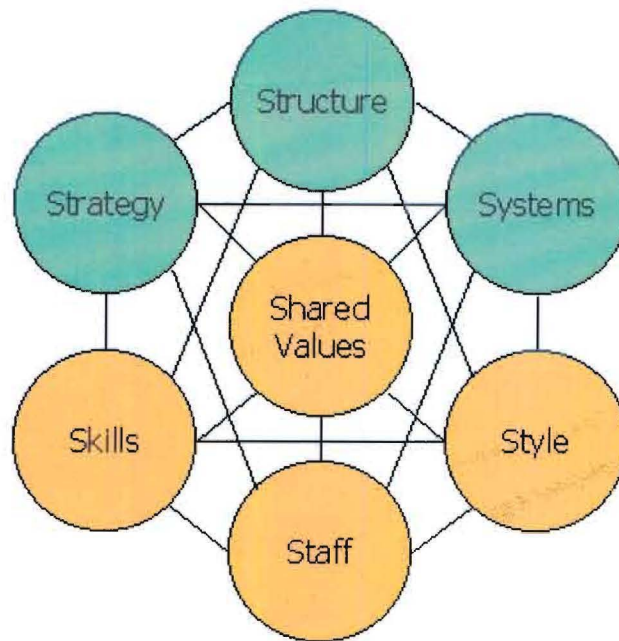
The model starts from the premise that an organisation is not just structure, but consists of seven elements.

These seven elements (structure, systems, style, staff, skills, strategy and shared values) are distinguished in so called hard S's (elements) and soft S's (elements). The hard elements (green circles: strategy, structure and systems) are feasible, easy to identify and can be found in strategy statements, organisational plans, organisational charts and other documentation (Waterman *et al.*, 1980:18).

The four soft S's (style, staff, skills and shared values), however, are difficult to describe since capabilities, values and elements of corporate culture are continuously developing and changing. As these are highly determined by the people at work in the organisation, it is much more difficult to plan or to influence the characteristics of the soft elements. Although the soft elements are below the surface, it can have a great

impact on the hard structures, strategies and systems of the organisation (Waterman *et al.*, 1980:18).

Figure 3.9: The 7-S-Model of Peters and Waterman



Adapted from Waterman, Peters and Phillips (1980:18).

The 7-S model focuses on the management of strategies, systems and structures, which could include the structures within the university used for the management of the implementation of a CASS plan.

3.2.5 Quality models

3.2.5.1 Sustaining quality education through ISO 9000

Paunescu and Fok (2005), state that one of the many problems facing HEIs during the implementation of a Quality Management System is the multiple levels of customers. Many constituencies are often at stake, including students' parents who pay tuition

fees, existing and prospective employers of students, professional bodies, government agencies, and surrounding communities. Some argue that each institution must determine, based on its own circumstances, how many of these form part of its customer base. For most higher education institutions, major customer groups include senior executives, recruiters, lecturers, alumni and students. Regardless of how many constituencies are included, students have to be regarded as internal customers and their needs have to be satisfied. To be competitive, HEIs would have to meet or exceed the expectations of their customers (Paunescu & Fok, 2005).

Traditionally, HEIs only had to compete locally and regionally. However, HEIs presently have to think and act globally in order to survive. To enhance competitiveness, many HEIs turn to higher levels of quality education and research so as to increase their reputation. In addition, many engage in improving the quality of their internal systems and processes so as to gain operational effectiveness as well as strategic positioning (Karapetrovik, 2001:4).

In order to avoid re-inventing the wheel, many HEIs rely on proven quality management systems (providing quality standards) such as ISO 9000 as benchmarks for their own quality levels. These well-recognised quality standards can provide a systematic way for improving the quality levels of the HEI, as well as providing a seal of approval for many external constituencies .

Compared to their business counterparts, few HEIs have gained ISO 9000 certification. However, in countries such as the United Kingdom, Germany and Australia, many universities have been operating for five or more years with ISO 9000 certified quality systems (Karapetrovik *et al.*, 1997:108; Karapetrovik, 2001:4).

It is a known fact that in future there will be increasing competition between HEIs regarding excellent students and lecturers. This, in turn, will generate growing pressure for continuous improvement of education and research processes, and

intensify pressure for outcomes assessment, evidenced by increased attention paid to national and international accreditation criteria (Mariun, 1998; Warnack, 2003:42).

Karapetrovik *et al.* (1998:183) developed a framework for using the ISO 9001 international standard in engineering education and research. The ISO 9001 is the next generation standard in the family of ISO 9000 standards. They conceptualised three main products of an engineering school, namely student knowledge, programmes/courses and research. In addition to the above, researchers' interpretation of some fundamental terms used in the revised ISO 9000 family of standards are applicable to higher education.

According to Kiefer (2003:61), an ISO 9001 model of quality management for higher education provides the rigour to focus on student achievement, develop unity of purpose, align processes, develop strong leaders, exploit the intellectual capacity of all staff, measure progress, make decisions based on data and provide for continuous improvement.

Table 3.1: Benefits of integrating ISO 9000 into Higher Education

Benefit factor	Explanation
Documentation of quality management system	University can demonstrate a documented quality management system. Documentation: • Guides teaching, learning, research, and other university processes in a convenient, predictable and generally acceptable way. • Improves understanding and communication among faculty, staff, and students. • Aligns all university processes and develops a unity of purpose. • Provides faculty, staff and students with clear rights and responsibilities.

Table 3.1: Benefits of integrating ISO 9000 into Higher Education (continued)

Process approach	Process approach: • Allows the university to identify the real needs and expectations for undergraduate, graduate, and other courses and programmes being offered. • Allows the university to focus on student achievement. • Allows the university to design courses and programmes that meet the stated and implied needs and expectations, and, also, to offer adequate programme delivery. • Allows the university to identify quality problems of products and services being offered. • Allows the university to implement corrective and preventive actions in order for it to continuously improve results.
Training of faculty and staff	The implementation of an ISO 9000 quality management system in a university environment: • Ensures a focus on the training and professional development of every faculty and staff member. • Exploits the intellectual capacity of all faculty and staff members.
Image and impact on society	The implementation of an ISO 9000 quality management system in a university environment: • Enhances the university's image with the internationally accepted quality management standard. • Contributes to marketing and government accreditation benefits.
Focus on quality improvement	Focus on quality improvement: • Ensures commitment to permanent improvement and involves measurement of performance and progress. • Ensures continual improvement of results that could be assessed through internal quality auditing, self-assessment, as well as external quality auditing. • Provides some measures for a university's quality management system performance, such as: • course or programme accreditation; • teaching appraisal; • external recognitions; • quality awards; • quality awareness; • motivation; • cooperation; and • consciousness of faculty and staff.

Table 3.1: Benefits of integrating ISO 9000 into Higher Education (continued)

Focus on quality problems	Focus on quality problems: • Allows university to decrease failure rates of students, failure of courses to meet planned objectives or failure of research projects to meet contract requirements. • Reduces student complaints.
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Kiefer (2003:62-63)

The focus on quality assurance and quality improvement prescribed in ISO 9001 becomes part of the cross-level functions described in Chapter 6, involved in the management of the implementation of a CASS plan.

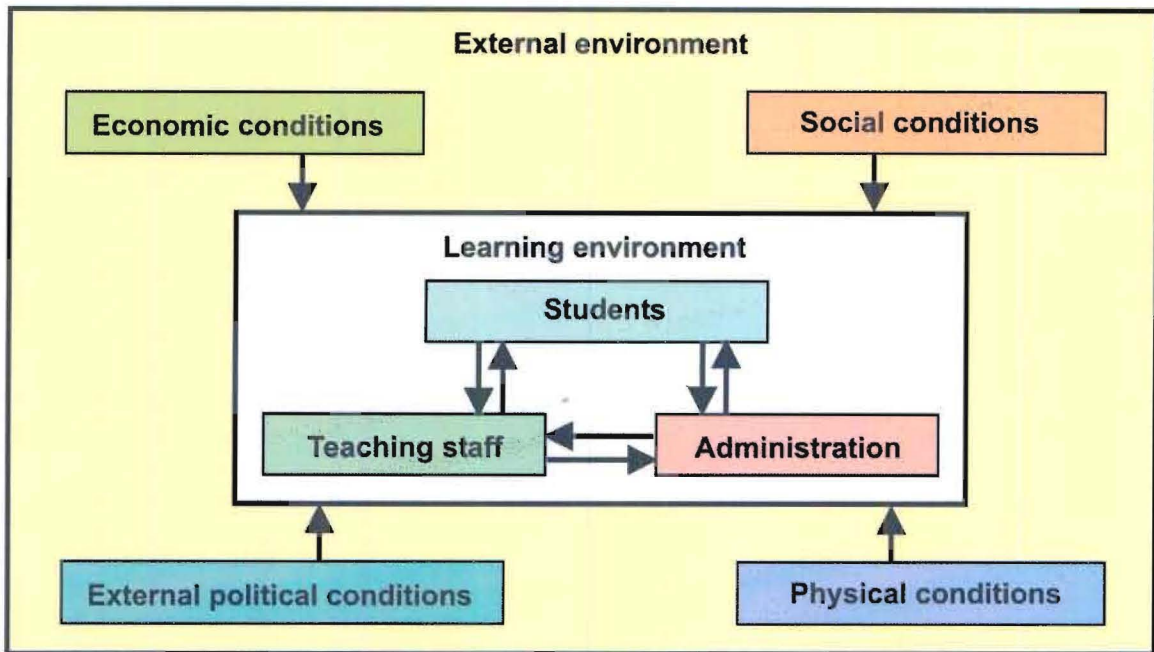
3.2.5.2 An adaptive management model

Presently, education is often seen as a commodity to be bought and sold and not as the fundamental component of society that it really is (Riley, 1997:67). Those who can buy more may have access to (arguably) better educational facilities (Berge, 1998:6).

In order to change the way learning environments are perceived and managed, there also needs to be a shift in the boundaries of the thinking genre for educational management (De Bono, 1990).

De Bono (1990) defines a sustainable learning environment as: “a learning environment that is capable of being maintained at a steady level without exhausting or adversely affecting its human components or on-site material resources”. De Bono further states that in order to maintain a steady level of the learning environment without work overload, which would exhaust the role players in the adaptive management model, the responsibility of the management of the process should reside with a coordinator that would ensure that the performance of the process is kept at a high level.

Figure 3.10: Model of the learning environment



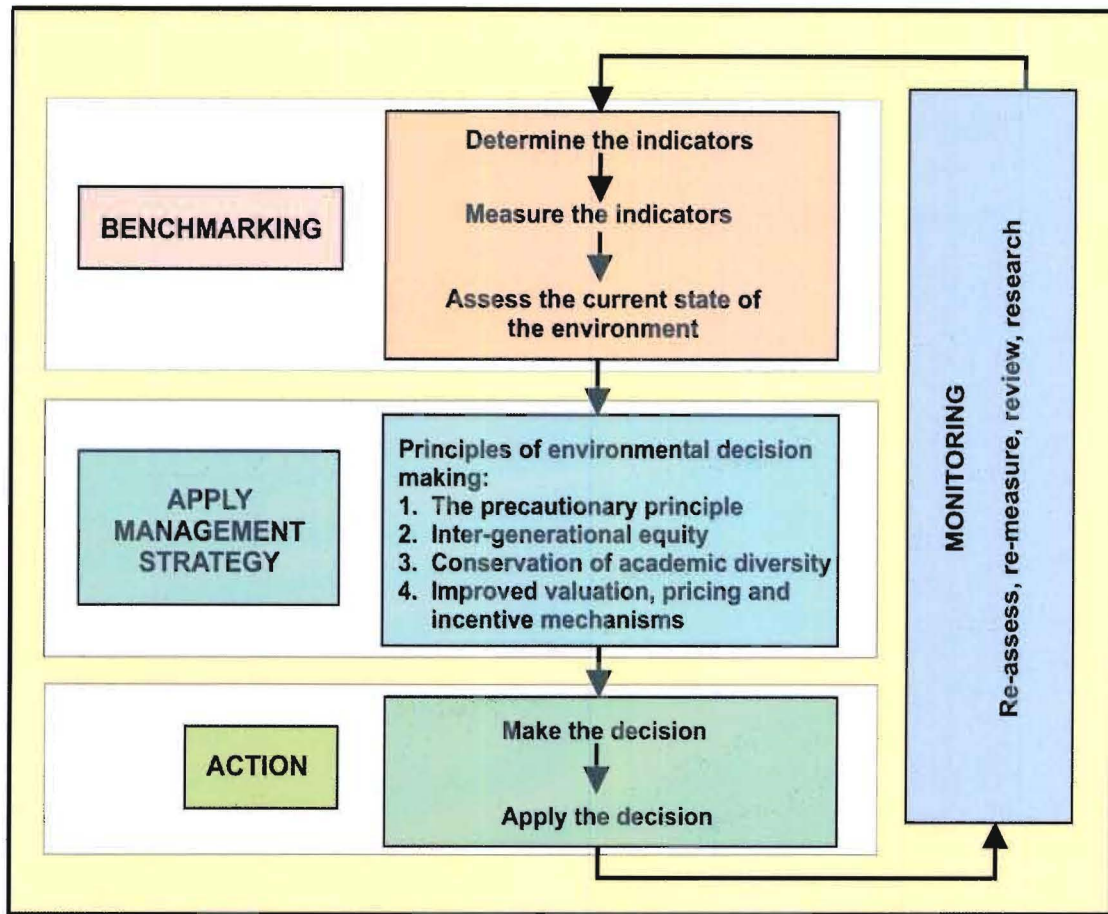
Adapted from De Bono (1990)

The learning environment thus is affected by the external environment within which the learning environment is active. Conditions, such as the economic, social, political and physical conditions of the external environment, impact on the learning environment and its effectiveness.

Adaptive management techniques are commonly used in environmental and natural resource management. Adaptive management essentially involves four steps as illustrated in Figure 3.11:

1. Benchmarking to assess the state of the learning environment.
2. Application of a management strategy to inform decisions.
3. Action to invoke changes to the learning environment.
4. Monitoring to assess the effectiveness of the action on achieving the desired outcomes and to inform future action (Jacobs, 1991:127).

Figure 3.11: An adaptive management model for sustaining quality learning environments



Adapted from Jacobs (1991:128)

The adaptive management model can be used by lecturers at all levels to make decisions regarding the management of CASS in the learning environment. One may not be able to actively control the external factors influencing the learning environment, but one must at least learn to manage it.

“It is in their role as citizens, not consumers, that individual people will create a sustainable [learning environment] ...it is through collective political choices that sustainability will be achieved” (Jacobs, 1991:129). Jacobs calls on lecturers at all levels, from classroom lecturer to lecturer, campus manager to vice-chancellor, to place a value on education and to nurture a sustainable learning environment. The

learning environment should also include the environment within which assessment and, specifically, CASS will be conducted.

To manage the learning environment is part of the management process for the implementation of a CASS plan at a university of technology.

3.2.6 Conceptual Models

3.2.6.1 Conceptual models and their uses

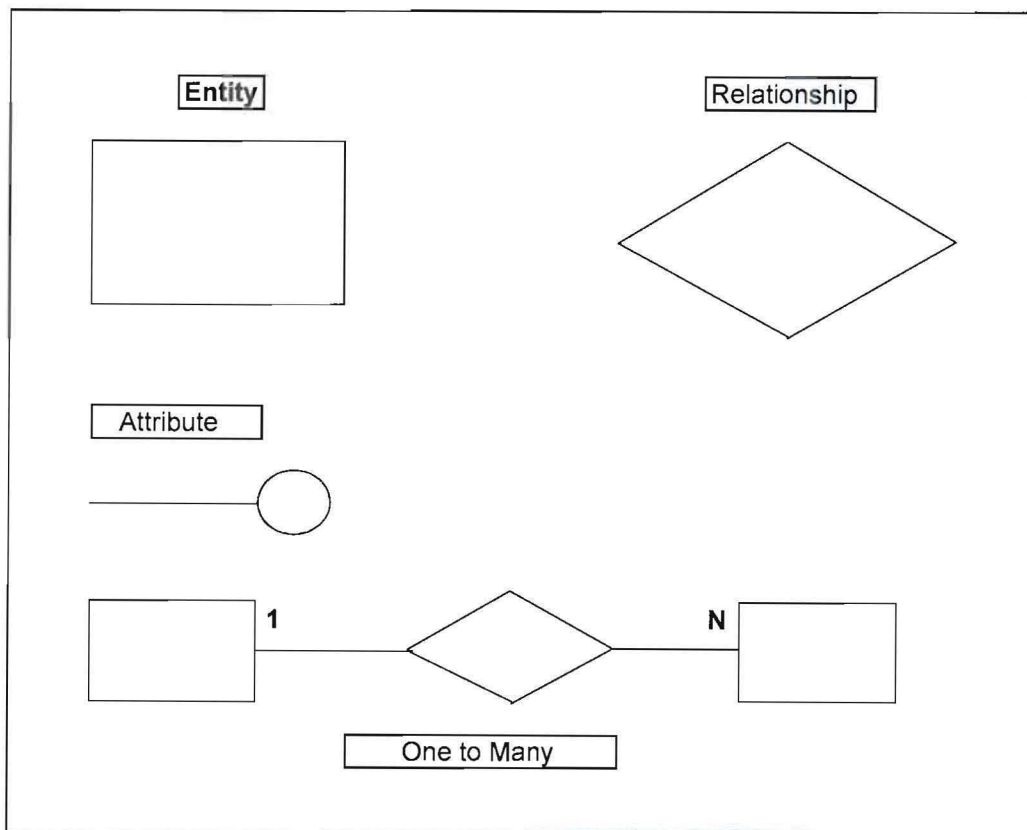
All research is based on an underlying model of the phenomena it investigates, be it tacitly assumed or explicit. Such models, called conceptual frameworks (Engelbart, 1962) or **conceptual models**, readily become topics of discussion and debate when a research area is in transition. Often, two or more models are compared and assessed for possible use. In this section, the function of conceptual frameworks/models will be discussed and the principles for judging their merits will be stated.

According to Engelbart (1962), the following must be specified when conceptual models are developed (as represented in Figure 3.12):

- Essential objects or components - the **entities** - of the system to be studied.
- The **relationships** of the objects that are recognised.
- What kinds of changes in the objects or their relationships affect the functioning of the system - and in what ways (**attributes**).
- Promising or fruitful goals and methods of research.

The symbols used in entity-relationship diagrams are shown in Figure 3.12.

Figure 3.12: Symbols used in entity-relationship diagrams



Adapted from Brown (2003)

According to Brown (2003), the symbols used in entity-relationship diagrams include:

- **rectangles** representing ENTITY CLASSES;
- **circles** representing ATTRIBUTES;
- **diamonds** representing RELATIONSHIPS;
- **arcs** connecting entities to relationships. Arcs are also used to connect attributes to entities. Some styles of entity-relationship diagrams use arrows and double arrows to indicate the one and the many in relationships; and
- **underlining** to indicate the key attributes of entities.

Conceptual models are broader and more fundamental than scientific theories in that they set the preconditions of theory formulation. In fact, these models provide the conceptual and methodological tools for formulating hypotheses and theories. If conceptual models are seen to represent schools of thought, chronological continuity,

or principles, beliefs and values of the research community, they become paradigms. The conceptual model of a research area is always constructed - it does not simply lie somewhere waiting for someone to pick it up. However, **scientific theories** have functions that are also suitable functions of conceptual models, which are more general in nature than theories (Brown, 2003).

The literature of the Philosophy of Science provides discussions on the functions of **scientific theories**. According to Bunge (1967:568), scientific theories are needed (or used) for the following functions:

- Systematisation of knowledge by:
 - integrating formerly separate parts of knowledge;
 - generalising and explaining lower abstraction-level knowledge (or observations, data) through higher-level constructs;
 - explanation of facts through systems of hypotheses which entail the facts;
 - expanding knowledge by deducing new propositions, based on selected starting points and collected information; and
 - improving the testability of hypotheses through the control context provided by systems of hypotheses.
- Guiding research by:
 - pointing to fruitful problems;
 - proposing the collection of data; and
 - proposing totally new lines of research.
- Mapping a portion of reality by:
 - representing or modelling the objects (and relationships) of that chunk instead of just summarising the data; and
 - providing a tool for producing new data (Bunge, 1967:568).

Conceptual models may and should map reality, guide research and systematise knowledge; for example, by integration and by proposing systems of hypotheses.

A conceptual model provides a working strategy, a scheme containing general, major concepts and their interrelations. It orients research towards specific sets of research questions. A conceptual model cannot be assessed directly as it forms the basis of formulating empirically-testable research questions and hypotheses (Vakkari, 1998:373).

At this point of the discussion it seems appropriate to consider the merits of various conceptual models. The following are the types of arguments that can be used to judge the merits of a conceptual model (Hay, 2001):

General scientific principles

- Phenomena should be studied in all situations, and also under extreme conditions. Thus, the study would not only consider information seeking by academics but also by other professions or by laymen.
- The framework should be limited in a meaningful way as a system. For understanding information, the proper system is not some service (for example, a library) and its clients, but rather an information actor immersed in his or her situation and information environment (for example, all information access systems).

When two conceptual models under consideration are compared, the following criteria may be applied to judge their merits:

- Simplicity
- Accuracy
- Scope
- Systematic power
- Explanatory power
- Reliability
- Validity
- Fruitfulness (Hay, 2001).

The theoretical development or the construction of new conceptual models, according to Hay (2001), in any research area often requires conceptual and terminological development. Conceptual development may mean fulfilling, perhaps in a better way than before, the basic requirements for scientific concepts, including precision, accuracy, simplicity, generality and suitability for expressing propositions, which may be shown to be true or false. Moreover, good concepts represent essential features (objects, relationships, events) of the research area and should differentiate and classify the phenomena in ways that lead to interesting hypotheses (or research problems). The concepts, therefore, must relate to each other in systematic and fruitful ways. Concepts also need to support research into the phenomena by known research methods (or by methods that can be developed) (Hay, 2001).

At this point of the discussion it may be advantageous to look at two examples of conceptual models used to retrieve information.

3.2.6.2 Two sample frameworks used for information retrieval

The frameworks developed by Ellis (1989:331; Ellis, *et al.*, 1993:360) and Ingwersen (1996:18) will be discussed as examples only, and no claims will be made about their merits with respect to the research tasks for which they were originally intended.

Ellis's elaboration of the different behaviours involved in information seeking consists of six features. Ellis (1989:327) makes no claims to the effect that the different behaviours constitute a single set of stages; indeed, he uses the term 'features' rather than 'stages'. These features are named and defined as follows:

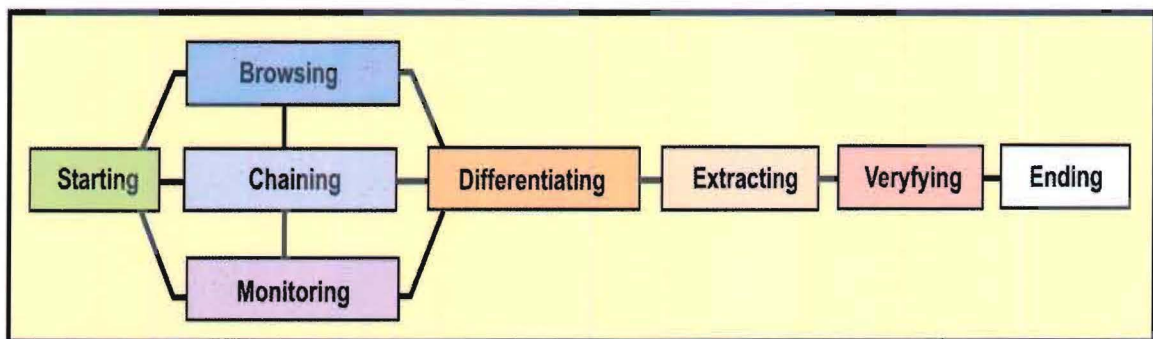
- **Starting:** the means employed by the user to begin seeking information, for example asking some knowledgeable colleague.
- **Chaining:** following footnotes and citations in known material or 'forward' chaining from known items through citation indexes.
- **Browsing:** 'semi-directed or semi-structured searching'.
- **Differentiating:** using known differences in information sources as a way of filtering the amount of information obtained.
- **Monitoring:** keeping up-to-date or current awareness searching.

- **Extracting:** selectively identifying relevant material in an information source.
- **Verifying:** checking the accuracy of information.
- **Ending:** 'tying up loose ends' through a final search (Ellis, 1989:328).

The strength of Ellis's (1989:331) model is that it is based on empirical research and has been tested in subsequent studies, most recently in the context of an engineering company.

Of the features, Ellis (1989:329) notes that, "...the detailed interrelation or interaction of the features in any individual information seeking pattern will depend on the unique circumstances of the information seeking activities of the person concerned at that particular point in time". Wilson (1999:256) proposes how these features may relate to each other temporally, providing a partial order (see Figure 3.13).

Figure 3.13: A process version of Ellis's behavioural framework

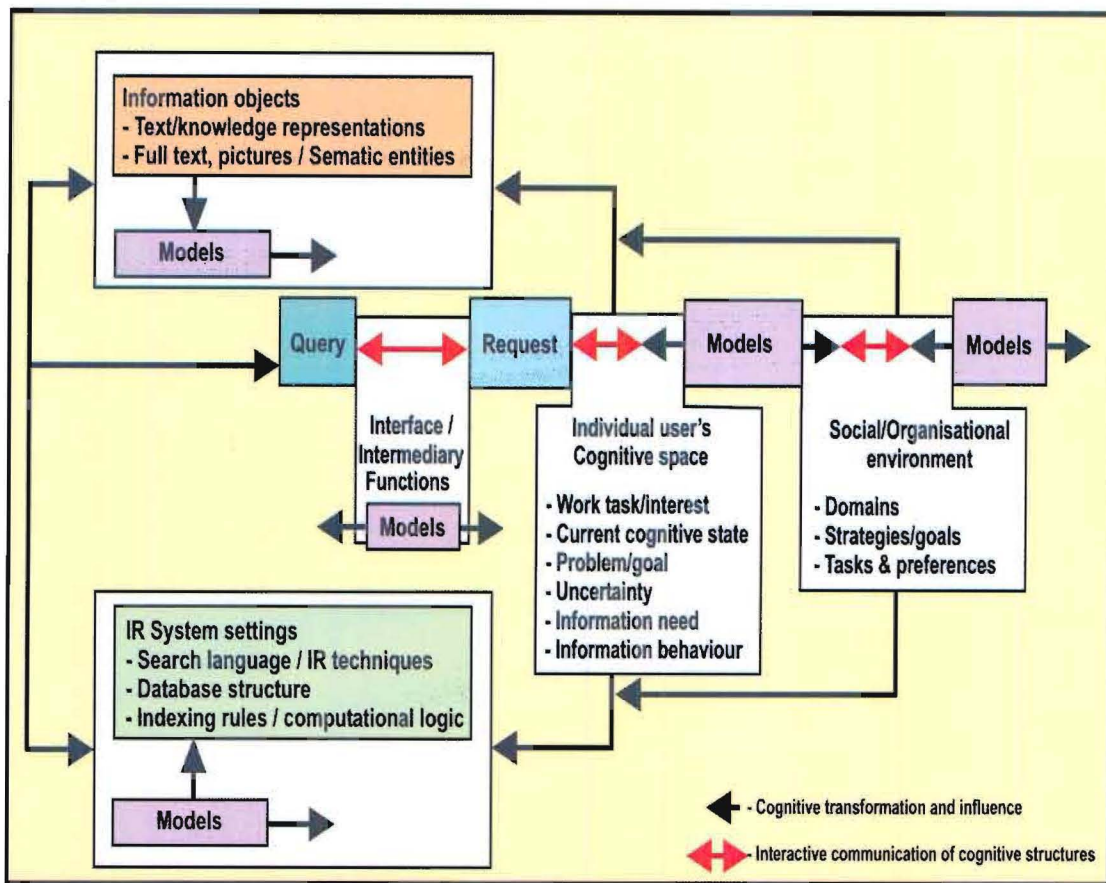


Adapted from Wilson (1999:256)

One may *describe* any information-seeking activities through Ellis's features. Indeed, these features are general enough to fit a large number of empirical situations. However, if one is to *explain* information-seeking behaviour, for example in terms of the work tasks the subjects are engaged with or their knowledge of the task, the features fall short because they are not explicitly related to such external possible causative factors.

Ingwersen's (1996:12) model is slightly simplified in Figure 3.14. In particular, the elements *user's cognitive space* and *social/organisational environment* resemble the *person in context* and *environmental factors* specified in Wilson's (1999:256) models. Ingwersen (1996:12), however, makes explicit a number of other elements. Firstly, he demonstrates that within each area of the model, the functions of the information user, the document author, the intermediary, the interface and the information retrieval (IR) system are the results of explicit or implicit cognitive models of the domain of interest at that particular point. Thus, according to Ingwersen (1996:12), users have models of their work task or their information need, or their problem or goal, which are usually implicit, but often capable of explication. Secondly, Ingwersen (1996:13) brings the IR system into the picture, suggesting that a comprehensive model of information-seeking behaviour must include the system that points to the information objects that may be of interest to the enquirer. Thirdly, he shows that various cognitive transformations take place in moving from the life-world in which the user experiences a problem or identifies a goal to a situation in which a store of pointers to information objects can be satisfactorily searched and useful objects identified. Finally, he points to the need for these cognitive structures and their transformations to be effectively communicated throughout the 'system', which will include the user, the author and the IR system designer. If all this true, it is easy to agree (Ingwersen, 1996:12).

Figure 3.14: Ingwersen's model of the information retrieval process

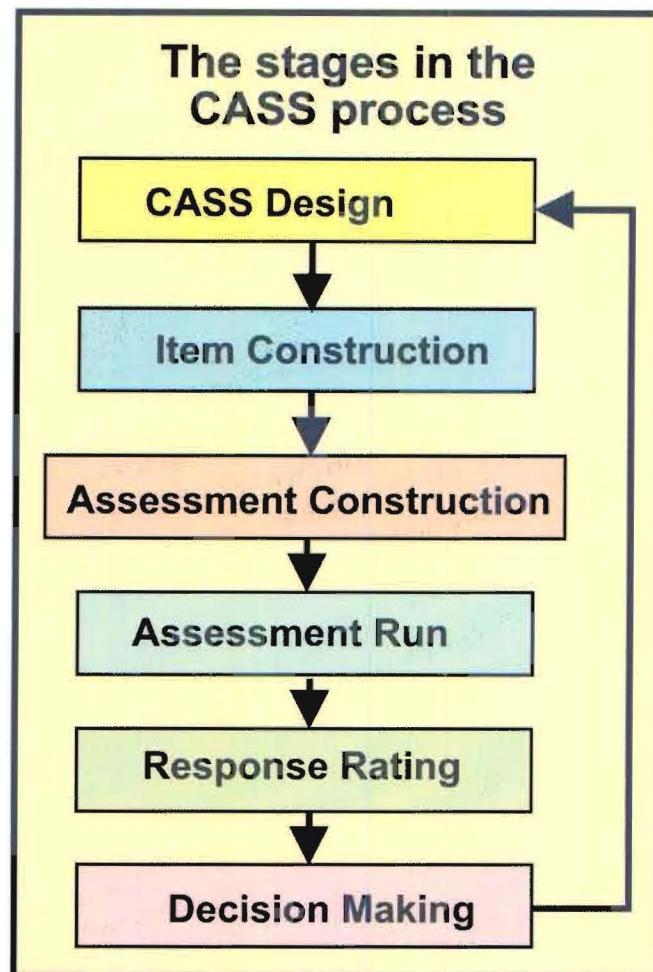


Wilson (1999:256) based on Ingwersen (1996:12)

From the above it is clear that a myriad of possible models exist and, therefore, such models need to be discussed in terms of their efficacy so as to be able to make a decision on what type of model to use for the development of an assessment plan for the university.

From the above models and the discussions of the various models it is now possible to make a preliminary prediction of what a process model for CASS at a UoT will include. Figure 3.15 indicates the various stages and levels of involvement of the CASS process as foreseen by the researcher.

Figure 3.15: Stages in the CASS process.



Each of the stages in the process will be further explained in Chapter 6.

3.3 DESCRIPTION AND DISCUSSION OF A MODEL

According to Jonker (1994:208), a model can be viewed as a supportive construction for research. A model identifies a central problem or question concerned with the problem statement that is being investigated (Mouton & Marais, 1990:144). Phenomena that are complex in nature can be rendered more visual and understandable by reducing it to an essential or fundamental coherence. A model

restricts, isolates, simplifies and systemises the domain under investigation (Mouton & Marais, 1990:144). A model indicates the relationships that exist between the components that are researched. According to De Corte *et al.* (1981:6), the definition of a model depends partially on the function of the model. A model can be viewed as a psychological device (to simplify visual relationships); a normative device (to accommodate broad comparisons); an organisational device (the manipulation and collection of data); an illustrative device (a diagram of the model) and a constructive device (in search of a theory). Additional to the fact that models can be distinguished by their functions, models may also be distinguished in terms of their content. The content can include maps, graphs or scaled representations of real-world simulations. DeCorte *et al.* (1981:6) indicate that it should be kept in mind that a model is not a theory *per se* but should rather be viewed as an aid to develop a general or specific theory. A model supplies the explanations, figures and means to make predictions, but the model still does not supply the total explanation of the phenomenon (Mouton and Marais, 1990:144).

For the purpose of this study, a conceptual model for the management of the implementation of a CASS plan, using an educational model, will be developed, as this type of model seems best suited for the educational situation. According to Gunter *et al.* (1995:59), an educational conceptual model represents the steps that are needed to achieve a specific outcome; in this case, a CASS management plan. The use of an educational model acknowledges the importance of the different components of the educational situation - the lecturer, student and the learning content or material. These components must be integrated into a decision-making framework, based on the consideration of the respective components according to Eggen and Kauchak (1988:8).

For the purpose of this study, a model can be defined as a simplified representation of an educational strategy, which in this case is utilised for the management of the implementation of a CASS plan.

3.3.1 Characteristics of a quality model

The concept pertaining to the quality of a model is very vague. In many cases, only a list of expected criteria or characteristics is provided. Lindland, Sindre and Solvberg (1994:42-49); Teeuw and Van den Berg (1997) and Van Sinderen (1995) refer to the qualities of a conceptual model as follows:

- **Semantic quality** indicates the degree of correspondence between the conceptual model and the reality. In the case where the model contains statements that have no correspondence with the reality, the model is deemed invalid. In the case where the high correspondence with reality is retained, the model is deemed complete.
- **Syntactic quality** is the measure of correspondence between the conceptual model and its representation. The model may not contain any syntactical mistakes. Syntactical mistakes refer to statements expressed in the model, but which cannot be formulated linguistically. It would thus refer to situations or conditions that are not possible in the real world, but that exist according to the model.
- **Pragmatic quality** indicates the measure of correspondence between the conceptual model and the individual interpretation thereof. It indicates the extent to which the model is understandable and therefore executable.
- **Completeness** indicates that the concepts must be complete enough to address all the essential aspects of the real world.
- **Coherency** expects the concepts to be stated unambiguously and to address only the essential characteristics.
- **Explicitness** refers to the design of the model in such a way that all rules and concepts are contained in the design. It would thus be possible to implement the model.

Based on the above discussion, it can be deduced that a model should represent all the essential aspects of the real world, and that those should be represented in such a way that it could be communicated.

Yetton (1997:24-28) postulates that a model should also entail the external qualities of the model; in other words, the measure to which the users of the model are satisfied with the model. The following aspects should be considered:

- The structure of the process.
- The strategy that supports the process.
- The management of the total process.
- Roles and skills of the people involved.

From the above it can be derived that a quality model should represent reality such that it can be reduced to an extent that only the most important components are reflected in the model. Furthermore, these components must be placed in perspective to facilitate a workable and meaningful application of the model, for example in the management of the implementation process of CASS.

3.4 CONCLUSION

From the discussions of models it is clear that the type of model suitable for describing the management of the implementation of a CASS-plan of a university should clearly be based on a ***conceptual model*** that integrates a number of domain models with educational and quality models.

Therefore, the **conceptual model for the management of the implementation of a CASS plan**, will be based on the development of a ***combination conceptual model*** rather than any other one type of model.

In the next chapter, Chapter 4, the research methodology followed in this study will be discussed.

CHAPTER 4

RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

The purpose of this chapter is to outline the design and methodology of the research regarding the management of the implementation of a continuous assessment (CASS) plan at a university of technology. The literature study in the first three chapters formed the framework for the empirical research. In Chapter 1 the objectives of this study were stated as:

- determining the key issues involved in the planning for the implementation of CASS;
- determining how the process can be successfully managed; and
- designing a conceptual model for the management of the implementation of a CASS plan at a university of technology.

The empirical investigation aims to gather information about the experiences of lecturers, students and administrative staff regarding the management of the implementation of a CASS plan at universities of technology.

4.2 METHOD OF RESEARCH

This research was conducted by means of a literature review and an empirical research study, which included a survey and focus group interviews.

4.2.1 Review of the literature

Primary and secondary literature sources were studied to gather information about assessment, continuous assessment, assessment of student outcomes, assessment plan

design, models for management of assessment, conceptual modelling and management of assessment at institutions of higher learning. Online database searches of EBSCO HOST, NEXUS, SABINET, Swets Wise, Ingenta, DIALOG and ERIC were undertaken to obtain the relevant literature. Keywords that were used included the following:

- outcomes-based education;
- continuous assessment;
- student assessment;
- assessment policy;
- outcomes assessment;
- student-centred assessment;
- ongoing assessment;
- assessment plans;
- management models;
- conceptual modelling; and
- management of assessment.

The information gathered from the primary and secondary literature sources was utilised to construct a questionnaire. A number of the questionnaire items (questions) were not directly addressed in the literature, but were implied in the underlying interpretation of the literature sources. These embedded and implied factors were thus also implemented in the construction of the questionnaires. This questionnaire was then used to gather information on the experiences of lecturers and students at universities of technology who have already implemented CASS, and to determine the shortfalls in the system that should be addressed in the continuous assessment plan of the university. In addition, focus group interviews were conducted with administrative staff at these institutions to verify the information obtained from the questionnaires.

4.2.2 Empirical research

The research design used in this study is both qualitative and quantitative in nature. For the purpose of this research, a structured questionnaire was selected as the research tool and this was combined with focus group interviews. The research was of an analytical nature, which attempted to find causal relationships. Once causal relationships between the traditional way of evaluation and the CASS way were uncovered, the research shifted to investigating factors that could be changed (variables) in order to influence the chain of causality.

Structured questionnaires were used to gather data in order to determine whether there are any recurrent patterns in the attitudes of students and lecturers towards the traditional evaluation methods and the proposed CASS method. The questionnaires were self-administered and personally delivered. This was done to try and ensure a better response rate from the participants after personal contact was made.

Structured-undisguised questions were selected given their benefit of alleviating respondents' difficulty in replying to such questions, together with the greater reliability generally afforded by such questions (Churchill & Iacobucci, 2002:271).

Questions were mainly of the fixed-alternative type. The fixed-alternative format was selected on the basis that such questions facilitate comparability of respondents' responses (Aaker *et al.*, 2004:317) and, again, aid in ensuring reliability (Churchill & Iacobucci, 2002:271).

These questionnaires were then followed by focus group interviews with administrative staff to determine whether the process of *triangulation* resulted in the same data as was obtained from the questionnaires.

The rationale for the use of the structured questionnaires, focus group interviews and triangulation will now be presented.

4.2.2.1 The questionnaire as a research tool

A questionnaire can be a self-reporting instrument (as used in this study), used for gathering data about variables of interest to the researcher and consists of a number of questions or items that a respondent reads and answers (Best & Kahn, 1993:230).

According to Tuckman (1994:216), a survey questionnaire is a tool used in the collection of research data and is, ultimately, dependent on the purpose of the study. Researchers use questionnaires to convert information given by people directly into data. In this sense, the questionnaire was appropriate to gather data for this research in that it would elicit factual data about the experiences of lecturers and students regarding the management of the implementation of CASS at their universities.

The suitability of the questionnaire for this research is based on the fact that the respondents are lecturers and students who are directly involved in the implementation of CASS at their universities. The respondents are likely to be profoundly interested in the final outcome of the research as it will provide them with a strategy to manage the CASS implementation problems that they experience at their universities.

According to Fraenkel and Wallen (1990:336), the questionnaire has definite characteristics, as well as advantages and disadvantages. These will now be discussed.

According to Patton (1987:113), the defining characteristics of a questionnaire can be listed as follows. A questionnaire:

- can be a paper document (such as used in this study) that presents a set of questions to which a person responds;
- can be anonymous or the person responding can identify him or herself in some way;
- can be mailed to the respondent directly or indirectly (some questionnaires are sent to specific people by name; others are sent to types of people, such as nurses or lecturers, without identifying specific individuals). Questionnaires can be sent through the mail or can be administered by interviewers in person or by phone. They can also be e-mailed or posted on the Internet;
- can have several different types of questions, for example multiple-choice or open-ended questions; and
- can vary in length, but should rarely take more than ten to fifteen minutes of a person's time to complete.

The following are some of the advantages of the questionnaire, as used in this research (Fraenkel & Wallen, 1990:421; Best & Kahn, 1993:230; Tuckman, 1994:216):

- It can be distributed to respondents with financial and time cost-effectiveness and has a wide coverage.
- It reaches people who would be difficult to reach, thus obtaining a broad spectrum of views.
- Since the questions are phrased identically, the questionnaire allows for uniformity and elicits more comparable data.
- Anonymity of respondents is assured since respondents are not required to expose their identities, addresses and institutions.
- It is relatively easy to plan, construct and administer.
- Trained fieldworkers can administer it on behalf of the researcher.
- Respondents can answer the questionnaire without pressure for immediate response.
- The influence that an interviewer might have on the respondent is obviated.
- Processing is made easy by the questionnaire being well constructed.

- Owing to its impersonal nature, the questionnaire may elicit more candid and objective, thus, more valid responses.
- The questionnaire enhances progress in many areas of educational research and brings to light much information, which would otherwise be lost.

According to Fraenkel and Wallen (1990:336), Best and Kahn (1993:230) and Tuckman (1994:216), questionnaires have a number of disadvantages:

- Questionnaires might be interpreted and understood differently by respondents.
- As the motivation of the respondents is difficult to check, the researcher might receive misleading responses.
- It is difficult to determine who really completed the questionnaire.
- A low response rate is the biggest disadvantage of the questionnaire and may lead to misleading responses.
- Respondents may feel that their personal opinions are left out.
- Respondents may be unwilling to respond to questions on private matters or controversial issues and may, consequently, provide what they regard as desirable responses.
- The length of the questionnaire may lead to careless or inaccurate responses and may result in low return rates.
- Questionnaires that do not probe deep enough do not reveal a true picture of opinions and feelings.
- Respondents might have little interest in a particular problem and, therefore, might answer the questionnaire indiscriminately.

Wolf (1997:422) states that careful and sensitive developmental work will help to identify and make full provision for the limitations of questionnaires. The researcher must be satisfied that the questions are stated with sufficient clarity to function in the impersonal interaction and must maximise the likelihood that a respondent will answer the questions and return the questionnaire (Ary *et al.*, 2002:423).

According to Ary *et al.* (2002:429), the questionnaire items and the covering letter are the main sources of information that the respondent will refer to in deciding whether or not to complete the questionnaire. The following rules of questionnaire formatting must be adhered to:

- The questionnaire must be made attractive.
- Questions should be laid out or organised in such a way that the questionnaire is easy to complete.
- Questions should display a natural ordering or flow so that it keeps the respondent moving towards completion.
- Questionnaire items and pages must be numbered.
- Brief, clear and bold-type printed instructions should be included.
- The questionnaire should start with a few interesting and non-threatening items.
- Questionnaires should not be too long and should include enough information so that items are interesting to the respondents.

The above stated rules were taken into consideration in the formatting of the questionnaire used in this research. Instructions for answering and keys for ranking the items were provided in each section.

As suggested by Ary *et al.* (2002:422-424); Frary (1996) and Gall *et al.* (2003:294), the design of a questionnaire must be well organised by a thorough process. The questionnaire used in this research was designed in accordance with the suggestion that the following factors be considered in the preparation of a questionnaire:

- The questionnaire should reflect scholarship as to elicit high returns.
- The questionnaire should be as brief as possible so that answering it requires a minimum of the respondents' time.
- The questionnaire should not include unnecessary items.
- All respondents should be able to phrase open-ended questionnaire items in a manner that is understandable.

- Items in the questionnaire should be phrased in a way that they will elicit unambiguous responses. Words such as ‘often’ and ‘sometimes’ should be avoided.
- Items should be phrased in such a manner that it avoids bias or prejudice that might predetermine respondents’ answers.
- Alternatives to questions should be exhaustive.
- Questions that might elicit embarrassment, suspicion or hostility from the respondents should be avoided.
- Questions should be arranged in the correct psychological order. If both general and specific questions are included, the general should precede the specific.
- The questionnaire should be attractive, neatly arranged and clearly duplicated or printed.
- Questions should allow for respondents to review their own relevant experiences in order to arrive at accurate and complete responses.
- Questionnaires should communicate necessary rules about the process of answering so as to reduce complexities.
- Questionnaire items must be constructed carefully in order to measure a specific aspect of the study’s objectives or hypotheses.

The construction of the questionnaire items in this study was done with due care. The aim of the empirical research was taken into consideration. Furthermore, some of the items included in the questionnaires were not directly dealt with in the literature study, but were implied and embedded in the material that was used for the literature study.

4.2.2.2 Focus group interviews as a research tool

Focus group interviews have their origins in the work of social scientists in the 1930s and 1940s. Robert Merton, a prominent social scientist, used group interviewing to

evaluate audience reactions to radio programmes and to analyse World War II training and morale films. The term 'focus group' is thought to have been coined by Merton in 1956 (Denzin & Lincoln, 1994:365).

Denzin and Lincoln (1994:126-129), as well as Greenbaum (1993:45-49), define a focus group interview as a focused discussion where a moderator leads a group of participants, usually ranging from 5 to 12 people, through a set of questions on a particular topic. Focus groups are often used to gather or to obtain feedback about users, processes, concepts, tasks, strategies and environments. Focus groups can also be used to obtain consensus about specific issues.

Focus group moderators generally follow a discussion plan that includes the questions, prompts, tasks and exercises for the group. The success of a focus group is heavily dependent on the skill of the moderator. The moderator must generate interest in the topic, involve all the participants, keep the discussion on track (but also allow for unexpected diversions), keep dominant personalities from overwhelming other participants, and not present his/her own beliefs or expectations (Greenbaum, 1993:45-49).

Denzin and Lincoln (1994:126-129) indicate the following advantages of focus group interviews:

- Feedback about what people did over a long period of time can be obtained.
- Focus groups used early in a project can produce insights and questions from the interaction among different users or stakeholders.
- Focus groups are relatively inexpensive (assuming that participants are from the same geographical area) and can be arranged quickly.

Greenbaum (1993:121) lists a range of possible disadvantages of focus group interviews. These are:

- Focus groups involve 'stories' about behaviour and do not examine actual user/stakeholder behaviour.
- The data from focus groups are self-reporting data, which depend on the participants' truthfulness and recall accuracy. What people report may be quite different than what they actually do.
- Dominant participants can skew the results of the focus groups. Conflicts and power struggles can arise among participants.
- Quantitative conclusions from a focus group may be suspect because the participants are often chosen from a convenience sample.
- Moderating a focus group is difficult. Moderators must be trained to deal with a wide range of group dynamics, as well as individual differences among participants.

4.2.2.3 Triangulation through focus group interviews

Triangulation is the application and combination of several research methodologies or tools in a study of the same phenomenon (Greenbaum 1993:127) and has the following advantages:

- It can be employed in both quantitative (validation) and qualitative (inquiry) studies.
- It is a method-appropriate strategy for determining the credibility of qualitative analyses.
- It becomes an alternative to "traditional criteria like reliability and validity".
- It is the preferred line of research in the social sciences.

In this research the researcher made use of a combination of structured questionnaires and focus group interviews. The focus group interviews were used to verify the data obtained from the questionnaires, which are purely quantitative in nature.

4.2.3 Population and sample

Population is a term that sets boundaries on the study units, which also refers to all the individuals in the universe who poses specific characteristics. A population is further defined as the totality of persons, events, organisation units, case records or other sampling units with which a specific research problem is concerned (De Vos, *et al.*, 1998:76). The target population for this research was identified as lecturers, students and administrative staff at universities of technology who are involved in the implementation of CASS.

Hinkle *et al.* (1985:276) state that a sample is the element of the population considered for actual inclusion in the study, and represents a small portion of the total set of objectives, events or persons that together comprise the subject of study. From the total number of lecturers involved in CASS (N=130), a probability sample of n=65 was selected, which would constitute a sample of 50 percent of the total population. The same sampling technique was applied to the student body of N=1200 involved in CASS and a sample of n=240 was decided on, constituting 20 percent of the population. In the case of the administrative staff (N=30), a sample of 10 was decided upon for the focus group interviews. This would give a 33 percent sample of the total population.

According to De Vos *et al.* (1998:76), random sampling is the only technique available that will ensure an optimal chance of drawing a sample that is representative of the population from which it was drawn.

In this study the random sampling technique advocated by De Vos *et al.* (1998:76) was followed (*cf.* 1.5.2.1).

4.2.4 Pilot study

In addition to the preliminary check made on the questions in order to locate ambiguities, it is desirable to carry out a pre-test (pilot study) on the questionnaire before using it in the research. For the pre-test, a sample of individuals from a population similar to that of the research participants should be selected. The pre-test form should provide space for respondents to comment about the questionnaire itself in order to indicate whether some questions seem ambiguous and to indicate other aspects that can lead to improving the questionnaire (Tuckman, 1994:56).

The questionnaire for this research was piloted on a sample of lecturers (n=20). The sample group was drawn from the intended target population. The pilot group was requested to comment on the questionnaire in terms of its length, any unclear or ambiguous questions and any further suggestions, as is advised by Ary *et al.* (1996:23).

The pilot study responses were analysed and it was revealed that certain changes had to be made to the questionnaire, which were then implemented in the final questionnaire.

4.2.5 Questionnaire distribution

The final questionnaire was then distributed. The accompanying cover letter aimed at orientating the respondents to the questionnaire, as well as assuring them of confidentiality and anonymity.

Questionnaires were personally distributed in order to minimise the disadvantages of postal questionnaire surveys and to ensure a high return rate, as well as to exercise

control over the time for returning the questionnaires. A total of 130 questionnaires were distributed to lecturers at six universities of technology and comprehensive universities that offer university of technology type programmes, as well as 240 questionnaires to students at these institutions. Interviews were conducted with 10 administrative staff members at these institutions.

4.2.6 Statistical analysis

The Statistical Services of the Vaal University of Technology analysed and processed the data collected using the SAS-program. The program was used to find the frequencies and means in the data. Frequency tables and cross-tabulation tables were used to represent the results.

Descriptive statistics were calculated to describe the basic features of the data in the study as they provide simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data. Various techniques that were commonly used are classified as:

- Graphical description in which graphs are used to summarise data.
- Tabular description in which tables are used to summarise data.
- Summary statistics in which certain values are calculated to summarise data.

4.3 CONCLUSION

In this chapter the research design was presented briefly. The research method, development and the pilot study were outlined. The next chapter will present the success of the survey, as well as the research data analysis and interpretations of both the questionnaires and the focus group interviews.

CHAPTER 5

DATA ANALYSIS AND INTERPRETATION

5.1 INTRODUCTION

This chapter reports on and interprets the empirical findings of this study. Data were collected using the survey questionnaire format, together with a focus group interview. The first questionnaire (Annexure 1) was directed at lecturers involved in CASS. The second questionnaire (Annexure 2) was directed at students involved in CASS. In addition, a focus group interview was conducted with administrative staff involved in administering CASS. Questionnaires were distributed to 65 lecturers and to 240 students. The focus group interview was conducted with 10 administrative staff members involved in CASS (*cf.* 4.2.3).

The lecturer response rate was calculated at 75 percent, with 49 of the 65 questionnaires distributed to lecturers being returned. This constitutes a reliable sample from which meaningful deductions can be made. Of the 240 questionnaires sent to students, 166 were returned, which renders a response rate of 69 percent. Again, this can be regarded as a useful response from which to make meaningful deductions according to Seaberg's 10 percent theory (quoted by Vermeulen, 1998:56).

For the purpose of data analysis and interpretation, the participating institutions were numbered from A to K. Table 5.1 shows the number of participating lecturers and students per institution:

Table 5.1: Number of lecturers and students per participating institutions

PARTICIPATING INSTITUTION	LECTURERS	STUDENTS
Institution A	1	
Institution B	2	5
Institution C	1	7
Institution D	1	
Institution E	2	16
Institution F	3	5
Institution G	1	3
Institution H	1	
Institution I	1	
Institution J	30	126
Institution K	6	4
Total	49	166

The findings of the research will be dealt with as follows:

- Results obtained from the participating lecturers and students will be discussed individually.
- Next, the results of the lecturers and students on the questions that were generic for the two questionnaires will be compared.
- The results of the focus group interviews will then be brought into account to triangulate the findings of some of the open-ended questions of the questionnaires.
- Certain of the questions will not be responded to as these were “teaser” questions to set the scene and context of the questions that are to follow.

5.2 FORMALISING DATA OBTAINED FROM QUESTIONNAIRES

The questions of the questionnaires can be divided into several sub-categories. The division of the questions in the two questionnaires into the various sub-categories is depicted in Table 5.2:

Table 5.2: Sub-categories of questionnaire data

SUB-CATEGORY	LECTURERS (Questions)	STUDENTS (Questions)
5.2.1. Responsibility for CASS management	1.5 2.1	1
5.2.2 Systems, plans and policies	2.5 2.6 3.1 4.1 4.2	2.4 3.1
5.2.3. Historical use of CASS	2.2	2.1 2.2
5.2.4. CASS strategies used	2.4	2.3
5.2.5. Compliance and efficiency of CASS	2.8.1 – 2.8.10	2.6.1 – 2.6.10
5.2.6. Assessment methods used as part of CASS	3.4	3.4.1 – 3.4.4
5.2.7. Perceptions of CASS	5.1 5.2 5.8	5.1 – 5.8
5.2.8. Administration of CASS	5.9.1 – 5.9.10	
5.2.9 Factors hampering implementation of CASS	2.9	2.7

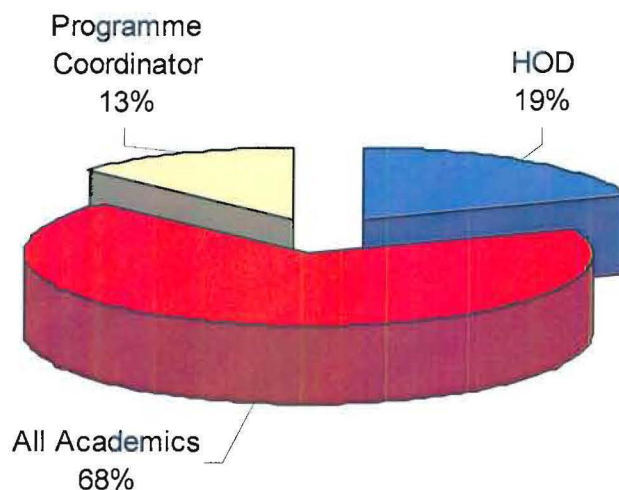
The sub-categories as indicated in Table 5.2 would serve as a guideline for the discussion of the data obtained from the questionnaires.

5.2.1 Responsibility for CASS management

This sub-section indicates the respondents' varied perceptions regarding the responsibility of managing the CASS plan within the university. This is a clear indication that the CASS plan of the departments within which the lecturers function and the departments within which the students study, do not possess a clear CASS

plan that is communicated to all the role players within that department. It also indicated that the CASS strategy of the university is not clearly communicated (*cf.*1.2.3; *cf.*2.3.11) to all the role players as this would eradicate the confusion that exists within the department.

Figure 5.1: Responsibility for management of CASS (Lecturer respondents)

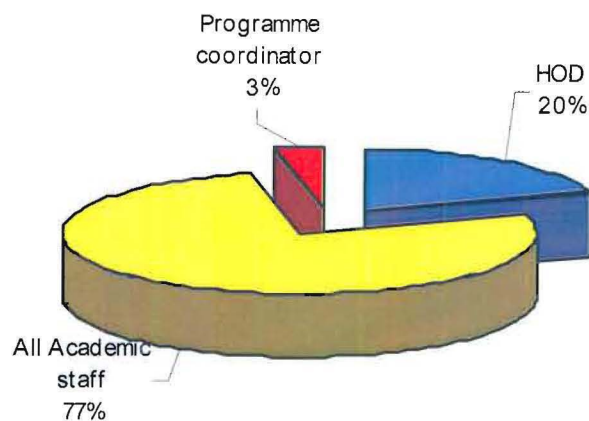


As is depicted in Figure 5.1, 13 percent of the lecturer respondents indicated that they were under the impression that the programme coordinators within a department were responsible for the management of the CASS plan. A further 19 percent of the respondents indicated that the heads of department (HOD) of the academic departments were responsible for managing the CASS plan. An overwhelming majority, 68 percent of the respondents, felt that all academics were responsible for the management of the CASS plan.

Figure 5.2 depicts that 3 percent of the student respondents indicated that programme coordinators were responsible for the management of CASS in the departments where they studied. Of these respondents, 20 percent indicated that the HODs were

responsible for managing the department's CASS plan, while 77 percent were under the impression that all academic staff members were responsible for the management of the CASS plan in their departments.

Figure 5.2: Responsibility for management of CASS (Student respondents)

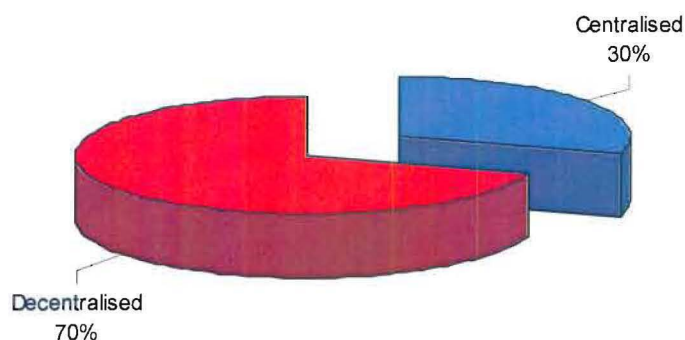


There is a correlation between the lecturer respondents and student respondents as the majority of both indicated that all the academic staff members are responsible for the management of the CASS plan in the department. Although all academic staff members (lecturers) are involved in the design of the CASS plan in the department, the programme coordinator needs to take control of and manage the processes described in the department's CASS. This leads to a coordinated effort in CASS implementation and record keeping. This can only be established through proper communication and management from a suitably appointed responsible individual (*cf.* 3.2.3 and *cf.* 3.2.5.2).

The fact that most of the respondents from both samples, lecturers and students, indicated that all academic staff are responsible for the management of the CASS plan is an indicator that no “real plan” is in existence or communicated properly to the role players (*cf.*2.3.11).

On the matter of centralised or decentralised assessment offices, which directly affect the management of the CASS process, the following results, as shown in Figure 5.3, were obtained from the lecturers involved in the study.

Figure 5.3: Centralised vs. Decentralised Assessment offices

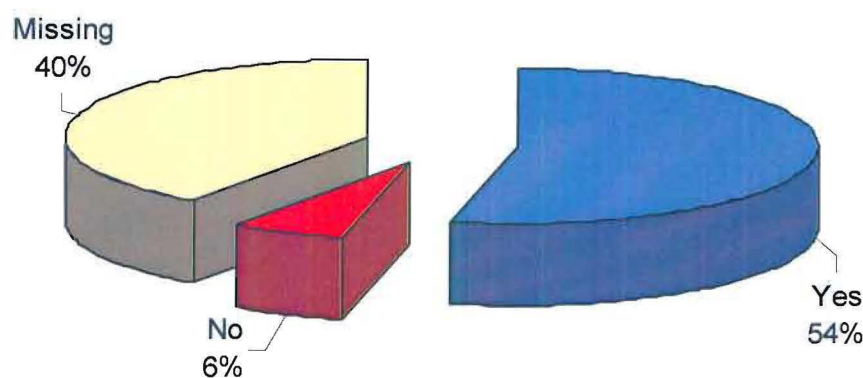


Of the respondents, 70 percent indicated that their assessment offices were decentralised. This would indicate that the institutions CASS strategy would be implemented in different faculties or departments. Therefore, a very clear strategy should be in place and this strategy should be communicated to all the faculties (*cf.*1.2.3). If the policies and CASS plans of the different departments were added to this equation, it would necessitate an even better knowledge by all staff members, academic as well as administrative, involved in CASS regarding the management and implementation of the CASS strategy, CASS plans and CASS policies.

5.2.2 Systems, plans and policies

When asked whether a CASS plan is in existence for the department, a positive response was received from 54 percent of the lecturers. The fact that a large percentage of respondents, 40 percent, did not answer this question could indicate that they are not aware of such a plan being in existence, or that they are not informed regarding this plan.

Figure 5.4: Existence of a CASS plan in the departments

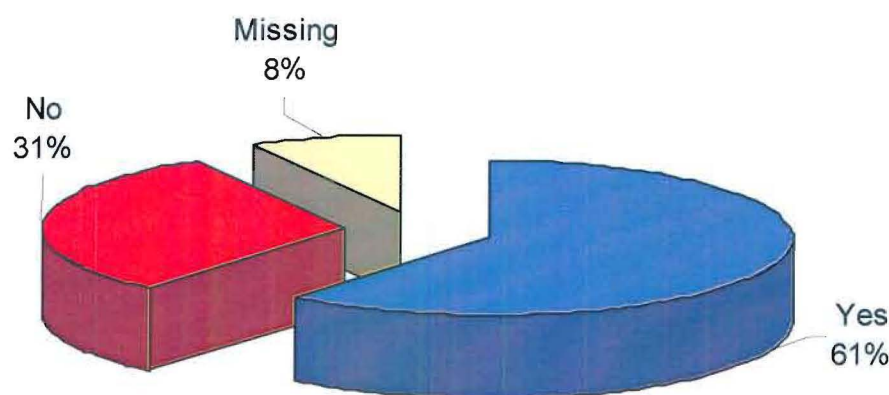


This indicates that, if a CASS plan is in existence, at least 40 percent of the lecturers are not aware of such a plan and, therefore, operate and assess without knowledge of the department's CASS plan. This could lead to CASS practices that are not in accordance with the CASS plan of the department and, possibly, outside the regulations of the institution's CASS strategy and CASS policy.

Taking the above question further and determining whether the respondents are aware of a CASS strategy for the institution, the response was overwhelmingly positive.

Figure 5.5 indicates that 61 percent of the respondents replied that their institution does have a CASS strategy, 31 percent of respondents indicated that the institution does not have a CASS strategy. Of the responses received, 8 percent did not answer the question, which again would indicate that the existence of the CASS strategy is not known to all the lecturers in the institutions (*cf.*2.4.3).

Figure 5.5: Existence of an institutional CASS strategy

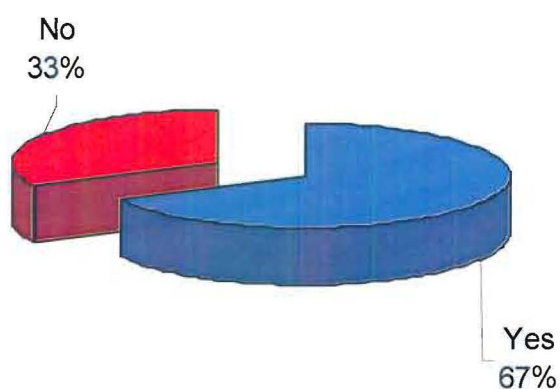


Again, this situation reflects that the existence of CASS-strategies is not communicated to all lecturers and therefore, they cannot operate within the principles of the said strategy. This necessitates the development of a CASS strategy for the institutions and the communication thereof to all the lecturers that are involved in CASS.

When these results were linked to the results obtained from the student respondents of whether students should be informed regarding the institutional CASS strategy, the response was positive. Figure 5.6 indicates that 67 percent of the student respondents felt that they should be aware of the CASS strategy of the institution. This would necessitate proper communication of the CASS strategy to all the stakeholders in the

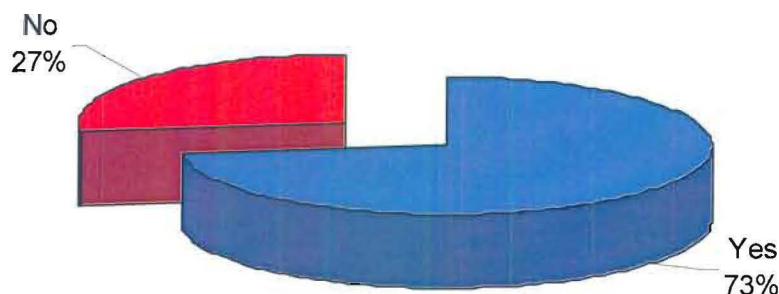
CASS process. The existence of a CASS strategy without the stakeholders' knowledge of what is entailed in such a strategy has no meaning. Therefore, proper communication to all stakeholders should be part of the development of both CASS strategies and CASS plans (*cf.* 2.4.4).

Figure 5.6: Should students be aware of the institution's CASS strategy?



Linked closely to the CASS strategy of the institution is the CASS policy of the institution (*cf.* Question 3.2). Figure 5.7 depicts the findings on the question of whether a CASS policy is in existence within the institution.

Figure 5.7: CASS-policy



In the lecturer sample, 73 percent indicated that they are aware of the existence of a CASS policy in their institution. It is a cause for concern that 27 percent of the lecturers indicated that no CASS policy exists in their institutions considering that all of these respondents are involved in CASS at their respective institutions. This could be either that the policy does not exist or that the lecturers are not aware of the existence of such a policy. The fact that lecturers involved in applying CASS do not know about the CASS policy of their institution or do not have CASS policy at their institution makes it even more necessary for the development of a CASS strategy for the institution, which will also include a CASS policy (*cf.* 1.3).

The implementation of the CASS plan, the CASS strategy and the CASS-policy would necessitate that the students involved in CASS are properly informed on how they will be assessed. Figure 5.8 indicates the response of the student respondents to whether they were informed on how they will be assessed in the programme that they are following.

Figure 5.8: Student informed on assessment in their programme

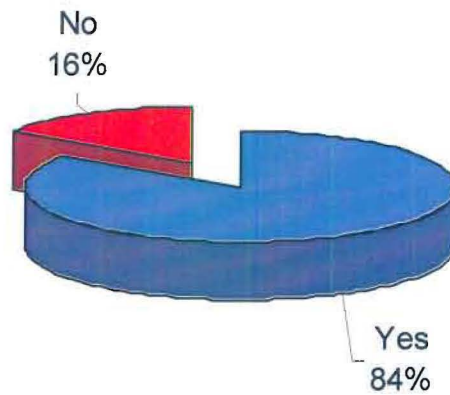


Figure 5.8 indicates that 84 percent of the student respondents replied that they were informed on how they will be assessed in the programmes that they are following. This hints at the existence of some sort of a CASS plan being in place. However, 16 percent of the students indicated that they were not informed on how they will be assessed within the programmes that they are following. This again reflects on poor communication of the CASS plan, or even the non-existence of such a plan, however, it could also reflect on non-attendance of students to classes where the method of assessment was explained. This would necessitate the development of a CASS plan for the department and the proper management thereof which would include clear communication of the plan to all stakeholders.

On the question of whether lecturers are trained as assessors within their different institutions, the response was positive.

Figure 5.9: Assessor training

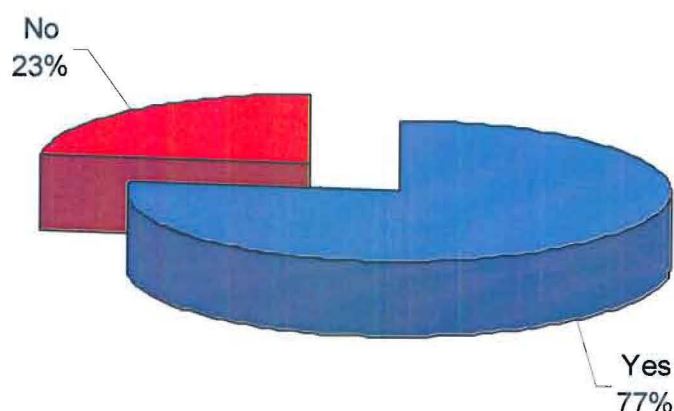
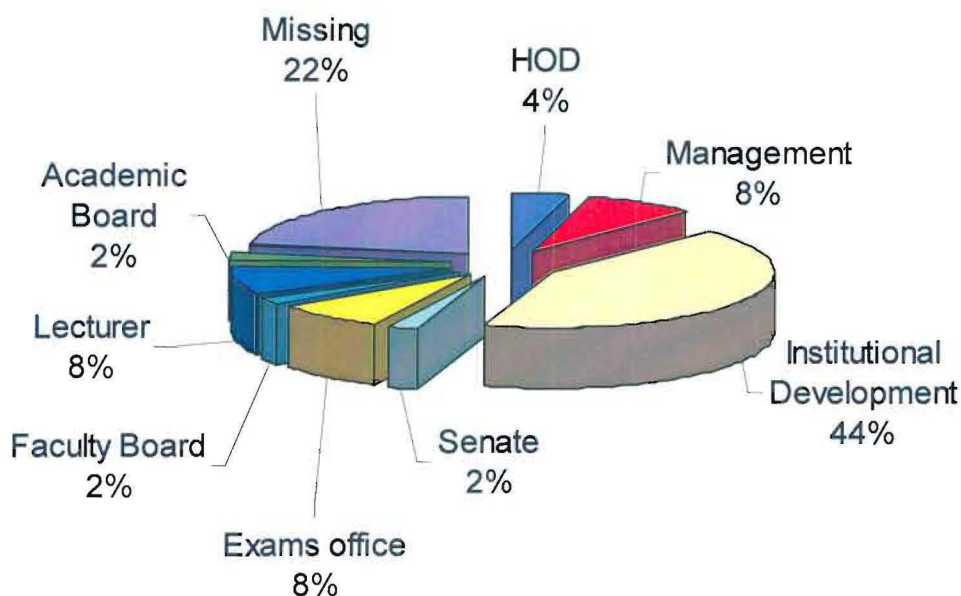


Figure 5.9 depicts that 77 percent of the lecturer respondents indicated that they have undergone assessor training at their institutions. The fact that 23 percent of the lecturers indicated that they do not have assessor training at their institutions is a cause for concern, as all these respondents are involved in CASS. The training of lecturers and the constant communication of the CASS plan, CASS strategy and CASS-policy is of utmost importance (*cf.*2.4.1; *cf.*2.4.4).

The issue of responsibility for drafting the CASS-policy and the maintenance of the CASS-policy is depicted in Figure 5.10(a) and 5.10(b) respectively. A range of responses was obtained from the lecturers regarding the responsibility for the drafting of the CASS-policy. This is indicative of the fact that there is little knowledge amongst the lecturers as to the responsibility of policy drafting within the institutions. The CASS-policy, which is the policy that all of these lecturers are supposed to be implementing within their institutions and is supposed to be aligned with the institutional vision and mission, is supposed to be a policy that is well known to all of those who have to implement it.

The responses vary from 44 percent of the respondents who indicated that the Institutional Development Unit of the institution is responsible for the development of the policy, to 8 percent who stated it to be the responsibility of management, the examination office and the lecturers themselves. Of the respondents, 2 percent thought it to be the responsibility of faculty boards, academic boards and senate. What is disturbing is that 22 percent of the lecturer respondents did not answer this question indicating that they are unaware of who is responsible for the drafting of the CASS policy.

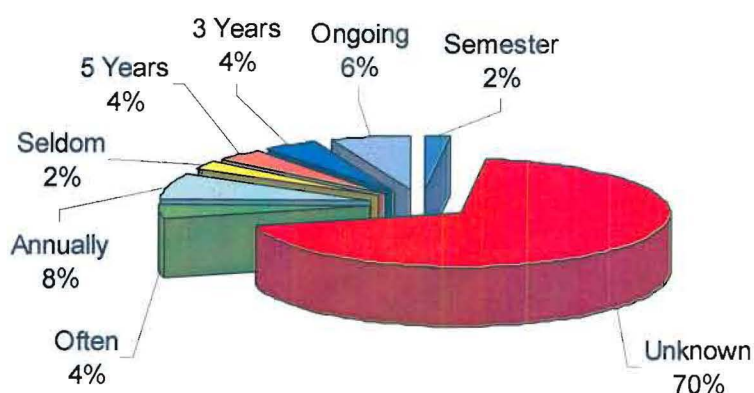
Figure 5.10(a): Responsibility for drafting CASS-policy



Regarding the maintenance of the CASS policy, as depicted in figure 5.10(b), a whole range of responses were obtained. These ranged from 2 percent indicating that policy revisions were made every semester, 2 percent indicating that the CASS policy is revised seldom, 4 percent indicating 3 year and 5 year revision periods and 8 percent indicating that the policy is revised annually. Of the respondents, 6 percent indicated that policy revisions are made on an ongoing basis. What is disturbing, however, is

that to 70 percent of the respondents the revision periods of the CASS policy is unknown. This again indicates that lecturers are not involved in the development and maintenance of the CASS policy, and have a lack of knowledge regarding the CASS policy. As assessment, and therefore also CASS, is in essence a process that should be revised and adjusted regularly to accommodate the changes in the environment, student cohort and national policies. The CASS policy of an institution is a living document and should be revised accordingly (*cf.*1.3). The responsibility for the maintenance and management of the CASS policy should reside within the offices of the academic registrars of the institutions as they are closely linked to all the academic processes, including CASS, within the institution.

Figure 5.10(b): Maintenance of CASS-policy



5.2.3 Historical use of CASS

Question 2.2 of the lecturers' questionnaire was aimed at determining whether continuous assessment or continual assessment was used within the different institutions and whether lecturers could distinguish between the two.

Figure 5.11: Continuous vs. continual assessment

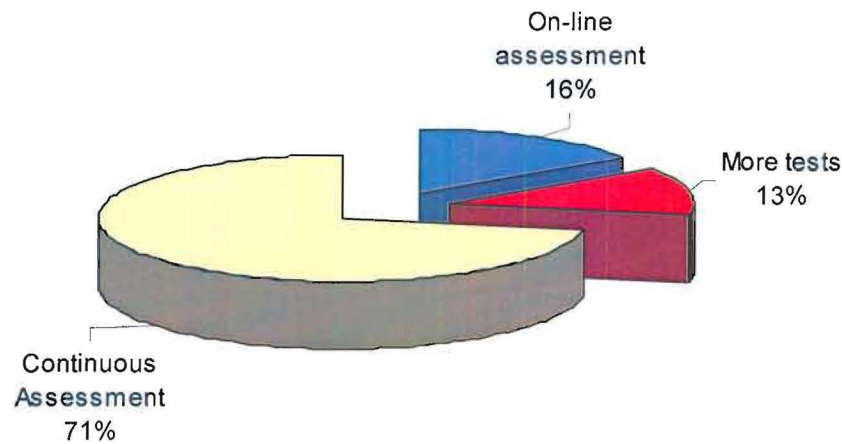
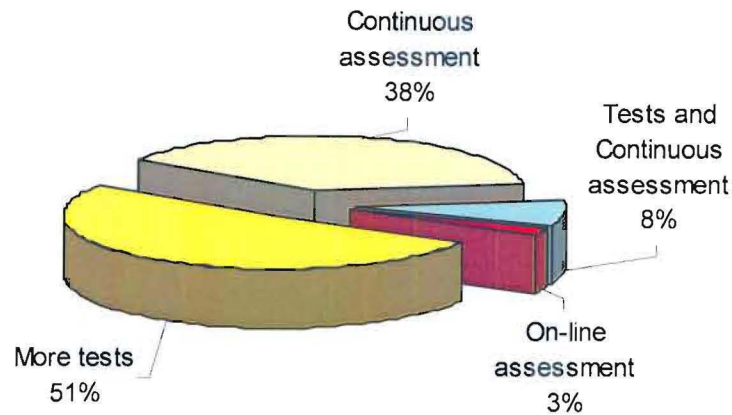


Figure 5.11 depicts the results obtained from lecturers regarding how they have implemented CASS in the past. The overwhelming response, 71 percent, was that they implemented continuous assessment. However, 13 percent indicated that they have implemented more tests (*cf.* 2.2). This indicates a confusion of continuous assessment with continual assessment and could be one of the reasons for the work overload referred to in later questions.

To determine what students have experienced in the past regarding CASS, students were asked to respond to Question 2.2. The responses from the students to Question 2.2 are depicted in Figure 5.12.

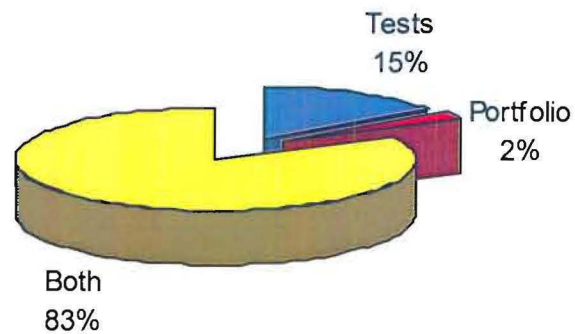
Figure 5.12: Student experiences of CASS in the past



There is a correlation between the lecturers' responses and the student responses regarding the use of CASS in the past. Although 38 percent of the students indicated that they have been subjected to continuous assessment, a further 51 percent indicated that they were subjected only to more tests. This is an indication of the confusion between continuous assessment and continual assessment which could lead to work overload for both lecturers and students (*cf.*2.4.2.2).

Affirmation of the confusion between continuous and continual assessment was obtained from the students' response to question 2.3 in which they had to indicate the methods of assessment that were used in the past. Figure 5.13 depicts the different assessment methods that were used as CASS in the past. This indicates a lack of understanding of the process of CASS (*cf.*2.3.1).

Figure 5.13: Assessment methods used as CASS in the past

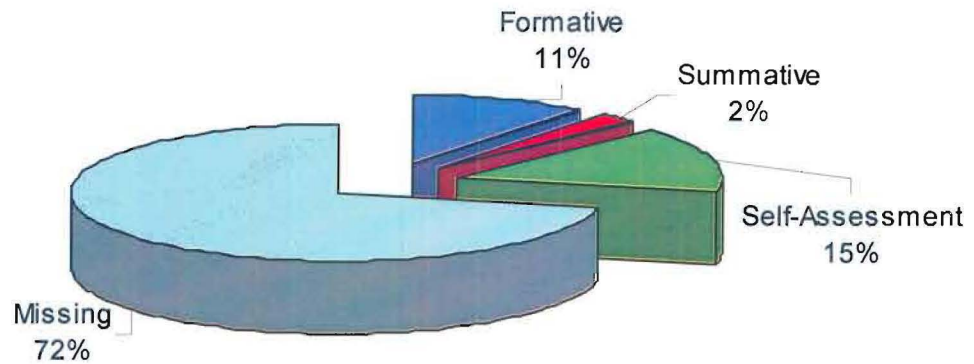


The student respondents indicated that only 2 percent of the assessment was done through portfolios. The use of only tests was indicated by 15 percent of the respondents whilst 83 percent indicated that both tests and portfolios were used. This would indicate that real CASS was implemented, but it is refuted by the findings of Question 2.2 which clearly indicated that more tests were used as the basis for CASS. These results could therefore be disregarded.

5.2.4 CASS strategies used

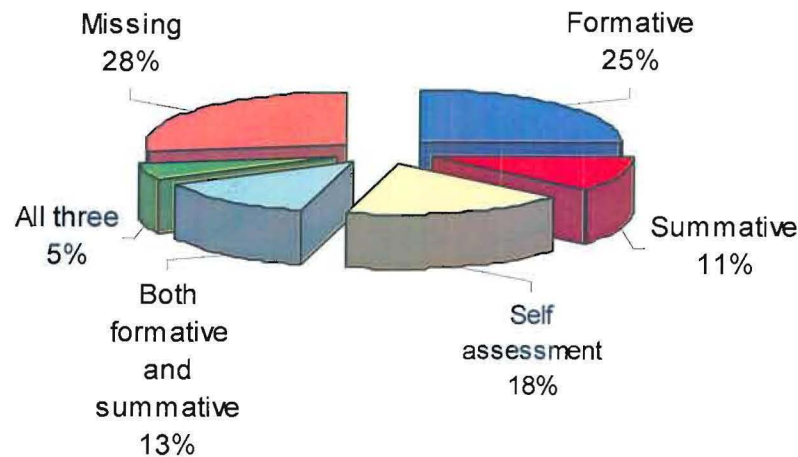
In attempting to ascertain the main focus of the CASS that is implemented by the lecturers, question 2.4 was introduced into the questionnaire. The responses from the participating lecturers are shown in Figure 5.14.

Figure 5.14: Main focus of CASS



According to the results depicted in Figure 5.14, only 2 percent of the lecturers use CASS as a means of summative assessment (*cf.* 2.3.5.3). CASS is used as a means of formative assessment by 11 percent of the respondents (*cf.* 2.3.5.2) and 15 percent of the lecturers indicated that they use CASS as a means of self-assessment. Of the respondents, 72 percent did not respond to this question, which may indicate that they are not familiar with the concepts of formative and summative assessment, or that they cannot identify either one of these concepts as the main focus of their CASS. This is a very disturbing situation as it indicates that the vast majority of the lecturers are not aware as to why or how they are to implement CASS. The students' response to the same question is depicted in Figure 5.15.

Figure 5.15: Main use of CASS (students' view)



The results to Question 2.3, from the students' questionnaire, indicate that 25 percent of the student respondents perceive CASS to be used mainly as a formative assessment. Summative assessment was indicated as the main use of CASS by 11 percent of the student respondents, while 18 percent of the students experience the main use of CASS to be for self-assessment. A further 13 percent of the students indicated that CASS is used for both formative and summative purposes and 5 percent indicated that CASS can be used for all three purposes. What is disconcerting in this response is that 28 percent of the students did not respond to this question. This could indicate that they are not familiar with these concepts of CASS or that they do not understand the reason for using CASS.

If these responses are linked to the previous results that were obtained from the lecturers, it emphasises the confusion regarding CASS and its main focus and use.

5.2.5 Compliance and efficiency of CASS

In endeavouring to establish the effectiveness of the current CASS practices and to determine whether the current CASS practices comply with the prescribed characteristics of all assessment processes, Question 2.8 was posed to lecturers at the different institutions. In order to determine how the students experience the efficiency and compliance of the CASS practices currently employed at their institutions, the students were asked the same question in Question 2.6. Figures 5.16 and 5.17 depict the findings obtained from lecturers and students regarding the efficiency and compliance of the CASS processes respectively.

The Likert scale that was used in the following section of the questionnaires required the respondents to indicate the extent to which they experience a favourable or unfavourable attitude towards a series of evaluative elements regarding the good practice characteristics of CASS, as experienced in their current CASS processes. The study made use of a four-point Likert scale, ranging from 'always' to 'never'. An even, rather than odd, rating scale was selected in order to mitigate the potential of respondents choosing the 'middle of the road' response. Additionally, all questions using scaled responses included a no-response option, 'missing', to alleviate potential loss of validity arising from forced response.

Figure 5.16: Lecturers' perceptions regarding efficiency and compliance of the current CASS-processes

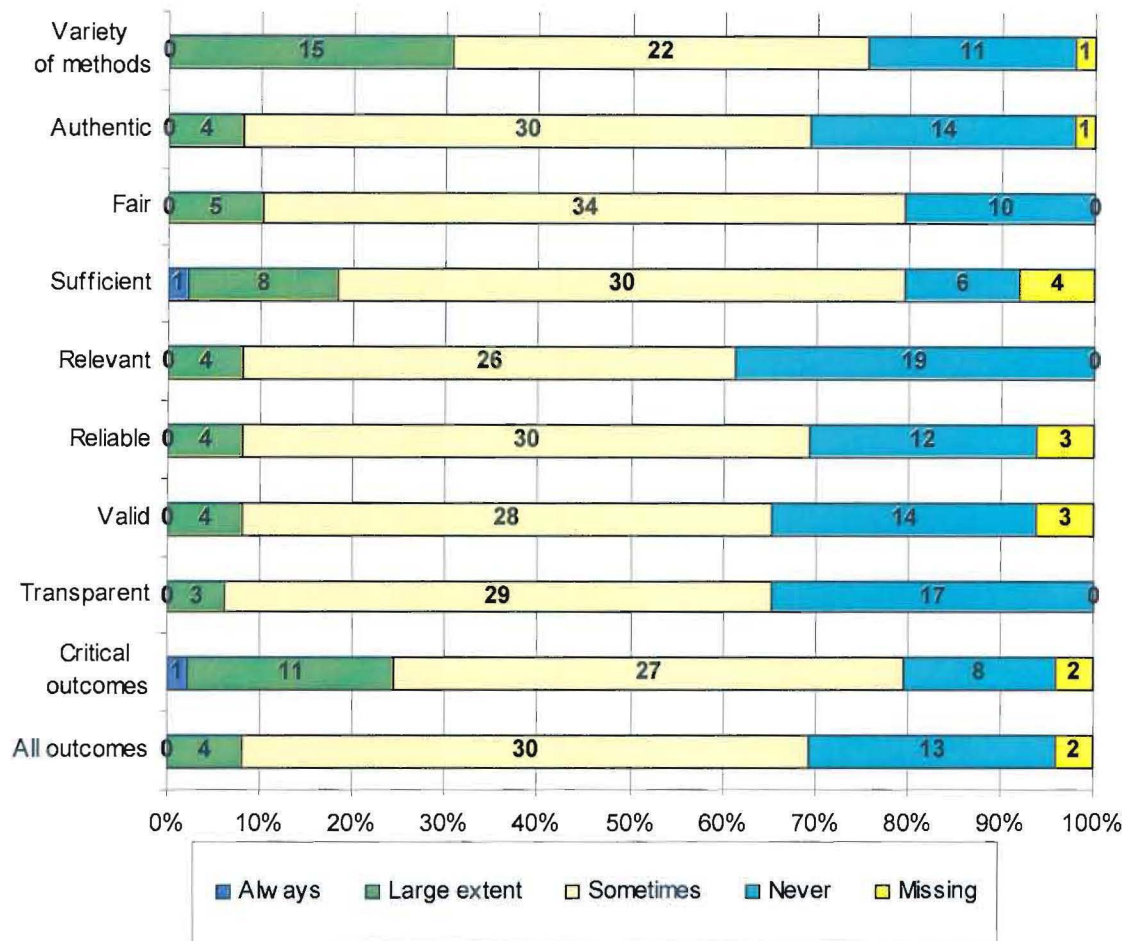


Figure 5.16 depicts the responses from lecturers regarding the compliance and efficiency of the current CASS process that is employed in the different institutions. In only two of the good practice characteristics, sufficiency and critical outcomes, did 2 percent of the respondents indicate that the current CASS process is always efficient. The largest number of respondents, ranging from 45 percent to 69 percent, indicated that all of the characteristics of good practice for CASS are sometimes addressed in their current CASS processes. A large number of the respondents, between 12 percent and 39 percent, indicated that their current CASS processes never address the good practice characteristics of CASS (*cf.* 2.4.3; *cf.* 2.3.5; *cf.* 2.3.7; *cf.* 2.3.8; *cf.* 2.3.9).

This leads to the assumption that the CASS plan for their departments, if such a plan exists at all, is insufficient and should be replaced by a properly designed and communicated plan.

Table 5.3: Descriptive statistics: compliance and efficiency (lecturers' response)

	Mean	df	p-value	Standard deviation	F-ratio variance	Cohen's d-statistic
All outcomes	3.19148	205	0.01305	0.57628	2.83585	0.38408
Critical outcomes	2.89361	201	0.05293	0.69888	2.13871	
Transparency	3.28571	200	0.00000	0.57735	2.78122	1.04343
Validity	3.21739	201	0.00313	0.59303	2.62004	0.46534
Reliability	3.17391	198	0.03699	0.56977	3.05146	0.32479
Relevance	3.30612	202	0.00530	0.61927	1.96783	0.43407
Sufficiency	2.91111	196	0.20947	0.63325	2.14049	
Fairness	3.10204	200	0.00005	0.54942	2.29677	0.63276
Authenticity	3.20833	195	0.00000	0.58193	2.25952	0.80591
Variety of methods	2.91666	200	0.05596	0.73898	2.41241	

In this question, which deals with the characteristics of good practice in CASS, the overall mean was calculated as 3.12064 and the average standard deviation as 0.61382. This indicates that the overall feeling is that these characteristics are not efficiently applied within the current CASS processes used in the different institutions. The lowest mean, 2.91111, and thus the highest indicated efficiency and compliance, occurred on the issue of 'sufficiency'. This indicates that the lecturers are of the opinion that they already do enough to assess the students' performance and seem to shy away from an increased workload. The highest mean, 3.30612, and thus the lowest indicated efficiency and compliance, occurred on the issue of 'relevance'.

Question 2.8.10, which deals with the issue of a 'variety of assessment methods used' in the CASS-process, encountered the greatest level of standard deviation at 0.73898. The occurrence of high levels of standard deviation in certain questions may indicate

the variety of the CASS plans and CASS-strategies that are used in the different institutions.

Figure 5.17: Students' perceptions regarding efficiency and compliance of the current CASS-processes

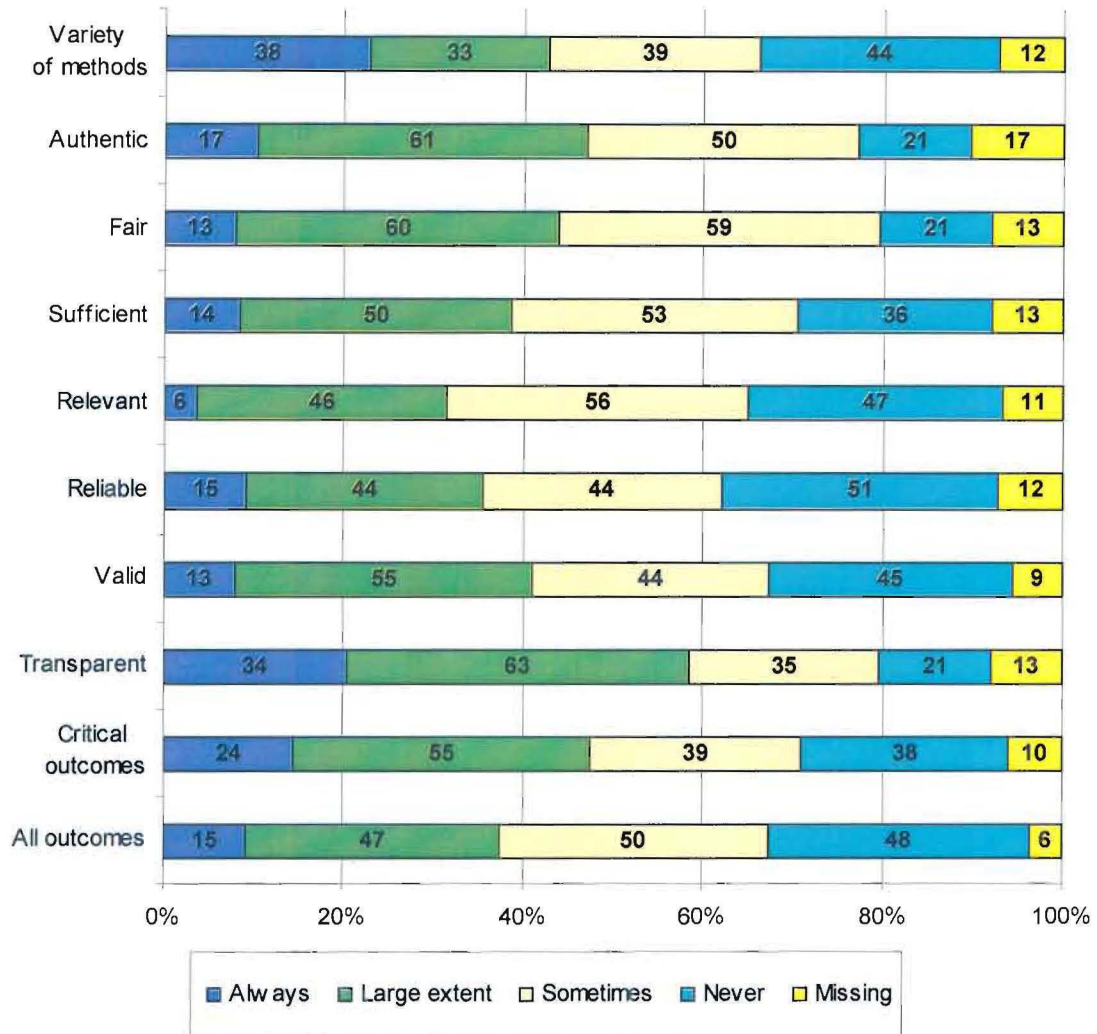


Figure 5.17 depicts the responses from students regarding the compliance and efficiency of the current CASS processes that are employed in the different institutions. Very low levels of responses indicating 'always' are reflected in the student responses. This, however, is still better than in the case of the lecturers. This indicates that the students experience the situation differently to that of the lecturers. Generally, students appear to be convinced that their CASS process satisfies good practice for CASS. However, the largest number of respondents, ranging from 20 percent to 38 percent, indicated that all of the characteristics of good practice for

CASS are sometimes addressed in their current CASS processes. A large number of the respondents, between 13 percent and 29 percent, indicated that their current CASS processes never address the good practice characteristics of CASS (cf.2.4.3).

This leads to the assumption that the CASS plan for their departments, if such a plan exists at all, is insufficient and should be replaced by a properly designed and communicated plan.

Table 5.4: Descriptive statistics: compliance and efficiency (students' response)

	Mean	df	p-value	Standard deviation	F-ratio variance	p-variance
All outcomes	2.818750	205	0.01305	0.970456	2.83585	0.000090
Critical outcomes	2.583333	201	0.05293	1.022068	2.13871	0.003458
Transparency	2.281046	200	0.00000	0.962846	2.78122	0.000091
Validity	2.770701	201	0.00313	0.959919	2.62004	0.000312
Reliability	2.850649	198	0.03699	0.995299	3.05146	0.000039
Relevance	2.929032	202	0.00530	0.868718	1.96783	0.007597
Sufficiency	2.725490	196	0.20947	0.926477	2.14049	0.004167
Fairness	2.575163	200	0.00005	0.832662	2.29677	0.001216
Authenticity	2.503356	195	0.00000	0.874752	2.25952	0.001689
Variety of methods	2.577922	200	0.05596	1.147788	2.41241	0.000721

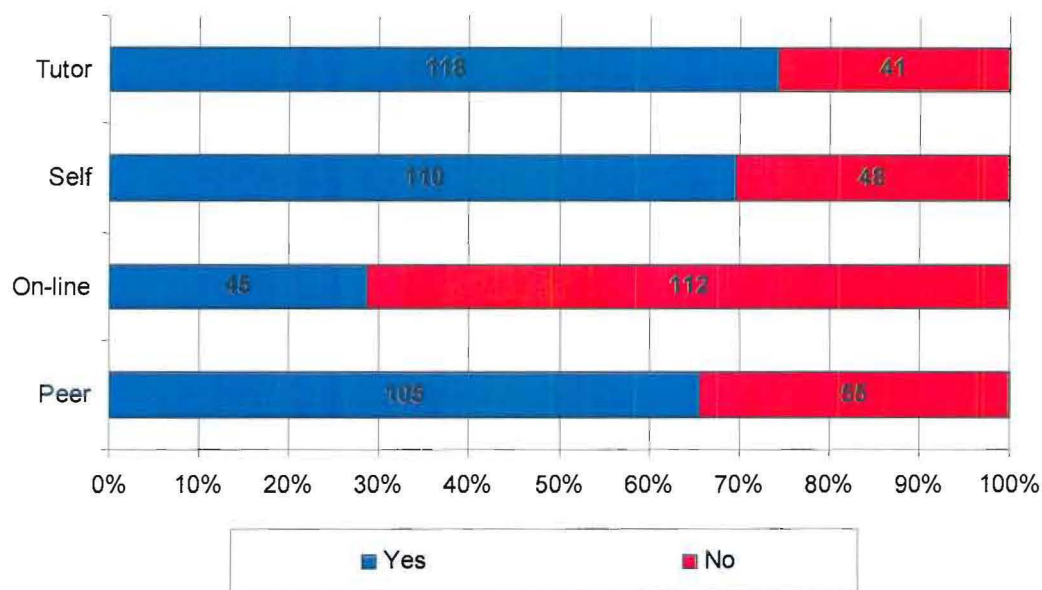
In the responses of the participating students to this question that deals with the characteristics of good practice in CASS, the overall mean was calculated as 2.66154 and the average standard deviation as 0.95651. This indicates that the overall feeling is that these characteristics are not efficiently applied within the current CASS processes used in the different institutions. The lowest mean, 2.281046, and thus the highest indicated efficiency and compliance, occurred on the issue of 'transparency'. This indicates that the students are of the opinion that they are properly involved in the process of feedback regarding their performance in the CASS processes. The highest mean, 2.929032, and thus the lowest indicated efficiency and compliance,

occurred on the issue of 'relevance'. This correlates with the findings from the lecturer survey.

Question 2.8.10, which deals with the issue of a 'variety of assessment methods used' in the CASS-process, encountered the greatest level of standard deviation at 1.147788. The occurrence of high levels of standard deviation in certain questions may indicate the variety of the CASS plans and CASS-strategies that are used in the different institutions.

5.2.6 Assessment methods used as part of CASS

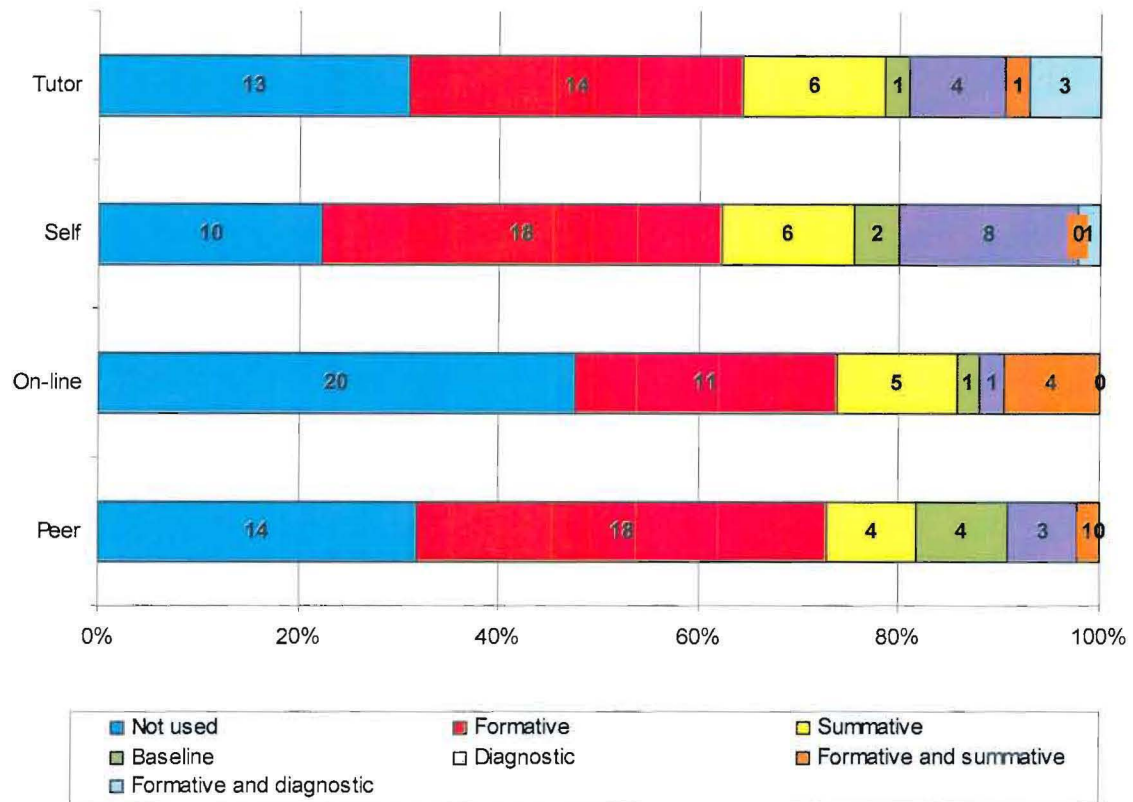
Figure 5.18: Use of different assessors in CASS (students' response)



According to the results depicted in figure 5.18, student respondents indicate that 71 percent were assessed by tutors in the CASS process used in their institutions. Of the respondents, 66 percent indicated that they use self-assessment in their CASS and 63 percent indicated that they utilise peer assessment, as well as self-assessment. This would indicate that CASS is well implemented in as far as the use of a variety of assessors is concerned (*cf.* 2.4.4). The question, however, is whether these assessors are well trained in the art of assessment, seen in the light of the results obtained on

Question 3.1 (cf.5.2.2 figure 5.9). This could lead to individual interpretations of the CASS plan and, therefore, problems in the implementation of said plan.

Figure 5.19: Use of different assessment strategies and assessors as part of CASS (lecturers' response)



The lecturer respondents to question 3.4, indicated that different assessors are used in their CASS-process. A large number of lecturers do not use other assessors, 10 of the respondents do not use self-assessment, 13 respondents do not use tutors as assessors, 14 respondents do not utilise peer assessment and 20 respondents do not implement on-line assessment. This could be due to a lack of infrastructure that prohibits the use of on-line and tutor assessment. However, the use of peer- and self-assessment should be part of the CASS-process. The implementation of these strategies could help to prevent work over-load and are excellent ways of formative assessment.

The use of baseline assessment and diagnostic assessment seem to be still underutilised. Baseline assessment, 4 respondents, seems to be used maximally in peer assessment, while diagnostic assessment, 8 respondents, is mostly used in self-

assessment (*cf.* 2.3.5.1). These are both good practices, but are only used by a minimum of the lecturers involved in the survey.

What is, however, disturbing in this analysis, is the fact that tutors are used by 6 of the respondents for summative assessments, self-assessment is used by another 6 of the respondents for summative events and 4 of the respondents indicated that they use peer assessment in summative assessment. These are not acceptable practices, as summative assessment is the final, recordable assessment of a learning event that leads to credits and even certification. This would have been prevented had there been proper CASS plans, -strategies and -policies in place.

5.2.7 Perceptions regarding CASS

In Question 5, the perceptions of students and lecturers on CASS were measured. For Question 5.8, the student respondents, an overwhelmingly 86 percent, indicated that they were of the opinion that assessment was an integral part of learning. The same overwhelming response was obtained on Question 5.3, with 82 percent of the students indicating that they do not agree with the Minister of Education's statement that first-year students who fail should not be re-admitted to studies.

On Question 5.4, regarding the influence of reading speed on students' performance in tests, Figure 5.20 depicts that 86 percent of the student respondents agreed with this statement. Question 5.7, which asked whether peer assessment could be deemed valid, 64 percent of the students agreed that this is so. On the question of whether examination papers should be made available to students in their own language, Question 5.6, 61 percent of the student respondents indicated that they disagree with this statement.

Student respondents, 54 percent, also indicated that students should not be allowed to answer their examination papers in any language. On Question 5.2, on whether one

final examination is sufficient to determine a student's competence, 55 percent of the student respondents disagreed. Of the student respondents, 54 percent also disagreed with the statement that CASS leads to work overload.

All of the above indicate that students are in general positive towards the process of CASS.

Figure 5.20: Student perceptions

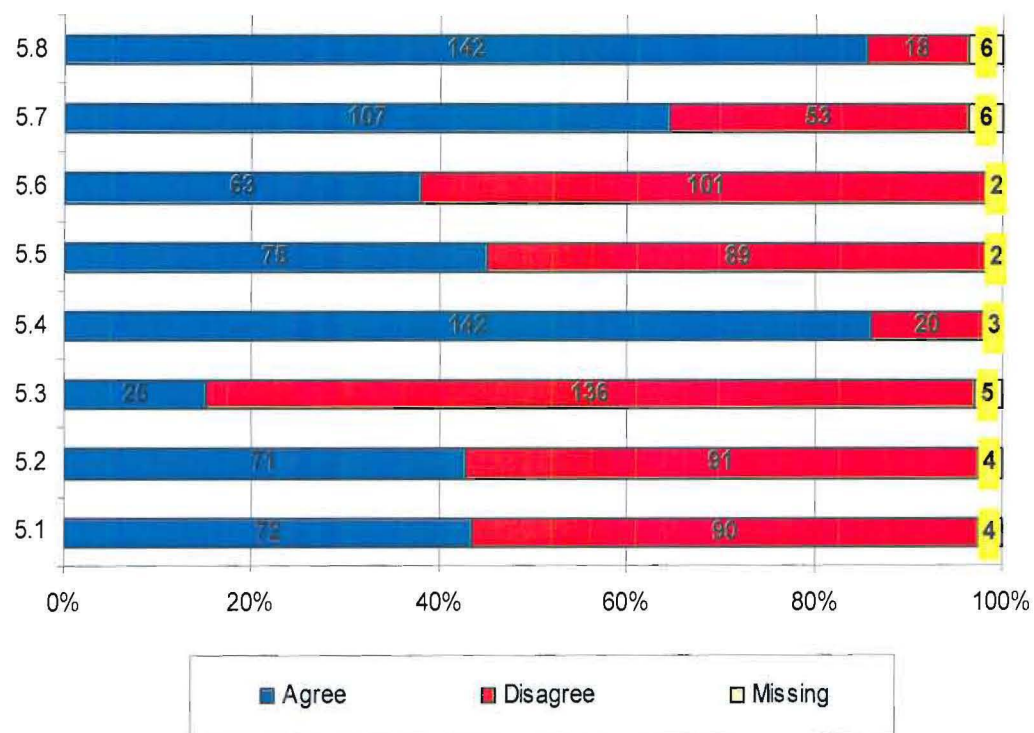


Table 5.5: Descriptive statistics: perceptions (students' response)

	Mean	df	p-value	Standard deviation	F-ratio variance	p-variance
Work overload	1.555556	209	0.191977	0.498445	1.01652	0.910556
One examination	1.561728	209	0.000045	0.497714	2.25827	0.001438
Re-admittance	1.844720	208	0.000001	0.363301	1.93277	0.002528
Reading speed	1.251534	210	0.591346	1.667939	25.36166	0.000000
Any language	1.542683	210	0.000001	0.499701	3.20071	0.000012
Own language	1.615854	210	0.000222	0.487882	2.49765	0.000433
Peer assessment	1.331250	204	0.068374	0.472141	1.14425	0.539092
Part of learning	1.112500	206	0.014926	0.316973	0.00000	1.000000

In the responses of the participating students to the question that deals with the perceptions of students regarding CASS, the overall mean was as 1.4770 and the average standard deviation as 0.6005. The overall perception appears to be that current CASS processes, as used in the different institutions, are well structured. They also appear to serve their purpose. The lowest mean, 1.11250, and thus the highest indicated agreement amongst students, occurred on the issue of 'assessment is part of the learning process'. This indicates that the students are of the opinion that they are properly involved in the total process of teaching and learning, as part of the CASS process. The highest mean, 1.84472, and thus the lowest indicated agreement, occurred on the issue of 're-admittance'.

Question 5.4, which deals with the issue of a 'reading speed affecting a students performance', which is one of the implied factors discussed earlier (*cf.* 4.2.1), in the CASS-process, encountered the greatest level of standard deviation at 1.66793. This indicates that student respondents agree that reading speed is one of the most important issues affecting students' performance.

Figure 5.21: Lecturers' perceptions

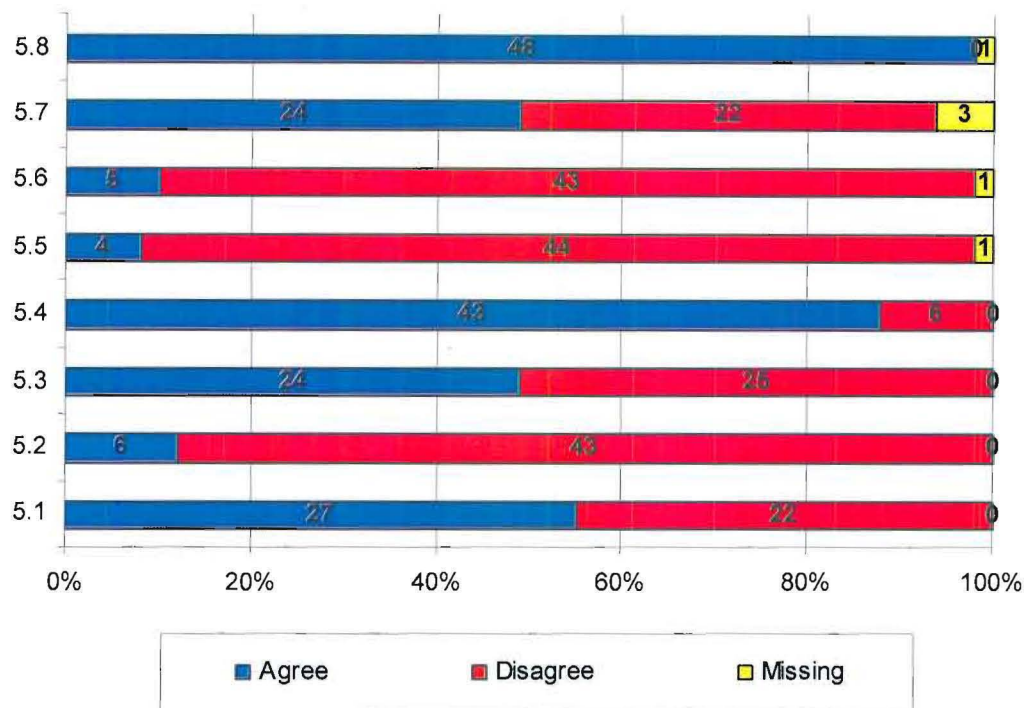


Figure 5.21 depicts the findings on Question 5 for the lecturer survey. Of the lecturer respondents, 55 percent agreed that CASS leads to work overload. This could be alleviated had the lecturers make use of more peer and tutor assessments, as was indicated in Question 3.4 (*cf.* 5.2.6). The lecturer respondents were overwhelmingly in agreement that one final examination is not sufficient to determine a student's competence.

The majority of respondents, 87 percent, agreed that the students' reading speed has a detrimental influence on students' performance. This correlates with the findings from the student respondents. The statistical analysis indicates that 90 percent of the lecturer respondents disagreed with the statement that students could answer their tests and examinations in any language. This correlates with the findings on making examination papers available in the students' own language, where 88 percent of the lecturer respondents disagreed with this statement.

On the matter of whether peer assessment is fair and valid, 49 percent of the respondents indicated that they agreed with this statement, whilst 45 percent disagreed. This is in agreement with the findings on Question 3.4 (*cf.* 5.2.6). This shows that lecturers still feel that they should be the only assessors of learning (lecturer centred), and thus the shift to student centred teaching and learning, as part of the OBE paradigm, has not yet been accepted by all lecturers. The lecturers were overwhelmingly in agreement that CASS is an integral part of the learning process and 98 percent of the respondents replied in agreement.

Table 5.6: Descriptive statistics: perceptions (lecturers' response)

	Mean	df	p-value	Standard deviation	F-ratio variance	Cohen's d-statistic
Work overload	1.448980	209	0.191977	0.502545	1.01652	
One examination	1.877551	209	0.000045	0.331201	2.25827	0.634547
Re-admittance	1.510204	208	0.000001	0.505076	1.93277	0.662309
Reading speed	1.122449	210	0.591346	0.331201	25.36166	
Any language	1.916667	210	0.000001	0.279310	3.20071	0.748416
Own language	1.895833	210	0.000222	0.308709	2.49765	0.573867
Peer assessment	1.478261	204	0.068374	0.505047	1.14425	
Part of learning	1.000000	206	0.014926	0.000000	0.00000	0.35492

Question 5 deals with the perceptions that lecturers have regarding CASS. For the lecturer respondents, the overall mean was calculated as 1.5312 and the average standard deviation as 0.345386. This indicates the overall perception to be that the CASS processes are very efficient. The lowest mean, 1.00000, and thus the highest indicated agreement, occurred on the issue of 'assessment being part of the learning process'. This indicates that the lecturers agree that CASS forms part of the total teaching-learning experience. The highest mean, 1.916667, and thus the lowest indicated agreement, occurred on the issue of 'students being allowed to answer their examinations in any language'.

Question 5.3, which deals with the issue of 're-admittance' encountered the greatest level of standard deviation at 0.505076. Although this is the greatest level of standard deviation it still indicates agreement amongst the respondents.

5.2.8 Administration of CASS

Question 5.9 was designed to determine which of the listed administrative tasks are deemed as the most important by the lecturer respondents, with 1 being most important and 10 being least important. This would then also indicate which of the listed administrative functions are perceived as being most critical.

Figure 5.22: Ranking of administrative tasks

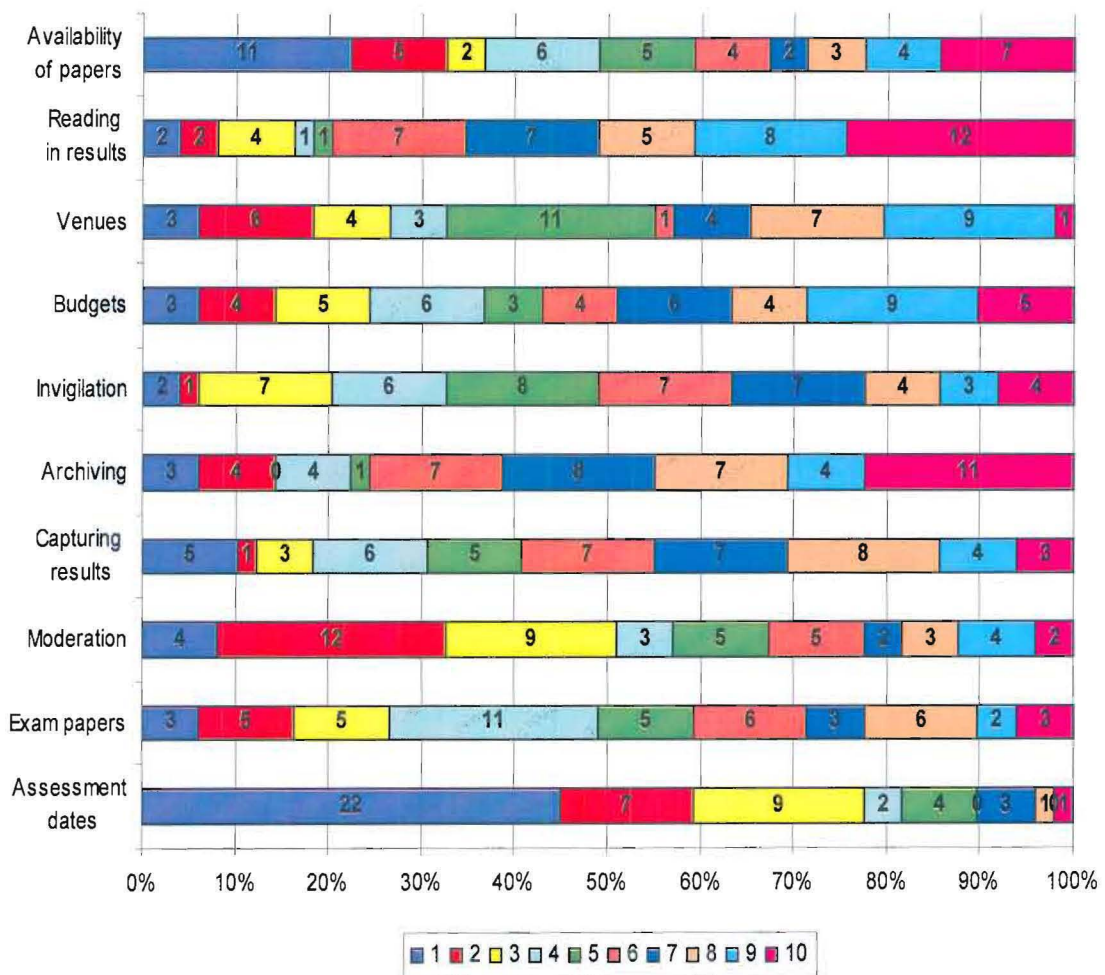


Table 5.7: Ranking of administrative functions

Rating	5.9.1	5.9.2	5.9.3	5.9.4	5.9.5	5.9.6	5.9.7	5.9.8	5.9.9	5.9.10
1	22	3	4	5	3	2	3	3	2	11
2	7	5	12	1	4	1	4	6	2	5
3	9	5	9	3	0	7	5	4	4	2
4	2	11	3	6	4	6	6	3	1	6
5	4	5	5	5	1	8	3	11	1	5
6	0	6	5	7	7	7	4	1	7	4
7	3	3	2	7	8	7	6	4	7	2
8	1	6	3	8	7	4	4	7	5	3
9	0	2	4	4	4	3	9	9	8	4
10	1	3	2	3	11	4	5	1	12	7

The lecturers' response to Question 5.9 indicated that 45 percent (22 respondents) deem the announcement of CASS assessment dates as the most important administrative function. Eleven of the respondents (22 percent) indicated that the availability of the examination papers is the most important function. Twelve (25 percent) and eleven (22 percent) indicated that assistance in recording of CASS results and archiving of proof document, respectively, are the least important administrative functions. These results would indicate that the lecturer respondents are generally satisfied by the way in which the administration of CASS is executed at the different institutions.

5.2.9 Factors hampering implementation of CASS

Question 2.9 in the lecturers' questionnaire was an open-ended question used to determine which factors hamper the effective implementation of CASS. The responses from the participants were encoded to facilitate the statistical analysis of the responses into the categories shown in Table 5.8.

Table 5.8: Factors hampering implementation of CASS (lecturers' response)

Factors hampering implementation of CASS	Number of respondents
Facilities	5
Plagiarism	3
Time	14
Work overload	12
Lack of training	13
No response	2

Figure 5.23 depicts that 29 percent of the lecturer respondents indicate the major obstacle in the effective implementation of CASS to be that they do not have enough **time** to respond effectively to submitted student work. This is especially the case in large classes.

The second factor which hampers the effective implementation of CASS according to the lecturer respondents, is a **lack of training**, 27 percent, in the successful implementation of CASS and the methodologies to be followed.

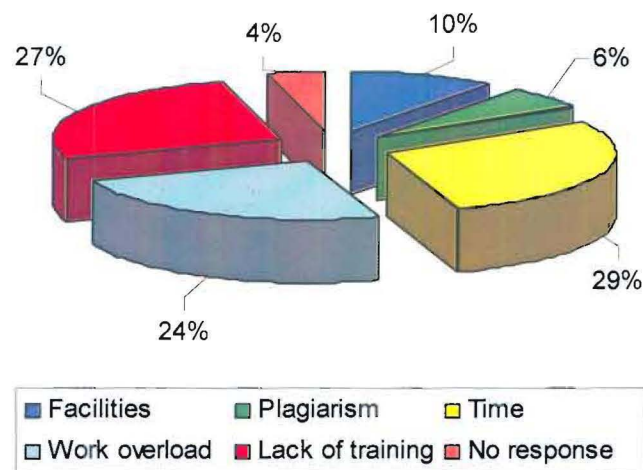
Of the respondents, 24% also mentioned **work overload** as a major setback in the effective implementation of CASS. This is linked to the **time** issue that is especially prevalent in large classes. CASS necessitates, as the name indicates, continuous assessment of student performance. This problem can be alleviated if the lecturers make greater use of tutor-, self- and peer-assessments, as formative assessment methods (*cf.* 2.4.3; *cf.* 2.4.4).

Equally important is a lack of facilities, indicated by 10 percent of the respondents, which hampers the use of CASS. Items such as venues that are not conducive to group work, the inability of lecturers to use orals and presentations, as they are not skilled in

these methods of assessment and the lack of technology in venues to make use of online assessment were mentioned.

The issue of plagiarism, especially in 'take-home' assignments, also seems to be a factor that the lecturers have to deal with.

Figure 5.23: Factors hampering implementation of CASS (lecturers' response)



The student questionnaire contained the same question, in this case numbered Question 2.7. Again, this was an open-ended question. This question attempted to determine the students' perception as to which factors hampers the effective implementation of CASS.

The responses from the participants were encoded to facilitate the statistical analysis of the responses into the categories shown in Table 5.9.

The largest number of the students did not respond to this question, leaving one with the impression that they either did not understand the question, or that they are so unfamiliar with the process of CASS that they are exposed to, that they can not comment on the effective implementation thereof.

Table 5.9: Factors hampering implementation of CASS (students' response)

Factors hampering implementation of CASS	Number of respondents
Admin	5
Time	4
Work overload	14
Students not prepared	18
Staff too strict	2
Staff not trained	9
Staff availability	2
Communication	6
No re-evaluation	1
No plan/ unorganised	6
No response	81

Figure 2.24 depicts the results obtained from Question 2.7 in the students' questionnaire. From the student responses, the largest hampering factor was found to be **preparedness of students**, indicated by 28 percent of the respondents. Students seem to feel unsure of what is expected of them. This again reflects back to the lecturers' responses that they lack in training.

The second issue, mentioned by 21 percent of the student respondents, is **work overload**. Again, this would reflect that a proper CASS plan for the subject/module does not exist and, therefore, too many tasks are given to students. In retrospect, this would then also lead to lecturers being overloaded with work.

Of the students respondents, 9 percent also feel that the CASS implementation is **unorganised** and that **no plan** exists according to which the CASS is implemented. This would reflect negatively on the department and could be responsible for many of the problems experienced by both student and lecturers.

The issue of **lecturers not being properly trained** was cited by 13 percent of the students. This would reflect negatively on the institution that implements a CASS strategy without first training their staff. Training should form an integral part of the CASS strategy of an institution.

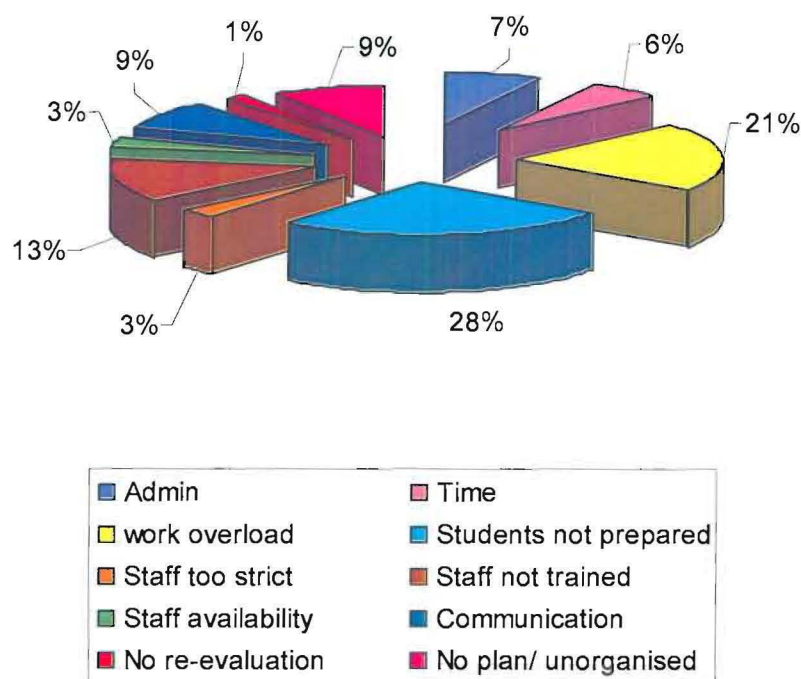
Lack of communication was indicated by 9 percent of the student respondents. This issue should be addressed in all implementation processes. A lack of communication leads to a lack of understanding. This, in turn, hampers the effective implementation of any process, including CASS.

The **administration** of the CASS process was an issue for 7 percent of the respondents. This would reflect on the record-keeping and feedback processes of the CASS process used in the institutions.

Of the student respondents, 6 percent indicated that **time** is a factor that hampers the effective implementation of CASS. The time issue should also be addressed via a properly developed CASS plan for the department.

The other issues that were mentioned by the student respondents included staff being too strict (3 percent), staff not available to assist with assignments (3 percent) and insufficient re-evaluation/ re-assessment opportunities (1 percent).

Figure 2.24: Factors hampering implementation of CASS (students' response)



The responses from both students and lecturers indicated that a **lack of training** for both lecturers and students regarding CASS, the **work overload** that results from poorly planned CASS-processes and a lack of **time** to complete CASS assignments and **time** for the marking and feedback processes, are the main factors that hamper the implementation of CASS.

5.3 TRIANGULATION

In accordance with the method of the study that was described in Chapter 4, a focus group interview was conducted to use as a method of triangulation and verification of data obtained through the questionnaires.

5.3.1 Background

During the focus group interviews conducted with the administrative staff of the different institutions, the same open-ended question as Question 2.9 in the lecturers' questionnaire and Question 2.7 from the students' questionnaire was used. This was done to substantiate the findings from the questionnaires and to determine whether there are any difference in perceptions between lecturer and administrative staff. These differences, if any, could be a source of frustration to both parties and could hamper the implementation of the CASS process.

5.3.2 The focus group interview

Administrative staff members of the participating institutions in the northern region were invited to take part in a focus group interview. This included administrative staff members from all the institutions in the Free State and Gauteng that formed part of this research. All the participants convened at one of the Gauteng institutions. This made it possible to have only one interview group and, therefore, to have a more balanced response; that is, not biased towards one institution.

Table 5.10: Participating Administrative staff

PARTICIPATING INSTITUTION	Number of participants
Institution B	1
Institution E	2
Institution G	1
Institution H	2
Institution J	2
Institution K	2
Total	10

The focus group interview was conducted in such a way that the information already gained from the lecturer and student respondents on Questions 2.9 and 2.7 respectively, was used to lead the discussion in the interview. However, some fresh information came to light that was not reflected by either the lecturer or student respondents.

Table 5.11: Admin staff response (focus group interview)

Factors hampering implementation of CASS	Number of respondents
Admin staff not trained	10
Lecturers not trained	8
Student unsure of process	8
Facilities not adequate	10
Budget for extra events not sufficient	10
CASS plans not properly communicated	10
CASS strategy not visible	10
Work overload	10
Outcomes to be attained not clear	10

All of the administrative staff members that were involved in the focus group interview were employed in the examination/assessment offices at the different institutions.

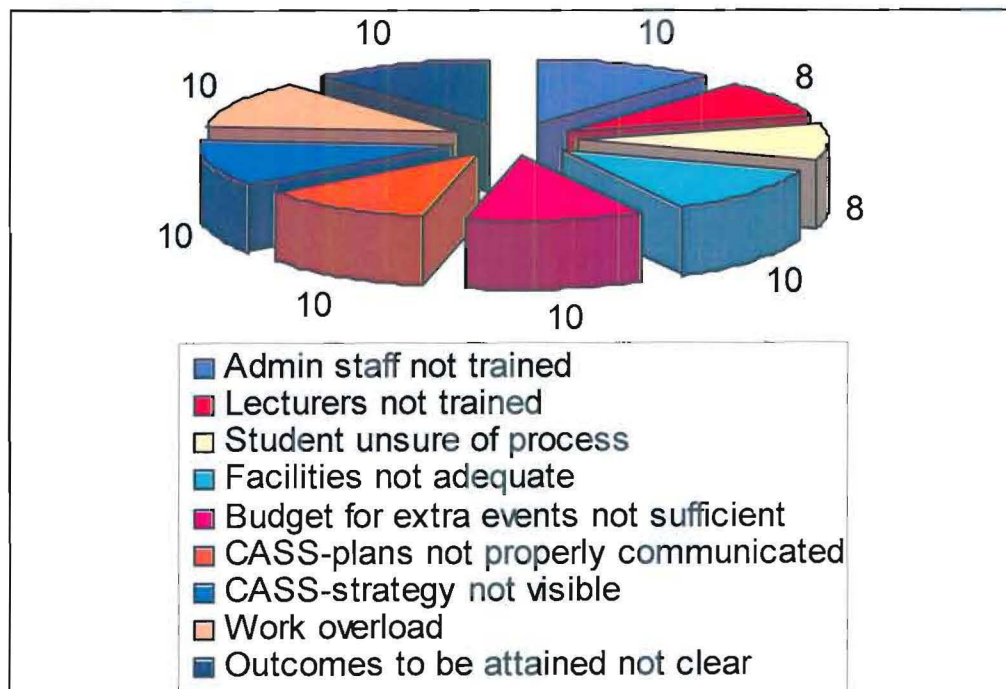
All of the administration staff members agreed that they were not trained in the issues pertaining to CASS. This left them at a disadvantage as they could not give guidance, either to students or lecturers, on the way in which they implemented CASS. All of the administrative staff members also agreed that facilities were inadequate, the CASS plans of the different departments were not properly communicated to them, and the CASS strategies were not visible in the way that CASS was implemented. Furthermore, they agreed that CASS caused a work overload for administrative staff members in the assessment offices. This work overload was due to the larger number of summative assessment events per subject/module. These findings coincide with

what was found in the lecturer and student questionnaires and, therefore, increase the validity of these findings.

On the issues of lecturers not being trained and students being unsure of what the process of CASS entails, two administrative staff members from one of the institutions felt that their institution was on track with training of both lecturers and students regarding the implementation of CASS. Eight of the administrative staff members, however, still indicated that these two issues remained a problem at their institutions. This confirms the findings from the questionnaires.

New factors that influence the effective implementation of CASS that became known in the focus group interview were the issues of **budget** and **outcomes** to be attained not being clearly specified. The budget of the assessment offices needs to be increased in order to deal with the higher demands on these offices due to more summative assessment events forming part of CASS.

Figure 5.25: Admin staff response (focus group interview)



As far as the issue of outcomes to be attained not being clearly specified, this reflects on the non-existence or poorly constructed CASS plans of the different departments. The clear statement of outcomes that have to be achieved form part of a well designed CASS plan.

5.4 CONCLUSION

In the analysis of the statistical data obtained from the questionnaires, the following key issues were identified as being the most important factors that should be addressed in the development of a CASS plan for a department and a CASS strategy for the institution.

5.4.1 Development and drafting of the CASS plan

- This is a coordinated effort by all lecturers in a department and should form part of the total programme-development process, including module development and specification of learning outcomes.

5.4.2 Responsibility for the management of the CASS plan and strategy

- A programme coordinator needs to be appointed to take responsibility for the management of the CASS plan in the department.
- The management and maintenance of the CASS strategy and CASS policy should reside in the office of the academic registrar of the institution.

5.4.3

Factors that influence and hamper the effective implementation of the CASS strategy and CASS plan:

- These factors should be kept in mind during the development of the CASS strategy and CASS plan.
- Contingency plans should be part of the total CASS plan.
- Quality assurance of all these processes are of the utmost importance, as CASS should take place within the guidelines of the HEQC and the DoE.

In Chapter 6, these key factors will be considered in the development of the CASS plan and CASS strategy at a university of technology.

CHAPTER 6

A CONCEPTUAL MODEL FOR THE MANAGEMENT OF THE IMPLEMENTATION OF A CONTINUOUS ASSESSMENT PLAN AT A UNIVERSITY OF TECHNOLOGY.

6.1 INTRODUCTION

The research findings presented in Chapter 5 clearly indicate the main obstacles to the implementation of continuous assessment (CASS) at a university of technology. These include a lack of management of the process which is manifested in a work overload for both staff and students as well as the lack of administrative support due to poor planning within the institutions at large, as well as within the academic departments. In order to overcome these problems, a proper management system, the CASS strategy, for assessment has to be developed including CASS plans for the academic departments within the institution. In the new learning approach, assessment is integrated in learning and teaching and addresses complex traits (the abilities, the characteristics in a specific domain) of students. To match this new approach, new types of assessment are implemented, like peer assessment and competence assessment. In order to support the use of both new and traditional assessment types an educational model for the *management* of the *implementation* of a CASS plan at a university of technology will be developed.

In chapter 2 the following facets were identified as the most important aspects to be considered in the development of a CASS plan and strategy:

- institutional commitment to CASS (policy and strategy);
- programme mission and vision and alignment of the curriculum;
- evaluation/assessment of the CASS plan and strategy;
- issues and solutions; and
- management and maintenance of the CASS plan and CASS strategy.

In the previous sections the identified aspects to be considered in the development of the CASS plan for a university of technology were described. The first of these was the development of a CASS strategy or CASS-policy demonstrating institutional commitment. In this section the development of a CASS strategy for the institution as a whole as well as the management of the strategy will be discussed.

CASS in universities is a complex business. If the question, “What does it take to improve assessment in a university?” is posed, the reply is likely to encompass such a range of activities, functions, organisational groupings, philosophies, funding arrangements, structures, and a potentially endless list of obstacles and challenges, not to mention personal anecdotes, that it would be difficult to conclude with a coherent picture of the situation. And that's without considering the impact on the students' experience.

CASS is something which is ‘experienced’, though not always positively, by almost all involved in a higher education institution: students, lecturers, administrators, managers, policy makers, institutional leaders and library staff. Given this complexity, surely it is important to try to understand the relationships between these groups in some systematic way.

A CASS strategy for the management of the CASS-process in higher education is developed to help to make sense of the milieu, to be useful in identifying critical points for intervention, and to assist in seeing why attempts to improve CASS across a system, or in a particular part of a system, may succeed or fail.

A model of the CASS strategy can remind one of what one already knows, help one to see things that one may not have seen before or to see familiar things in a new way. A model of the CASS strategy may help to explain what was previously unclear. To develop a model, the variables involved are specified and the relationships between these variables are identified, while recognising that any model needs to be constantly modified to reflect better understanding or to address additional dimensions needing further investigation. The proposed model, discussed here, is offered to serve the above functions.

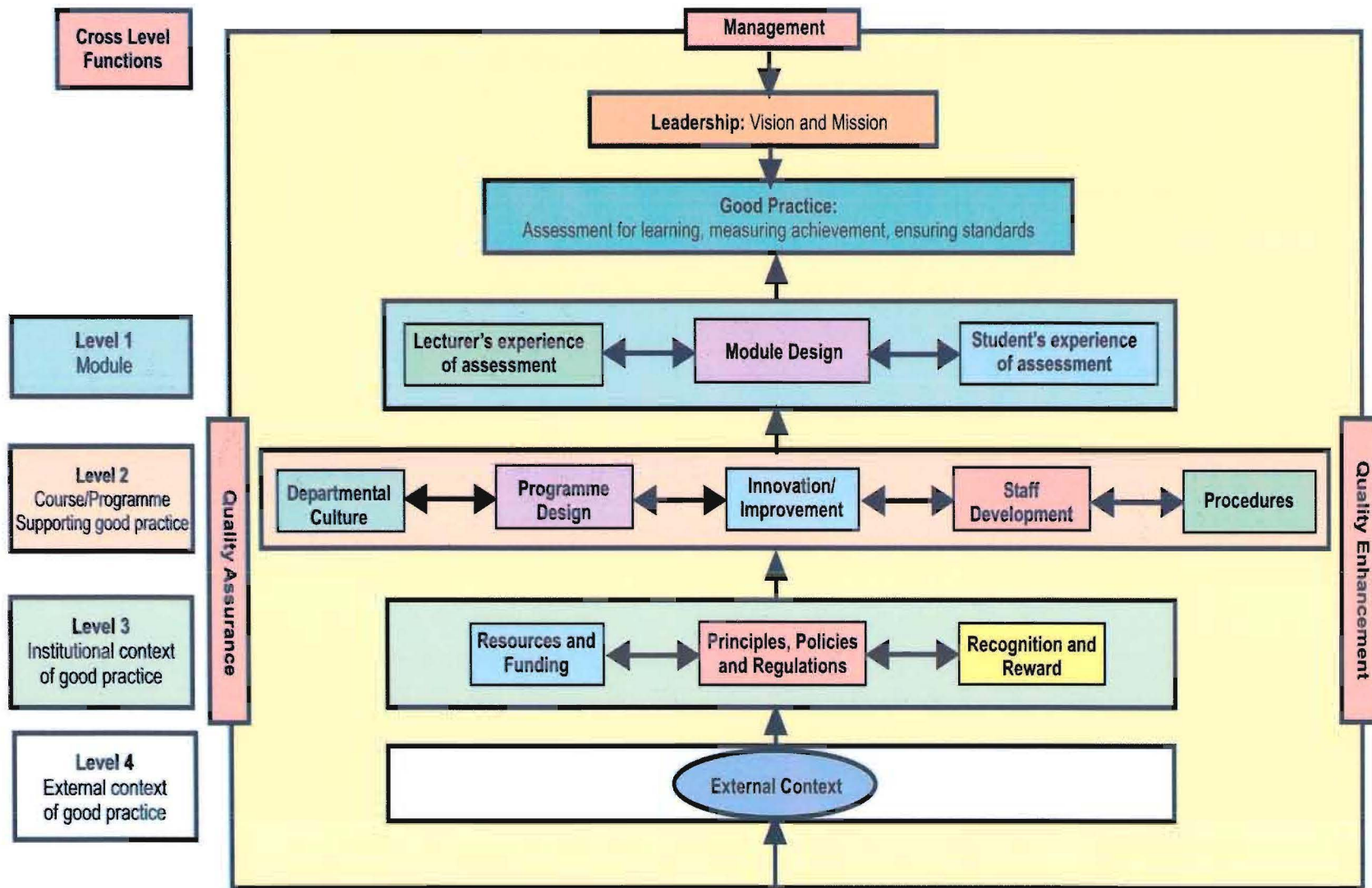
The model of a CASS strategy for a UoT is presented, its principal elements are identified and some key issues with respect to each element are discussed. Some critical relationships between the elements are also noted. Attention is drawn to a small number of articles that consider substantial components of the model.

6.2.1 A management model for the CASS strategy of a UoT

The CASS management model as an institutional CASS strategy that is proposed, comprises four principal levels with a number of elements at each level. *Level 1* is where CASS actually happens, with good practice occurring in the context of students' and lecturers' experience of CASS and is dependent on effective module design. This is where the departmental CASS plan is implemented. *Level 2* supports this practice and includes the elements of staff development and training, departmental culture, programme design, innovation and improvement, and departmental procedures. This is where the departmental CASS plan is developed as will be discussed in the next section. *Level 3* represents the institutional context of CASS, where resources are allocated, principles, policies and regulations are determined, and processes for recognising and rewarding good teaching practice are put into place. *Level 4* represents the overall context of the institution, including government policy and the expectations of external bodies such as professional bodies, the Council on Higher Education (CHE), the Higher Education Quality Committee (HEQC), the Department of Education (DoE), the South African

Qualifications Authority (SAQA) and the implementation of the Higher Education Qualifications Framework (HEQF). The model also includes functions that cut across these four levels and impact on each of them, namely management, leadership, quality enhancement and quality assurance. *Management* oversees the total implementation of the CASS strategy of the institution. The *quality* of the strategy is constantly monitored and reported on to management. This ensures that the CASS strategy is continuously assessed and reviewed to enhance and ensure that it remains current and that all the departmental CASS plans and quality features of the CASS strategy are adapted to accommodate new developments in the external environment. The CASS strategy model is represented graphically in Figure 6.1.

Figure 6.1: Model for institutional CASS strategy



6.2.1.1 Level 1: The Module level: Good practice

This level reflects and monitors ‘good practice’ and is the level at which CASS happens. Here the departmental CASS plan is implemented. At this level, a clear expression of the ultimate purposes of CASS is needed, commonly stated as encouraging learning, measuring student achievement and maintaining standards. The key elements at this level are the ‘pedagogy’ of good assessment practice expressed through module design, including clear learning outcomes and assessment criteria/standards. The people who are immediately involved in this level are students and their lecturers/assessors. This is the realm of the lecturer, the student or the cohort of students, and the individual course or module. It is where assessment methods are selected, tasks are designed and students respond, setting in action a web of interactions that are at the very heart of teaching and learning. At this level, the focus is on ‘tactics’ or specific methods of assessment within the CASS plan rather than on broader strategies.

Module design

Critical issues

- The alignment of assessment methods, such as CASS, and tasks with module outcomes and learning activities.
- Balancing the multiple purposes of CASS - for learning, measurement of achievement, and maintaining standards.
- The accessibility and inclusivity of CASS, so that assessment tasks enable all students to fully demonstrate the quality of their learning with an equal amount of effort.
- Feedback that is detailed, timely, related to outcomes, and leads to a response from students.
- The balance in time allocated for teaching and for assessment.

Lecturers' experience of CASS

Critical issues

- Lecturers' awareness of good practice and their repertoire of assessment methods.
- Lecturers' time – to design assessment tasks, evaluate student responses, provide feedback that is genuinely useful and innovative, avoiding work overload.
- Lecturers' conceptions of and values/beliefs about CASS.
- Lecturers' experience of CASS.
- Lecturers' enthusiasm and motivation.

Students

Critical issues

- Students' perceptions of CASS tasks and the alignment of these perceptions with lecturers' intentions.
- Experience of CASS and being assessed.
- Workload and time-pressures.
- Students' approaches to studying, including strategic approaches based on motivation and workload.
- Students' preparation for CASS – their understanding of the task, familiarity with the format and ability to engage with assessment criteria.
- Students' family-, educational-, employment- and social backgrounds.
- Student culture.
- The student's 'life-world' including the competing demands on their time and commitment for studying.

6.2.1.2 Level 2: Course/Programme: Supporting good practice

Level 2 provides the immediate context for good practice. At this level the departmental CASS plan is developed. It is the level that determines whether lecturers

experience support or isolation, whether students experience an integrated programme or a series of discrete modules, and whether innovation and improvement can flourish. It is the realm of the programme, the department, the programme coordinator and the student cohort. It is where institutional policies and CASS-strategies are translated into practices through the development of a CASS plan, and where procedural requirements are implemented. It is the critical level for supporting improvement at level 1.

Departmental culture

Critical issues

- The departmental culture and the extent to which it supports lecturers and encourages innovation.
- Values such as scholarship and respect for, and valuing of, individuals.
- Community of practice and extent to which there is a core and periphery to CASS practice.

Programme design

Critical issues

- The design of a CASS plan at the programme level to maximise coherence in students' experience.
- The extent to which the CASS plan reflects programme learning outcomes.

Innovation and improvement

Critical issues

- Innovation based on programme-level outcomes and learning processes.
- Innovation involving changes in assessment methods.
- Embedding change at the programme level.

Staff development

Critical issues

- Access to information on CASS.
- Opportunities to reflect on current practices and to discuss practices with colleagues.
- A structured programme of research and writing on CASS practices.
- Whether staff development is perceived as meeting deficiencies, addresses management agendas or is more developmental.

Procedures

Critical issues

- Moderation procedures.
- Peer review of teaching, including review of CASS plan design and evidence of student learning.
- The expression of institutional CASS-policies and CASS-strategies in the departmental CASS plans and procedures.

6.2.1.3 Level 3: The institutional context for good practice

Institutions are not homogeneous bodies, but have their own cultures, priorities and organisational structures and processes – all of which may change to some extent over time. Responding to external demands from the DoE, funding formulas, professional bodies, the HEQC, research bodies, the CHE, means that what happens in learning, teaching and assessment may not always appear to be top of the policy agenda.

However, it is at this level that the valuing, recognition and rewarding of good practice, together with the approaches adopted to quality assurance and enhancement, shape institutional practice at levels 1 and 2. It should, of course, be recognised that, even at this level, individuals are important and the Vice-Chancellor/Principal, Deputy-Vice Chancellors, and Registrar can all have an effect on CASS-policy, CASS strategy and CASS plans.

Principles, policies and regulations

Critical issues

- The existence and quality of institutional policies, principles and strategies.
- The process of developing policies, principles and strategies, including the involvement of staff and students.
- The nature of institutional policies, principles and strategies as edicts or guides.
- The extent to which policies, regulations and strategies are seen as constraining or enabling.

Resources/funding

Critical issues

- Academic support units that are viable.
- Funding for innovation.
- Targeting of resources for strategic improvement.
- Resources for teaching (including CASS).
- The balance of resource allocation between research, teaching and other activities.

Recognition and reward (for good teaching, including assessment)

Critical issues

- Institutional recognition of good teaching.
- Institutionally endorsed processes for the review of teaching and assessment (including, for example, peer observation/peer review).
- Rewards, promotions and allocation of roles and responsibilities for teaching and assessment.

6.2.1.4 Level 4: The external context

The external context reflects political, economic and social forces that impact on higher education, as well as initiatives from within the higher education sector itself. It also includes the competitive environment in which institutions find themselves – for students, funds for teaching and research, sponsorship and international partners.

Key issues

- National issues/government policies.
- Professional bodies.
- External examiners and moderators.
- Funding issues.
- Media perception and portrayal of higher education.
- Interpreting quality assurance requirements and managing external quality assurance processes (HEQC).
- Perceptions of employers.
- External research and evaluation.

6.2.1.5 Cross-level functions

There are at least **four functions** that impact across the various levels and elements: leadership; management; quality assurance; and quality enhancement.

This raises interesting potential polarities between quality assurance and quality enhancement and between management and leadership. Whilst they should be part of a holistic approach, they may well be seen as the remit of different people/roles at different, or even, all levels within the institution. Whilst they may be drawn together by institutional mission statements and by strategic and operational planning, at a day-to-day level they may be perceived as having their own committees, champions and processes. There is also the potential for always choosing the safe or convergent approach when a more divergent, riskier or ‘out of the box’ approach might yield more beneficial outcomes.

In assessment terms this might relate to the greater use of continuous assessment (CASS) rather than unseen examinations; to the involvement of students in more self-assessment and peer assessment rather than the lecturer being the sole assessor; to assessment being experienced by students as being more about helping their learning rather than just showing them how much they do or don’t know; and to the greater use of *feed forward* to improve learning rather than just *feedback* to reflect on what has been done before.

6.2.1.6 Critical relationships between elements and functions

There are a myriad of connections to be made between the twelve elements and four functions proposed in the model for a CASS strategy for a university of technology. The links between the following pairs of elements are illustrative of relationships that may be highly functional or characterised by unresolved tension:

- Institutional strategies *and* departmental plans.
- Programme design *and* module design.
- Students’ experience *and* lecturers’ experience.

The role of staff/educational development or other functions in providing the links between and within the levels is highlighted by the proposed model for the implementation of a CASS strategy at a university of technology.

In this section a model for the implementation of a CASS strategy for a university of technology was developed and described. In the following section the focus is on a conceptual model for the management of the implementation of a CASS plan for a department or programme within a university of technology.

6.3 A CONCEPTUAL MODEL FOR THE MANAGEMENT OF THE IMPLEMENTATION OF A CASS PLAN IN A DEPARTMENT OR PROGRAMME

In this section such a model is presented. The model is validated against Stiggins' (1992:78) guidelines for the development of performance assessments and the five-process framework of Almond, Steinberg and Mislevy (2001; 2003), a specification for performance assessment (competence assessment) as a new type of assessment. The model for the management of the implementation of a CASS plan gives new input to the alignment of teaching, learning and assessment.

Assessments are at the core of the educational process because they have a direct impact on the learning processes of students. Summative assessments help to establish whether students have attained the set goals and outcomes. Formative assessments provide prescriptive feedback to assist students in reaching these goals and outcomes (Birenbaum, 1996:5). In this model assessment is defined as *all the systematic methods that can be used to gather information and evidence about student properties, based on a process, a product or the progress of a student, for the purposes of certification, placement or diagnoses in formative and summative contexts*. This definition includes classical tests, examinations and questionnaires, as well as newer types of assessment, such as performance assessment, portfolio

assessment and peer assessment. All of these assessment methods can be incorporated into a model for the management of the implementation of a CASS plan at a university of technology.

Continuous assessments are typically embedded in an educational context where they require more stipulation of the processes of assessment and rely on higher levels of student involvement in assessment (Sluijsmans *et al.*, 2004:62). The shift from a perspective that focused on the lecturer to a perspective that is centred on student learning is the greatest conceptual shift that has occurred in recent times in higher education (Boud, 1995:16). “New learning” is described by Biggs (1999:35) as a system in which teaching, learning and assessment interact and therefore requires that the curriculum outcomes, the teaching and learning activities and the assessment tasks are kept aligned. Continuous assessments try to give an adequate answer to these new ideas. Cizek (1997:14) emphasises that CASS is not a replacement for traditional assessments, but that it gives answers to different assessment questions than could be achieved through the traditional types of assessments. CASS claims to give tutors and students a deeper understanding of the student traits. Examples of the new types of assessment that form part of CASS are portfolio assessment, performance assessment, self-assessment and peer-assessment. In portfolio assessment, students compile a portfolio to demonstrate evidence of, for example, personal growth. In a performance assessment, a student has to show competent behaviour. Self-assessment and peer-assessment are ways to involve students in assessment. These types of assessment require students to think critically about what they are learning, to identify appropriate standards of performance and to apply them to their own work (Dochy *et al.*, 1999:334). CASS has great potential, but problems are experienced in terms of quality criteria, resources and management. The assessment developers have to cope with quality criteria, like authenticity, meaningfulness, fairness and educational consequences. The development of reliable and valid assessments is time-consuming as was indicated in the questionnaire- and focus group interview results in Chapter 5. To overcome these problems, proper CASS plans need to be developed and the implementation thereof needs to be properly managed.

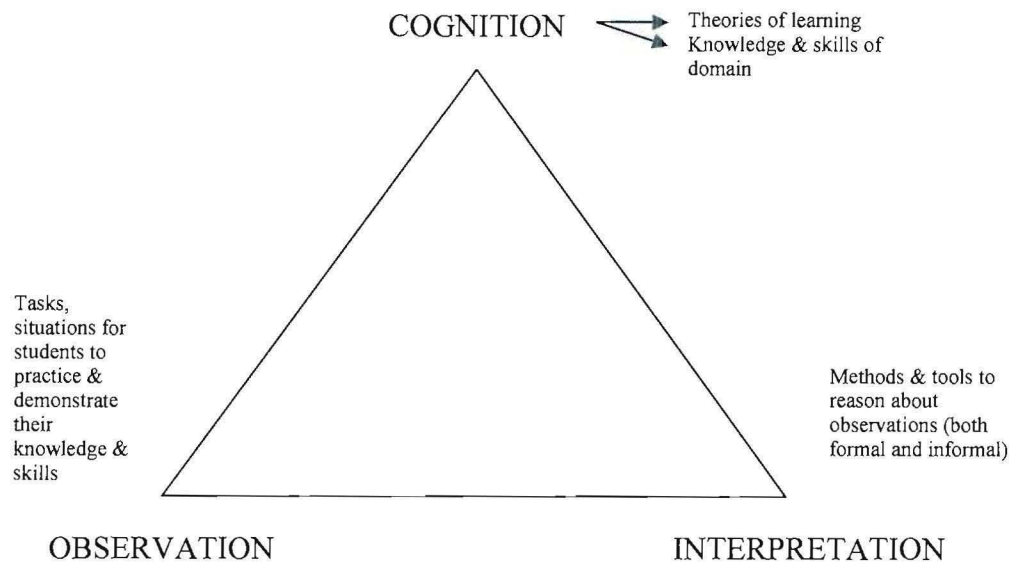
The question then is how these additional demands can be met within the constraints of the limited resources available. One way out of this dilemma is to design assessments in such a way that they can be shared amongst assessment developers and re-used in other contexts (Williamson *et al.*, 2003). Here technology can play a role. Mislevy *et al.* (1999) state that given advances in technology, more complex performances can be captured in assessment settings. They use an evidence-centred approach that presents a design framework which incorporates integrated structures for modelling the student traits, designing tasks, and extracting and synthesising evidence. These technological advances form the basis for the use of assessments that are developed by others.

However, technological improvements alone will not solve the problems of re-use or exchange of assessments. Assessment developers must also share the same conceptual framework of the assessment domain to understand what can be re-used or exchanged. To this end, the institution should have a clear CASS policy, a CASS strategy that can be implemented, and each academic department that wishes to take part in the exchange programme should have a clear and compatible CASS plan. From these limitations several requirements are stated that any complete conceptual model should comply to. Such a conceptual model is referred to as an 'educational model', i.e. a model of an educational subsystem, in this case CASS. Examples of other subsystems that can be modelled are units of learning (programmes, courses and study tasks), portfolios, learning objectives and curriculum structures. In this study the focus is on the assessment subsystem.

Every assessment, regardless of its purpose or the context in which it is used, rests on three pillars: (1) a model of how students represent knowledge and develop competence in the subject domain; (2) tasks or situations that allow one to observe students' performance; and (3) interpretation methods for drawing inferences from the performance evidence thus obtained.

These three foundational elements - cognition, observation and interpretation - influence all aspects of an assessment's design and use, including content, format, scoring, reporting and use of the results.

Figure 6.2: Assessment triangle



Adapted from National Research Council (2001)

CASS is also supported by this approach. CASS is based on insights into how people learn, how knowledge and knowledge structures develop and how they relate to the assessment of competencies. New insights into assessment are explained by Pellegrino *et al.* (2001:32), who defined a new framework for assessment based on the assessment triangle of 'cognition', 'observation' and 'interpretation'. Here, cognition is a model of how a learner represents knowledge and develops competencies; observations are tasks or situations in which (complex) behaviour can be observed, and interpretation is a means by which one can make sense of the observations. Pellegrino *et al.* (2001:33) provide several examples of new linkages, such as the use of concept mapping to assess knowledge structures (linking cognition to observation), or the use of latent semantic analysis to interpret student essays (linking observation to interpretation). In this framework items (tasks) provide part of

the evidence that is linked to the learning outcomes and must support decisions that are based on the assessment results. The items that are selected for observation should be developed with the purpose of the assessment in mind (that is going from cognition to observation). The evidence gathered still needs to be interpreted. This interpretation makes clear how the collected observations constitute evidence about the learner's competencies.

An important consequence of the new foundations of assessment (CASS) seems to be that any exchange of assessment, including CASS, has to include all three points of the triangle.

In the conceptual assessment framework of Almond *et al.* (2001; 2003) assessment is viewed as a process in which an administrator, who is responsible for setting up and maintaining the assessment, and a candidate, whose traits are being assessed, are actors in a *system*. In the next section, the requirements that such a model needs to match are described.

6.4 REQUIREMENTS FOR AN EDUCATIONAL MODEL FOR CASS

An educational model for CASS needs to match the same requirements (derived from Koper, 2001:54) that any complete conceptual model should, in the long run, comply to:

1. **Flexibility:** The CASS model can describe assessments that are based on different theories and models.
2. **Formalisation:** The CASS model describes assessments and its processes in such a formal way that it can be processed. The formalisation provides the possibility of extending the model if new developments in CASS arise.
3. **Reusability:** The CASS model supports identification, isolation, de-contextualisation and exchange of useful objects (for example, items,

assessment units, competencies, assessment plans) and their re-use in other contexts.

4. **Completeness:** The CASS model covers the whole assessment process, including all the stated objects, the relations between the objects and the workflow.
5. **Explicitly stated objects:** The CASS model expresses the semantic meaning of different objects within the context of an assessment.
6. **Reproducibility:** The CASS model describes assessments in such a way that replicated execution is possible.
7. **Medium neutrality:** The educational model for CASS, where possible, supports the use of different media, in different formats, such as computerised assessments on the Web or paper and pencil tests.
8. **Compatibility:** The CASS model matches available standards and specifications.

For this reason, a protractible educational model for a CASS plan was developed to provide a broader basis for specifications for the whole CASS process from construction to evaluation. The model allows a tight embedding of CASS in educational practice and it caters for new types of observation and interpretation. During the development of the model, priority was given to the following requirements: completeness (covering the whole CASS process), flexibility, reproducibility, reusability and formalisation. The next paragraph describes the method of model construction, which is followed by a description and illustration of the model itself.

6.5 A CONCEPTUAL MODEL FOR THE MANAGEMENT OF THE IMPLEMENTATION OF A CASS PLAN AT A UNIVERSITY OF TECHNOLOGY

The development of a conceptual model for the management of the implementation of a CASS plan elaborates the original work by Hermans *et al.* (2002:43). The

conceptual model was developed in three consecutive steps: (1) development of a first version based on expert input and findings from the survey; (2) validation of the first version using cases and literature; (3) adjustment of the model based on the validated results.

The first version of the model was constructed during a series of focus group interviews with ten assessment administrators who are experts from educational institutions, and a small project team (two assessment experts, one modelling expert, one scribe and one project leader).

The model was validated and adjusted after development and a description of the processes followed is given. The modelling rules are defined to constrain aspects of the assessment model and how they relate to each other.

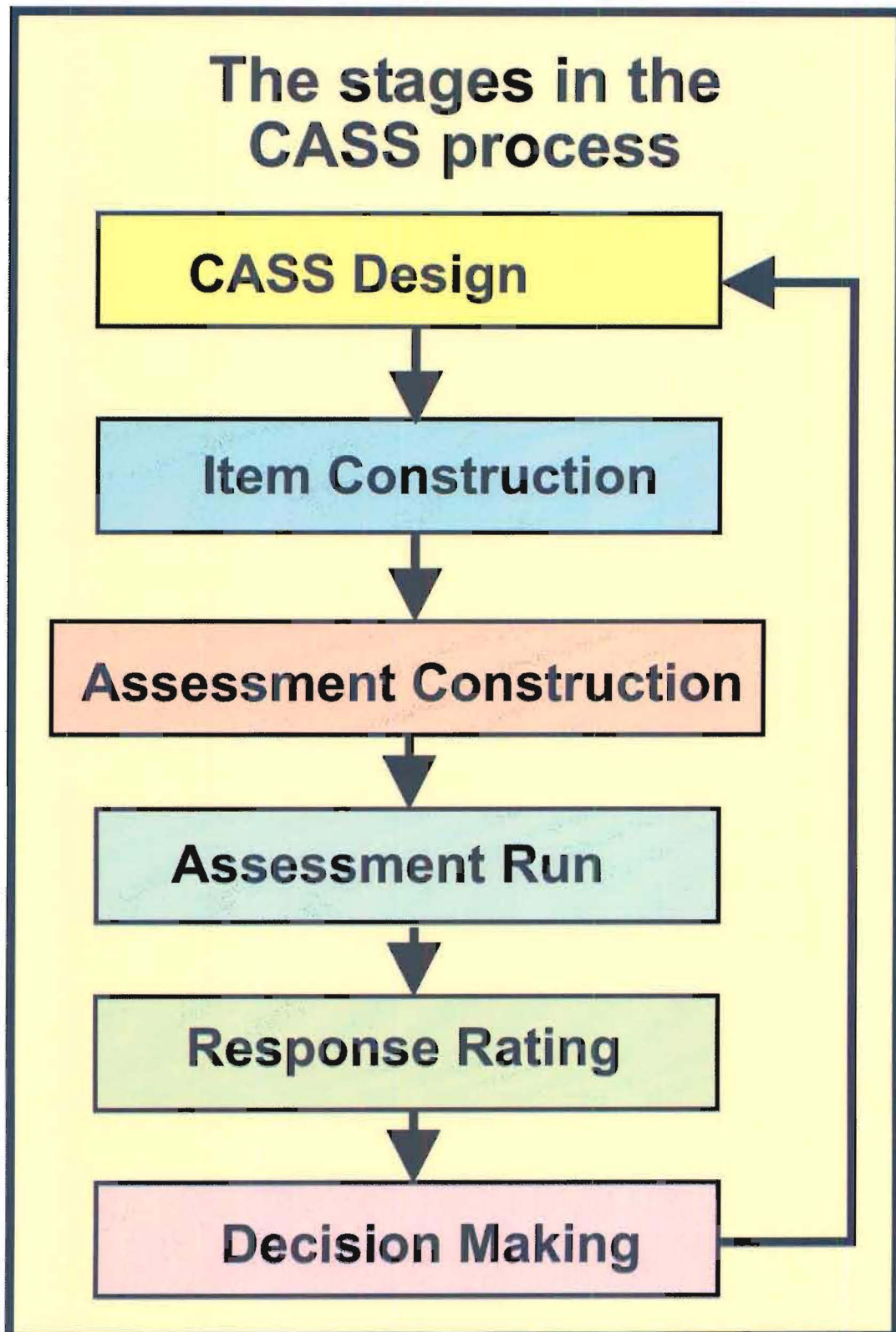
6.6 VALIDATION OF THE STUDIES' RESULTS

In this section the results of the development of the conceptual model for the management of the implementation of a CASS plan are given, as well as the results of the validation studies of this model are described.

6.6.1 The assessment model

The model is built on several sub-models, each matching a different stage in the CASS process as depicted in Figure 6.3. In the CASS design the objectives for the assessment are clarified. Decisions taken at this stage of development influence the elaboration of the next stages.

Figure 6.3: Stages in the CASS process

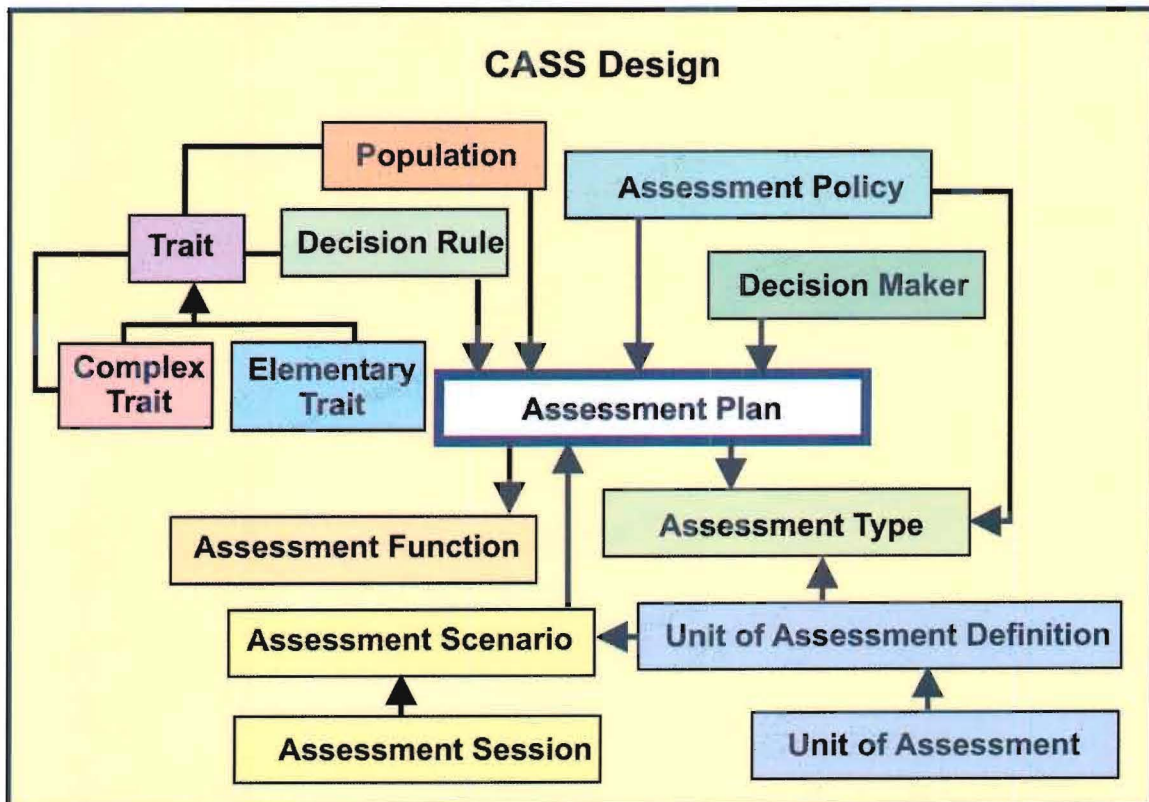


The following discussion includes the concepts that are part of the model. The characteristics described are omitted from the Figures to increase readability.

CASS design

The reasons for using CASS are expressed in the stage of CASS design. The challenge in CASS design is to select the assessment types that yield the appropriate evidence of students' competence, skills or knowledge that best suits a particular programme or module. A competence assessment, for example, can consist of a portfolio assessment, that provides a measure of individual growth with respect to individual goals, in combination with a multiple-choice exam that provides a measure of knowledge acquisition. Both assessment measures are important providers of information about student traits and both can be used in a competence assessment. The concepts and their relations in CASS design are represented in Figure 6.4.

Figure 6.4: CASS design for an assessment plan of a module or programme

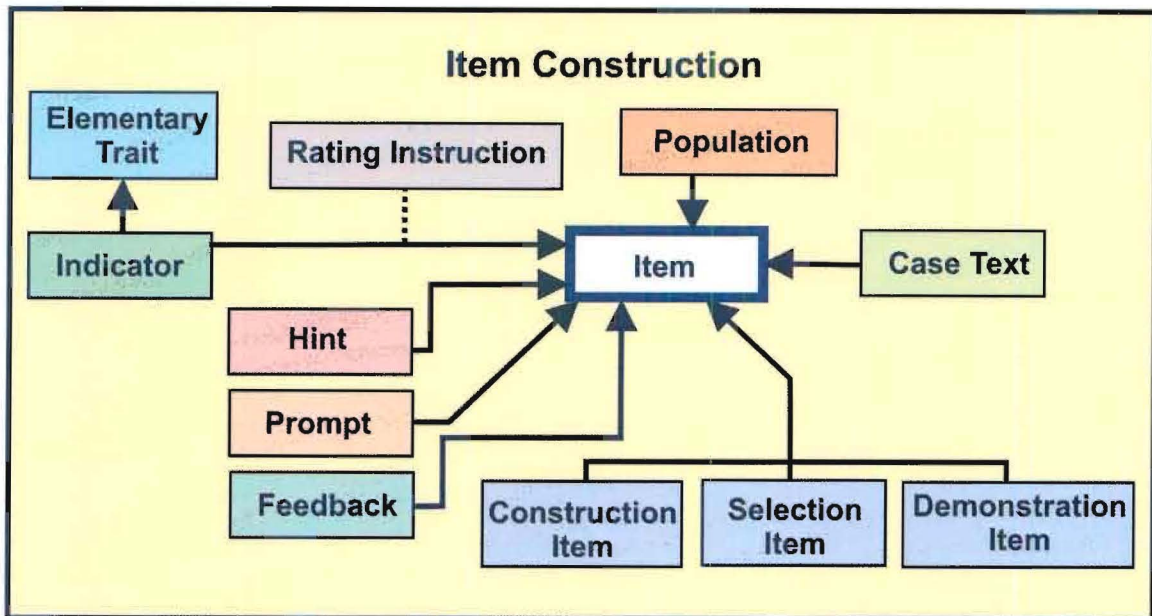


The *assessment policy* of an educational institution is the basis for the development of a CASS plan (Van Zutven, Polderdijk & De Volder, 2004:98). This framework enumerates *assessment types* that are allowed according to the policy of the institution. Within the scope of this *assessment policy* one or more assessment plans can be designed. A *CASS plan* includes the basic assumptions for an assessment. An example of a CASS plan is an assessment to measure writing skills. The plan stipulates the *decision rules* that set down how a *decision maker* will come to a decision on a candidate. The *assessment function* in the *CASS plan* stipulates the purpose of the decision. *Assessment functions* include diagnosis of individual candidates, formation of groups, selection or certification. The *CASS plan* addresses one specific *population*. The *CASS plan* prescribes which *assessment types* can be used as units of assessment. These *assessment types* must match the *assessment policy* of the institution. The *assessment scenario* is part of the CASS plan. An *assessment scenario* determines the mandatory and *optional units of assessment* for a candidate, as well as their sequence and time schedule. The *units of assessment* are described in the *unit of assessment definition*. The last, but very important part of the CASS plan is the *trait*. This is the abstract concept of the characteristics of the candidate on which decisions will be taken. These *traits* are important for educational contexts because they give the criteria for education in terms of level and direction. A *trait* is determined in advance for the *population* for which the *CASS plan* is set up and it can be decomposed into *complex traits* and *elementary traits*.

Item construction

The model for item construction is represented in Figure 6.5. The main concept at this stage is the *item*.

Figure 6.5: Model for item construction



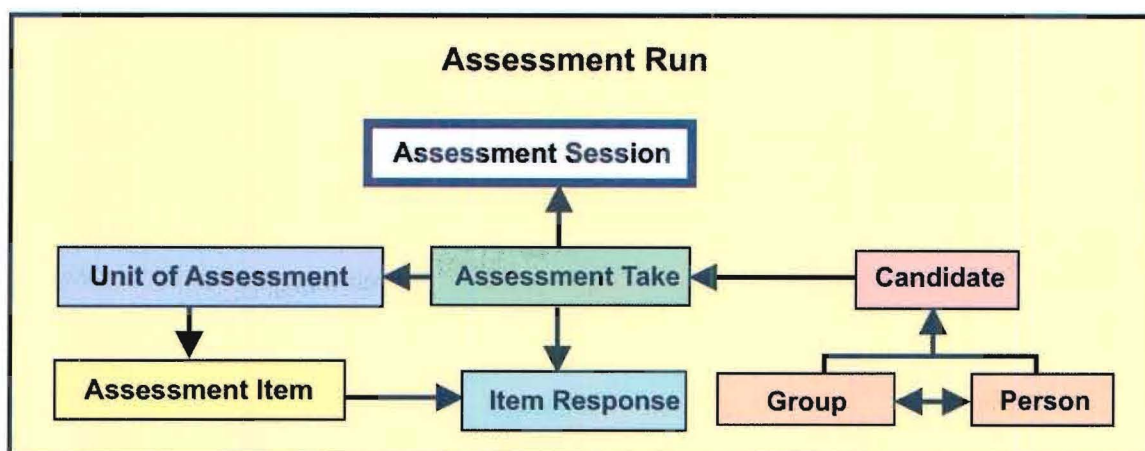
At this stage, the concepts *elementary trait* and *population*, described in the previous stage, constitute the guidelines for the construction of *items*. Indicators measure the elementary trait. Often, however, direct observation of a characteristic of a student (*trait*) is not possible. For example, it is not possible to directly measure whether the lecturer understands how students learn by observing a lecturer in the classroom. To this end, *indicators* are specified that provide evidence on the trait. These *indicators* are measurable descriptions of the trait. A score on an assessment has a meaning for a *trait*, but it is directly based on scores on the underlying indicators by applying a calculation rule on the scores. For every *indicator* items can be developed that are suitable for the *population* to which the CASS plan applies. The term ‘item’ in this model has to be interpreted in a broad sense. For example, it applies to a multiple-choice item with four answer options, as well as to a task in which a candidate has to show a performance. Candidates can provide answers in a number of formats, such as a construction, a selection out of response possibilities or the demonstration of a skill. These item types are named *construction items*, *selection items* and *demonstration items*. An item usually has a *prompt*, a *case text*, *hints* and *feedback*. The *prompt* is the explicit message to the candidate that makes clear what is expected (within the item) of the candidate. In unannounced workplace observations it is possible that the

definition. In this definition the composition rules describe the structure of the assessment. Composition rules may be used in advance to generate an assessment, as well as dynamic during assessment sessions to select new items, for instance in adaptive assessment. The *assessment type* of a unit of assessment is restrained to the *types* that were defined in the assessment plan. The characteristics of a *unit of assessment definition* are the session time, the number of candidates that may participate, the way the *unit of assessment* is presented to the candidate, the possible roles the candidate has to fulfil in the *unit of assessment* and several rules. These rules are about the composition of the assessment. These include rules prescribing what items may be used and in what order and rules that specify how the final score on a *unit of assessment* will be calculated. The *definition* defines which *trait* will be assessed in a specific unit of assessment (*unit of assessment trait*) and which indicators are used for this purpose (*unit of assessment indicator*). The *items* used in a *unit of assessment* are selected because they measure a specific indicator. They might measure other indicators as well, for example critical cross field outcomes, but that is irrelevant in the context of this unit of assessment. Therefore the *assessment item* is defined for a specific item in a specific unit of assessment. The *assessment item indicator* gives the specific indicator that is meant to be measured with this item. The *scale* prescribes which values can be given to the *assessment item indicator*.

Assessment run

As soon as the unit of assessment is composed, the assessment can be delivered to the candidates. The model of the concepts and their relations in this assessment run stage are represented in Figure 6.7. The central concept in the stage of assessment run is the *assessment session*.

Figure 6.7: Model for the assessment run

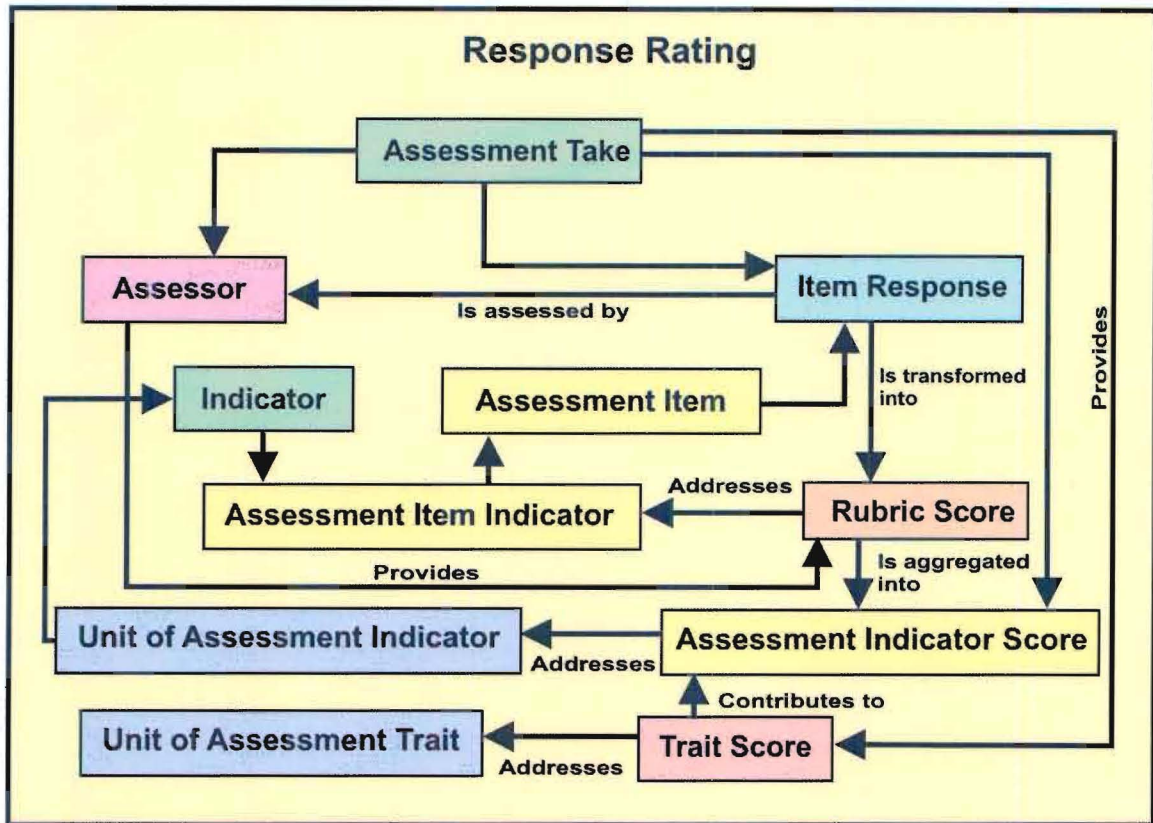


Depending on the kind of assessment, which forms part of the total CASS plan, a candidate must provide responses, or demonstrate or present something to an assessor. *Units of assessment* are presented to *candidates*, who can be *individual persons* or *groups*. The actual presentation of one or more units of assessment to the candidates is done during *assessment sessions*. Each session has a date, a starting time and a stop time. During this *assessment session* each candidate has an *assessment take* which specifies the medium in which the unit of assessment is presented, as well as the available candidate roles. The outputs of a session are *item responses*. An *item response* can be an answer to a question, a performance or a report.

Response rating

The next stage is that of response rating. The model of the concepts and their relations in this so called response rating stage are presented in Figure 6.8.

Figure 6.8: Model for the response rating of an assessment run

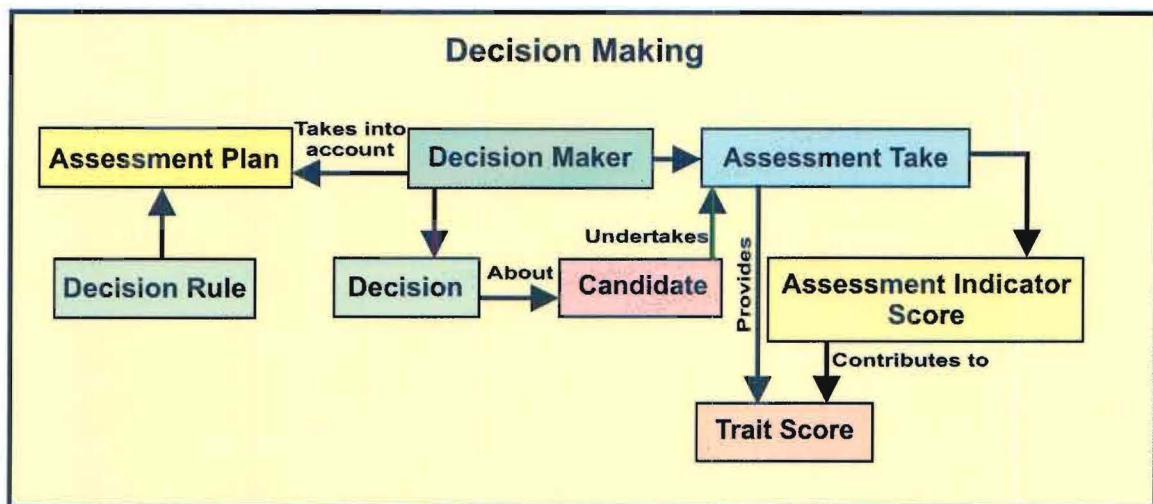


After an *assessment take* an assessor must assess the item responses. The assessor can be a computer, a lecturer, peer candidates or even the candidate (self-assessment). The assessor provides a *rubric score* that addresses the *assessment item indicators*. To do so the assessor uses transformation rules to get from a rubric value to a rubric score, to an *assessment indicator score* and to a *trait score*. The *assessment indicator score* addresses the *unit of assessment indicator*, while the *trait score* addresses the *unit of assessment trait*, the scoring prescription described in the scoring rule of the CASS plan, and a scoring instruction.

Decision making

The last stage is that of decision making. The model of the concepts and their relations in the decision making process of this assessment run stage are represented in Figure 6.9.

Figure 6.9: Model for the decision making process



At the end of the process a *decision* must be made that is based on the *score* of a *candidate* on a certain *assessment take*. The types of decisions that can be made are described in the *CASS plan* (see CASS design stage). Often, the person who makes the decision is a lecturer at the institution where the candidate is enrolled. The *decision* is based on *decision rules* that form part of the CASS plan.

This initial model was put to the test in a number of validation studies that are reported below.

6.7 VALIDATION OF THE MODEL FOR THE MANAGEMENT OF THE IMPLEMENTATION OF A CASS PLAN AT A UNIVERSITY OF TECHNOLOGY

The validation studies were conducted to test if the model satisfied the requirements of flexibility, formalisation, reusability, completeness and reproducibility.

Descriptions of existing assessment frameworks and assessment cases were gathered for this validation. Identified assessments and concepts in the model were scrutinised. Whenever a problem was encountered, a problem description was compiled and any solutions were proposed using a change request.

Results of the validation studies of the model.

Firstly, the model was validated on Stiggins' (1992:78) guidelines for assessments. Secondly, the model was validated on the five-process framework of Almond *et al.* (2001; 2003). Thirdly, the model was used to describe and plan assessment in an academic staff development programme to test the expressiveness of the model's terminology.

Validation 1

Stiggins (1992:79) provides guidelines for the design of assessments in authentic learning situations. The steps in this framework are: (1) the specification of a trait to be evaluated; (2) the definition of what needs to be evaluated; (3) the development of tasks used to elicit that performance; and (4) the design of a scoring and recording scheme for results.

The information that must be specified in step one contains the kind of decisions that can be made, who the decision makers are, how the results of the assessment are being used and for what population the assessment is meant. In this model these aspects are reflected in the *assessment policy*, the *CASS plan*, the *population*, the *function of assessment* and *decision rule* and *decision maker* (cf. Figure 6.4). The function of an assessment depends on the decisions that an institution wants to make.

Stiggins' second step is focused on the subject of assessment, the item and the characteristic of the student that must be evaluated. In this step, Stiggins demands that the assessment designer knows what kind of tasks a candidate has to fulfil. A task

may be the delivery of a product, but it might also be that the process of constructing the product is more informative. Therefore, it is important to define the *rating instruction* at an early stage (Stiggins, 1992:81). Stiggins emphasises that this *rating instruction* must be derived from the authentic situation. This step is modelled in the programme's *CASS plan, population, trait, indicator* and *rating instruction* (cf. Figure 6.4; cf. Figure 6.5; cf. Figure 6.8).

The third step addresses the development of the assessment tasks. The assessment type that best matches the objective has to be selected. For example, this may mean that multiple-choice questions are selected in a knowledge domain and that portfolio assessment is selected when students have to present evidence of their competences. In this step, the assessment designer also has to decide on the number of measurements that are necessary to make an assessment reliable in accordance with the CASS plan. Furthermore, one has to decide whether or not students will be made aware beforehand that they are being assessed. The stages in this model that correspond to the information in the third step are *assessment function, trait, item, assessment scenario* and *unit of assessment* (cf. Figure 6.4).

Finally, in the fourth step, a plan for judging the assessment is specified. Here, the assessment designer describes the type of scoring (holistic or analytic), the persons who will or may act as assessors, and the exact method of scoring. The judgment is constrained by the types of decisions that are specified in the first step. Stages from the model that correspond to this step are *item response* (cf. Figure 6.7), *assessor, rubric score, assessment indicator score, trait score*, (cf. Figure 6.8) *CASS plan, decision* and *decision rules* (cf. Figure 6.9).

This first validation study shows that the model for the management of the implementation of a CASS plan for a university of technology can describe assessments that are constructed according to the framework of Stiggins (1992:81) and that the model covers the whole assessment process as described by Stiggins. Therefore, this validation study is a positive indication that the model meets the requirements of flexibility and completeness.

Validation 2

The second validation was done on the basis of the five-process framework of Almond *et al.* (2001; 2003). Whereas the Stiggins' approach was derived from a CASS design perspective, the Almond *et al.* view is derived from viewing assessment as a process in which an administrator, responsible for setting up and maintaining the assessment, and a candidate, the person whose traits are being assessed, are actors in a system. Although the model of Almond *et al.* is phrased in terms of computer-based testing, it can be used in a broader sense.

The five-process framework, comparable with the basic assumptions of this CASS plan model, is defined from the perspective of the re-use of functional objects of assessments in different contexts. The framework consists of six different types of models that specify the materials, capabilities, and other information needed by the processes necessary to deliver a particular assessment:

1. **The student model:** what construct of knowledge, skills or other traits of the student is assessed?
2. **The task model:** what tasks or situations should elicit those behaviours?
3. **The evidence model:** a set of instructions for interpreting the result of the task.
4. **The assembly model:** a set of instructions for assembling the assessment.
5. **The presentation model:** how to present a particular task in a particular delivery environment.
6. **The delivery model:** a container for events and articles that affect the entire assessment.

These models are the basis for the processes that, according to Almond *et al.*, take place in assessment. The processes in the five-process framework are: (1) the 'activity selection process' (responsible for selecting and sequencing tasks, including items, set of items, or other activities); (2) the 'presentation process' (responsible for presenting the task to the candidate and capturing responses); (3) the 'evidence identification

process' (responsible for identifying the essential characteristics of the response); (4) the 'work product' (that provides evidence about the candidate's traits) and; (5) the 'evidence accumulation process' (responsible for the update of the belief about the candidate's trait). The last two phases are called 'response processing' and 'summary scoring process' which are mentioned in later work of Almond, Steinberg and Mislevy (2003).

The elaboration of the scoring process in the proposed model for the management of the implementation of a CASS plan at a university of technology is based on the same principles. Firstly, the scores on items are related to the indicators that the items measure and later these measurements on the indicator level are summarised in an assessment score. In terms of Almond *et al.*, the indicators are estimates of participant proficiency(ies). One or more assessment scores give information about the trait of the candidate.

The information stored in a *CASS plan*, is the guiding input for the activity selection process in the model of Almond *et al.* The candidate's current knowledge, skills and abilities (in this model named *traits*) are reflected in the student model of Almond *et al.* (2001; 2003). The observable variables mentioned are *indicators*. The concepts *trait*, *item*, *prompt*, *hint*, *item formats*, *instructions* are part of the task mentioned by Almond *et al.* in the task model. The *rating instruction* is comparable with the evidence rules of Almond *et al.* (2001; 2003). These rules (rubrics for example) describe how to identify and evaluate essential characteristics of the item response (in the terms of Almond *et al.*, 'the work product'). The scoring record and the weight of evidence are used in the *scoring prescription*. The scoring prescription gives input to an assessor to evaluate an item used in an assessment. It indicates the contribution of this item to the total amount of information that the unit of assessment will give about the candidate's trait. Almond *et al.* (2001) mention two types of feedback: task-level feedback (an immediate response to the candidate's action in a particular task, independent of evidence from other tasks) and summary feedback (a report about the accumulated belief based on evidence from multiple tasks) (Almond *et al.*, 2001; 2003).

Components of the assessment construction stage of the proposed model are closely related to the activity selection process and the presentation process. The *assessment scenario* uses a set of instructions for assembling the assessment. Almond *et al.* (2003) reflect this in the assembly model. The presentation process describes how a particular task has to be presented. In the proposed model for the management of the implementation of a CASS plan at a university of technology, this is described in the *assessment session* (cf. Figure 6.7). Information on the history of the candidate (collection of completed tasks, state of the scoring, and so on) is not described separately in the proposed CASS plan model. In Almond *et al.*'s (2003) model, this is referred to as the 'examinee record'. The *decision* is positioned in the 'activity selection process'. This process makes a decision about what to do next, based on the current beliefs about the participant or other criteria. In the proposed model for the management of the implementation of a CASS plan this is described by the *decision rules*.

The conclusion of this validation study is that the five-process framework of Almond *et al.* (2001; 2003) can be described by using the model for the management of the implementation of a CASS plan. This validation study is a further indication that the model meets the requirements of flexibility and completeness.

Validation 3. Performance assessment

In this section the model for the management of the implementation of a CASS plan is used to describe a performance assessment in academic staff development as an example. In the description of the assessment the corresponding concepts of the model for the management of the implementation of a CASS plan are placed in italics between brackets. An example standard in academic staff development is 'The lecturer works effectively in cooperation with other professionals and students in order to promote learning' (*trait*). This standard is translated in lower level standards,

for example, 'by the end of the programme, lecturers will demonstrate that they are able to work cooperatively in the classroom with other professionals and students' (*complex trait*). On the lowest level this means that lecturers have to demonstrate that they can manage a student-feedback interview with the desired outcomes (*simple trait*). For this trait a performance task (*item; demonstration item*) is developed which requires lecturers (*candidate*) to interview the students and develop a written report of that interview. The policy of the institution (*assessment policy*) prescribes that lecturers have to do the student-feedback interview twice (*assessment plan*). An assessor (*assessor*) observes the interviews. The total assessment take is described in a CASS plan of the department. If a lecturer fails the feedback interview, the report may still be written, but the interview has to be done again. Other assessments are not dependent on the result of the feedback interview (*assessment scenario*).

A scoring rubric is available for the evaluation of the interviews. After the interview (*unit of assessment 1*) the lecturer prepares the report (*unit of assessment 2*). For a specific lecturer (*candidate*) the interview takes ten minutes (*assessment session; item response*) and the report must be delivered to the assessor within a week after the interview (*item response*). The assessor assigns two ratings (*assessment indicator scores*), one for the interview and one for the report. The mean of the ratings will be the end score (*trait score*) for this competence.

This validation study gives evidence that the model for the management of the implementation of a CASS plan can describe a complete performance assessment and therefore indicates that the model can meet the requirements of flexibility and completeness.

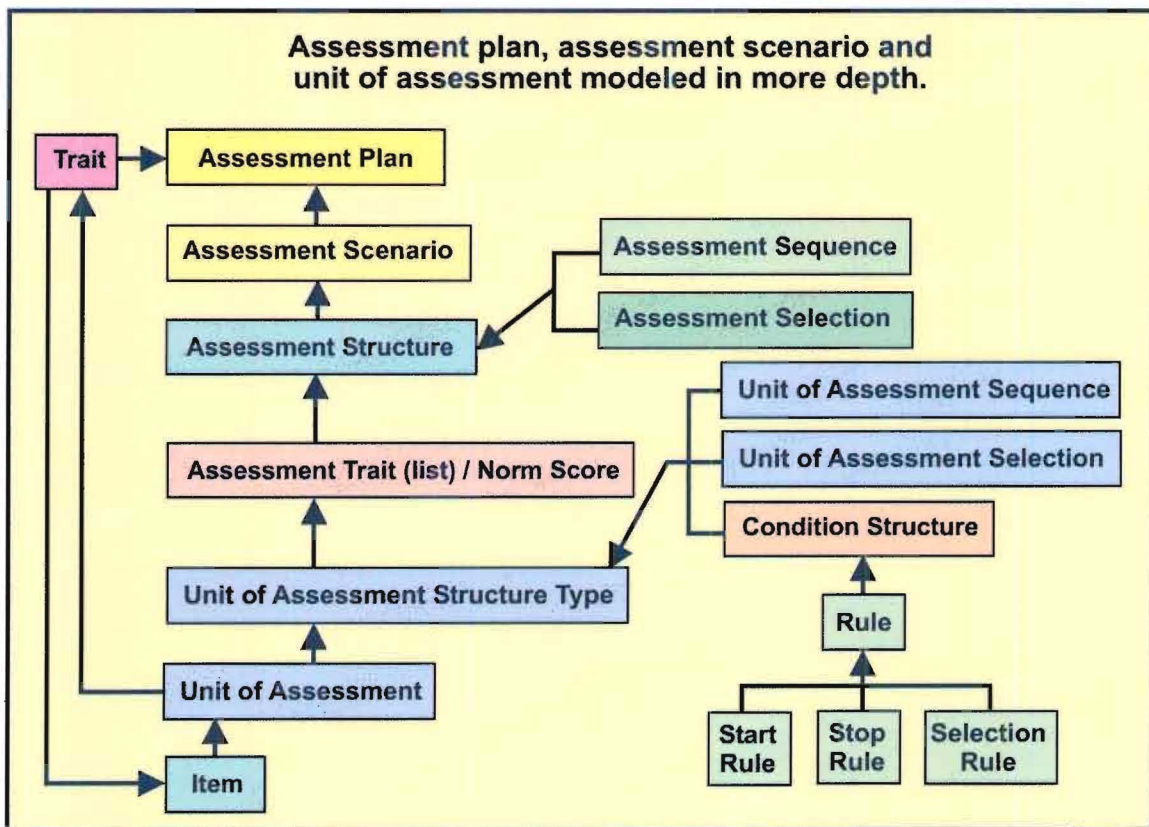
External review of the model for the management of the implementation of a CASS-plan at a university of technology

After several trials with assessment designers (lecturers) it was agreed that this was a consolidated model for the management of the implementation of a CASS plan that

covered various types of assessments, like portfolio assessment, group assignments and self-assessment. From this review it was concluded that the model is understandable and useable for experts in the assessment domain.

The development of a model for the management of the implementation of a CASS plan for use on departmental level was described and formulated including a number of criteria that such a model should meet. A more detailed model for use as a CASS plan in an academic department is depicted in Figure 6.10.

Figure 6.10: Assessment plan, scenario and unit of assessment modelled in more depth.



The assessment rule that is included in this model, sets a point at which the rule is implemented (start rule), a point at which the rule is terminated (stop rule), and a selection rule which informs the rule that sets the conditions of the structure of the assessment.

The model for the management of the implementation of a CASS plan at a university of technology, thus seems to be implementable as can be seen from the various validations that the model was subjected to.

CHAPTER 7

SUMMARY, RECOMMENDATIONS AND CONCLUSION

7.1 INTRODUCTION

If the truth about an educational system is to be discovered, its assessment procedures need to be investigated. The extent to which the qualities and achievements of students are actively valued and rewarded by the system should be investigated. The extent to which students' hopes, ideals, aims and objectives are addressed by the system should be formalised. The spirit and style of student assessment defines the *de facto* curriculum.

In traditional education and training, assessment is often interpreted to be the 'tail that wags the dog'. For many students, the **real** curriculum has been what they have to study for the test/examination/assignment. It could thus be surmised that assessment tasks define the curriculum in the sense that students often focus on topics that are to be assessed in the hope of achieving good marks.

7.2 SUMMARY

In chapter 1 the following guidelines were identified as providing possible answers to some basic questions about designing and implementing an assessment plan:

- Each instructional programme should determine and articulate the specific student learning outcomes and how those outcomes fit into the mission of the university.

- Each instructional programme should examine the role that individual modules play in meeting the exit level outcomes and the methods used to accomplish those outcomes.
- Each instructional programme should specify how assessment results should be utilised for curricular improvement.

The above questions were all incorporated into the model for the management of the implementation of a CASS-plan at a university of technology, and form an integral part of the design process.

Each instructional programme should specify how the results of the assessment will be utilised for curricular improvement.

Perspectives on assessment in an outcomes-based context, as well as the role players and processes involved in planning for the implementation of continuous assessment were addressed. International and national CASS plans, and their development were studied (Chapter 2)

In order for a continuous assessment plan to be developed, a suitable model for the management of the implementation of a CASS plan at a university of technology needed to be constructed.

Different models that could possibly be used in the development of such a model for the management of the implementation of a CASS plan at a university of technology was explored and discussed. In accordance with the aim of this study, possible models were investigated for the management of educational processes, together with possible general management models. The purpose was to develop a model for the management of the implementation of a continuous assessment plan at a university of technology (Chapter 3).

The design outline and methodology of the research regarding the management of the implementation of continuous assessment (CASS) at a university of technology were discussed. The literature study in the first three chapters formed the framework for the empirical research. The objectives of this study were stated as:

- determining the key issues involved in the planning for the implementation of CASS;
- determining how the process can be successfully managed; and
- designing a conceptual model for the management of the implementation of a CASS plan at a university of technology.

The empirical investigation aimed at the gathering of information about the experiences of lecturers, students and administrative staff regarding the management of the implementation of CASS in universities of technology (Chapter 4).

A report of the investigation conducted was presented. This investigation consisted of a questionnaire directed at lecturers (Annexure 1) involved in CASS, a second questionnaire directed at students (Annexure 2) involved in CASS and a focus group interview with administrative staff involved in administering CASS. Questionnaires were distributed to 65 lecturers and 240 students. The focus group interview was conducted with 10 administrative staff members involved in CASS (*cf.*4.2.4).

The response rate from the lecturers amounted to 75 percent. This constitutes a reliable sample from which meaningful deductions can be made. Of the 240 questionnaires directed at students, 166 were returned, which renders a response rate of 69 percent. Again, this can be regarded as a useful response from which to make meaningful deductions.

The analysis and descriptive statistics reflected were obtained by means of the computer programs Statistica and SAS (Chapter 5).

The results of Chapter 5 clearly indicated that the main obstacles to the implementation of continuous assessment (CASS) at a university of technology are the lack of management of the process which is manifested in a work overload for both staff and students as well as the lack of administrative support due to poor planning within the institutions at large, as well as within the academic departments. In order to overcome these problems, a proper management system, the CASS strategy, for assessment had to be developed including CASS plans for the academic departments within the institution. In the new learning approach, assessment is integrated in learning and teaching and addresses complex traits (the abilities, the characteristics in a specific domain) of students. To match this new approach, new types of assessment are implemented, like peer assessment and competence assessment. In order to support the use of both new and traditional assessment types a conceptual model for the management of the implementation of a CASS plan at a university of technology was developed (Chapter 6).

7.3 CONTRIBUTION OF THE STUDY

This study contributes to the implementation of continuous assessment at universities of technology, as is recommended in the White Paper on Higher Education and as is expected by the CHE in their criteria for institutional accreditation and programme accreditation.

In assessment terms, this might relate to the greater use of CASS rather than unseen examinations. It may relate to the involvement of students in more self- and peer-assessment rather than the lecturer being the sole assessor. In addition, it may relate to assessment being experienced by students as being more about helping their learning rather than just showing them how much they do or do not know, and to the greater use of *feed forward* to improve learning rather than just *feedback* to reflect on what has been done before.

There are a myriad of connections that can be made between the twelve elements and four functions proposed in the model. The links between the following pairs of elements are illustrative of relationships that may be highly functional or characterised by unresolved tension:

- Institutional strategies *and* departmental plans.
- Programme design *and* module design.
- Students' experience *and* lecturers' experience.

The role of staff/educational development or other functions in providing the links between and within levels is highlighted by the proposed model.

All of these can be seen as contributions of this study to the management and implementation of this very contentious matter within the higher education realms of South Africa. The model provides an open approach to this problem. In addition, the model can be adjusted to serve the needs of a specific department or institution.

7.4 FINDINGS AND RECOMMENDATIONS

In the analysis of the statistical data obtained from the questionnaires the following key issues were identified as being the most important factors that should be addressed in the development of a CASS plan for a department and also a CASS strategy for the institution.

7.4.1 Finding and recommendation 1

The lecturer respondents indicated that 13 percent of the respondents were the impression that the programme coordinators within a department were responsible for

the *management of the CASS plan*. A further 19 percent of the respondents indicated that the heads of department of the academic departments were responsible for managing the CASS plan. An overwhelming majority, 68 percent of the respondents, felt that all academics were responsible for the CASS plan management.

The student responses, enumerated 3 percent of the respondents as indicating that programme coordinators were responsible for the management of CASS in their departments where they studied. A total of 20 percent indicated that the heads of department were responsible for managing the CASS plan of the department. The student respondents indicated that 77 percent were under the impression that all academic staff members were responsible for the management of the CASS plan in their departments.

This indicates the respondents' varied perceptions regarding the responsibility of managing the CASS plan within the university. This is a clear indication that the CASS plan of the departments within which the lecturers function and the departments within which the students study, do not possess a clear CASS plan that is communicated to all the role players within that department. It also indicated that the CASS strategy of the university is not clearly communicated (*cf.1.2.3; cf.2.3.11*) to all the role players as this would eradicate the confusion that exists within the department.

Recommendation 1

The management of the CASS plan should be the responsibility of a designated person in the department. It is recommended that the responsibility should reside with the programme coordinator of each programme.

The management and maintenance of the CASS strategy and CASS-policy should reside in the office of the academic registrar of the institution.

7.4.2 Finding and recommendation 2

The issues of *responsibility for drafting the CASS-policy* and the *maintenance of the CASS-policy* are not well known facts among both lecturers and students. The CASS-policy, which is the policy that all these lecturers are supposed to be implementing within their institutions and is supposed to be aligned with the institutional vision and mission, is supposed to be a policy that is well known to all these respondents that have to implement it.

The responses vary from 44 percent respondents indicating that the Institutional Development Unit of the institution is responsible for the development of the policy to 8 percent for management, the examination office and lecturers themselves and to as low as 2 percent for faculty boards, academic boards and senate. What is however disturbing, is that 22 percent of the lecturer respondents did not answer this question indicating that they are totally unaware of who is responsible for the drafting of the CASS-policy.

This indicates that lecturers are not involved in development and maintenance of the CASS-policy, and have a lack of knowledge regarding the CASS-policy. As assessment, and therefore also CASS, is in essence a process that should be revised and adjusted regularly to accommodate the changes in environment, student cohort and national policies, the CASS-policy of an institution is a living document and should be revised accordingly (cf.1.3).

Recommendation 2

In order to be able to have total commitment and a proper understanding of the CASS-policy of the institution, the development and maintenance of the CASS-policy should be a centralised, well communicated effort, ensuring that all stakeholders are well informed about the policy and its implementation. Therefore, it is recommended

that the drafting and maintenance of the CASS-policy, as with all other academic policies, should reside in the office of the academic registrar of the institution.

7.4.3 Finding and recommendation 3

It was found that many different influences on the CASS plan implementation hamper the process. These factors include **preparedness of students, work overload**, the implementation is **unorganised** and that **no CASS plan** exists, **lecturers are not properly trained, a lack of communication**, the **administration** of the CASS process and **time**.

Recommendation 3

Factors that influence and hamper the effective implementation of the CASS strategy and CASS plan should be kept in mind during the development of an institution specific management model for the implementation of CASS at a university of technology.

Contingency plans should be part of the total CASS plan.

Quality assurance of all these processes are of the utmost importance, as CASS should take place within the guidelines of the HEQC and the DoE.

7.5 FUTURE RESEARCH OPPORTUNITIES

There are a number of directions in which this research can be extended. For example, while this study developed a comprehensive model for CASS plans in an academic department or programme and a model for a CASS strategy within an institution, research into the successful implementation of the models still needs to be done.

Further research into the influence of the implementation of such models on the results of students and whether the models contribute to the total throughput of the institution should be conducted.

Determining the effect that these models have on the workload of both lecturers and students, if implemented properly, still needs to be researched. The effect of the use of more peer- and self-assessment, the use of portfolios and competence assessments still need to be determined.

7.6 CONCLUDING REMARKS

The changes that are taking place in higher education in South Africa lead to the introduction of innovative, new approaches to teaching and learning. As assessment, and in particular continuous assessment, is an integral part of the total learning experience, higher education institutions should start looking at the implementation of the suggestions made in the White Paper on Higher Education of 1995.

In order for the higher education institutions to adapt to the prescriptions of the said White Paper, it is of utmost importance that the implementation of CASS becomes a reality within these institutions. As was found during this study, various institutions attempted to implement CASS, but this was done with varying success rates.

The most prominent problem that these institutions encountered is the lack of a well constructed and executed CASS plan in the departments and the non-existence of a CASS strategy for the institution.

The development of the model for the management of the implementation of a CASS plan at a university of technology, as proposed in this study, could help to alleviate these problems and facilitate the successful implementation of CASS within higher education institutions.

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Lecturers' Questionnaire

ANNEXURE 1

CONTINUOUS ASSESSMENT (CASS) FEEDBACK FORM

Questionnaire on implementation of CASS in programmes at various Institutions of Higher Learning



VAAL TRIANGLE CAMPUS

Dear respondent,

Your expectations, concerns and experiences are of great value to us, because we want to offer our students the best learning experiences possible. We, however, are also concerned about the perceptions and experiences of staff members and therefore, we would like you to complete the following questionnaire to enable us to gauge your experiences with CASS.

BIOGRAPHICAL INFORMATION:

Institution:

Years experience:

1.1 In Higher Education:

1.2 Other level of Education:

1.3 Commerce and Industry:

1.4 Highest academic qualification:

0 – 2	2-5	5-10	10+

INSTRUCTIONS Indicate your answers with a cross in the applicable block.

1. PEOPLE

1.5 Who is responsible for CASS Management at your institution?

☐ Head of Department ☐ All academic staff ☐ Programme co-ordinator

1.6 Who is responsible for Work Integrated Learning Assessment?

☐ Lecturer ☐ Mentor ☐ Student

2. PROCESSES

2.1 Is your assessment office: ☐ Centralised ☐ Decentralised

2.2 Did you implement any of the following strategies in the past 2 (two) years to increase your through-put rate?

☐ On-line assessment ☐ More tests ☐ Continuous assessment

2.3 Any other interventions:

2.4 In using CASS, what is its main focus?

☐ Formative 1 ☐ Summative 2 ☐ Self-assessment 3

2.5 Do you have a CASS plan for the department?

☐ Yes 1 ☐ No 2

2.6 Do you have a CASS strategy for the institution?

Yes 1	No 2
-------	------

2.7 Does industry/commerce play a role in assessment?

Moderators 1	External Examiners 2
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2.8 Do you feel that your current method of assessment/evaluation complies with the following?

	4	3	2	1
2.8.1 Testing all outcomes	Always	To a large extent	Sometimes	Never
2.8.2 Testing critical cross field outcomes	Always	To a large extent	Sometimes	Never
2.8.3 Transparency	Always	To a large extent	Sometimes	Never
2.8.4 Validity	Always	To a large extent	Sometimes	Never
2.8.5 Reliability	Always	To a large extent	Sometimes	Never
2.8.6 Relevance	Always	To a large extent	Sometimes	Never
2.8.7 Sufficiency	Always	To a large extent	Sometimes	Never
2.8.8 Fairness	Always	To a large extent	Sometimes	Never
2.8.9 Authenticity	Always	To a large extent	Sometimes	Never
2.8.10 Using a variety of assessment methods	Always	To a large extent	Sometimes	Never

2.9 Which factors, according to you, hinder the effective implementation of CASS?

3. PROCEDURES

3.1 Do you have any Assessor training at your institution?

1	2
---	---

3.2 Does your institution have a CASS-policy?

Yes	No
-----	----

3.3 Does assessment play any part in this recognition?

Yes	No
-----	----

3.4 How are the following methods of assessment applied in your programme?

	1	2	3	4	5
3.4.1 Peer assessment	Not used	Formative	Summative	Baseline	Diagnostic
3.4.2 On-line assessment	Not used	Formative	Summative	Baseline	Diagnostic
3.4.3 Self assessment	Not used	Formative	Summative	Baseline	Diagnostic
3.4.4 Tutor assessment	Not used	Formative	Summative	Baseline	Diagnostic

4. POLICIES

4.1 Who is responsible for the assessment policy of your institution?

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4.2 How often is it revised

1	2	3
---	---	---

4.3 How many times can a student be re-assessed on the same unit/module/subject?

Once	Twice	Other
------	-------	-------

5. PERCEPTIONS

Indicate whether you agree or disagree with the following statements:

	1	2
5.1 Continuous assessment leads to a work overload	Agree	Disagree
5.2 One final exam is sufficient to determine a student's competence	Agree	Disagree
5.3 The Minister of Education's statement that unsuccessful 1 st year students should not be re-admitted to programmes	Agree	Disagree
5.4 Reading speed of the students influences their performance in tests	Agree	Disagree
5.5 Students should be allowed to answer their exams in any of the indigenous languages.	Agree	Disagree
5.6 Papers should be made available to students in their own language	Agree	Disagree
5.7 Peer assessment is valid and fair	Agree	Disagree
5.8 CASS is an integral part of the learning process	Agree	Disagree

5.9 **Rank** the following 10 administrative functions from 1 to 10, 1 being most important and 10 being least important, as to what you perceive as the most critical function for CASS: **Also indicate whether or not these functions are supplied by the university indicating "yes" or "no".**

Function	Priority (1-10)	Yes	No
5.9.1 Announcement of CASS dates			
5.9.2 Reproduction of examination papers			
5.9.3 Moderation			
5.9.4 Capturing of results on ITS			
5.9.5 Archiving of proof documents			
5.9.6 Invigilation support			
5.9.7 Budgets			
5.9.8 Availability of venues			
5.9.9 Assistance with recording of results			
5.9.10 Ensuring that exam papers are available on time at all sites of delivery			

5.10 It is well-known that all institutions should increase their throughput rates by 2007. What do you perceive as the major change that has to take place, to make sure that institutions will reach this target?

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5.11 What management information reporting does your institution have to monitor the effectiveness of its current assessment policy and strategies. For example: is a report submitted to academic board after every exam? Are poor performing subjects/modules identified?

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5.12 Do you have an Early tracking system for poor performing students in formative assessment in place?

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Thank you very much for your time. It is highly appreciated.

ANNEXURE 2

Students' Questionnaire

CONTINUOUS ASSESSMENT (CASS) FEEDBACK FORM FOR STUDENTS



VAAL TRIANGLE CAMPUS

Dear respondent,

Your expectations, concerns and experiences are of great value to us, because we want to offer our students the best learning experiences possible. We, however, are also concerned about the perceptions and experiences of **students** and therefore, we would like you to complete the following questionnaire to enable us to gauge your experiences with CASS.

BIOGRAPHICAL INFORMATION:

Institution:

INSTRUCTIONS Indicate your answers with a cross in the applicable block.

1. PEOPLE

Who is responsible for CASS management in your programme?

1	2	3
Head of Department	All academic staff	Programme coordinator

2. PROCESSES

2.1 Is your assessment done based only on one of the following?

1	2	3
Tests & assignments	Portfolio	Both

2.2 Were you assessed using any of the following strategies in the past?

1	2	3
On-line assessment	More tests	Continuous assessment

2.3 What is the main use of your CASS process?

1	2	3
For-mative	Sum-mative	Self-assessment

2.4 Should you be aware of the institutions CASS strategy?

1	2
Yes	No

2.5 Does industry/commerce play a role in assessment as?

1	2
Moderators	External Examiners

2.6 Do you feel the way that you are assessed currently complies with the following?

	4	3	2	1
2.6.1 Testing all outcomes	Always	To a large extent	Sometimes	Never
2.6.2 Testing critical outcomes	Always	To a large extent	Sometimes	Never
2.6.3 Is transparent	Always	To a large extent	Sometimes	Never
2.6.4 Is valid	Always	To a large extent	Sometimes	Never
2.6.5 Is reliable	Always	To a large extent	Sometimes	Never
2.6.6 Is relevant	Always	To a large extent	Sometimes	Never
2.6.7 Is sufficient	Always	To a large extent	Sometimes	Never
2.6.8 Is fair	Always	To a large extent	Sometimes	Never
2.6.9 Is authentic	Always	To a large extent	Sometimes	Never
2.6.10 Uses a variety of assess methods	Always	To a large extent	Sometimes	Never

2.7 From a student's perspective, what are the factors that hinder the effective implementation of CASS?

1. PROCEDURES

	1	2
3.1 Were you informed on how assessment is done in your programme?	Yes	No
3.2 Do you give any feedback to staff on their assessment methods?	Yes	No
3.3 Are you aware of the assessment criteria (standards) in advance?	Yes	No

3.4 Are the following methods of assessment applied in your programme?

	1	2
3.4.1 Peer assessment	Yes	No
3.4.2 On-line assessment	Yes	No
3.4.3 Self assessment	Yes	No
3.4.4 Tutor assessment	Yes	No

4. POLICIES

	1	2	3
4.1 How many times can a student be re-assessed on the same unit/module/subject?	Once	Twice	Other

5. PERCEPTIONS

Indicate whether you, as student, agree or disagree with the following statements:

	1	2
5.1 Continuous assessment leads to a work overload	Agree	Disagree
5.2 One final exam is sufficient to determine a student's competence	Agree	Disagree
5.3 The Minister of Education's statement that unsuccessful 1 st year students should not be re-admitted to programmes	Agree	Disagree
5.4 Reading speed of the students influences their performance in tests	Agree	Disagree
5.5 Students should be allowed to answer their exams in any of the indigenous languages.	Agree	Disagree
5.6 Papers should be made available to students in their own language	Agree	Disagree
5.7 Peer assessment is valid and fair	Agree	Disagree
5.8 CASS is an integral part of the learning process	Agree	Disagree

Thank you very much for your time. It is highly appreciated.