CHAPTER 1

INTRODUCTION

1.1 BACKGROUND TO THE PROBLEM

In terms of the Technikon Act 125 of 1993, South African technikons began to offer degree courses in addition to the National Diplomas and National Higher Diplomas they offered in the past. In line with this new focus, research became a critical output of these institutions. In 2004 several technikons were given university of technology status. Loosely the Australasian model for such institutions is being followed, as Australia and New Zealand have also recently gone through a transition from polytechnics (similar to South African technikons) to universities of technology.

In Australasia, as in Great Britain higher education has recently been reorganized into a single, centralised system. Before 1987, the higher education system in Australia and New Zealand consisted of universities and colleges of higher education. Then the government promulgated a single unified system. This same re-organisation of higher education structures occurred in the U.K. in 1991 (Leonard 1994a:148). This created a problem for the libraries at these institutions as formulated by Leonard (1994a:149):

> As former colleges of advanced education merge or become universities …
> the adequacy of library services and collections comes into question. Can a
> library that served as a library for a college be transformed overnight into a
> university library?

The new focus on research, and on a higher level of academic qualifications in traditional technikons have placed a considerable strain on libraries and information services which have historically aimed to meet information needs of not only undergraduates, but more specifically, of underdiplomates. These libraries now have

to meet the information needs of researchers at masters, doctoral and even post-doctoral levels and of the academics preparing and teaching the courses. New curricula have to be developed, research has to be carried out and research projects must be supervised.

In terms of the South African Department of Education's new funding formula for private higher education institutions (SA. Ministry of Education 2003), a higher subsidy for funding public higher education is now given for research than was previously the case. In terms of the formula, each institution's research output will be audited every year and the following research weightings will apply: 1 per publication unit, 1 per research master's graduate and 3 per doctoral graduate (SA. Ministry of Education 2005:4). For the years 2005/6 and 2007/8 these so-called research development grants for which an institution is eligible will be added to each institution's block grant as a matter of course (SA. Ministry of Education 2005:6). Research-based master's and doctoral degrees are thus funded at a much higher level than previously and the published research of academics is highly subsidised by government compared to the funding given for undergraduate degrees and teaching outputs. In addition, the Department of Education has approved a benchmark for the ratio of weighted publication units to permanent staff. This too will be a consideration in the funding given to each institution. In terms of the benchmark, permanent research and teaching staff at universities are expected to deliver 1,25 research units per annum and those in technikons (universities of technology) 0,5 units (SA. Ministry of Education 2004:13). This new emphasis on research output for government subsidies means that the libraries at public higher education institutions must provide information resources to support research in order to facilitate research output. Financial support of library collections has become vitally important because this will have a direct benefit in terms of financial support from government in the form of higher grants for research output.

Because of these developments, it became necessary to investigate the collection development and management policies, standards and guidelines of technikon libraries in South Africa as these will have to support the information needs of

researchers and academics in the new generation of institutions of higher education: universities of technology.

In Australia and New Zealand it was found that polytechnics and the new universities or technology did not have the kind of collections that would be able to support the needs of researchers at university level (Cochrane & Rickards 1991:147; Powell & Bushing 1991:12). They have been forced to revise the policies, standards and guidelines which had previously been adequate to meet the information needs of academics and researchers in a polytechnic. Similarly, collection development foci in South Africa will have to be metamorphosed if technikon libraries are to become the type of research library required in the new dispensation. In order to meet the increasing demands placed on these institutions, collection development and management policies, guidelines and standards have to be reviewed and revised. Funding for library collections has not increased in proportion to the higher demands these libraries face, and without a dramatic increase in funding, technikon (university of technology) libraries will never rise above the level of inadequacy at which they have historically operated.

1.2   STATEMENT OF THE PROBLEM

South African technikons have undergone changes in the past from "technical colleges" to "colleges for higher technical education" and then to "technikons". Each change has brought about different approaches to teaching and training and each change has brought about a higher level of education. The change to universities of technology is however the greatest leap to date and brings with it a responsibility to produce both pure and applied research in greater volume and at a higher level than ever before. Were this not to occur, the research and academic programmes at these institutions would lack credibility and accreditation.

Financial constraints have resulted in technikons reducing financial support to their libraries in real terms. Increases in materials budgets have not kept up with inflation. This means that instead of expanding collections, institutions have been able at best to maintain collection sizes and in some instances the weeding and shrinkage of

collections has meant that collections have shrunk in size. This has resulted in collections that are inferior to those of universities in terms of number and variety of books, journal subscriptions, audiovisual material, CD-ROM and online bibliographic and full-text databases (Van Zijl 2002:4).

It is possible that South African technikon library collections will have to be extended significantly and be managed differently in order to meet the information needs of academics and researchers at a fully-fledged university of technology, as per the Australasian model.   Collection development and management policies, guidelines and standards will in all probability have to be altered to support research and scholarly pursuits of academics at a university of technology.

The key problem and question to be addressed in this study is:

> To what extent do the collection development and management policies, guidelines and standards adhered to by universities of technology satisfy the information needs and behaviour of lecturers and researchers in these institutions?

Sub-problems that must be addressed are:

1. Which factors must be considered when formulating policies, standards and guidelines for developing and managing collections for researchers and academics in academic libraries?
2. What are the typical characteristics of academics and researchers in universities and universities of technology with regard to their interaction with information as scholars, as lecturers and as researchers?
3. What are the information needs of academics and researchers at an institution classified as a type of university?

4. What is the information behaviour of academics and researchers in academic libraries, with special reference to the developments in scholarly communication?

5. What are the collection development issues in an academic library relating to the various types of information media?

6. How do the collection development policies, standards and guidelines used in universities of technology in South Africa and New Zealand compare?

1.3   PURPOSE OF THE STUDY

Technikons have been upgraded to universities of technology recently. This change presupposes that there should be an infrastructure in place to enable academics and researchers at such institutions to obtain the information they require in institutions of higher learning that offer postgraduate qualifications. The purpose of this study is to discover what the needs of academics and researchers at such institutions are, and subsequently to arrive at recommendations and a model collection development policy (CDP) statement that will enable libraries at these institutions to meet these needs. The model CDP statement could then be adapted by individual institutions to conform to their requirements.

1.4   ASSUMPTIONS

The researcher assumes that educational structures and standards in New Zealand are similar to those in South Africa, and that library requirements for similar categories of libraries will not differ substantially between the two countries. Both countries are geographically distanced from the large information-providing continents such as the United States of America and Europe and would thus be faced with similar problems relating to access to information resources.

Another assumption is that there are not substantial differences in the information needs of academics and researchers in established universities worldwide and those at universities of technology. Most of the relevant literature deals with universities *per se* and not with universities of technology in particular. Findings in research relating to the information needs and behaviour of academics and researchers in universities will be accepted as a norm that can be generalised for universities of technology.

The institution that will be called X University of Technology in this study (due to an undertaking not to mention the actual institution by name) is a new South African University of Technology that was selected for the case study. It is assumed to be typical of other South African universities of technology, having gone through the same historical changes as other such institutions. Similarly, the Auckland University of Technology (AUT) is assumed to be typical of other institutions of this type in New Zealand.

1.5   DEFINITION OF TERMS

1.5.1   University of technology

In South Africa, Technikons became fully-fledged institutions of higher education in 1979. In 1993, government passed legislation allowing them to grant degrees. In order to do this, they had to engage in staff development, offer post-graduate programmes, update facilities and establish a Research and Development culture (VUT 2003:2).

South Africa's newly formed universities of technology should have the following attributes (VUT 2003:8-9):

- They must be "research informed".

- Their curriculum must be developed around graduate profiles defined by industry and professions.
- They must have multi-level entry and exit points for students.
- They must be concerned primarily with the development of vocational and professional education.
- Technological capabilities must be regarded as important as cognitive skills.
- These institutions must focus on applied Research and Development (R&D).

There is no single concept identified to define a university of technology. Different countries define them differently.

In South Africa, a university of technology can be defined as a higher education institution that is research informed, follows curricula developed around graduate profiles defined by industry and professions, has multi-level entry and exit points, is concerned with vocational and professional education, is technologically focussed and has a culture of applied R&D.

1.5.2   Collection development

Atkinson (1998:10) defines collection development succinctly as "the programs and processes by which library materials are selected ".

This definition is expanded by Buckland (1989:216) who states that:

> The development of library collections is essentially concerned with the placing in libraries of copies of pre-existing materials. It is at root a logistical exercise to improve service. It is the activity of marshalling or deploying that should be the focus of attention in considering both the roles of collections and the scope of collection development.

Both of these definitions state that this is the process by which library materials are placed in a library, but the important step of actively selecting material, which the researcher believes to be crucial to collection development is lacking in Buckland's

definition. Atkinson's definition is also too general to give an adequate explanation of this concept.

 Evans (2000:16) provides a more accurate definition when he states:

> Collection development is the process of making certain [that] information needs of the people using the collection are met in a timely and economic manner by seeking out information resources held both inside and outside the organization.

Evans (2000:16) states further that it is a constant cycle which consists of six elements: "community analysis, collection development policies, selection, acquisitions, weeding and collection evaluation (or analysis)". As selection of library materials must be based on the information needs of the community it serves, this aspect of collection development is very important. It is also very important to consider the availability of information outside the library or information service. In modern collections, these external information resources must form part of selection decisions. To the elements Evans believes to be central to collection development, Gorman and Miller (1997:x) adds "policy issues" which appear to be broader than collection development policies. Moskowitz (1984:5) adds "budgeting" and "allocating" as vital elements of collection development, which he defines as "… the systematic building of a library collection based on meaningful data rather than subjective choice or chance." The aspect of being critical in selecting material is central to the process of collection development. Howard (1988:205) makes the observation that collection development includes the "continued examination of the collection to determine new research areas to be supported". This aspect of the process could be included in the concept of community analysis. The researcher will include the processes of budgeting and allocation under the concept "collection management" rather than in collection development.

The selection of electronic resources must also be included in collection development because collections are changing relentlessly from print to digital format. The criteria

applied to selection of traditional, print collections must also be applicable to that of digital information materials.

As document delivery services and resource sharing become increasingly used in academic libraries, knowledge of these resources cannot be ignored whilst one develops a collection.

Taking all of the above into consideration, collection development can be defined as the policies, standards and guidelines whereby information resources (traditional or digital) are selected and acquired with the view to developing a balanced, easily accessible collection of information material which will meet the information needs of all users of that collection. The following are crucial elements of the collection development process: community analysis, developing collection development policies, critical selection, format selection, acquisition, collection analysis and evaluation, weeding and evaluation of the external infrastructure for resource sharing.

1.5.3   Collection management

Collection management, although closely linked to collection development, is seen by Atkinson (1998:10) as an expansion of collection development. He defines this concept as "an umbrella term under which collection development is subsumed". By managing collections, one adds value to information objects after their selection (Atkinson 1998:12). The concept of adding value to collections is central to collection management. Collection managers should make the collection more easily accessible to the users of the information.

There is some diversity in what authors believe should be included in the tasks of a collection manager. Common to most are housing, preserving and storage of information resources (Gorman & Miller 1997:x; Fourie 2001:8-9; Jenkins & Morley 1999:xvi; Law 1999:15). Jenkins and Morley (1999:xvi) also include selection, acquisition and weeding in the concept of collection management, but as

these tasks are concerned with building up the collection to meet the information needs of users, these will not form part of collection management in this study. Law (1999:15) lists as part of collection management:

> … the allocation of the bookfund and the balance between books, journals and conservation, the disposition of stock and closed access; the decision to acquire access to electronic resources and other media through purchase or lease; location decisions as between branches of the library and stores; and … the monitoring and encouragement of collection use.

Law (1999:15) also points out that the latter is aimed at the presentation of the collection to the user rather than at the actual collection. The management of budgets, management of technological aspects of collection management and of making collections easily available to users have to do more with adding value to collections, and as such should form part of collection management. Gorman and Miller (1997:x) add to the tasks performed in collection management those of binding, monitoring collections, staffing, systems development, networking, new technology and resource sharing. As these all have to do with adding value to collections and not with building them up, these should form part of collection management.

In Naylor's (1999:274) view, collection managers must "process acquisitions decisions and are responsible for seeing locally accessible collections onto the shelves". This supports Atkinson's belief that collection management has to do with making collections available to users. Whereas collection development entails making selection decisions and building a collection, collection management is involved with the procurement of resources and then processing material to make it accessible to users.

Collection management is the process whereby value is added to collections of library materials by ensuring that required information resources in the most appropriate format are easily and speedily accessible to those who require them.

This includes the physical care of both traditional and digital resources. Collection managers must see to the processing, convenient housing and preservation of information resources as well as the storage thereof in a safe and convenient facility. Adequate classification and cataloguing is also part of collection management, as users must be guided to the resources they require. A collection manager will also be responsible for monitoring use of the collection, fiscal management and allocation of funds for various types of resources, technological support for digital collections and adequate networking.

This study deals with both collection management and collection development, and examines how policies, standards and guidelines relating to these activities must be managed in a university of technology. Of the two programmes, more attention will be given to collection development as it is the development of collections that is most affected by the shift from a technikon (or polytechnic) to a university of technology. In the case studies of AUT and XUT, all such practices are examined and evaluated as to their applicability in a South African university of technology with the emphasis on collection development.

1.5.4   Information needs

A "need" can be defined as "a situation in which something is necessary, especially something that is not happening yet or is not yet available" (*Longman dictionary of contemporary English* 1995:949). According to Kerkham (1986:2-16) information needs can be either expressed, articulated needs or unexpressed, dormant needs. They can be both internal (conscious and unconscious) and external (expressed and unexpressed). Clearly both expressed and unexpressed needs must be addressed in an information service and even unconscious needs play a role in the information milieu of users.

Krikelas (1983:8) defines an information need as the "recognition of the existence of uncertainty".

Gericke (2001:55) categorised information needs as follows:

These are, firstly, conscious information needs which include:

- Expressed, suspected needs or demands which are the needs as "agreed upon between the information worker and the user".
- Expressed needs or demands that are the needs actually communicated to the information worker during the user's search for information.
- Unexpressed needs that have not yet become requests but which are needs understood and experienced by the user.
- Unexpressed, suspected needs which are needs that the information provider must intuitively assume to be present in the user.

Secondly, there are unconscious needs, including subconscious needs that are needs of which the user is actually unaware, although they are present in the information-seeking environment, and also potential or future needs.

Other kinds of needs could be information wants which are often unexpressed desires for information and information demands which can sometimes not even be linked to real information needs but are articulated desires for information (Gericke 2001:56).

An information need can be defined as any expressed or unexpressed, conscious or subconscious need experienced by people when they require a means of resolving an uncertainty, gaining knowledge or solving a problem. Information needs include information wants and information demands and refer to those inner promptings which drive the user to seek information.

The following operational definition of an information need will be used in this study:

An information need is a need for information expressed or experienced either consciously or subconsciously by academics and researchers and this need motivates them to pursue avenues to satisfy the need.

1.5.5　Information behaviour

According to Gericke (2001:72), user behaviour, also known as information behaviour, relates to:

- Who uses what information?
- How, when, where, and why is it used?
- What channels are used?
- What factors have an influence on such use?

There are two major elements to information behaviour. It is possible to describe the ways in which information is used (e.g. reading habits, media usage preferences, information usage, information-seeking behaviour and the interpretation of information) and also to explain the factors which influence user behaviour. These can be called descriptive and explanatory aspects of information behaviour (Gericke 2001:72). A description of information behaviour include (Gericke 2001:74):

- Factors influencing the decision to use information
- How channels and sources are selected
- How these sources are acquired and utilised.

The explanation of user behaviour includes the identification and description of factors that influence these activities.

Information behaviour is thus a broad term to describe and explain the ways in which users go about getting the information they require or desire. This covers problems such as the channels they prefer, media preferences and the use of information services.

1.5.6　Information-seeking behaviour

Information-seeking behaviour is one aspect of information behaviour. Krikelas (1983:6) defines information-seeking behaviour as:

> … an activity of an individual that is undertaken to identify a message that satisfies a perceived need.

As specified in the definition for "information needs" the definition for information-seeking behaviour needs to be broadened to include the un- and subconscious behaviour of information users. It is important to note that Krikelas (1983:6) defines this concept as "an activity". Information-seeking behaviour encompasses all the actions taken by users in their pursuit of information.

Information-seeking behaviour is a concept which describes all activities which are undertaken to acquire the information an individual wants, needs or requires (even on a subconscious level) to perform a task, reduce uncertainty or satisfy any other expressed or unexpressed need.

Gericke (2001:73) indicates that it is possible to study information-seeking behaviour at a macrolevel (such as examining the use of information services) or at a microlevel (including how the user goes about locating information sources within a service such as a library).

The operational definition used in this study will be that information-seeking behaviour is an indicator of the activities pursued by academics and researchers to find information both within the formal information infrastructure and without. This includes how, why, where and when they seek information.

1.6   LIMITATIONS AND DELIMITATION OF THE STUDY

The population in this study is academics and researchers in institutions of higher learning such as universities and technikons and it is the information needs, scholarly communication practices and information-seeking behaviour of this population that are evaluated. As universities of technology are a relatively new concept in South Africa, and even in Australasia, which is used as a model, it is not possible to deal exclusively with information creation and use in such institutions.

A decision has been taken to concentrate specifically on academics and researchers to the exclusion of undergraduate students, who form a large part of the users at universities of technology. The reason for this is that collections at technikons have had to be upgraded to meet the needs of researchers at postgraduate levels and also of academics who are expected to have postgraduate qualifications. Their ability to meet the needs of undergraduate students is not in dispute.

Because the focus here is on collection development and management in a university of technology library, the so-called historically-disadvantaged institutions (HDI's) will not be included, as it will be some time before these strive to become universities of technology due to their having been financially disadvantaged in the past.

As the researcher has a background of working in a technikon library, this will colour her W*eltanschauung* or World View.

When it comes to collection development and management, it is necessary to look at print as well as electronic information resources, as these are all integral parts of the information package made available to academics and researchers.

The case studies of universities of technology was limited to a single such institution in New Zealand and another in South Africa. The researcher investigated the universities of technology in New Zealand through their websites and then selected one in the capital, Auckland, as one that could serve as a case study for the purposes of this study. According to student numbers and the history of this institution, it appears to be very similar to South African technikons. The researcher also relied on colleagues living in New Zealand to help to identify a typical university of technology. It was not possible to select an institution personally by visiting various institutions prior to the commencement of the study due to the distances that had to be travelled.

The fact that there are no established universities of technology in South Africa on which to base a case study is a limiting factor. XUT became a university of technology in 2004, and thus it is impossible to study any real development in this

institution since this development. The case study of the university of technology in New Zealand is more penetrating than that of the South African institution as it has been established for a longer period. Although academics and researchers at New Zealand universities of technology are reasonably similar to those at South African technikons in their information needs there will be several areas in which differences occur.

This study is essentially limited to the field of information science. No attention will be given to the field of education when dealing with universities of technologies, technikons and universities.

There is not much published literature specifically dealing with collection development and management in universities of technology. This means that most of the data used in the case studies will be primary data.

Another limiting factor is that higher education is currently in a state of flux in South Africa. Many technikons are forced to merge with other technikons or even with universities in terms of the South African national education plan. During the time in which this study was conducted, the current technikons have changed in name or in stature. Although this will alter higher education in South Africa as it was at the time of this study, the basic issue of changing technikons into universities of technology still remains, and the problem of developing and managing library collections for these changed institutions is still relevant.

1.7   IMPORTANCE OF THE STUDY

This research project will be valuable as higher education in South Africa is undergoing considerable change in the 21st century. Technikons have had to adapt to the changes which accompany moving from a diploma-based institution to one offering both undergraduate and postgraduate degree courses. If the library collections in these institutions continue to cater only for the needs of diplomates and undergraduates, it is doubtful if the status of a "university of technology" can ever be reached. Academics at universities of any kind are expected to have acquired

postgraduate qualifications themselves, and are expected to be involved in research. They should be active participants in the scholarly communication process. In order to fit into the new roles, their information needs might have surpassed the assistance that is currently offered in technikon libraries.

Technikon Vice-Chancellors and Principals as well as Library directors at South African technikons would benefit from information about collection development and collection management procedures in a university of technology. It is important that South African technikons adapt their own collection development practices in line with the new research-orientated focus they have recently embraced.

1.8   RESEARCH PROCEDURES

A case study of collection development and management policies, standards and guidelines at a university of technology in New Zealand was undertaken, to serve as a basis for the formulation of an ideal collection development policy statement for South African universities of technology.   This was compared with a case study of those followed at a South African university of technology.

1.8.1   Research design

This was essentially an exploratory, descriptive and comparative qualitative investigation, the ultimate aim of which was to formulate a specimen collection development policy statement for a South African University of Technology. In order to do this, it was essential to find out about the information needs and behaviour of academics and researchers in institutions of higher learning. The empirical part of this study consists of case studies of an established Australasian University of Technology: Auckland University of Technology (AUT) and of a newly accredited South African university of technology: X University of Technology (XUT).

A New Zealand institution's (AUT) library's collection development and collection management policies, standards and guidelines were studied in depth. In South Africa, XUT's policies, standards and guidelines were also studied. In essence, the

case studies are comparative, because AUT's library collection development and management policies were compared to that of XUT, to ascertain the extent to which the latter can support the information requirements of academics and researchers at that level.

In order to give a clear picture of the theoretical basis of the study, a literature study was another essential component of the study. Documents, which provide a frame of reference for collection development and management policies, standards and guidelines, were studied and their contents synthesised. An extensive literature study was undertaken in order to gauge the information needs and behaviour of academics and researchers in universities and technikons (or their equivalent) throughout the world. It was also necessary to study documents relating to changing trends in the scholarly communication process.

1.8.2   Case study methodology

The nature of the study dictated the use of the case study method. Firstly, the comparisons need to be dealt with qualitatively. Kratwohl (1993:311) states that the data in qualitative research, which are often reported in the form of a case study, are:

> … accounts of careful observations, including detailed descriptions of context and nearly verbatim records of conversation. They may also include analyses of documents and records.

Another reason for selecting the case study method is that case studies provide detailed analysis of a limited number or conditions or events (cases) and their relationships (Soy 1997:1), which was necessary in this study.

Stated succinctly, there are six steps in case study research (Kratwohl 1993:312-320: Soy 1997:1-5):

- The researcher must formulate the research questions and determine the purpose of the study.

- Cases must be selected and data collecting and analysis techniques must be determined. Possible tools could be interviews, email, surveys, observation or the review of documents. Observation, which is a popular means of gathering data in a case study, can be either covert or overt.

- Databases must be prepared to organise the vast amounts of data that are characteristically gathered during a case study.

- The researcher must then collect the data. These data must be categorised and referenced or coded to facilitate their analysis and use.

- The data have to be evaluated and analysed by finding common themes, categories and linkages between the research object and the research questions.

- Ultimately, a report must be prepared using mostly qualitative methods. The narrative style is commonly used for this purpose.

The case study method was selected because it presented the most appropriate means of gathering, categorising, comparing, analysing and reporting on the collection development theories, practices and guidelines at the selected universities of technology. The researcher could negotiate access to the required data and build up a rapport with the informants allocated by the institutions for this purpose. Data were gathered from both institutions and these were categorised and viewed through the theoretical lens to which Creswell (2003:131) refers. This step is essential to qualitative research as the theoretical framework provides focus and direction to a case study.

1.8.3   Data collection methods

The researcher contacted the Directors of AUT's and XUT's libraries to obtain permission to study collection management procedures and policies at those institutions. Throughout the study, staff members at these institutions were contacted via email or telephone to carry out the case studies. Policies, guidelines and other documents were sought and their websites were also examined critically, to ensure external validity of the data..

A literature study was conducted to discover the information needs and behaviour of researchers worldwide. Information was also sought on the status of scholarly communication as currently undertaken and on collection development and management practices in academic libraries in the world today.

1.9   RESEARCH PROGRAMME

The research programme was divided into the following chapters:

Chapter 2:	This chapter provides a broad theoretical frame of reference for the concepts of collection development and collection management, specifically with the development and management of collections in academic libraries.
Chapter 3:	This chapter covers the academic and researcher as information user. These categories of information users are discussed as scholars, as lecturers and as researchers. This chapter is based on a literature study.
Chapter 4:	In this chapter the information needs of academics and researchers are examined through a speculative examination of the relevant literature.
Chapter 5:	The information behaviour of academics and researchers is investigated. The trends in scholarly communication are also examined. This chapter too is based on a literature study.
Chapter 6:	An overview is given of collection development issues relating to various categories of information media.
Chapter 7:	The case studies of AUT and XUT are dealt with. The case studies concentrate on the collection development and management policies, standards and guidelines at these institutions. The policies, standards and guidelines of these two institutions are compared.
Chapter 8:	Based on the information needs and behaviour of academics and researchers and on the case studies of an established university of technology and a fledgling university of technology, a collection development policy statement is drawn up to serve as a guideline and standard for a South African University of Technology.