Academic Integration of Libraries at Universities of Technology (UoTs) in South Africa

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DECLARATION

I, Shirlene Neerputh, do declare that this dissertation represents research work carried out by myself and that it has not been submitted in any form for another degree at any university or higher learning institution. All information used from published or unpublished work has been acknowledged in the text.

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ABSTRACT

Academic libraries should lead in the instructional change process by being at the nexus of teaching, learning and research in the university. This study was set in the context of the current higher educational landscape of South Africa. In particular, it focused on the emerging role of the University of Technology (UoT) library to enhance academic success.

This was an exploratory study juxtaposed with a literature review pertinent to national and international library integration programmes and practices. Justification for this study stemmed from the current local and international trend for academic libraries to become proactive partners in teaching and learning through academic integration and leadership in promoting the university's mission and goals. Underpinned by the process learning theoretical framework, the aim of this study was to explore the extent to which academic integration has been adopted by UoT libraries in South Africa. Process learning was chosen by the researcher because it is considered a learner-centred teaching technique for student engagement and it is consistent with the constructivist theory postulated and applicable to UoT libraries.

The specific objectives of the survey were to determine: what academic integration programmes are offered by UoT libraries to enhance teaching, learning and research in South Africa; existing information literacy programmes and assessment practices in UoT libraries; what postgraduate/research programmes are offered by the library to academics and students and how they are represented in strategy or policy documents; and the similarities and differences in academic integration programmes in all six UoTs in SA. A mixed methods approach (quantitative and qualitative methodologies) were used to collect data

regarding programmes and practices prevalent in UoT libraries across all six UoTs in South Africa. An online questionnaire was administered using SurveyMonkey. Forty-two subject librarians participated in the survey, yielding a sixty- two percent response rate.

The objectives of the study were achieved by the identification of the following key academic integration programmes: embedded information literacy programmes; resource collection and development; faculty collaboration and partnerships to promote academic success; research scholarship and open access initiatives; social media networking; and reading and writing programmes. This study found that while academic integration has gained momentum in UoTs in South Africa, greater effort should be made in collaboration with academics in: embedded information literacy and blended learning; open access and scholarship; reading and writing programmes; and collaboration in postgraduate interventions. The findings also revealed that while most libraries internationally have embraced reading and writing programmes, libraries offering reading and writing programmes to enhance academic success are relatively scarce in UoTs in South Africa.

It is recommended that the subject librarians engage in academic integration practices by: supporting the curricula and research programmes; improving institutional outcomes; improving collaborations; building intellectual or knowledge centres and providing relevant information to students and staff within a knowledge society.

DEDICATION

This dissertation is dedicated to the most precious people in my life:

My parents, Mr and Mrs S. Ramdhin;

My husband Mr S K Neerputh;

My lovely daughters Kritika and Prelene, and my special boy Vidhir Neerputh.

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List of Abbreviations used in the study

ACRL	Association of College and Research Libraries
CARET	Centre for Applied Research in Educational Technologies
CHELSA	Council of Higher Education in South Africa
CPUT	Cape Peninsula University of Technology
CUT	Central University of Technology, Free State
DUT	Durban University of Technology
ICT	Information and Communications Technology
IL	Information Literacy
IR	Institutional Repository
LIASA	Library and Information Association of South Africa
LMS	Learning Management System
MDGs	Millennium Development Goals
MUT	Mangosuthu University of Technology
NEPI	National Education Policy Initiatives
NCHE	National Commission on Higher Education
OPAC	Online Public Access Catalogue
RFID	Radio Frequency Identification Data
SATN	South African Technology Network
SAQA	South African Qualifications Authority
TUT	Tshwane University of Technology
UoTs	Universities of Technology
VLE	Virtual Learning Environment
VRE	Virtual Research Environment (VRE),
VUT	Vaal University of Technology (VUT)
WIL	Work Integrated Learning

CHAPTER ONE – INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Background

A university is defined by Lategan (2005: 195) as an "academic institution which conducts teaching, learning and research and is supported by networking, cooperation and collaboration with other academic partners to create, develop and transmit knowledge". Universities are also crucial to developing a nation. Their functions in this regard, according to Cloete (2011: 1) are to:

- educate and train people with high level skills for the employment needs in the country;
- critique information and find new local and global applications for existing knowledge as the dominant producers of new knowledge;
- set standards, determine the curriculum, languages and knowledge, ethics and philosophy underpinning a nation's knowledge capital and, particularly in South Africa, to
- redress the apartheid legacy by providing opportunities for strengthening equity, social justice and democracy.

The higher education policy context in South Africa has therefore had to focus on societal needs while at the same time carrying out similar functions to those of universities elsewhere and recognising the potential impact of global trends.

In order to address the challenges of globalisation and the complex needs in South Africa, higher education may need to move away from the model of traditional discipline-based knowledge production to interdisciplinary knowledge production.

Interdisciplinary knowledge production has to be interactive and responsive to the ever changing external environment. Greater responsiveness implies a shift in curriculum content and is normally associated with a specific focus on 'student-centred learning'. This in turn shifts the focus from inculcating knowledge of a discipline to producing graduates who can demonstrate mastery of its related skills – that is from knowledge to competence (Council on Higher Education [CHE], 2004).

The shift in focus to student-centred learning and the concomitant opportunity for the production of interdisciplinary knowledge, as distinct from following curricula developed in disciplinary silos, is supported by Cotta-Schonberg (2005: 2) who also notes that the major tasks of universities are increasingly seen as the dissemination of knowledge and increased research output. The learner in this context is expected to become empowered with knowledge, skills and abilities suited to the competencies and processes of knowledge dissemination required in the world of work. The higher education landscape in the 21st century is also crucially dominated by the electronic dissemination of knowledge. This is closely linked to ideas of an 'information society' or a 'knowledge society' - the distinction between the two is not always made but it has special relevance to this study.

1.1.2 Knowledge Society

The notion of the 'knowledge society' emerged at the end of the 1990s and is sometimes used interchangeably with 'information society' but this is problematic as a society may have ample sources of information but, if it lacks the skills to analyse, interpret, evaluate and present information, it is not empowered.

The researcher is of the opinion that the library is in a position to serve as a powerhouse not only for disseminating information but for converting information into knowledge. A unique opportunity exists in higher education

for the library to become integral in developing new strategies for educational development in the pursuit of student-centred learning – that is, in the creation of a genuine 'knowledge society' in South Africa.

Afgan and Carvalho (2010: abstract) define a knowledge society as:

> a human structured organisation based on contemporary developed knowledge and representing new quality of life support systems. It implies the need to fully understand distribution of knowledge, access to information and capability to transfer information into knowledge.

In this respect the knowledge society represents a new paradigm for future developments in education. Access to the global information pool is the main driving force for the development of a knowledge society and it is a natural progression for Universities of Technology (UoTs) which form the focus for this study.

Abdul Waheed Khan, General Sub-Director of UNESCO for Communication and Information (Afgan and Carvalho, 2010) speaks about the value of an information society as follows:

> an information society is the building block for knowledge societies. Whereas I see the concept of 'information society' as linked to the idea of 'technological innovation', the concept of 'knowledge societies' includes a dimension of social, cultural, economic, political and institutional transformation, and a more pluralistic and developmental perspective. In my view, the concept of the 'knowledge society' is preferable to that of the 'information society' because it better captures the complexity and dynamism of the changes taking place.

The role of information in a knowledge society thus provides the foundation for engaging the potential of the changing role of the academic library and is central to the aims and objectives of this study. Academic libraries can evolve to become full partners in the academic life of the university by actively promoting the creation of knowledge in higher education.

According to Van Eldik and Fowler (2004: 149) the role of higher education in a knowledge-driven world is three-fold:

- human resource development for lifelong learning for the social, economic, cultural and intellectual life of a rapidly changing society;
- high-level skills training to strengthen the country's enterprises, professionals and knowledge workers in contributing to the national development and social transformation; and
- production, acquisition and application of new knowledge: national growth and competitiveness is dependent on continuous technological improvement and innovation, driven by a well-organized, vibrant research and development system which integrates the research and training capacity of higher education with the needs of industry and of social reconstruction.

Can South Africa be considered to have the characteristics of a knowledge society? It certainly works and trades with countries that can be considered as such but this is not sufficient to indicate that it has yet achieved the status of a knowledge society itself.

Jiyane et al. (2013) use the criteria of economic activity, spatial and technological infrastructure and political, social and cultural activity to gauge its present condition. Their conclusion is that South Africa meets some of the conditions necessary but fails to meet others. South Africa still largely lacks a populace capable of making efficient and effective use of the information that is potentially available. At best, it can be said that South Africa is in the process of transforming into a knowledge society. The potential for UoT libraries to contribute towards this transformation via academic integration will be explored in this thesis.

The following section highlights some of the challenges and trends which may impact on this possibility.

1.2 Challenges of Higher Education in South Africa

As in other countries, universities in South Africa are currently governed largely by market ideologies and the discourse of effectiveness and efficiency. At the same time they have to accommodate rising social demands for higher education opportunities in a context of huge disparities in wealth along with demands for advanced skills and knowledge to equip people to work in an increasingly sophisticated economy. In short, they have to meet the requirements of a knowledge society as they struggle to meet the needs of an equitable society.

From the late 1970s to the early 1990s, higher education in South Africa was characterized by instability and confrontations between students, faculties and government due to apartheid and its discriminatory racial policies. Unfortunately confrontations between students, university authorities and government are still prevalent, mainly because of the persistent inequalities in society and perceived inequitable access to higher education and inadequate funding opportunities for disadvantaged students.

Additional challenges external to higher educational institutions include constrained financial resources combined with an unprecedented demand for access, the legacy of colonialism and apartheid and racial divisions as well as the prevalence of HIV/AIDs throughout society. Other internal challenges involve competition between different institutions. In a climate of decreasing enrolments, competition is fierce for recruiting matriculants with mathematics and science skills and for attracting the best students in any discipline given the acknowledged severe weaknesses in the schooling system. There is also a prevalence of what is known as ‘internet savvy’ students (that is, students who have technological competence - but not necessarily the ability to use this information with discrimination).

The South African higher educational landscape has undergone formidable educational and technological transformation in the last ten years and it

has also experienced unprecedented change in the diversity of students; proliferation and sophistication of user needs; and a change in governance ideology which has altered the way in which universities are managed and, in turn, the way in which the curricula and syllabi are conceived. A variety of programmes are now offered within diverse educational settings largely dictated by market ideologies often accepted by the Department of Education. This creates an unfortunate tension which inhibits the emerging trend towards 'student- centred' teaching and learning explained above. Student-centred pedagogies are necessarily resource intensive while managerial ideologies limit the resources available for such initiatives.

It can therefore be concluded that the higher education system in South Africa is under considerable pressure to innovate and develop new ways of addressing its current challenges. While many new pedagogies are resource intensive, this can be balanced by innovative educational approaches which utilize new technologies to bring the best current teaching in higher education to large numbers of students simultaneously. The potential role of university libraries and in particular, University of Technology libraries, in this regard is clear.

1.2.1 Strategies for Educational Development in the current context

The discussion above suggests that strategies to develop higher education in South Africa will require improved access; improved technological expertise; enhanced research output and better graduation throughput rates. However, Scott (2009) documents the present poor performance in South Africa in each of these areas, compared with global trends. All of this implies the need for curriculum renewal.

Technology has enhanced teaching and learning with the advent of the 'Google Scholar Generation'. According to Lonka (2012: 25), the millennial generation student responds to more engaging, experiential and creative learning methods, including games, simulations, social media and knowledge-creation projects. Academics prepared to adapt to these trends

can help students become lifelong learners by using current and appropriate learning methods and sophisticated personal and collaborative learning tools. The library has a crucial role to play in this regard both in supporting these innovations and in working directly with staff and students. The researcher sees this academic integration as a vehicle for driving the educational development change process.

As established above, and also as understood by the Department of Education, a key challenge for those seeking a situation of global competitiveness in South Africa is to establish a system of lifelong learning that will develop the knowledge, skills and competencies required to facilitate innovation, social development and economic growth (Department of Education, 2001: 1). The issue of lifelong learning is linked to developing self-paced individual learning which is required for both the personal and the public good in a knowledge society.

According to the *Collins English dictionary* (2013) 'lifelong learning' is defined as the provision or use of both formal and informal learning opportunities throughout people's lives in order to foster the continuous development and improvement of the knowledge and skills needed for employment and personal fulfilment. One approach to conceptualizing lifelong learning is concerned with promoting skills and competences necessary for performance in work situations within a knowledge economy. Lifelong learning forms a natural progression for educational development.

The strategies for educational development relevant in South African higher institutions, according to the Council on Higher Education (2004) are:

- curriculum and programme design to accommodate different levels of preparedness for tertiary education;
- student selection and admissions, including the iterative relationship between student selection and curriculum design for a diverse South African population;

- teaching approaches, including the use of educational technology, for dealing with diversity and large classes;
- course design to be educationally sound in relation to student profiles and the desired learning outcomes;
- generic skills and literacies, provision for language development and academic literacy, quantitative literacy and information literacy as tools for learning as well as desired graduate attributes;
- the alignment of assessment with curriculum/course design and learning outcomes; and
- the management of teaching and learning including leading and coordinating design and delivery in faculty programmes, course and learning outcomes in higher education for continuous improvement.

As discussed above, educational development strategies required to achieve this range of outputs imply a shift from an emphasis on teaching to an emphasis on inculcating lifelong learning, greater use of technologies and better collaboration between role players including students, staff and library personnel. Ian Scott (2009: 46) who is an acknowledged authority, believes that "the situation of higher education in South Africa has features that create special difficulties, but at the same time make it unusually interesting and a significant area for research and creativity in educational development".

1.3 The Higher Education Landscape in South Africa

The higher education landscape in South Africa consists of twenty-three public institutions: eleven universities, six comprehensive universities and six Universities of Technology. There are also further education and training colleges and numerous private educational institutions.

The emergence of Universities of Technology in South African higher education stemmed from the vision of the Minister of Education in 2001 – Kadar Asmal. This sought to restructure and rationalize programmes to: encourage collaboration between institutions; enhance responsiveness;

build capacity; and to refocus institutions with new institutional identities, all guided by the South African constitutional commitment to the redress of inequities created by the former apartheid regime (Cloete, 2011). This led to a series of mergers between existing institutions and re-designation of other institutions.

Higher education institutions were restructured in 2003. Mergers between traditional universities and technikons (the name given to the more academically advanced technical colleges) occurred to form a new landscape.

'Traditional universities' is the term reserved for the established universities that existed prior to the mergers. Traditional universities provide wide-ranging undergraduate and postgraduate degree programmes and emphasise research output. 'Comprehensive universities' arose mainly from the mergers between technikons and universities. Comprehensive universities offer programmes across the discipline spectrum (but in a more limited range than traditional universities), and to career-oriented diplomas.

A further differentiation was introduced with the establishment of universities of technology through mergers effected between various smaller traditional universities with technikons. Comprehensive and traditional universities offer "a mix of programmes, including career-oriented and professional degrees, research masters and doctoral programmes, while Universities of Technology (UoTs) offer vocational education both at degree and undergraduate levels" (Council on Higher Education, 2009: 8). UoTs are thus a relatively new phenomenon in the South African higher education landscape.

1.3.1 UoTs in South Africa

Du Pré (2004) emphasises that it is the utilisation of technology in the creation of knowledge that is at the core of the definition of a University of technology.

Brook, writing in 2000 and quoted by Du Pré (2004: 26) further amplifies this as:

- being research informed;
- consisting of a curriculum developed around graduate profiles defined by industry and professions;
- focused on strategic research and applied research emerging in proffessional practice;
- having multi-level entry and exit points for students;
- concerned primarily with the development of vocational/professional education; and
- recognising technological capabilities as being as important as cognitive skills.

The six UoTs formed as a result of the mergers advocated by Minister Kader Asmal in 2001 are as follows:

- Cape Peninsula University of Technology, with four campuses in Cape Town, one in Wellington and one in the Western Cape;
- Central University of Technology, Free State, with campuses in Bloemfontein and Welkom;
- Durban University of Technology with four campuses in Durban, and two in Pietermaritzburg, KwaZulu-Natal;
- Mangosuthu University of Technology with one campus in Umlazi, in KwaZulu-Natal;
- Tshwane University of Technology with one campus in each of eMalahleni, Ga-Rankuwa, Nelspruit, and Polokwane; two campuses in Soshanguve; three campuses in Tshwane, Gauteng, Limpopo, Mpumalanga, North West; and
- Vaal University of Technology with a main campus in Vanderbijlpark and delivery sites in Ekurhuleni, Klerksdorp, Secunda and Upington, Gauteng, Mpumalanga, Northern Cape.

With one exception, the UoTs were formed by the merger of smaller traditional universities with Technikons. The exception was the Cape Peninsula University of Technology which was formed through the merger of the Cape Technikon with Peninsula Technikon.

1.3.1.1 The Focus of a UoT

Du Pré (2009: 16) asks an important question for this study:

> What makes a UoT different from any other university (compared to the classical concept of a university)? It is not the use of technology within a university, which classifies it as a technological university, but rather the interweaving, focus and interrelation between technology and the nature of a university which constitutes a technological university.

The above has however not been easy to achieve in practice. Challenges faced by merged UoTs included establishing identities and clarity of purpose for the newly formed UoT institutions, accommodating different institutional cultures and traditions and aligning various policies and procedures for a new identity. UoTs have worked under the umbrella of the South African Technology Network (SATN) to define their identity and role within the higher education vision. The SATN is a coalition formed in 2005 between all the South African Universities of Technology. Its principal purpose is to ensure the continuation of the process of cooperation, collaboration and support involving joint academic development and research activities.

Winberg (2005: 191) identified the following chronoscopes (i.e. measurement of very small intervals of time) in the evolution of UoTs in South Africa:

- educating for the needs of industry;
- imitating the universities; and
- rediscovering technology.

These chronoscopes frame the design, shape and the function of UoT institutions in South Africa as they happened. Applied research and

innovation in the workplace have been highlighted as key elements in the work of UoTs but progress has been slow and this area remains a challenge in South Africa. According to Winberg (2005: 3) there have been considerable research investments in UoTs by the National Research Foundation and international donors. Winberg's study is clearly at the very early stages of UoT development but the situation has continued. She points out that despite these aspirations and considerable investments made there remains a dismal record of research outputs, a paucity of postgraduate graduation candidates and a lack of rated researchers. This indicates the failure of UoTs at that time to emulate the research output of traditional universities.

It is perhaps the additional elements which distinguish UoTs from traditional universities which may however ensure their current and future relevance. Expanding upon this, Du Pré (2009: 11) lists the key elements distinguishing UoTs as:

- the application of technological knowledge;
- training of technicians and technologists;
- focused on applied research;
- having a direct interaction with employment providers;
- multidisciplinary subject (course) packages;
- cost-effective and quality career-orientated education;
- outcomes-based, demand-driven curricula; and
- an emphasis on immediate and productive employability and its relationship with industry.

Mthembu (2012: 190-191) adds that UoTs are required to:

> provide career focused education; be responsive to community and industry needs; provide social and technological innovations; provide more open access; frequently use advisory groups to ensure that curricula align with business/industry demands and provide work integrated learning and thereby ensure that students also learn from real-life workplaces. In the field of research and innovation, UoTs have to apply whatever knowledge has been discovered

and produce social and technological innovations that business and industry could find useful.

Mthembu (2012: 185) states further that transforming these elements into practical curriculum revision and development implies the development of:

- work integrated learning (WIL);
- institutional differentiation; and
- technology enhanced quality teaching and learning methodologies and student learning, rather than teaching.

Work integrated learning (WIL) forms an integral component of education and training in a UoT. Academics (and ideally library staff) have to prepare students for practical challenges in the workplace. This approach strengthens learning in a knowledge-based system. Institutional differentiation may be thought of as a development and marketing strategy, encouraging the formation of centres of excellence. The increased use of technology in teaching is both a consequence of the adoption of ICTs and a response to the need to create learning systems that can cope with large numbers of geographically-dispersed students. It clearly has direct benefits in being one of the core aspects which set UoTs apart as well as potential for cutting certain costs in the dissemination of high quality lectures and other material inputs to large numbers of students (as touched upon above). Hence the concluding chronoscope (above) which speaks of 're-discovering technology'.

It can be concluded that the ethos of a UoT seems to engage with a knowledge-based society. Du Pré (2004: 66-67) sees this as typified in:

- engaging with the development of learning lifelong learning skills;
- the ability of students to transfer from one level of education to another level at any other higher educational institution;
- students acquiring computer literacy with a sound understanding of entrepreneurial and work ethic skills;

- students acquiring a basic knowledge of information literacy and business practices;
- students acquiring language proficiency in at least one international language; and
- qualifications leading to employability.

The educational focus of a UoT is specific to work-based competencies. Mthembu (2012: 189) notes that “UoT typology of scholarship propounded by Boyer in 1990 is discovery, integration, application and teaching”. He adds that “UoTs must produce graduates with skills and competences geared for the workplace, whilst education at traditional universities could be broad-based and detached from workplace-focused programmes”.

1.4 The Role of the Academic Library in the University

The purpose of an academic library is to contribute to the core business of the university which is teaching, learning and research.

The library is often referred to as the ‘heart’ of an institution (a saying attributed to Charles Eliot, President of Harvard University from 1869 - 1909), yet it is rarely viewed as core to teaching, learning and research. Neither is the academic library perceived as an instructional partner in higher education. According to Gilchrist (2007: 23), “only a small percentage of discipline faculties integrate instruction in library research methods into their courses or maximize the instructional opportunities embedded in the library’s facilities and collections”. She adds that “this situation persists in spite of the fact that the library’s educational role forms a significant spoke, if not indeed the hub, of many college library missions”.

The academic library in South Africa has always aimed to uphold the educational mission in the university that it serves. However, the perception that it played the role of a support service was understandable prior to the information era. It could be argued that academic libraries have necessarily developed beyond this in a knowledge society.

According to Gilchrist (2007:17) the distinguishing features of academic libraries include a philosophy and tradition of collaboration and facilities designed to support and engage a diversity of student needs in a variety of ways. Libraries can support a strong interdisciplinary perspective, inter-institutional partnerships and curriculum designed to reach all academic departments (Hill, 1980). These attributes provide the potential to cross institutional boundaries and part with traditions (i.e., discipline-centric instruction, one instructor per class, and instruction within set time periods) to embrace a strong educational role in ways strongly indicated for lifelong learning and student-centred teaching.

This study investigates the next stage of development for the library to become integral in transforming learning. The main point, argued by Dale, Holland and Matthews (2006:13-14) is that the "library needs to be taken out of its confining role as support service and be seen as a central element in any institution's response to the learner of the future".

The issues of lifelong learning and the influences of information and communication technologies (ICTs), including the development of e-learning and electronic services in libraries, together with an emerging knowledge society and a transformation of educational strategy within the new higher educational landscape, present opportunities for UoT libraries to become an academic partner in the university. Academic libraries historically have been spurred on in the best instances by a long and rich tradition of promoting lifelong learning in the university.

Academic integration refers to the active partnership between the subject librarian and academics in promoting lifelong learning, which contemporary pedagogy and the needs of the knowledge society strongly indicate as the way to engender academic success. As an example, the academic integration service framework adopted by the Durban University of Technology (2013b), integrates library collections, resources and services with the learning and research priorities of the University through

instructional activities, research consulting, collection development, and web access.

All of these approaches are relevant for this study.

Work integrated learning, applied research, innovation, applications of technology as well as lifelong learning are the foci advocated by UoTs which present a significant arena for libraries to become proactive in helping to promote the mission of UoTs. The development of a strong research focus aligned to the specific mission of the UoT is likely to emerge in time addressing the lack of success in this regard as compared with traditional universities noted above. Thus the role of the academic library has a clear opportunity to change in order to be in alignment with the institutional learning mission.

Gilchrist (2007: 4) asserts that “in examining the teaching roles for academic librarians, the literature has suggested that the new learning-centred focus of higher education offers librarians increased opportunities to play a forceful, dynamic role in collaboratively designing and developing learning strategies”. However, such a development may not be easy due to the persistence of the traditional perception that the library is not core to teaching and learning in the university and also that student-centred learning strategies have not been fully adopted in South Africa. Ross and Sennyey (2008: 146) have this to say: "[Libraries] are no longer islands of information, but one among many nodes through which information flows to the users." This makes the point that there has been an historical shift between the time of Eliot's statement and the present.

Mavodza (2011: 446) also claims that “change is happening in a new, increasingly competitive information environment in which the academic library is no longer the conventional resource of first choice for the academe it exists to serve”. Other powerful sources of information, notably the internet, are presumably in danger of taking over this role. McKnight (2011: 3) believes that the future will not recognize the silo of the academic

library, nor even a converged service between the library and information technology. Libraries must re-invent themselves in powerful ways to meet these challenges.

According to Feetham (2006: 6) however, the concept of 'academic convergence' which refers to "activities within the library and information services that exist to support individual learners, will involve librarians playing a greater role in learner support in the curricula, including team-teaching with academics". The library staff will engage across the campus and embed the library resources into the curriculum.

Thus, despite counter-influences, the educational mission of the academic library service is also positively affected by several influences present in the higher educational landscape.

The current recognition of the educational role of librarians is as a result of the convergence of three developments:

- the development of bibliographic instruction and its transition into information literacy;
- the impact of electronic resources in teaching, learning and research; and the
- appointment of subject librarians as facilitators of learning within a discipline, having a primary liaison with academics.

It should be noted that bibliographic instruction and information literacy are based firmly in the library but are largely viewed as an intervention separate from academic activity, whilst the availability of campus-wide electronic resources moves the locus of academic activity beyond the library.

With all these competing influences and the fact that student-centred pedagogies are still fairly new, the impact of information literacy on lifelong learning and research capability has to be seen currently as largely a matter of professional faith rather than providing a demonstrable,

measurable, effect. Nonetheless, Farber (1999); De Jager, Nassembeni and Underwood (2007); Dale, Holland and Matthews (2006); Gwyer, Stubbings and Walton (2012) advocate that academic libraries promote lifelong learning in the university. However very few studies, (Neerputh [2012]; Chipeta, Jacobs and Mostert [2009]) provide evidence for lifelong learning occurring in UoTs linked to strategies of integration.

According to Zhong and Alexander (2007: 142) the following issues in higher education impact on academic libraries and library programmes, which are relevant to this study:

- information competency initiatives;
- transitional and first year experience programmes;
- student preparation in library use prior to college;
- student usage and perception of the academic library; and
- co-operative partnerships between the library and other university stakeholders.

Dickenson (2006); Brophy (2007b); Gilchrist (2007); and Mavodza (2011), all suggest that university libraries are evolving from having a passive mission to being proactive in building academic success. The need is to seek effective new ways to embed the library activities within the academic programmes in the university. As already discussed, one approach is to form strong instructional partnerships and make the library a locus for enhancing teaching and learning. The authors add another two approaches, as follows: as custodians of knowledge and hosts for creative research; and as the locus for electronic teaching.

Academic libraries therefore have a potentially important new role to play within the changing higher educational landscape in South Africa. The challenges of the 21st century have altered the way that academic libraries can contribute to teaching, learning and research. Furthermore, opportunities exist for subject librarians to play a stronger role in supporting their institutions' educational mission.

1.4.1 Subject Librarians

Subject librarians are described as the facilitators of information resources and information tools promoting the library services to the university community. Subject librarians, also known as academic librarians, act as intermediaries between the library and faculty (usually discipline specific departments or programmes). Subject librarians in South African universities usually possess generic library and information skills with varied library experiences and qualifications rather than discipline specific qualifications. However academic integration helps connect the library services and facilities to the student experience in the university. Subject librarian engagement with the teaching and learning and quality assurance processes and the development of the virtual learning environments linked to subject-specific knowledge present unique opportunities for the enhancing of the core tasks that subject librarians undertake (Dale, Holland and Matthews, 2006: 192) as explored further in this study.

1.4.2 Academic Integration in Libraries

The academic integration service framework adopted by the University of Villanova (2009) integrates library collections, resources and services with the learning and research priorities of the university through instructional activities, research consulting, collection development, and web access. All of these approaches are relevant for this study.

1.4.3 Academic Convergence

The concept of academic convergence is based on the premise that the student is an independent learner, the lecturer is no longer the only source of knowledge and co- operative learning is valued in the university. These principles are increasingly advocated in higher education trends in order to meet current challenges. They provide a strategy for UoT libraries to follow in building a knowledge society in South Africa.

The importance of librarians serving on university or instructional teams presents another avenue for academic convergence. This includes information literacy, mediated access to databases and tailored

navigational support (that is, subject librarians with subject-specific knowledge using the most appropriate resources for their subject discipline to give help to academics and students).

1.4.4 Information Literacy

Information literacy has been developed by university librarians in the past ten years and builds upon more traditional academic literacies. According to the Association of College and Research Libraries (ACRL, 2000: Introduction) an information literate individual is able to:

- determine the extent of information needed;
- access the needed information effectively and efficiently;
- evaluate information and its sources critically;
- incorporate selected information into one's knowledge base;
- use information effectively to accomplish a specific purpose; and
- understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally.

In summary, information literacy is defined by the act setting up the South African National Council for Library and Information Services (South Africa, 2001: 1) as "the ability of learners to access, use and evaluate information from different sources, in order to enhance learning, solve problems and generate new knowledge".

The effect of both sets of definitions is that learners must be critically aware of information and knowledge, interrogate the myriad information resources potentially available, evaluate and apply information appropriately, undertake research and observe academic integrity (Neerputh, 2012: 257). Sharma (2006: 129) states that the mastery of information literacy skills prepares students to tackle any research based tasks that they might undertake during their academic and later professional careers.

This study supports Sharma's view and argues that effective library services will succeed especially when they become embedded into the learning process and subject librarians in UoT libraries are more involved in curricula development (Feetham, 2006:3).

1.5 UoT Libraries in South Africa

All six UoT institutions in South Africa proclaim in their mission statements that the library supports the teaching, learning and research mission. While the reality is that the mission and vision statements are not always rigidly followed, it opens the door for examination of the changing role of the library with the help of good progressive leadership in UoT institutions. A brief synopsis of each library mission and vision statement follows to allow for reflection upon the intended focus of UoT libraries in South Africa.

1.5.1 Mission Statements

The vision and mission statements of all of the libraries of the UoTs mention enhancing the teaching, learning and research function in the institution. This can be seen as a reflection of a desire or aspiration for the role of academic libraries to be recognised as integral to the university objectives.

Authors, Selematsela and Du Toit (2007), Corrall (2007), Gilchrist (2007), Hart and Lynn (2011) and Gwyer, Stubbings and Walton (2012) all indicate that academic libraries are or should be engaged in lifelong learning with most libraries specifying information literacy as a goal in their mission statements. The promotion of information literacy as a lifelong learning skill clearly presents another avenue for advancing student-centred learning.

Transformation in South African higher education and rapidly emerging technologies provide the context for change.

1.5.2 The Purpose of UoT Libraries

Bell and Shank (2007: 355) affirm that the core values of academic librarianship, including 'blended librarianship' (another term implying

integration between traditional library services and more advanced technical and academic involvement), are to:

- enhance library integration into the teaching and learning process;
- employ design thinking;
- embrace appropriate instructional technologies; and
- emphasize local and global community building.

The opportunity afforded by the creation of UoTs should enhance the potential relationship between the library and the specific mission and goals of these universities and focus attention, for instance, on offering quality technologically advanced services and support for research linked to workplace experience through collaboration and partnerships with academics. Subject librarians must lead by creating an enabling environment for student success by supporting the university mission within subject- specific locations.

The values of the library in the university, and of significance for this study, are in close accord with the ACRL Research, Planning and Review Committee conclusions about the directions for diversification:

- collaborating with faculty to integrate library resources into the curriculum and seeking opportunities for information literacy instruction;
- working with scholars to enhance access to their data, projects, research papers in virtual research environments and digital repositories;
- collaborating with information technology experts to develop online tutorials, and user friendly interfaces for local and digital collections;
- collaborating with student support services to provide integrated services for students; and
- collaborating with librarians at other institutions to improve open source software, share resources, purchase materials, and preserve collections (2010: 289-290).

Changes in the digital environment, in particular sophisticated end-user access and support to information resources, have affected the provision of information services. In some cases subject expertise, which connotes a deeper disciplinary understanding than subject knowledge, is in danger of being overshadowed by a demand for advanced technological skills in the recruitment and training of subject librarians. While new skills and knowledge are required for the future roles envisaged for subject librarians in a digital era, these need to be situated within an understanding of specific academic clientele needs and information sources. This goes beyond the ability to use technology and into a much deeper understanding of the link between provision and effective use of information sources within subject-specific areas.

Interestingly, Mavodza explains that subject librarians are not yet always, nor do they have to be, fully 'technology savvy' (2011: 448). Aharony (2009: 29) also acknowledges this:

> Librarians' use of modern technology is affected by personality characteristics (resistance to change, cognitive appraisal, empowerment, and extroversion) and computer expertise; motivation, importance, and inclination toward studying and integrating the variety of modern web applications that facilitate the use of networked interactive platforms.

While Webb, Gannon-Leary and Bent (2006: 190-196) note that the librarian's deliberations and considerations are taking place in the context of sweeping changes in academic libraries, Bell and Shank coined the term "blended librarian" - one who combines the traditional professional skills with proficiency in the use of information technology and the skills of the educational technologist in producing structured learning. This can however be seen as an ongoing process allowing for the fully technologically expert librarian to emerge over time:

> As academic librarians, we serve the needs of faculty, and as higher education evolves, our faculty will increasingly be searching for ways to enhance their teaching and provide students with better learning experiences. . . . We also see some exciting new technologies developing, and in many ways they can be

> thought of as instructional technologies with applications for improved pedagogy. As new generations of students come to our institutions as native users of the latest digital technologies and electronic gadgets, blended librarians must understand those technologies and develop ways to integrate them into our traditional ways of educating students about research methods. It will be an evolutionary period for academic librarians, and we believe that evolution can be shaped by design thinking (Bell and Shank, 2007: 151).

According to Dale, Holland and Matthews (2006: 191) "subject librarians are uniquely placed to develop the role of the knowledge broker, working with students and academics to enhance their contributions to learning and teaching", thus providing a solid justification for the focus of this study.

1.6 Rationale for this study

The role of the academic library in supporting and providing value in teaching, learning and research is explored in this study in the context of transformation (both social and technical) in the higher educational landscape. In the context of South Africa, there have been no systematic reviews up to this time of how, or to what degree, academic libraries do, or could be, made to support these core functions in Universities of Technology.

The rationale for the study thus develops from the following questions around library issues:

- What constitutes the core information services that enhance teaching, learning and research in a UoT?
- Which pedagogical and didactic trends are important for learning in a knowledge society?
- Which pedagogical and didactic trends are important for an emerging economy with huge economic disparities presenting the need to heal social injustices of the past?
- To what extent can the new trends in library science particularly information literacy, library integration and 'blended librarianship' help to enhance the vision and mission of Universities of Technology in South Africa?

The study is also needed because of the national acceptance of the need for developing skills associated with 'lifelong learning' and the notion of the 'gateway concept' of access to learning in higher education.

Faber (1999: 175) explains the 'gateway' concept further as:

> a concept where the library serves as the point of access to other research resources. What is new is the emphasis on using electronic technology, and how that changes so much of what the library does and how it does it. What is important is the recognition of the proactive role of the librarian in this new environment.

In framing the aim of this study, the researcher has recognised the potential of the proactive role for the subject librarian. Lawrence Dowler (1997) referred to the library as an active educational partner in the university. Dowler (1997: 228) sees that "the gateway provides systematic changes in the way in which libraries support teaching, learning and research, provide a bridge to the future and to the evolving structures and mission of higher education". The researcher supports this view and seeks to consider how UoT libraries can reflect this possibility in practice.

1.7 Aim and Objectives for this Study

The aim of this study was to examine the role of the academic library in teaching, learning and research in UoTs in South Africa.

The specific objectives that this study attempted to address were to determine:

- what academic integration programmes are offered by UoT libraries to enhance teaching, learning and research in South Africa;
- the existence of information literacy programmes and assessment practices in UoT libraries;
- what postgraduate/research programmes are offered by the library to academics and students and how they are represented in strategy or policy documents; and
- the similarities or differences in academic integration programmes among all six UoTs in SA.

1.8 Overview of the Research Methodology

In the absence of any previous study within South Africa, the aim was to make a preliminary assessment and chart the way for more extensive studies. The researcher conducted a literature review which provided insights into aspects that needed to be probed.

With the study aims and objectives in mind, the researcher decided to make use of a mixed methods methodology as a means of collecting data on programmes offered by UoT libraries across all six UoTs in South Africa using self-administered questionnaires. By searching directories and web sites a total of sixty-eight subject librarians in UoT libraries were identified as being employed in this post. Accordingly, this constituted the population of the study and a questionnaire was sent to each identified subject librarian to ascertain what academic integration practices are prevalent in UoTs in South Africa.

1.9 Scope and Limitation of the Study

This study was confined to academic integration and did not delve into the social integration of libraries or into teaching and learning in the UoTs. In universities, social integration features prominently alongside academic integration practices in enhancing teaching, learning and research experiences. However the scope of this research is limited to academic integration.

The study was been conducted in all six UoT libraries, namely:

- Cape Peninsula University of Technology (CPUT);
- Central University of Technology, Free State (CUT);
- Durban University of Technology (DUT);
- Mangosuthu University of Technology (MUT);
- Tshwane University of Technology (TUT); and
- Vaal University of Technology (VUT).

1.10 Contribution of this study

The study contributes to the research literature of library and information science. This study attempts to add to the body of literature on the role of the academic library in South Africa and provide an original contribution to the potential role of UoT libraries in enhancing teaching, learning and research in the university in South Africa. A strategy for UoT libraries in South Africa to focus on becoming integrated in the academe is presented in this study.

1.11 Summary and Structure of the Study

This chapter provided the background and context for this study. An introduction to the role of the library in teaching, learning and research in UoTs in South Africa was presented. The aim and objectives that guided the study, relevant definitions, an overview of the methodology used, and delimitations of the study were also discussed.

Chapter Two provides the theoretical framework underpinning academic integration practices. The literature pertinent to the study is reviewed in Chapter Three. The research methodology employed in the study is explained in Chapter Four, followed by an analysis and interpretation of the data in Chapter Five. Chapter Six comprises of the summary, conclusions, recommendations and future areas of research.

CHAPTER TWO – THEORETICAL FRAMEWORK

2.1 Introduction

This chapter provides the theoretical framework for the study. The theories which underpin the research and frame the study within a knowledge context with reference to UoT library academic integration and student-centred learning are presented in this chapter. A framework model for an academic library is presented at the end of the chapter.

The phonotypes of a university of technology, referred to in Chapter One, indicate that its identity and culture are informed by the use of technology and the application thereof in teaching and learning. UoT institutions in South Africa should consequently place emphasis on applying the use of appropriate technologies and seek effective collaborative partners such as the library to address the new realities facing higher education in this regard.

The stated mission of the academic library is increasingly changing from being a support service to taking up an active educational focus in the university. The effectiveness of a library in contributing toward student success, or the library as a prospective partner in teaching and learning, however appears to be insufficiently recognised in higher education in South Africa. The study draws attention to the potential of the role of the library as a collaborative partner with academic staff in this regard.

Contemporary theories in teaching and learning view the learner as central in the creation of knowledge and meaning, not the teacher as the transmitter of knowledge. Lonka (2012:16) assert that learning is viewed as an active, constructive process rather than a passive, reproductive, process. If active, engaged, learning is to become the institutional culture then the academic library must not only embrace this mode – it has the potential to become proactive in promoting it.

2.2 Teaching, Learning and Research

The ultimate aim of teaching and learning is to promote academic success and enhance student learning. According to Gilchrist (2007: 79) while pedagogical change has been a constant in higher education, it has not impacted on learning in deep or meaningful ways. He indicates four areas that hold significant influence for the success of this transformation in higher education: the learning paradigm; academic culture; the scholarship of teaching and learning; and outcomes assessment. These issues, if interpreted in the light of student-centred contemporary learning theory, are clearly relevant to the academic library in developing active and lifelong learning.

Transformation of pedagogy in higher education necessarily involves the various practices of teaching, learning and research. The tenets inherent in the scholarship of teaching and learning (vision, design, interactions, outcomes and analysis) serve as a framework for the design and support of university efforts and initiatives in academic success (Cottrell and Jones, 2003). The current learner-centred paradigm in teaching and learning is important for understanding the concept of academic integration which is further discussed in Chapter Three.

Pedagogical and didactic trends important to learning in the knowledge society emerge from the following premises: the student learns to learn; the learner is self-sufficient; the teacher is no longer the foremost source of knowledge; and the student learns by experience, individualized pedagogy, and cooperative instruction (Gilchrist, 2007).

The outcomes-based education model is another reason why pedagogical transitions (transformation and evolution of teaching and learning in the 21st century) are significant to higher education and the application of knowledge. This is compatible with student- centred learning since the focus is upon demonstration by the student of learning outcomes in the form of competencies. Assessment efforts traditionally focused on

students relaying what they know about a subject and less about applying that knowledge. In contrast, outcomes assessment has changed educational pedagogies to discover what a student can do with the knowledge and skills acquired in higher education.

The ‘outcomes’ model of education in South Africa requires that academics at all levels of an institution establish learning goals or outcomes, design instructional experiences in an integrated manner and make changes based on information from summative and formative assessments. According to D’Angelo (2003: 103) “central to assessment is the belief that our assumptions about learning outcomes should be empirically tested and that our claims should be based on evidence”. Several researchers (Ramsden,1994; Drew and Vaughan, 2002; Corrall and Keates, 2011) affirm that student learning outcomes are most improved when faculty development is focused on learner-centred teaching strategies.

Recommended methods and practices in higher education in South Africa cultivate inquiry-based collaborative methods that intellectually socialize students to participate in solving problems, providing explanations, and developing their conceptual understanding through problem-based learning and collaborative inquiry processes.

While technology-mediated environments allow for the extension of these inquiry practices across a variety of learning environments it is agreed that not enough effort has as yet been put into integrating pedagogical design with new technological learning tools. Academic success depends not only on the availability of resources but also on the ability to make efficient and effective use of those resources. Such library resources and technology are precisely the areas in which Jiyane and others (2013) consider that South Africa fails to meet the criteria of a knowledge society.

2.3 Learning in a Knowledge Society

Traditional concepts of learning are in need of revision if they are to be relevant to a knowledge society. If knowledge is to be applied in real situations (Du Pré, 2009) (which is a specific focus of Universities of Technology) then constantly updated and relevant information is crucial. There is limited value in acquiring information during the process of formal learning if the information gathered will shortly be superseded. It is pointless learning 'this is how things are' if tomorrow things change. It is therefore not surprising that the information-transmission view of learning is fast fading.

Learning has also to be reflective in a knowledge society – that is it needs to be constantly re-visited by its users and adapted as required. If universities hold the key to drive the knowledge economy and society then UoTs are perhaps in a uniquely strong position to be involved in this applied research and innovation as well as in advancing technologies. Spurred on by the challenges in higher education, UoTs should address the challenge of how to instil lifelong learning in students, crucially strengthen the excellence of teaching and research, while ensuring community involvement and fair and democratic access to education (Afgan and Carvalho, 2010). It can be argued that the role of the library in this broad context is also not adequately exploited at present.

2.4 Learning Theories

This section reviews the applicable learning theories upon which to embed academic integration in teaching, learning and research in UoT libraries. Learning theories seek to discover how experience or practice affects learner behaviour. While the literature on learning theories is substantial and complex, the researcher has selected theories applicable to student-centred learning, reflective of a knowledge society in South Africa.

Learning is defined as “a relatively permanent change in behaviour or knowledge brought about by practice or experience” (Wingfield, 1979: 3). An understanding of learning theory informs not only what we teach but how we teach it. Instruction that fails to apply various learning theories is at risk of transmitting information in ways that do not allow students to use it effectively and transfer it to future information-related tasks (Laverty and Saleh, 2013).

2.4.1 Learning Constructs and Frameworks

The principal learning theory frameworks are outlined below. The three main frameworks are:

- Behaviourism: a theory of animal and human learning that only focuses on objectively observable behaviours and discounts mental activities. Authors such as Ivan Pavlov, B. F. Skinner, Edward Thorndike, and John Watson supported behaviourist approaches to learning;
- Cognitivist: cognitive theorists view learning as involving the acquisition or reorganization of the cognitive structures through which human beings process and store information. It is an approach advocated by Albert Bandura, Jean Piaget, Jerome Bruner, and David Ausubel. Metacognitive learning theory addresses strategies students need to help themselves monitor and direct their own learning. These strategies include predicting outcomes, planning research steps, time management, decision-making, and alternate strategies when a search fails;
- Constructivism: a philosophy of learning founded on the premise that, by reflecting on our experiences, we construct our own understanding of the world we live in. Learning, therefore, is the process of adjusting our mental models to accommodate new experiences. The approach is advocated by: Jean Piaget, Lev Vygotsky, Howard Gardner, Carl Bereiter and Marlene Scardamalia.

Although behaviourist theories bear some relevance to the library for information searching and library use patterns of behaviour, the researcher does not dwell on behavioural theories because of its limited

view of mental activity. The constructivist model is considered by the researcher a more appropriate lens for viewing learning in UoTs in South Africa.

Within a constructivist model, it is apparent that the academic library has the potential to be a change agent by integrating with the development of curricula and research, thus deepening the learning experience in the university. The concept of the student-centred library or the learning library emerges from the constructivist approach.

2.4.2 Constructivist theory applicable in the study

The researcher notes that the study by Gilchrist (2007) relates to 'active learning' and the point that the 'learning library' is a construct rooted in the social constructivist theories propounded by Vygotsky and supported by Simons, Young and Gibson (2000) who maintained that learning occurs as a result of curricular integration:

> the learning library is a construct based on the sociocultural theories of Lev Vygotsky and Jean Lave. These theories hold that learning happens through social interaction, that learners move through increasingly complex zones of development through the assistance of more capable others, and that real learning is situated in cultural environments (2000: 123).

The constructivist theory holds that the library's resources and instruction should become essential elements of student success in the university. All this interaction, in the learning library, creates a 'web of influence' or a 'multiplier effect' in which librarians become more visible on campus, where new instructional opportunities arise, where the teaching and learning environment is transformed because librarians, as change agents, serve on curriculum committees. The extension of this theory to the learning library, then, is through library design on four linked elements based on communication and interactions among students, faculty, librarians, information resources, and the curriculum (Simons, Young and Gibson, 2000: 125).

The theories of a second prominent theorist, Jean Lave, can be interwoven with Vygotsky's constructivist groundwork to provide a further theoretical backdrop to the educational role of the library in the university. Lava's pedagogical theories of situated cognition and communities of practice are promulgated from Vygotsky's concept that the higher order abilities develop as a result of social interaction. The academic library enables students to gain higher order thinking abilities "through a process of acculturation into communities of expertise located in real situations, not contrived, academic ones" (Lave, 1991: 127) by students engaging with the literature and problem solving in their real situations.

2.4.3 Process Learning

Process learning was chosen by the researcher because it is a learner-centred teaching technique involving student engagement and it is consistent with the constructivist theory. Process learning or process pedagogies are umbrella concepts that encompass several more specific pedagogies. Four of these which are relevant are: problem-based learning, inquiry-based learning, project-based learning, and resource-based learning.

2.4.3.1 Problem-Based Learning

Problem based learning also signifies a natural conceptual understanding of the value of the library for students who seek information for problem solving. The focus is on using questions to solve problems, sourcing appropriate research information to answer a research question, evaluating information resources, and defining course expectations for information gathering. This process blends well with the concept of the academic library or the learning library for enriching student learning experience.

In problem-based learning, students evaluate their own prior knowledge of an unfamiliar and intentional problem, identify gaps in their learning, formulate hypotheses regarding the cause and solution and determine what more needs to be learned in order to confirm or disprove the

hypotheses. Students then enter an information cycle where they seek out and evaluate appropriate information, discuss what they have learned, and cooperatively determine the relevance of the information to the problem or hypotheses until they reach closure (Gilchrist, 2007).

This researcher values the scaffolding approach for the adoption of the library as a learning centre for students. The student learns in specific problem areas, evaluating information for relevance to hypotheses which results in a more productive student experience. For example, a team comprised of a faculty member, librarian, and instructional designer at Pennsylvania State University focused on problem-based learning for a freshman seminar, because it presented an "opportunity for librarians and instructors to collaborate in designing learning experiences that will allow students to acquire information gathering skills as part of their subject curriculum" (Cheney, 2004: 495). Collaborators described the experience as a way to create innovative ways of learning in the university (Cheney, 2004; Hill, 1980; Pelikan, 2004) and have forecast that, "librarians, if made an integral part of the development process, can play a key role in helping students attain the skills needed to be successful with [problem-based learning]" (Pelikan, 2004: 510).

2.4.3.2 Inquiry-Based Learning

While current research in learning indicates process-oriented pedagogies (as compared to content-oriented pedagogies) lead to more effective learning, content delivery remains the major instructional mode of UoTs for various reasons such as: perceived time constraints, familiarity with the content mode of teaching practice, resistance to change, and curriculum content to be completed in short semester periods.

Process learning pedagogies are generally defined as diverse learning since they involve acquiring and using knowledge. Those approaches "marry learning strategies to content … to help students acquire a repertoire of strategies, approaches, and techniques that can be used to

master increasingly sophisticated content on their own" (Weimer, 2003: 50).

The researcher argues for the value of the library as a learner-centred institution in the university; process learning was chosen because it is commonly contrasted with content-based pedagogies that emphasize the mastery of information. Content pedagogies focus on the importance of a right answer and are generally teacher-centred. The main reason that academics give for not engaging in process-based learning is because of their perception of time constraints to complete the curricular content and the pressure of examinations. This of course indicates their lack of awareness of the potential for alternative pedagogies which are not dependent on transmitting content verbally to students and do not have to be additionally time-consuming.

Academics are also not always sure how to effect the change to learner-centred pedagogies and the modelling of content instruction from their own educational experiences continues to play a big role in their personal choice of teaching methodologies. Their reluctance to incorporate learner-centred pedagogies such as process-based learning may not be rooted as much in their own experiences as on their lack of knowledge of what are the advantages of these techniques in the classroom. In this situation it could be argued that the learning library might take the lead in demonstrating the value of process learning as the most appropriate system for curriculum change designed to suit a knowledge society.

Simons, Young and Gibson (2000) called attention to how the learning library emulates proximal development that Vygotsky proposed by 'scaffolding' the learning. This means that as the learner receives support from others, he or she progresses from a novice intellectual to embrace increasingly more sophisticated thinking and critical processes. Students collaborate with peers, faculty works with project groups or classes, or librarians instruct students individually at the reference desk or formally through course-integrated instruction. This type of collaboration results in

student learning moving through tiers of basic use and understanding of information, synthesizing concepts, developing unique ideas, incorporating sophisticated research strategies, and applying knowledge through wise, independent use of information. Consistent with Vygotsky's model, the individual scholar emphasized the educative role of the library to engage students in group study, active resource-based and inquiry-based projects, and collaborative development between the academic and the librarian.

2.4.3.3 Collaborative Instructional Design

Scaffold learning involves (1) collaboration; (2) inquiry or enquiry based learning, and (3) building critical thinking, each of which resonate with the original theory of Vygotsky which suggests that students' progress in understanding when supported (as with the scaffolding of a building) to develop the next stage of their understanding. This support can be gradually removed.

Collaborative instructional design, where faculty and the library present a team approach to teaching and learning, involves the librarian's expertise in an approach to renew the curriculum, foster self-paced and deeper student learning, and develop partnerships which would seem to offer great potential for UoTs.

Teaching time or faculty time is perceived as the most critical resource in an academic institution. Efficient use of faculty time to maximize student learning is key to the future sustainability of higher education in South Africa. Instructional change initiatives could provide information regarding the most efficient and effective ways to work with academics in experimenting with new pedagogies or shedding light on process-based learning's potential to capitalize on this valuable and limited asset.

A paradigm shift is apparently required for collaboration and partnerships in instructional design to become reality. Instructional design still almost always occurs at the faculty level without involving collaborative teaching and learning. It is still the norm for academics in UoTs to teach

independently. The study by Gilchrist (2007: 21-25) shows that the current academic structure and culture sees team teaching as the exception, despite this having been shown to optimize faculty time and improve student-centred learning.

2.4.3.4 Resource or Research-Based Learning

Resource or research-based learning can be described as an approach in which the student learns from individual interaction with resources, library research methods, and activities connected with the resources rather than from classroom exposition (Gilchrist, 2007). Supporting this approach is the premise that students learning to think and solve challenging problems, concerns and dilemmas while using resources, will be more prepared to examine issues and questions and apply information outside of the classroom.

While academics have always used resources beyond textbooks, the use of these materials by students has most commonly been directed, focused, and limited in scope, such as hand-outs or material held in reserve collections. In resource or research-based learning, meaning can be guided for direct understanding of specific points, or it can be more open when individual student construction of meaning is sought (Hill, 1980).

2.4.3.5 Project-Based Learning

In a project-based learning approach learners not only generate questions and analyse information to solve an intentionally determined problem but also produce a final product or series of products collaboratively that address the problem.

2.4.3.6 Conclusion

All process pedagogies are learner-centred teaching approaches where students are active participants in the learning process. Learning is optimised when students are engaged in problem solving and move from content based to process based learning. Process pedagogies provide a

basis for future learning, improve critical thinking, and develop higher order abilities which students can transfer to other environments.

The value of the above pedagogies has been clearly demonstrated but research has failed to identify any undergraduate programmes that are currently either research or resource/research-based or library-centric. It would therefore appear that an opportunity exists for the library to act as a change agent in UoTs in South Africa in this regard.

2.5 A Framework Model for an Academic Library

The changing role of the library within the context of higher education and that which adopts a learning paradigm is alluded to by many authors (Stueart and Moran, 2001; Bell and Shank 2011; Campbell and Maggs, 2006). As early as 1980 Hill looked to library leadership as the key to educational transformation.

Quality assurance standards in universities require faculty to incorporate learning resources into course programmes, recognizing the importance of information retrieval abilities and lifelong learning in the university. Fuller (2003) indicates that information retrieval is important to undergraduate success, stating that locating information needed to make decisions and solve problems ranks as the second most important item of undergraduate education, preceded only by defining and solving problems. However, Fuller's study leaves a gap by not mentioning the library's role in the findings or its potential leadership role in furthering a student's ability to connect information use with decision-making and problem solving. This gap points to the need for developing the theoretical foundations for integrating the library into the academic process to engender academic success. The University of Technology library would seem to provide an ideal context for achieving this.

The relevant characteristics of the library in learning theory are: instructional leadership, lifelong learning, active and engaged learning, constructivism, outreach programmes, partnerships, curricular integration, interdisciplinary educational value, team teaching, diverse learning

environments, and pervasive interactions with academic constituencies (Hill, 1980; Owusu-Ansah, 2004; Simons, Young and Gibson, 2000; Snavely and Dewald, 2011). “Together, these qualities create a ‘web of influence’, elevating the visibility and educational influence of the library” (Simons, Young and Gibson, 2000: 125). This is important for future educational activities designed to enhance teaching and learning in the university.

Lonka (2012: 19) believes that “in the future, the value of educational activities may be measured in terms of how they promote engagement and self-regulated learning”. It seems likely that learning may become increasingly blended in the 21st century: instead of talking about learning environments or technological tools, we should talk about knowledge building environments - collaborative efforts to create and continually improve ideas.

Lonka (2012) also proposes that the ‘Google Generation’ requires more engaging, experiential and creative learning methods, including games, simulations, social media and knowledge-creation projects. The learning environments in higher education should therefore foster active learning, collaborative scientific inquiry, problem-solving skills and systematic creation of new knowledge. Our knowledge practices should facilitate motivation, engagement, and well-being. Again the Universities of Technology would seem to be the ideal sites for these developments.

Academic libraries adopt and promote information literacy which forms the core of most teaching and learning initiatives in higher education including e-learning. Quarton (2003) concluded that information literacy abilities are best developed with process- based learning strategies.

The Gilchrist (2007) study includes an analysis of mission statement language identifying common phrases related to instructional leadership and learning strategies. These included supporting the curriculum, providing access, and improving institutional outcomes.

College libraries noted teaching of information skills as a common theme, while universities elevated integrating print and electronic resources into the curricula to one of their top five stated purposes. It was also found that 57% of university mission statements emphasized both support of research and the support of the curricula, while only 24% emphasized the more traditional role of developing collections.

The Gilchrist summary analysis saw libraries as intellectual/knowledge centres, rather than ‘information centres’, indicating to her that the “academic library of the next century is expected to play a role beyond the provision of information and resources and that libraries intend to move beyond collecting resources to more actively shaping future generations of students” (Gilchrist, 2007: 11).

Extracting the phrases encountered by Gilchrist and aligning them with manifestations of each in UoTs in South Africa yields the table below.

The manifestations are a set of characteristics, strategies, programmes and other interventions that could be considered typical of an academic library leading, or participating in, instructional change in the institution. By extension they represent a strategy of academic integration for UoT libraries in South Africa.

This table below will be used during the analysis phase of the study to determine if UoT libraries in the study show evidence of such involvement.

Gilchrist (2007) study indicating aspects of instructional	Apparent manifestation of these in UoTs in South Africa:
Supporting the Curriculum	• Information literacy programmes; • Co-teaching in Extra-Curricular Programmes (ECP), • Curricula related activities
Supporting Research	• Teaching or training in research databases or research tools • Teaching or training in academic integrity and referencing.
Improving Institutional Outcomes	• Enhancing teaching and learning; • Enhancing research output; • Developing student-centred learning; Providing knowledge centres; • Enhancing the quality assurance processes in the institution by collaboration with quality promotion staff • Promoting student academic experiences in innovative ways.
Improving Collaborations	• Developing liaisons between Subject Librarians and Academics; • Subject librarian representation on Faculty Boards, • Subject librarian representation on e-learning committees and institutional research committees • Senior academic representation on the library committee, • Library Directors are members of Senate and • All UoT libraries structurally positioned under the auspices of the Deputy Vice-Chancellor: Academic.
Building Intellectual or Knowledge Centres	• Library constituted as an instructional leader in the institution by means of a mission driven change to integrate with the teaching, learning and research activities throughout the institution. • Academic Library redesigned facilities and space for student-centred learning/ postgraduate and research output.
Providing Access	• Provision of physical and digital collections to support teaching and learning (anywhere, anytime - 24/7) access; • Development and evaluation of the collections/resources for the university's teaching and learning outcomes; • Implementation of Discovery and Open Access systems to enhance learning and access to scholarly publications

2.6 Summary of the Chapter

This chapter presented a theoretical framework for a student-centred approach to embed library academic integration in UoTs in South Africa. The researcher adopted process based learning theories in framing this study because these fit well into the learning paradigm for UoTs providing students with optimised learning, opportunities for practicing skills and acquiring knowledge as they learn, and the challenge of solving increasingly complex problems. Constructivism and process based learning theories provided the foundation for academic integration practices envisaged in the study.

The next chapter considers the literature relevant to the theoretical framework constructed in this chapter and to the wider aims of the study.

CHAPTER THREE - LITERATURE REVIEW

3.1 Framework

This chapter identifies and discusses the literature relevant to the research aims and objectives of this study. According to O' Leary (2010: 81) the production of new knowledge is fundamentally dependent on past knowledge. Knowledge builds and it is impossible for researchers to add to a body of literature if they are not conversant with it. The literature review also provides evidence for the need for and relevance of the research undertaken, by identifying 'gaps' in the knowledge, differences in theory and practice that indicate the need for further investigation (O'Leary, 2010: 81-82).

Therefore the structure of the literature review undertaken by the researcher was to:

- examine the South African higher education landscape and its challenges in light of the proactive role that the subject librarian can play to promote student success;
- identify other applicable discussions in the research literature and analyses of the body of knowledge on library programmes in teaching, learning and research generally, and that which is specific to UoTs in South Africa;
- contextualize the directions and drivers of academic libraries in the 21st century; and
- examine the academic integration programmes prevalent in UoTs in South Africa.

The literature review covers publications from 2005 to 2013 but also includes some earlier material of historical or contextual importance. A scan of the literature revealed very little prior to 2005 on academic integration studies in libraries.

3.2 Academic Libraries and Integration

The library is perceived as the 'heart of the university', and it has largely been assumed that the academic library plays a vital role in the institution. More recently, as higher education evolved to address new challenges and make use of developing technologies, libraries have been called upon to prove their value in the university. Several factors have precipitated this call: fiscal pressure as demands increase and resources decline, to remain static or justify growth; the social expectation of accountability and responsibility; the common belief that information technology can replace many of the functions of a library. The pressure has also been felt globally and there is every expectation that it will continue. In light of the pressures exerted in higher education, the value of the library is therefore under review.

A re-evaluation of the role of the academic library in teaching, learning and research began in the latter half of the twentieth-century. Kirkwood (2011: 6) claims that the forces that led to this shift in academic libraries were the tremendous increase in the amount of accessible information; the new technologies to help retrieve information coupled with the changes in educational policies and practices in higher education.

The research report from the Association of College and Research Libraries Research, Planning and Review Committee (2010) provides an agenda for academic librarians who seek to respond to the call and demonstrate the value of library services: "one part of the research agenda is to demonstrate the value that library services add to a university in the form of promoting academic success" (Bowles-Terry, 2012: 82). As the report makes clear, this is no easy task: there is a clash between the collegial culture of collaboration for the sake of scholarship and the managerial culture of resource allocation according to results. Whilst the present study will not attempt to explore further the nature of this clash, it is worth noting that many of the suggestions contained in the report explicitly mention 'integration' of the library and its resources as a strategic direction

towards demonstrating ‘added value’. For integration to be effective there must however be cooperation with both the collegial and the managerial cultures in the university.

The library literature is filled with discussions of the role of the academic library yet little is documented on how and what libraries can do to promote teaching, learning and research in the university. Studies by De Jager, Nassimbeni and Underwood (2007); Brophy (2007b); Gilchrist (2007); Zhong and Alexander (2007); OakLeaf (2010); Whitehurst (2010); and Derakhshan and Singh (2011) emphasize the changing role of academic libraries.

Zhong and Alexander (2007: 141) make a noteworthy point for this study:

> while the university community would agree that libraries are an integral part of the academic experience, is there recognition of a direct and practical connection between library programs and students’ academic success? The library assumes an important responsibility to facilitate students’ education, providing services, programs, and resources to assist students in being more effective and efficient in their academic career - to succeed academically.

They conclude (2007: 146) that the library:

> need to implement strategies that proactively highlight instructional benefits. Librarians need to create instructional courses that are relevant to student needs, assist students in their academic development, and provide real student learning experiences. These courses should not only teach library and research skills, but . . . also enforce and improve students’ academic experience in the areas of critical thinking, analysis, and writing.

Zhong and Alexander’s (2007) research has clear links to the concept and ideas of academic integration, with the notion (defined in Chapter One) of an active partnership between the subject librarian and academics.

In response, library leadership initiatives in open access scholarship, research assistance programmes, flexible teaching and learning facilities, the delivery of different modes of teaching and learning, e-learning tools

and methodologies, as well as transformative curricula which include information literacy, are being developed in universities in South Africa, with the aim of improving the quality of teaching, learning and research. There is, as yet, little formal evaluation of these initiatives in South Africa. Similarly the literature reveals a sparse collection on library academic integration in South Africa and very little of this relates specifically to the context of UoT Libraries. Neither is much written about how academic libraries integrate with faculty in promoting student success.

3.3 Libraries and Teaching, Learning and Research

As discussed in Chapter Two, the ultimate aim of teaching and learning is to promote academic success and enhance student learning. Libraries are in a unique and favourable position to instil a culture of lifelong learning to enhance academic success. According to Tiemensma (2012: 156) lifelong learning is to create people who learn throughout their lives, and who resolve their problems or take decisions by using information literacy skills and competencies. While documents dealing with the development of national policy for education in South Africa frequently mention lifelong learning as an aspiration, there is no hard evidence of what progress is being made on its realization. Lifelong learning is based on constructivist and process based learning theories discussed in Chapter Two, with the scaffolding approach to learning being at the core of the academic role of the library.

A glimpse into the scholarship of teaching and learning links closely to the theories noted above.

3.3.1 Scholarship of Teaching and Learning

According to Gilchrist (2007: 77) the scholarship of teaching and learning requires a systematic process of inquiry into one's own teaching and learning practices. What the term means is generally accepted to include a critical reflection on teaching; peer review and critique; and an inquiry ethic. Teaching and learning has been impacted by the various challenges

and changes in higher education. However, as noted in Chapter Two while change has been a constant in higher education, it has not impacted upon learning in deep or meaningful ways (Gilchrist, 2007: 79).

The tenets inherent in the scholarship of teaching and learning (vision, design, interactions, outcomes, and analysis) naturally serve as a framework for the design and support of university efforts and initiatives in academic success (Cottrell and Jones, 2003) and this framework is important for library 'academic integration' models as discussed above.

The 'outcomes' model of education requires that academics at all levels of an institution establish learning goals or outcomes, design instructional experiences in an integrated manner, make changes based on information from summative and formative assessments. In her review D'Angelo (2003: 353) makes the point that central to assessment is the belief that assumptions about learning outcomes should be empirically tested and that our conclusions about its effectiveness should be based on evidence. Several researchers support this view by affirming that student learning outcomes are best improved when faculty development is focused on learner-centred teaching strategies (Ramsden, 1994; Drew and Vaughan, 2002; Corrall and Keates, 2011).

The researcher advocates that South African universities have similar experiences as that pointed to by Gilchrist (2007: 79-80) namely that, while many academic libraries have moved to embrace the learning paradigm and are looking to play a stronger role in instruction, the following realities may challenge these efforts:

- academics do not choose to partner with the library mostly due to a lack of time and pressure to cover relevant content;
- process learning has been identified as one way to improve student learning since it manifests deeper and more transferable learning,

yet most faculty choose lecture mode over more participative forms of inquiry;

- the library's physical characteristics and philosophical underpinnings that support process learning and the library's overall potential as an instructional leader are not dominant themes in the literature or predominant actions taken by libraries;
- there is a need for higher education leaders to collaborate with faculty in transitioning instruction toward student-centred pedagogies and renew the support systems, reward structures, and culture of academic life; and
- an understanding of the experience and the meaning of the experience, of library leadership for instructional change or faculty-librarian collaboration for instructional change appears absent.

This suggests that there are both process and structural matters to be addressed before successful changes can be made. The process factors are dominated by the need to facilitate the development of collaboration between academics and the library; the structural by the need to produce evidence that such approaches to learning are both feasible and effective - ideally, more effective - than the *status quo*.

Gilchrist (2007: 79-80) provides the phenomenological lens for the academic library to consider how to initiate instructional change by understanding the university constituents and themes such as student-centred learning pedagogies; the need for close collaboration; and partnerships with faculty to deepen our understanding of this process. This may assist UoT libraries to enhance student learning and engagement, as well as fulfil the mission of promoting lifelong learning for building upon a knowledge society in South Africa.

3.3.2 Knowledge Society

The emergence of the knowledge society has forced a reconsideration of traditional concepts of learning. As noted above the speed of change and the nature of current knowledge have ensured that the information-

transmission view of learning is fading. Within the knowledge society, information and technology, and its appropriate application to knowledge production and acquisition form the key to learning.

In Chapter One, mention was made of Du Pré's comment that it is the utilisation of technology in the creation of knowledge that is at the core of the purpose of a UoT: learning has to also be reflective and directed towards student success for UoTs to engage in building a knowledge system in South Africa. Once again, this reinforces the idea of collaboration and integration as appropriate strategies that are supported by process learning theories.

The subject librarian has a knowledge brokerage role to play in supporting the teaching and research information needs of academics and students (Dale, Holland and Matthews, 2006: 25). The essence of this role is the development and use of a network to put learners in contact with accredited sources: this is an active role, requiring a good knowledge of tangible resources as well as the tacit knowledge that many academics possess. Subject librarians have to engage and collaborate continually to build lifelong learning as well as the network for the information literate university.

3.3.3 Collaborative teaching, learning and research

The literature by Yang (2000); Dale, Holland and Matthews (2006); Gilchrist (2007); Corrall and Keates (2011); and the Association of College and Research Libraries Research, Planning and Review Committee (2010) revealed that subject librarians are keen to enhance teaching, learning and research through partnership with faculty in order to create an enabling environment for lifelong learning in the university.

According to Dale, Holland and Matthews (2006: 28) partnering and forming learning communities with faculty, instructional designers and technologists, writing experts, professional development staff, and other colleagues enables us to accomplish the principal goal. Similarly, there is a

need to use design thinking in conjunction with appropriate technologies in order to successfully integrate the library into the teaching and learning process in academic institutions. As these socio-technological changes shape the higher education environment, so educators' and librarians' adaptations should be guided by their respective core professional values. Within South Africa, the Library and Information Association of South Africa (LIASA) and the higher education academy such as Council for Higher Education Libraries in South Africa (CHELSA) aim to create continuing professional development opportunities which empower librarians to respond to the changing environments and contribute to the teaching, learning and research agenda in South Africa.

The literature also revealed that while most of the research that examined process techniques looked at methods other than resource or research-based learning, none considered the library a critical element in the learning process (Gilchrist, 2007: 80). The researcher believes that there is a dire need for change to be brought about through the library's engagement in the teaching, learning and research design and outcomes.

3.3.4 Undergraduate Students

The primary focus of UoTs in South Africa is to educate undergraduates by instilling and developing knowledge and competencies of the disciplines students undertake to study.

The focus therefore of the undergraduate library can be deduced from the mission statements of UoT libraries discussed in Chapter One. It is to instil in students lifelong learning competencies; knowledge of the discipline; academic reading; writing; research development; information literacy and academic integrity; as well personal development opportunities. To be successful in this endeavour, the library must advocate strongly its involvement in teaching because many of the undergraduates in South Africa are underprepared for higher education and students enrolled at UoTs are no exception. Under-preparedness may be attributed to limited, or no opportunities of exposure to academic resources, such as the array

of information/curricula resources available in library services. It is this lack of functional preparedness, rather than lack of disciplinary knowledge, that can critically hinder academic success. The library therefore has to also serve a teaching function in the university.

Almost all universities in South Africa are faced with the challenge of the majority of students being 'underprepared' for higher education. Undergraduates generally arrive at the university without information literacy and other academic skills: on the other hand they are conversant with using personal communication technologies, computers and the internet since childhood. Yet, astonishingly, they lack information skills at an academic level. The ease of using search engines makes students unaware of how much relevant information they may be missing, and there is a tendency to use web-based information uncritically. There is scope for the library promoting information literacy at the academic level, either as separate courses or tutorials, or as an integrated part of the curriculum, in connection with the writing of assignments and project reports.

According to Bowles-Terry (2012: 82) library instruction seems to make the most difference to student success when it is repeated at different levels in the curriculum, especially when it is offered in upper-level programmes. Librarians responsible for [information] literacy instruction should differentiate between first year, second and third year students in order to create a more cohesive, interactive and non-repetitive academic integration programme. Promoting information literacy in the university requires cooperation and collaboration with academics and this encourages a move towards academic integration.

3.3.5 Teaching Library

The teaching library is a relatively new concept in higher education today. The teaching library, according to Kirkwood (2011: 8) is a library that is actively and directly involved in advancing all aspects of instruction in higher education; teaching, learning, and community service. For the

teaching library to succeed, close collaboration between the subject librarian and the academic is necessary.

The subject librarian must become involved in the curricular processes and in the learning design to assist students with their assignments and projects, also pointing the way for students to use highly relevant resources that enhances the quality of their assignments. When that happens, the library and the librarians become a powerful force helping the institution adapt to the changing needs within a technological era. The teaching library has potential value for UoTs in South Africa that struggle with the need for better throughput rates in higher education.

3.3.6 The Role of Technology in Teaching, Learning and Research

It is the interaction between the knowledge society and the technological society that has created much of the global pressure for change in higher education.

While the South African higher educational landscape has undergone formidable educational and technological transformation in the last seven years, higher education has experienced unprecedented change in the increased diversity of students; proliferation and enhanced sophistication of student and user needs; and high expectations of service quality. Due to the new realities in higher education and in universities, the role and impact of technologies has led to the creation of diverse and different teaching and learning modes; rapid and ‘anywhere anytime’ access to the global information and knowledge network; virtual platforms and learning tools are emergent trends in universities, nationally and internationally. Technology has widened the scope of teaching and learning which has enhanced the practice and user experience for the various constructs of learning including the notion of process based or constructivist learning for the user.

3.3.6.1 Age of the 'User- Experience'

According to Bell and Shank (2007:151) the issues of the technological era are eminent in the 'simplicity – complexity' conundrum, which means that the research process by its very nature, is inherently complex and students are perplexed by the assignment and its complexity. Student research behaviours mostly exhibit simplistic internet searching.

Bell and Shank (2007:151) note that this is the age of the user experience in which consumers measure the value of products and resources by their simplicity of usage:

> Academic libraries generally have to adapt roles so that design thinking plays a greater role in how services are created and resources offered to the clientele. The focus needs to shift to offering a better 'user experience' and building upon a 'customer service culture' in the university. In the 'age of the user experience', fewer, not more, features are important: simplicity as an element of design.

Enhanced technologies are offered in the library for building upon the academic needs of the student, for example a student is able to import relevant sources of information directly into their bibliographic management software of their mobile devices. Technology added features help the student to promote knowledge production.

Technology has also created the age of 'peer production' which means that a community of users who add and edit their own content with minimal oversight by authority figures: for example, Wikipedia, blogs and Twitter, together with Web 2.0, which many suggest is the future of the interface. This is characterized by collaborative development of content on the web, with the creation of content moving from the website owner to the website user (Bell and Shank, 2007: 151-2).

Thus learning in the form of constructivist theories and critical inquiry are gaining momentum via enhanced access and diverse features of

technology that universities can mediate and exploit to promote academic success.

According to Luo (2009: 39), Web 2.0 is becoming more prevalent in information literacy and its value in facilitating teaching is being accorded academic recognition; however little has been done to assess how effective these approaches are and evaluation studies should be conducted to scrutinize how well students accept the technology and how it affects their achievement of the learning outcomes.

Furthermore, the process of disintermediation, by providing direct end-user access to resources rather than through an intermediary, such as a subject librarian, may offer an opportunity for subject librarians to change their role towards providing a more supportive environment for teaching and learning (Dale, Holland and Matthews, 2006: 189).

3.3.6.2 E-learning

The introduction of the virtual learning environment has created further opportunities for librarians to offer innovative programmes in enhancing student learning. Electronic teaching and learning (e-learning), also known as the virtual learning environment (VLE), is increasingly being utilized by universities and UoTs in South Africa. The creation of successful learning environments depends on responding to the contextual and social change which is embodied in e-learning. It also provides subject librarians with a conundrum: how can the student who is receiving core learning materials through a VLE be supported and encouraged to explore a discipline beyond these resources? One response is to introduce the concept of the 'blended librarian', already considered in Chapter One. Blended learning represents a radical transformation in universities; similarly, the professional focus of the subject librarian operating as a blended librarian is a radical shift from a passive and responsive role to pro-active involvement in the educational programmes of the institution. Corrall and Keates (2011) stated that although the use of VLEs has been highly

documented in UK universities, there has been little empirical research on the level of involvement of subject librarians in them.

3.3.6.3 The Digital Divide

The digital divide poses another challenge for librarians in contributing to academic success. It may be thought of as those with the skills, resources and understanding to be able to make effective use of ICTs and those who cannot. Warschauer (2002: Rethinking the digital divide) explains that bridging the digital divide is about much more than providing internet and computer connections, because "access to information and communications technology (ICT) is embedded in a complex array of factors encompassing content; language; literacy; education; community; and institutional structures".

According to Borgman and others (2005: 636) digital libraries can support information seeking, creation and use for a wide variety of applications, one of the most promising of which is education. They can facilitate inquiry learning, which is one method of involving students in scientific or other scholarly practices so that they gain a deeper epistemological understanding of the discipline. Digital libraries hold great promise for improving undergraduate education by providing access to primary sources and by providing associated tools and services to deploy information resources in teaching and learning. The UoT library must be proactive in providing these services to undergraduates but Warschauer's cautionary statement (above) must be borne in mind: provision simply will not be enough to guarantee effective learning. This is supported by Mutula (2007: 400) who states that the drive towards e-learning requires libraries to transform and to host virtual services for the increasingly online populace. Systems developers and librarians should provide systems that provide a framework and support of e-learning initiatives, including content, in UoTs.

The provision of library services to online students requires more collaboration with faculty than that of the face-to-face classroom. The South African student requires personal contact within the e-learning

environment on a regular basis. In the electronic learning environment, students need initial hand-holding class sessions to enable them to become familiar with the online management platform and use of new technologies. It is also important that subject librarians provide equivalent services to online and face-to-face students.

The beguiling ease of ‘Google Scholar’ poses a challenge for subject librarians seeking to instil critical thinking in university students, most of whom are already reluctant library users. Libraries that provide a link to Google Scholar should also be helping users learn more about its services and how to effectively search the database, what the database may retrieve, how to interpret what the database retrieves, and how to access what they retrieve. Tools like ‘Google Scholar’ are already playing a key role in critical inquiry as well as enhancing teaching and learning.

3.3.7 Open Access Resources for Scholarship

The availability of open access resources for scholarship in the information and technological era has added value in teaching, learning and research. South Africans are in the early stages of developing Open Source access repositories and publishing in open access journals but, as Raju and others (2012) explain, open access repositories are fast being developed at academic institutions. The adoption of these resources, especially by students, will need active encouragement, almost an exercise in university and library marketing before their use becomes instinctive.

Enhanced access and diverse technology tools useful in teaching, learning and research provides the academic library with new opportunities to add value in the university. An analysis of the drivers of development in academic libraries today can help one to understand the direction to take in integrating the library in teaching, learning and research in the university.

3.4 The Drivers of Academic Libraries in the 21st Century

In view of the need to chart a way forward for UoT libraries in South Africa, current trends and drivers of academic libraries are outlined in the study. What can libraries meaningfully do with internal and external drivers in the future? Academic libraries are confronted by the effects of several forces in the 21st century, outlined below.

3.4.1 The Need to Survive

The need to survive within the changing higher educational landscape has driven libraries into new frontiers for promoting academic success. Libraries are under pressure to do more than simple assertion of belief in value with the need to *demonstrate* their value. One strategy is to engage with the need for lifelong learning and thus to play a proactive role in the university teaching and learning programme. For such a strategy to be successful, it requires the formulation of a deliberate plan to work alongside academics in an effort to bring the library into the learning space moreover, for the value of the library to be recognized in teaching, learning and research.

3.4.2 A Sense of Mission

According to Cotta-Schonberg (2005: Sense of mission) “libraries today are driven by a sense of mission in terms of service and user needs”. Academic libraries have radically transformed their client service ethic to justify library existence and instil information literacy competencies in students for optimizing the library resources. Whilst this may be true, it may also only be apparent to the professionals within the library: a sense of mission needs to be communicated to those outside.

3.4.3 A Personal Service

Technology has enabled users to become self-sufficient and capable of doing a lot by themselves on the library platform, such as requests for library resources, librarian assistance, and materials request for full text

and inter-library loans. Academic libraries already actively support self-service initiatives such as Radio Frequency Identification Data (RFID) services. However, the global information service available to users, including those information resources subscribed to or owned locally is complex. Despite the development of specialized search engines, it will become more and more complex. This is not an argument for intermediation: it has value for those who lack even the basic skills of searching but competent searchers are almost certain to prefer using the search engines themselves.

One of the important challenges for librarians will be to show that they can make a real difference in the global information network. The task is to develop the librarian into a highly competent information specialist with a deep knowledge of the functioning of the global information system, with specialist knowledge of the information resources relevant to the student needs of a particular UoT.

Pedagogical skills translate this specialist competence into a function of advice and guidance attractive to students. This service has to be made available to users on their own terms, directly in the study environments provided by the library, and indirectly through social media, for example: online chat, e-mail, web-page and sms facilities (Cotta-Schonberg, 2005: 5). To better appreciate and understand the components of the service needed, the subject librarian/information specialist must work in an environment that is integrated with the teaching and learning in the university.

3.4.4 De-hybridization

The hybrid library has both print and electronic collections relevant for the institutional teaching and learning needs. A conscious decision has to be made with regard to whether or not to pursue the hybrid library as a matter of principle: to continue as long as possible to have print collections; or, on the other hand to reduce progressively the print and aim at becoming an electronic library.

De-hybridization means to discontinue the print-based library altogether. Both models have infrastructure and budget implications. Managers have to take informed decisions about sustainability of either model, in the light of the infrastructure of each UoT and budget constraints. Potentially, a UoT library will have the possibility of being at the forefront of de-hybridization because of the high rate of obsolescence of discipline-specific literature, especially in technical areas. However, development in this area varies with most UoT libraries reluctant to offer total electronic collection services because of the restricted internet connectivity available at many academic institutions and the lack of access to computers available to many students in South Africa. Furthermore, such a change will need careful marketing to the user community because of the changes that will ensue in the teaching and learning space.

3.4.5 The Centrifugal Library

The continued existence of the library as a physical place does not mean that the library as an organization should be physically centred. On the contrary, it has become possible and necessary to have subject librarians working collaboratively with academics and students at decentralized service points, or possibly with researchers, be it physical or virtual. For this to become a reality, librarians will have to develop new professional identities for an e-learning environmental presence in the university.

3.4.6 Innovativeness

Another driver of academic library development is innovativeness and entrepreneurship, the urge to identify new opportunities; to exploit them; and to create innovative library services. According to Cotta-Schonberg (2005: 4-6) “innovativeness is, of course, dependent on librarians ‘thinking outside the box’. However, the library’s history, culture and structure may seriously either hinder or promote innovativeness, and it is very important to promote a culture of innovation and to develop structures which facilitate innovative services for the user”. The virtual learning environment, social

networking and collaborative partnerships provide a means for introducing innovative library services to users.

3.4.7 Learning Environments

A traditional function of the library is to provide an environment conducive to study and concentration which is still much in demand by students today. The futuristic academic library may not be a place for printed books, but it will certainly be a place for students and for study. In this sense, the library will continue to have a physical presence in the university, providing a fulcrum for the future.

According to Cotta–Schonberg, some may have thought that e-learning and distance learning make the physical university superfluous as a 'space':

> Why should students come to the university in order to study when they can perfectly well do so at home? The general trend seems to be the exact opposite. It appears that intensified information and communication technology (ICT) based communication does not diminish the need for young people to be together, directly and physically. A Danish university professor has recently proclaimed that the society of the future will not be the digital or the electronic society, but the convivial society. Information and communication technologies (ICT) do not abolish the social nature of man, but reinforce it (2005: 2-3).

A move towards academic integration might suggest that the convivial society is emerging, or has the potential to emerge, in South African UoT institutions. University students (apart from those pursuing distance-learning) flock to the physical premises of the universities not only to participate in programmes, but also to have study sessions in groups, to socialize, and to study independently. This trend provides an opportunity for libraries to underscore the usefulness of one completely traditional library service and ensure an active future for it, independent of the print or electronic format of its collections.

3.4.8 Scholarly Publishing and Dissemination of Knowledge

Librarians may add a new function by engaging in scholarly publishing through the maintenance of open archives and institutional repositories. There may also be scope for supporting the publication of journals with low rates of circulation. Libraries have an important role to play in the new functions of universities with respect to the 'dissemination of knowledge' by developing and maintaining appropriate interfaces to their open archives. This is possible via current information on new university publications and its researchers being hosted on specialised databases facilitating access to individual researchers in universities.

The specific role of the library will be to develop the instruments of dissemination and other activities based directly on their repository function to promote the publications output of the university and researchers.

3.4.9 Search Engines

Search engines have changed the way libraries help users to retrieve information. Formerly, it was accepted that libraries teach users to use the local library's catalogue as the first step in information searching and only proceed to search engines as their second choice. This position has been abandoned, at least by library users. The focus of libraries today is to provide enhanced 'user experience' discovery tools utilizing 'Google-like' search engine technologies for enhanced teaching, learning and research.

Examples of libraries advocating better search engines include the Apple's iPod or Google's search interface which are revered for their simple designs with increased user-expectations. Improved online public access catalogue interfaces offered by library vendors such as Summon, WorldCat Local, OCLC or Ebscohost Discovery tools help build good end-user experiences for students.

3.4.10 The Lean Library

The escalating costs of maintaining expensive, commercially based collections of electronic materials, as well as diminishing financial resources, will force libraries to make radical changes in their mode of operation. Self-service systems, maximum use of information technology and budget constraints have created the need for the 'Lean Library'. Libraries will have to focus on what should be their core functions in the future. A number of traditional functions will be handed over to suppliers or vendors.

Library work will be mostly driven by customized teaching, learning and research services. Academic library structures should be simple and effective and reflect the needs and structure of the university rather than parochial considerations of internal library functioning. Decision structures of libraries should be highly attuned to the needs and decision structures of the universities they serve.

3.5 The Role of the Subject Librarian

The role of the subject librarian as traditionally the primary link between the student and the library in the context of assisting with discipline-specific assignments has evolved and has the potential for further dynamic evolution.

Dale, Holland and Matthews (2006: 176) define subject librarians as information professionals who offer a programme that involves liaison and communication between the library and the academic community. Effective library interventions in teaching and learning are proving to be a key performance area for academic librarianship.

A subject librarian's role centres on five key areas: academic liaisons; collection development; information literacy skills; teaching and learning. According to Hoskins, Leach and Neerputh (2006: 27) key performance areas of the work of subject librarians are: instruction and teaching; reference services; academic liaison and communication; management

and organization; cataloguing and classification; and information and communication technologies. In terms of competencies, it is evident from the findings of the study that interpersonal skills are also considered very important by subject librarians. This competency is followed by knowledge of the total information environment and within this broad competency subject librarians should:

- be skilled and literate in information technology and communication;
- exhibit a thorough knowledge of varied information resources within their discipline focus to meet the needs of users;
- provide assistance to users, at their level of need; and
- be proficient in planning and executing effective search strategies.

Mbambo (2006: 176) affirms that “the concept of librarians dedicated to supporting academics is widely accepted in universities in South Africa. However, the model of practice varies from institution to institution and, except for countries with a single university, there was no national model of subject librarianship”.

Dale, Holland and Matthews (2006: 191) suggest that “subject librarians are uniquely placed to develop the role of the knowledge broker, working with students and academics to enhance their contributions to learning and teaching”. Despite this strong statement, there is little evidence offered to support this suggestion, nor are there many examples where this model has been consciously adopted. Despite this it may be that some subject librarians, because of personal motivation and existing good relationships with the academic community, have been able to develop their role in this direction.

This research discovered that each UoT has developed its own model of the subject librarians’ role. What may be helpful to the practice and implementation of the core functions for subject librarians in South Africa would be a standard or guideline for best practice.

Bell and Shank (2007: 155) claim that the academic librarian's key function is to support the teaching and the learning mission of the institution. The core values of academic librarianship, including blended librarianship, are to:

- enhance library integration into the teaching and learning process;
- employ design thinking;
- embrace appropriate instructional technologies; and
- emphasize local and global community building.

The stated role of the UoT subject librarian is to maintain the library's relationship with the university, and to forge ahead in offering services that enable students and academics to attain success in their academic goals.

According to Mbambo (2006: 176) universities in the United States set the pace in the 1970s in creating subject librarianship models which were two-fold in nature – offering technical or bibliographic as well as client service functions. Due to the automation of the public service functions in the 1980s, the dominant and significant role of the subject librarian was to supply client services and in the 1990s this extended to student-centred library services.

Nutefall and Chadwell (2012: 168) outlined the following important focus areas for academic libraries in the 21st century:

- support for the knowledge creation process (copyright, scholarly communication, data management);
- provision of centrally located and inviting place for users to study, collaborate and socialize;
- promotion of unique resources;
- customized information retrieval and fulfilment – the capacity to fill any sort of researcher request whenever and whatever, via transparent processes and systems;
- engagement with users, especially undergraduates, to help them be

successful in their studies; and

- application and development of tools and services to solve problems for users and for library staff.

The above challenges the traditional role of the subject librarian and provides the impetus for academic integration in UoTs in South Africa.

The debate about how subject librarians possessing subject knowledge can best deliver a more general quality information service in academia continues. The subject librarian needs to have a good subject background but must also rely upon generic professional skills.

Emerging changes in the digital environment, in particular sophisticated end-user access and support to information resources, have affected the provision of information services. Subject expertise (which is not the same as subject knowledge) has sometimes been overshadowed in the recruitment and training of librarians by requirements for advanced technological training skills. New skills and knowledge are required for the future roles envisaged for subject librarians in a digital era, but these must also be driven by an understanding of specific client needs and information sources.

The aim of academic libraries departing from the functionalist model (technical services and collection development) to a subject division/specialization approach was to improve the quality of information services. The subject specialization approach was based on three distinct collections: monographs, periodicals and reference, with subject librarians taking responsibility for collection development and management in these three subject collections and client services in faculties. In Nigeria, Port Harcourt University set up this subject specialization model, with the proviso that the subject librarian serving an individual faculty has to have a first degree in the appropriate subject plus a postgraduate qualification. The rationale is that subject librarians would possess an in-depth knowledge of subjects taught in the faculties they served and would

therefore be more effective in serving them. The University of Botswana adopted this approach to good effect.

According to Mbambo (2006: 177-8) the University of Pretoria Library in South Africa adopted subject reorganization in the 1980s. Developments in the duties of the subject librarian changed to include substantial instruction and pedagogy, although faculty has not always recognized librarians as educators.

Librarians working largely in information technology (IT) environments have seen their titles change to ‘cybrarian’ or ‘webrarian’ to reflect their increasing role of information management in cyberspace. The subject librarian concept is thus in danger of finding itself misaligned to academic librarianship, in information and communication technologies or student-centred approaches of the 21st century.

Mutula (2007: 397) advocates for the changed role of librarians in providing quality services for the end-user. Quality in library programmes remains important in UoTs. Librarians were long responsible for the welfare of books, carefully policing their use instead of emphasizing access or client services. The role of custodian and policing has evolved into information management, where librarians engage in creating tools and procedures to enhance access. As information facilitators, librarians are called upon to help academics and students use resources effectively. They are also seen as information consultants involved in behind the scenes activities such as helping software designers to develop systems that fit user information seeking behaviour and patterns.

Much of the subject librarian duties are allocated to evaluating or reviewing the customization of resources according to student or academic needs. Students represent diverse ages, ethnicities and abilities. Information seeking behaviours and technological and research competencies vary widely among South African students, which presents a challenge for both librarians and academics.

E-learning has ushered in the opportunity for greater collaboration and partnerships in teaching, learning and research by subject librarians. A South African study by Rensleigh and De Beer (2004) emphasized that academic libraries need to acknowledge librarians as educators, and librarians need to learn how to teach information literacy skills in an online learning environment. This is a critical issue that the researcher advocates as current practice in academic integration for UoTs in South Africa.

To meet such challenges, subject librarians will need new skills such as marketing, branding and advocacy, information and digital literacy, instruction and pedagogy. Change management, research know-how, funding applications and innovative use of technologies, for example the use of Open Source software and partnerships with colleagues, are required from subject librarians for promoting learning and addressing 21st century library challenges. The value of subject-specific expertise will however remain and will need to be accommodated within new models.

Selematsela and du Toit (2007: 127) identified the technical skills for instructional librarians as:

- the promotion of IL in the university;
- organising IL programmes for both undergraduates and postgraduates;
- the presentation of appropriate IL instruction skills;
- the course design and development of IL programmes in collaboration with academics;
- the continuous evaluation of IL programmes;
- keeping updated with e-learning and electronic resources; and
- learning methodology and pedagogy.

Shenton and Fitzgibbons (2010: 165) believe that if “lifelong learning is the true goal of information literacy, information specialists are ideally placed to impart skills that go beyond the ostensibly limited relevance (from a student's perspective) of academic assignments”. If the information literacy

programme is administered with prior faculty liaisons and conducted at a 'point of need' for students, this means that collaboration with academics creates programmes interwoven into student academic needs (Neerputh, 2012: 262).

Stueart and Moran (2001) also pointed out that changes in the information environment have made subject librarians become negotiators responsible for identifying needs; facilitators responsible for providing effective search strategies; educators familiar with information in many formats; and information intermediaries responsible for current awareness services in universities.

The time for the subject librarian to re-invent the role in order to remain relevant in a dynamic academic environment is crucial now more than ever. Millennium Development Goals (MDGs), the digital divide, the information society, e-government, e-records management, e-learning and Open Source are examples of the new challenges that the subject librarian is expected to respond to in higher education. The library and subject librarian must effectively deal with the competition that is occasioned by new information providers such as the internet, database service providers, the media, publishers and others. Subject librarians must re-evaluate their strategies for keeping abreast of the times, amidst prolific technological changes.

3.6 Information and Communication Technologies

The future of libraries, according to Cotta-Schonberg (2005: 1) will be determined by the alacrity with which libraries have embraced new technologies. The 21st century is also characterized by the rapid and prolific increase in information and communication technologies, impacting the lives of both the young and old. The challenge is for libraries to use technologies in appropriate ways and to take advantage of the benefits offered by ICT development, preferably ahead of students. The use of appropriate technologies in universities is a measure of the quality of teaching, learning and research services on offer in South Africa.

Schonfeld and Guthrie (2007: 8) claim that digital technologies continue to transform the university environment, with faculty information needs evolving steadily. They suggest the need for subject librarians to lead in helping academics transit to the 'Net-generation'. The Net-generation students are mobile users; they manage different aspects of their lifestyle with the aid of communications technologies; they are focused on personal development and will seek learning experiences that meet their specific needs.

The practice of academic librarianship has evolved to meet the Net-Generation user needs within a knowledge-based society; with social media applications ('apps') and other tools offering optimized use of information resources in the mobile environment.

The role of the library and the function of the subject librarian have undergone a metamorphosis in the technological era. Selematsela and Du Toit (2007); Corral (2007); and Corral and Keates (2011) assert that much has been said about how online resources, including the internet, have affected library services, yet less has been said about how other organizational imperatives help to redefine the role of the subject librarian in the 21st century. The authors claim that subject librarians are qualified and have the competencies to teach lifelong learning skills but no evidence can be offered to support this claim.

Another point of view by authors Nitecki and Rando (2004: 120) posed three broad assessment questions with regard to the use of digital technologies in teaching and learning:

- how do faculty members use digital images to teach?
- what changes occur in what students learn? and
- what effect does this technology have on service support offered by the Library?

A combination of survey and observation encourages them to propose "a new paradigm for service support involving cross-divisional expertise

brought together to maximize knowledge transformation in support of teaching and learning" (Nitecki and Rando, 2004: 125). Although the term 'academic integration' is not used, what emerged from the study are examples of such integration.

Information retrieval systems and methods have changed with the advent of new integrated software technologies. Libraries are providing discovery tools for efficient access to information, fulfilling the likes of the Net-generation student. According to Mutula (2007: 397) "the library has experienced a shift from 'ownership to access' with a focus on the quality of what can be accessed in terms of bandwidth, given the digital divide gap that exists between and within countries in Africa". What is somewhat neglected is the need to consider the effect of this change on the user, both the advantages of electronic access and the disadvantages.

Online Public Access Catalogues (OPACs) are now being used as gateways to information owned within libraries and outside the libraries. The library catalogue need no longer just be an inventory list or a retrieval process for what the library owns. It can become the portal to all library resources but, as earlier noted, many users search directly on the Internet, bypassing the library catalogue, in whatever form. One of the opportunities afforded by academic integration may be to persuade academics and students of the enhanced utility of OPACs configured in this way, especially if it can be demonstrated that the retrieval results tend to be superior to those obtained from direct searching of the Internet.

3.7 Standards for Academic Integration

Academic integration means that libraries must support independent and self-learning in the institution. According to Dabbagh and Kitsantas (2011: 4) efforts by academics and students have created innovative ways of teaching and learning, leading to the emergence of constructs such as e-learning, pedagogy 2.0, social and interactive learning characterized "by themes such as openness, personalization, collaboration, social networking, social presence, user-generated content, collective wisdom,

and demarcating areas of higher education where a potentially significant transformation of learning practice is underway". This suggests that there is a readiness within some academic communities to explore ways that could promote academic integration. Furthermore, according to Bell and Shank (2004: 373) the set of standards issued in 1992 by the American Southern Association of Colleges and Schools emphasized the following for academic integration:

- commitment to user instruction and the educational mission of the academic library in lifelong learning;
- cooperative working relationship of librarians and teaching faculty;
- directors to develop a vision for the future of the library, including the integration of new information technologies into library instruction and services to support the university's teaching and learning mission;
- the Director will articulate a clear vision of the library's vital role in supporting the teaching, learning and research activities of students, faculty, and other constituents; and
- one area, in which academic librarians lag behind, is in their understanding of pedagogy and the adoption of instructional design theory and practice.

The importance of this pedagogical skill set is essential for subject librarians and needs to be incorporated within library education. This could help members of the profession become more knowledgeable about how learning takes place; how structures for effective learning are designed; and how learning outcomes are achieved.

3.8 The Learning Library as the Hub in the University

The centrality of a library as a learning centre in the educational mission of an institution is assumed by the profession to be pivotal. However, as discussed earlier, this view is being challenged by competing services accessible over the Internet. It is important, therefore, to consider what

value a librarian can offer to the educational process that could enhance the learning function and support the case for academic integration.

A good understanding of the relationship between library instruction and the wider educational process of the institution is required for students to be successful. The excellence of professional librarians, according to Brophy (2007a: 516) is:

> measurable in part by the extent to which they are active participants in the academic enterprise, not merely custodians. Management should discuss the extent to which they view librarians as resource people who can offer students instruction but also help faculty in designing research projects. If we are serious about improvement in the teaching-learning cycle and student-centred learning, the library ought to play a pivotal role to make it work; librarians need to be empowered to develop a much deeper understanding of how learning happens, of pedagogical theory and practice. Librarians must get involved in perpetuating this deeper meaning of learning. Library resources and skills are dedicated to the sharing of knowledge, understanding and meaning, perhaps even to the development of wisdom, not simply organizing and preserving information.

A relevant model of subject librarians developing new skills for an enriched educational experience and that best describes library academic integration, is presented by Brophy (2007a: 519).

Process learning theory explains that the learner progresses through increasingly complex zones of development through the assistance of others who are more experienced or proficient and that real learning is situated only in specific cultural environments. The extension of this theory to the learning library, then, is through recognition that the library manifests its design and programme on four linked elements based on communication and interactions among students, faculty, librarians, information resources, and curricula.

According to Simons, Young and Gibson (2000: 124) these included active programme partnerships; curricular integration; and sustained interactions

among the constituent groups. Rather than an 'add on' to the educational experience, the library, as an information resource and gateway, is a primary catalyst for cognitive, behavioural, and affective changes in students, as they interact with information resources as directed by faculty, as they complete assignments and study with peers, as they extend their knowledge at multiple levels, seeking connections and making meaning in more self- directed ways. The learning library is therefore an agency of change in the educational process in the university.

As discussed more fully in Chapter Two, Simons, Young and Gibson (2000) also call attention to how the learning library emulates proximal development that Vygotsky proposed by 'scaffolding' the learning. This means that as the learner receives support from others, he or she progresses from a novice intellectual to embrace increasingly more sophisticated thinking and critical processes - an echo of Kuhlthau's ISP theory. They suggest that there is support for the progression that comes from students collaborating with peers, faculty working with project groups or classes, librarians instructing students individually at the reference desk or formally through course- integrated instruction. This type of collaboration results in students' moving through tiers of basic use and understanding of information, synthesizing concepts, developing unique ideas, incorporating sophisticated research strategies, and applying knowledge through wise, independent, use of information. Consistent with Vygotsky's model, the individual scholar emphasized in a more traditional library model is not pushed aside but rather uses the library alongside students engaged in group study, active resource-based and inquiry-based projects, and collaborative development.

3.8.1 Student-Centred Learning - Embedding the Library in the Learning Process

From the analysis of mission statements of UoTs, considered in Chapter One, it is evident than most have adopted a student-centred learning paradigm in enhancing teaching and learning in the university. There are

many implications for this learning paradigm, such as student-centred design of curricula and how the theoretical integrates with the practical in workplace teaching and learning; educational methodologies and technologies required in business and industry; and assessment strategies which promote interactive learning.

A student-centred approach means that the subject librarian must attempt to understand these students, in order to create meaningful educational environments and enduring information fluency programmes/modules that meet an individual's current and future needs in being a lifelong learner.

According to Mbambo (2006: 176) being student-centred means that good relations between the library and faculty lead to:

- academics supporting library programmes;
- the faculty effectively utilizing library services; and
- an improved support for researchers from librarians.

Work integrated learning (WIL) forms an integral component of student-centred education and training in UoTs. There is still a big challenge in this area in terms of how WIL is designed and integrated with the theoretical aspects of the modules; how well exposed the lecturers are to the workplace environment; and for what practical changes and nuances they need to prepare students in the world of work.

An action research approach is envisaged in a student-centred learning paradigm. Griffiths, Oates, and Lockyer (2007) stated that student-centred learning discusses the learning materials provided as an alternative to lectures including a book, a set of videos, courseware, and a web site. The teaching approach devolved to students working through the materials/information resources at their own pace. As the teaching approach reached a steady state, there was a discernible improvement in students' minimum marks and pass rates. In general, students preferred this teaching approach, particularly the autonomy it provided them. Griffiths, Oates, and Lockyer (2007: 460) stated that "staff recognized that

their time with students was more productive and that students became more self-reliant".

Increasing self-reliance may mean, however, that when seeking information, preference for the internet over books, newspapers, radio and television may develop an expectation that most useful information will be easy to access with digestible packages and be a combination of text, sound and graphics, preferably with some interactive functionality. It is not clear from the research how such expectations might be met. Whilst the 'package' concept is intuitively attractive to some, it raises profound problems of intellectual property rights, alongside the accusation that such approaches trivialize information. In the longer term, the problem of how to encourage and support primary research may be exacerbated by the indiscriminate use of 'packaged' information.

Here, again, is an argument for the involvement of the subject librarian to promote academic integration in the form of information literacy and research skills in the university.

Diverse learning opportunities have presented subject librarians with new educational roles which build on their traditional skills but also challenge them to acquire new skills. Brophy (2007a: 519) posits that:

> what will underpin success in adapting to the new networked world will be a willingness and determination to meet users in their own environments, learning their terminologies and their languages, and wholehearted adoption of constructivist notions of how effective learning, and effective research, takes place. In other words, librarians need to become much more visible and active in the learning and research process.

Brophy (2007a: 520) outlines the scenario of embedding the library in learning by domain-focused academic teams made up of faculty, learning and technology support, student representatives and librarians working together with a shared responsibility for the delivery of enriched learning. An important feature of this work is that it is underpinned by an explicit commitment to social constructivist pedagogy and active learning. This

approach provides for an enriched learner-centred experience and largely avoids the ‘packaged’ information problems mentioned above.

To achieve an enriched learner-centred experience in a UoT, subject librarians should be aware of the barriers of ‘professional silos’ – be it librarians, faculty or technologists - populated by those who want to guard their own turf and do things their own way. Breaking down the silos and becoming a real part of an academic integrated team can support the creation of enriched educational experiences. New professionals are described by Brophy (2007a: 519) as ‘pedo-techno-gogs’: that is, librarians characterized by their possession of pedagogic knowledge while also bringing specific expertise and technological know-how to learning and curricula. Although there is clear potential in the attempt, Brophy offers scant information on how such a change is to be accomplished - a lack that is evident in much of the literature.

According to Beard and Dale (2010: 482):

> if learning is to be enhanced by technology the staff development activity should include blended learning and groups using techno-booths and Wi-Fi enabled spaces offer additional opportunities for students to learn. These collaborative technology rich spaces have been observed to retain their popularity during the periods of exam revision, a time where the expectation might be for demand to be predominantly for the silent zones. The students who continue to use the collaborative spaces can be observed reviewing past exam papers as a group, discussing past lecture notes and reflecting on shared content posted within the virtual learning environment (VLE).

The learning library benefits both academics and students. Bodnar (2009: 404) also claims that while information and learning commons are designed primarily to benefit university students, these learning spaces also benefit academics with increased publications and postgraduate outputs and graduate throughput. The idea that information and learning commons might also support university teaching and research interests is one that has received little attention in the library literature to date.

According to Creese (2011: 328) “postgraduate research must be considered the training ground for researchers and academics of the future” and, furthermore, that universities are striving to build both discipline-specific and more generic research skills into the research experience. Creese (2011) proclaimed that higher degree programmes aim to make students proficient and professional independent researchers, who not only possess excellent specialized disciplinary knowledge but also have strong interdisciplinary research skills. In the past, research skills education was never formalized within higher degree programmes, and relied on the supervisor playing the role of mentor and trainer in the development of these skills, within the explicit context of the research discipline area. Generic skills should place particular emphasis on critical thinking, reading and writing skills. Formalized hands-on training both in generic and discipline-specific research resources and techniques is required, as well as formalizing research training, and the most effective methods of research skills education within the university's environment are those that are learner-centred. In light of this, the library can play a greater role in promoting research output.

Earlier, it was noted that many South African students are underprepared for tertiary education. In countries with more robust primary and secondary education systems, most students will already have acquired elementary to intermediate skills in using information and conducting research for school projects. The same is not apparent in South Africa. Scott (2009: 24) concludes that, “the academic preparedness of a significant proportion of these students, many of whom are the first in their families to pursue post-secondary studies, are poor, a factor that contributes to poor completion and graduation rates. These results have major implications for successful growth in the higher education sector and hence it’s capacity to close the skills gap”. Scott (2009) also identifies high drop-out and non-completion rates, especially evident in the UoT sector, and suggests, among other aspects, the need for more comprehensive academic support for students.

Although academic integration as a strategy is not specifically mentioned, one can conclude that its introduction would be favorably considered in UoTs in South Africa.

3.8.2 Librarian/ Faculty Collaboration

This study places particular emphasis on subject librarian/ academic collaboration as a possible strategy for the provision of an enriched and unique learning experience in UoTs in South Africa.

As noted above, authors Rockman (2002a; 2002b), Brophy (2007a; 2007b), and Gilchrist (2007) assert that academic librarians have a long and rich tradition of collaborating with discipline-based faculty members to advance the mission and goals of the library. Included in this tradition is information literacy, considered by the profession as a foundation skill for academic success and a key component of independent lifelong learning. With the rise of the General Educational Reform Movement (GERM) internationally on many campuses in the last decade, libraries have been able to move beyond course-integrated library instruction into a formal planning for General Education programmes. As a result, this has revealed the value of:

- strategic alliances, developed over time, to establish information literacy as a foundation for student and lifelong learning;
- strong partnerships within a multi-campus higher education system to promote and advance information literacy efforts; and
- assessment as a key component of outcomes-based information literacy activities.

There is, however, limited evidence of GERM concepts being adopted in South Africa, although some of the components, such as strategic alliances, strong partnerships and an interest in assessable elements of information literacy are being pursued. Mbambo (2006: 178) comments that library subject specialization models with close faculty/library collaboration have a positive impact on student learning and that

collaborative teaching and co-operation between faculty and libraries enhance student learning. DUT has initiated the General Education Module Development in 2012 in helping build a holistic approach to knowledge and instil critical thinking in students. The researcher serves as a member of the DUT General Education Task Team in DUT for library integration in the academic programmes. An intentional collaborative approach to learning, involving an inquiry ethic is valued in this module due for implementation in 2015 for all undergraduates in DUT.

While this model may seem to bring the library as a learning centre closer into the academic ambit building upon process based or constructivist theories for academic success, it is clearly premature to predict this outcome at this stage in DUT.

Mbambo (2006: 179) cautions about the emphasis placed on the information retrieval training role of the librarian at the expense of the need to train users in critical thinking. Critical users of the library would be active contributors to knowledge, not merely consumers. Subject Librarians are well positioned and trained to encourage critical thinking. The idea of encouraging critical thinking was a cornerstone of the development of information literacy skills. Information literacy is often embedded in the general curriculum with the opportunity for the subject librarian to play a proactive role in the teaching and learning programme.

Brown (2006) suggests the need for a commensurate changed role of the subject librarian with their focus on the total student learning experience in the university, by fostering independent learning skills, becoming a central part of the subject specialist librarian's working life. Role boundaries are blurring, as subject librarians start working more closely with academics involving mutual up-skilling and support, and interventions promoting literacies. Championing for professional accreditation of subject librarian programmes is still being explored in South Africa. One of the key

obstacles to advocacy is the lack of reliable, consistent and measurable effects arising from such programmes.

Furthermore “changes in technology influenced the content of bibliographic instruction resulting in more instruction on how to use technology for information retrieval” (Mbambo, 2006: 178-179). Explicit in this view is a concentration on technology, whereas academic integration would move the focus on to evaluation and use of information - away from technology as a focus to technology use as an effective tool. This would also result in a lessening of the intermediation role for subject librarians and a move more towards an apomediative role, as defined by Kwanya, Stilwell and Underwood (2012). The essential difference is that an intermediary intervenes between the information seeker and the source, whereas an apomediator ‘stands beside’ guides and advises from an expert perspective.

According to Rodwell (2001) subject specialists have a role to play in the disintermediated environment. Emergent in the literature is a view that not only is expertise required in the subject, but also breadth of knowledge and expertise on the dynamics of production, dissemination and storage of information in a subject. As argued throughout the prevalence of digital libraries and online resources demand ideally that librarians become more learner-centred. Subject librarians need to be conversant with Web-based teaching and learning tools, and be skilled in using the virtual learning environments such as BlackBoard, WebCT, and Moodle. Dale, Holland and Matthews (2006: 191) agree that “paradoxically, to introduce and develop successful electronic resources, subject librarians need to be good verbal communicators and fully integrated with academic as well as library networks”.

There is an allied task for libraries in the development of dynamic collections of electronic resources for individual university courses. Such collections will become quite essential in the future and may replace the traditional printed course packs (Cotta-Schonberg, 2005: 1), assuming that

the intellectual property issues mentioned earlier can be resolved. Academic literacies present another challenge for student success in higher education in South Africa.

3.8.3 Promoting Literacies

South African students generally lack academic literacies which is noted and discussed in this chapter as many students are underprepared for higher education. Within the construct of embedding academic literacies in the discipline, the role of the subject librarian in enhancing student learning is needed more than ever. Again here it is clear that it is becoming more important that librarians be part of multidisciplinary academic teams. South African libraries have taken steps to promote literacies over the past few years. Clearly, students and faculty can only succeed if they have the necessary skills and competencies required for higher education and lifelong learning.

One of the noticeable features of the debates on literacies over the last few decades has been the extent to which the subject has been addressed by the plethora of adjectives defined by: adult literacy; basic literacy; business literacy; children's literacy; computer literacy; emotional literacy; family literacy; financial literacy; functional literacy; health literacy; information literacy; information technology (IT) literacy; media literacy; numerical literacy; technological literacy; visual literacy; and workforce literacy. Perhaps, understandably, the overlap in definitions and the comparative lack of learning theory and lack of measurement has resulted in some scepticism.

3.8.4 Information Literacy

This study is set within the backdrop of the need for research advocated by authors such as Farber (1999), Somi and De Jager (2005), and Whitehurst (2010) all of whom have claimed that it is the duty of libraries to equip students with information literacy skills.

To be considered information literate, learners must be critically aware of information and knowledge, be able to select and interrogate appropriate information resources, evaluate and apply information appropriately, undertake research and observe academic integrity (Neerputh, 2012: 257). Sharma states (2006: 129) that the mastery of information literacy skills prepares students to tackle research based tasks that they might undertake during their academic and professional careers.

De Jager, Nassimbeni and Underwood (2007), Hart and Lynn (2011), and Bruce (2012) describe information literacy as the overarching literacy essential for 21st century living. According to Bruce (2001: 107) “information literacy is conceivably the foundation for learning in our contemporary environment of continuous technological change and information literacy is generally seen as pivotal in the pursuit of lifelong learning”.

A good information literacy programme needs to include critical thinking skills, that is, it needs to equip students with skills that will enable them to critically evaluate the information that they retrieve.

According to Neerputh (2012: 261), the Association of College and Research Libraries (2000) identified the five competency standards for higher education that the information literate student should meet. These are to:

- determine the scope of information required;
- access the required information effectively and efficiently;
- evaluate critically the information and its sources and incorporate this new information into his or her existing knowledge base;
- use information effectively in his or her studies and work; and
- understand the economic, legal and social issues pertaining to the use of information, and to access and use information ethically and legally.

Tiemensma (2012: 158) describes one framework of information literacy, known as the Big Six model, developed by Eisenberg and Berkowitz in 1990. There are six stages, typical of the structures to be found in procedural models (as distinct from the process model approach pioneered by Carol Kuhlthau), which are:

- stage 1: Task definition (define the information problem; identify information needed to solve the information problem);
- stage 2:Information seeking strategies (Determine possible sources; select the best sources);
- stage 3: Location and access of information (locate sources-intellectually and physically; find information within sources);
- stage 4: Use of information (Engage: for example, read, view, extract relevant information from a source);
- stage 5: Synthesis (organize information from multiple sources; present the information); and
- stage 6: Evaluation (Judge the product and its effectiveness; judge the information problem solving process and its effectiveness).

The Council of Higher Education in South Africa (CHELSA) draft guideline (Esterhuisen and Kuhn, 2010) indicates that further impetus to formalize information literacy training has come from new requirements included in the South African Qualifications Framework (SAQA) which include generic literacy outcomes, known as critical cross field outcomes. These have provided impetus for librarians to develop information literacy programmes and embed them within South African academic modules. The problem, however, is a lack of a coordinated national framework for information literacy training.

Stoffberg and Blignaut (2008) conducted a study at the Tshwane University of Technology and proposed the content, format, assessment approaches and delivery mode of the information literacy training useful for all UoTs in South Africa. This is also outlined in the CHELSA guideline mentioned

above. This however remains a proposal for due consideration by universities in South Africa.

A collaborative model of embedding information literacy in the undergraduate programme is imperative in the student-centred paradigm envisaged. Pritchard (2011: 463) claimed that teaching academics generally are ill-prepared or unwilling to provide intentional support in their courses. Librarians are uniquely qualified to help by faculty-librarian collaboration as a co-designer of the curriculum and a member of the teaching team, designed to promote the development of information and academic literacies.

As noted above the research findings by Dale, Holland and Matthews (2006) and Derakshan and Singh (2011) concluded that four themes (comprising: collaboration; information literacy pedagogy; information literacy skills; and knowledge) are needed to embed information literacy effectively in teaching and learning in the university.

Fain (2011: 118) noted that assessment is a major portion of the work of instructional librarians. Librarians must use the knowledge gained through assessment to improve teaching and learning. Reviewing data of student performance can assist librarians in evaluating the effectiveness of the programmes, in providing directions for improvement of the programmes. Furthermore, Oakleaf (2010: 1); Tiemensma (2012: 165) and Neerputh (2012: 264) find that subject librarians throughout higher education struggle to demonstrate the impact of information literacy on student learning and that a conceptual framework to guide IL assessment efforts in UoTs is needed. The toolkit developed by the Institute of Development Studies et al., (2013) represents a major contribution towards the development of suitable measures and an approach to their application.

According to Fain (2011: 110) to evaluate student learning outcomes many libraries have relied upon in-house methods of assessment and evaluation. Before choosing an assessment tool, librarians are expected to have

answered the relevant guiding questions about conducting assessment and to have considered the underlying needs and overall costs of the assessment, as well as the implications for the assessment results for UoTs. Options for assessment can include rubrics, surveys, interviews, portfolios, in-class evaluations and tests. Literature on assessment often focusses on test instruments as they have been shown to be a valid assessment tool. Subject librarians can use these assessment tools to evaluate their interventions and promote teaching and learning.

3.9 Publishing and Scholarship

Cotta-Schonberg (2005: 5) comments that learners are happy with e-journals and they should be maintained with an e-publishing system. A growing number of universities are realizing the advantages of the collaboration model in publishing scholarly e-journals and are not handing over their research product to commercial publishers. Academic publishing may eventually develop into a process of storing texts on the universities' own servers (open archives) and making them available through branded and quality-assured interfaces, though still assuming the format and the functions of traditional journals. In the long run, this trend presents a relief for the financial situation of libraries since it will alleviate some of the financial burden represented by the cost of periodicals. Moreover, it offers an opportunity for libraries to provide a new support service for universities in the form of open archives. Cotta-Schonberg (2005: 3) stated that "some libraries may even become central players in the academic publishing process itself, but it is doubtful that this will be a general trend. Academics will prefer to perform that task themselves".

Subject librarians have a new role to play in promoting publishing or research outputs via university repositories and open access scholarship. Brophy (2007a: 521) stated that "current efforts to break the publisher stranglehold on scholarly communication offer a huge opportunity for librarians, provided that they can achieve credibility with the authors". The key point to achievement of the transition depends critically on the ability

to communicate with academics on their terms and in their language

Brophy (2007b: 21-22) defined the institutional repository in 2003, as a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It is essentially an organizational commitment to the stewardship of these digital materials, including long-term preservation where appropriate, as well as organization and access or distribution. Stewardship of information resources is the traditional role of the library, but it needs to be secured in the new environment by demonstrating understanding of the authors' perspectives and concerns and, yet again, their language and contribution to open access. At present, most academics seem to regard institutional repositories as a preservation medium. The challenge is to accept them as part of the mainstream of scholarly communication, which poses another critical point for library academic integration.

3.10 Integrated Environments

Academic libraries must optimize the opportunities presented by integrated knowledge environments. There is a danger that the Virtual Learning Environment (VLE), the Virtual Research Environment (VRE), the institutional repository and the rest will turn into independent silos if the library is not proactive in integrating institutional repositories (IRs) in teaching, learning and research.

Brophy (2007a: 521) claims that it is "worth bearing in mind that the university mandates the use of VLE, making the library an interface of choice. A useful example of this is current work on DSpace integration with Sakai, which is widely used for online collaboration and virtual learning/research environments". The use of DSpace and other Open Access systems poses new avenues for integrating the library services in enhancing teaching, learning and research in the university, as is evident

by a number of research teams, including the Centre for Applied Research in Educational Technologies (CARET) at the University of Cambridge.

3.10.1 Curating the Data

Academic libraries are well-placed for curating data in helping faculty and students with the provision of rich research data. Their prime responsibility rests with ensuring that library clientele gain end-user support and assistance from information vendors and database houses. Brophy (2007a: 522) stated that:

> while repositories are fundamentally about publishing, the preservation function remains critical. . . . Most areas of eScience are dependent on the processing of huge quantities of data and the identification of complex relationships between datasets which emerge during data collection and use -- in other words curation occupies the whole data life cycle. In addition, where in the past the requirement was for long term preservation of static objects, the new requirement was for integration of curation into the workflow, for example, to capture the provenance of a particular dataset (where it came from, how it was collected, how reliable it is and so on) and to handle dynamic content. . . . Similarly, the advent of eScience is a reflection of digital data curation's importance to science more widely . . . . Researchers across a wide range of domains are finding themselves faced with new and challenging responsibilities for curating digital data.

The above quotation outlines the magnitude of challenges in the domain of data curation: it can also be suggested that the subject librarian can assist with the task of data curation with effective integration for curricula and research initiatives in UoTs in South Africa.

3.11 Summary

The research context of this study is shaped by the convergence and collaboration of the library and academics, information and technology which enhances teaching, learning and research. New realities in higher education present an opportunity for the subject librarian to play an integrated role in the teaching, learning and research programmes in the university. The drivers of an academic library were presented to highlight

the value of academic integration for enhanced teaching and learning in the university.

Professional challenges of subject librarians, such as diverse learner experiences and abilities; formidable educational and technological changes; the era of user service experience and needs; flexible modes of learning and teaching; Net-generation of learners and information literacy skills are outlined in this chapter.

Information literacy is a vital ability for the modern information intensive world, enabling personal, economic, social and cultural development as well as ensuring graduate competence for the world of work. Research conducted in this study aims to engender new learning paradigms for subject librarians in promoting lifelong learning in UoTs in South Africa.

A good concluding remark for this aspect of the research is made by Mutula (2007: 396) who advocates for information professionals in Africa to re-engineer the library in order to remain relevant. It is desirable to research how information access and use can be brought to bear on the attainment of Millennium Development Goals (MDGs), bridge the digital divide and build an information rich society.

The researcher envisages an information-rich UoT library, enabling high technology student-centred impact for promoting learning and academic success in South Africa. Effective academic integration programmes help to bridge the gap between student under-preparedness and graduate success. The researcher believes that the most tangible evidence of academic integration might be the existence of programmes such as information literacy that were linked to the teaching and learning processes. Information literacy is the most frequently discussed exemplar of approaches in academic integration; in fact, some may consider it as a proxy for academic integration.

The literature reviewed revealed an opportunity for this study to contribute to an understanding of what is needed to lead instructional change in UoTs in South Africa.

Chapter Four presents the research methodology used in this study.

CHAPTER FOUR - RESEARCH METHODOLOGY

4.1 Introduction

Leedy (2010: 93) states that to extract meaning from the data is called research methodology. For this reason, the methodology used for ascertaining what academic integration practices are prevalent in UoT libraries in South Africa took into account the data to be collected for the resolution of the aim and objectives of this study.

This chapter describes the research design and methodology employed in the study. The design of the data collection instrument, study population, sample frame, research ethics selected by the researcher to conduct an online survey and response rates are also discussed.

4.2 Exploratory Research

Chapter Three indicated that there is little literature about library initiatives in academic integration specific to UoT libraries in South Africa. Subsequent searches post-survey have failed to reveal any new studies on academic integration involving libraries in South Africa. This study was therefore based within an exploratory research context since: there is no existing study on academic integration in UoTs in South Africa; and the concept of the University of Technology is relatively new in higher education in South Africa with different practices and varying levels of institutional management and administration. The nature of the exploratory research design therefore examined academic integration practices across all six UoTs in an holistic manner.

The researcher believes that the most tangible evidence of academic integration might be the existence of programmes such as information literacy that were linked to the teaching and learning processes. Information literacy is the most frequently discussed exemplar of approaches in academic integration; in fact, some may consider it as a proxy for academic integration. Data were thus collected on programmes

that exist across all six UoTs in South Africa with the aim of contributing literature to the field, and charting a path for future research.

As this study was undertaken to understand and to investigate, academic practices prevalent in UoTs, a mixed methods approach was adopted, that is, quantitative and qualitative research methods were employed in the study. The researcher chose this methodology because of the advantages mixed methods offer to exploring the aims and objectives of the study.

4.2.1 Mixed Methods Approach

A mixed method approach incorporates both qualitative and quantitative elements in such a way that the information becomes meaningful and adds value to the study. Using the qualitative approach, evaluators collect in-depth information to answer some questions and numerical information for other questions. The advantage of a mixed methods approach is that it balances efficient data collection and analysis with data that provides context (ACET, 2013).

4.3 Qualitative Research

According to Selematsela and Du Toit (2007: 26), the qualitative approach to research is uniquely suited to uncovering the unexpected and exploring new avenues.

Qualitative methods are most suited to the theoretical framework articulated in Chapter Two. Quantitative research techniques do not apply holistically to exploring the nature of academic integration practices which are best gained from subject librarian responses and perceptions. Some questions however were quantitative to gauge the levels of academic integration, such as ‘yes or no’ questions which helped the researcher to probe the various academic integration practices prevalent in UoTs in South Africa.

The Gilchrist study (2007) seems to be the most pertinent and recent study conducted abroad which explores the avenues of academic integration practices in libraries in a qualitative methodology. Qualitative methods in

library and information studies can be especially useful in exploratory research to gather data about user behavior and information needs (Powell, 1997: 59). In so doing, this study explores new avenues for UoT libraries by unveiling the various types of embedded library services in teaching, learning and research.

4.4 Study Population

As discussed in Chapter One (1.2.1), the subject librarian's core job function is to liaise with academics for enhancing teaching and learning in the faculty. This is closely connected to the subjects or programmes that subject librarians cover in promoting the library to enhance academic success. This frequently involves meetings with academics and attending departmental or Faculty board meetings and, ideally, direct involvement in curricula and research programmes, as well as providing library resources and services to support such programmes in the university. Consequently, a decision was taken by the researcher that the subject librarians would be the main group directly involved in the study.

The population for this study therefore consisted of subject librarians at UoT libraries in South Africa. The study population comprised all subject librarians employed across the six UoTs in South Africa.

After checking directories and web sites the researcher identified sixty-eight subject librarians, a small number and, obviously, a fraction of the total professional staff of all the UoT libraries. This number was checked several times because it seemed so low: the response from the UoT Directors was that some subject librarian posts were vacant and although the staffing establishment included such posts, they presently had no incumbents. Having considered this, it was decided not to proceed with selecting a sample but, rather to include all sixty-eight in the survey. Thus, the study constituted a census and not a sample survey; the results are not then subject to statistical error but represent potentially absolute

statements arising from the respondents, rather similar to the nature of a case study.

An additional check was conducted to confirm that the population to be included shared similar characteristics in job description and key performance areas across the six UoTs. There were no significant variations other than differences in title designations which are outlined in 4.4.3 below. Specific subject librarian job designation titles are not considered further in the research because the researcher did not consider the wording of the job title to be a significant differentiating factor for the purposes of this study. The table below indicates the composition of the study population at each institution:

Institution		***No. of Subject Librarians***
1.	Cape Peninsula University of Technology	18
2.	Central University of Technology	4
3.	Durban University of Technology	15
4.	Mangosuthu University of Technology	4
5.	Tshwane University of Technology	21
6.	Vaal University of Technology	6
	Total	68

4.4.1 Characteristics of the Population

Gill and Johnson (2010: 127) affirm that a search of the literature or, in the case of research into one organization, employer databases should prove helpful and will aid in the task of identifying the characteristics of the research population.

The researcher reviewed the target population as listed on each institutional website. Where there was no clarity as to the status of professional librarians, follow-up telephone calls were made or e-mails were sent to the Library Directors / Deputy Directors for job descriptions and contact details of subject librarians.

The study population is characterized by one stratum of professional librarians engaged in client services in academic libraries, designated as subject librarians. An additional check was conducted to confirm that the population to be included shared similar characteristics in job description and key performance areas across the six UoTs.

There were no significant variations other than differences in title designations which are outlined in 4.4.3 below. The check previously mentioned had confirmed that the name of the post might vary but was usually connoted with a similar range of duties and responsibilities at each institution.

Thus, the known characteristics of the study population are:

- professional status – Subject Librarian / Faculty Librarian / Postgraduate Librarian or Training Librarians (titles of the post varies per institution) employed in all six UoT libraries in South Africa;
- librarians engaged in teaching, learning and research by virtue of their core job function and duties; and
- librarians who collaborate with academics or students for the purpose of enhancing teaching and learning in the university.

The researcher confirmed the veracity of the roles and responsibilities of each respondent by comparison with the institutional library website data.

4.5 Data Collection Instrument

The design of the data collection instrument is outlined in light of the qualitative methods employed to explore research practice in the study. Babbie (2010: 254) asserts that surveys may be used for descriptive, explanatory and exploratory purposes. They are chiefly used in studies that have individual people as the 'units of analysis'. Individual subject librarians served as respondents in this study. Babbie professes that survey research is the best method available to the social researcher who

is interested in collecting original data for describing a population too large to observe directly.

Although the number of subject librarians in UoT libraries is quite small, the distribution of the institutions is however wide as it includes satellite and remote campuses across South Africa. Direct observation was thus precluded. Lack of time and funds for travelling also made it imperative to rely upon indirect means of gathering data.

Insights gleaned from the literature about prevalent academic integration practices in academic libraries, both nationally and internationally were used to enrich the survey instrument and the subsequent analysis and interpretation of the data presented in the study.

Given the research aims and objectives, the researcher used the SurveyMonkey instrument to collect data from subject librarians employed across all six UoTs in South Africa.

Data was collated on SurveyMonkey in accordance with the thematic academic integration programmes identified in the literature review, namely: information literacy; academic liaisons; programme interventions; training for research, Open Access and Repositories and WIL. Data was collected from all six libraries dispersed across nine provinces in South Africa as follows:

- Cape Peninsula University of Technology - four campuses in Cape Town; one in Wellington, Western Cape;
- Central University of Technology, Free State - campuses in Bloemfontein Welkom, Free State;
- Durban University of Technology - four campuses in Durban, and two in Pietermaritzburg, KwaZulu-Natal;
- Mangosuthu University of Technology - one campus in Umlazi, KwaZulu-Natal;
- Tshwane University of Technology - one campus each in eMalahleni, Ga-Rankuwa, Nelspruit, and Polokwane; two campuses

in Soshanguve; three campuses in Tshwane, Gauteng, Limpopo, Mpumalanga, North West; and

- Vaal University of Technology - main campus in Vanderbijlpark; delivery sites in Ekurhuleni, Klerksdorp, Secunda, Upington Gauteng; Mpumalanga; and Northern Cape.

4.5.1 Administration of the Survey

The survey was distributed to the study population identified above. There was an uneven distribution and unequal size of the target population per institution. While one institution had fifteen subject librarians, another had only four. It must be remembered that this does not necessarily represent the staffing establishment for this grade of post but rather, the number of subject librarians. As noted above, several institutions also had vacant posts for subject librarians.

4.6 Web-based Survey

The choice of methodology, advantages and disadvantages of the use of an online survey to distribute the study questionnaire and data collection methodologies are examined further below.

The researcher used SurveyMonkey, a web-based (online) survey tool to collect data because of convenience and ease of use for both the researcher and respondents across all six UoTs. Some of the reasons for the choice of the online survey are articulated by David and Sutton (2011). According to David and Sutton (2011: 309-10) the use of the web-based survey application offers the researcher with little technical knowledge:

> the ability to build complex surveys, to develop questions and response formats that can be visually more interesting to the respondent. It also allows for complex routing of questions where only relevant questions are displayed onscreen which reduces respondent burden; the inclusion of a progression bar provides visual acknowledgment; quantitative data can be downloaded into a software analysis packages such as SPSS, MS Excel or MS Access.

The researcher obtained permission from the DUT Library Director to use the SurveyMonkey application software tool, which is a library-subscribed resource.

4.6.1 Advantages of an Online Survey

According to Fink (2009: 9) and Sue and Ritter (2012: 10-13) the benefits of the self- administered online surveys such as SurveyMonkey are:

- access that is potentially worldwide immediately (in 'real time');
- the possibility of building-in links that explain unfamiliar words and help with difficult questions, including ease of use;
- the ease of sending reminders to respondents;
- easier management of data because responses can be downloaded to a spreadsheet, data analysis package or database;
- the ability to make complex skip patterns of questions and to keep the path invisible to the respondent; and
- economy of setup and usage costs.

4.6.2 Disadvantages of an Online Survey

The disadvantages, according to authors Fink (2009: 9) and Sue and Ritter (2012) relate to:

- the need for reliable access to the internet for both the researcher and potential respondents;
- questionnaires do not always look the same in different browsers and on different monitors;
- respondents may have different levels of computer expertise and familiarity with a browser;
- the sample in an online survey is not really a random sample and there is no method for selecting random samples from general e-mail addresses;
- respondents can quit or abandon the survey at any time.

The researcher considered the advantages and disadvantages and compared them with the use of e-mail, telephone and post as a means of contacting the population identified in the survey. E-mail precluded the use of anything other than a linear survey, with no possibility of branching or the addition of explanations, and also carried the disadvantage that responding to a set questionnaire could be difficult because of vagaries in the way in which e-mail systems configure messages and because some institutional e-mail systems are set to reject e-mails containing unauthorized attachments. Telephone engendered the difficulty of respondents not necessarily being able to accept a call, the expense involved and difficulties with selection of a convenient time. The use of the postal system was rejected because it is considered unreliable. The use of the web-based approach was clearly the best choice.

The SurveyMonkey tool is dependent on the use of e-mail addresses. The statement by Fink (2009: 9) that "there is no method for selecting random samples from general e- mail addresses" is not applicable because there is no criterion of sampling required in this study. Respondents' e-mail addresses posed a challenge for anonymity of the survey. The study required non-anonymity for ensuring the accuracy of data collection. In compliance with the research ethics, the researcher therefore assured potential participants in the letter of intent that no respondent names will be used in the write-up of this thesis. Respondent identification was kept confidential. Only the researcher had access to the completed questionnaires.

4.7 Design of the Questionnaire

A self-administered online survey using SurveyMonkey was promulgated during the period June - December 2012. The survey questions were designed by the identification of the academic integration practices described in the literature and listed in the introduction above. To elicit accurate data, one has to take special note of the design of questions,

response choices, sampling methods, response rate and data analysis (Fink, 2009: 11; Sue and Ritter, 2012: 10-13).

According to Dillman (2000: 32) the "goal of writing a survey question for self - administration is to develop a query that every potential respondent will interpret in the same way, be able to respond accurately, and be willing to answer". The researcher considered and used the guidelines of Babbie (2010: 256-276) outlined as follows in composing the research questionnaire:

- choose appropriate question forms in open-ended or closed-ended questions;
- make items clear;
- avoid double-barrelled questions;
- ensure that respondents are competent and willing to answer;
- ensure that questions are relevant;
- avoid negative or biased items and terms; and
- short items are best.

The researcher examined the core functions and duties of a subject librarian profile and the diverse user population that subject librarians serve, such as: undergraduates, postgraduates, international students, researchers and academics. In light of this a questionnaire was designed to elicit primary data across all six UoT institutions in South Africa, with a specific focus on what was offered by each institution to their population in promoting teaching and learning in the university. The survey interrogated library academic integration strategies/programmes via open-ended and closed-ended, as well as multiple choice, questions.

4.7.1 Structure of the Questionnaire

The structure of the questionnaire considered the research aim and objectives. Considering this it was evident that, at several points, answers would be limited to a small range: for example, whether the University offers a particular service or has particular facilities for academic integration. The researcher outlined a range of well-defined possible

answers which the respondent could relate to in order to get good feedback. Other aspects of the questionnaire could not be contained in this way and would require respondents to comment and provide a fuller explanation.

Consequently, a range of question types is necessary to meet the objectives of the study and the nature of each type of information required. Bless and Higson-Smith (1995: 122) distinguished between two types of questions, namely open and closed questions.

4.7.2 Closed-Questions (Forced Choice)

The advantages of closed-questions, or limited option questions, included that they can be pre-coded and responses can be easily tabulated, saving time and money. These questions are less time-consuming for the respondent to complete (Newell, 1993: 101). The disadvantages of closed-questions are that they force the respondent to choose between answers provided by the researcher. To overcome this limitation, a general response category can be added, allowing the respondent to amplify a fixed-choice answer or explain some other variant.

Based upon the analysis of the literature and with the research question in mind, the researcher drafted closed-questions in advance with a wide range of foreseeable answers on academic integration in UoTs. Where it was considered necessary forced-choice questions included a non-categorized response opportunity.

4.7.3 Open-Ended Questions

The researcher built in open-ended questions to enable subject librarians to give their views or meaningful data relevant to the topic. Open-ended questions were used to gauge the range of other options on academic integration practices available in UoTs which the researcher could not predict. Newell (1993: 103) pointed out the drawbacks of open-questions to respondents and researchers. The former are required to spend time considering and recording an answer and the latter might have to deal with responses that are ambiguous, wide-ranging and difficult to categorize, as

well as being time-consuming to code and analyze. However, open-ended questions gave subject librarians the opportunity to express their own opinions on the topic.

4.7.4 Factual Questions

Factual questions covered the administrative data of the respondent's email address, employing institution, number of years of experience and professional status. Other characteristics such as gender, level of education and ethnic origin were considered as irrelevant in the study.

4.7.5 Layout

The questionnaire was structured into subthemes of academic integration strategies/norms and practices in higher education as identified in the literature. Thus open-ended questions were posed on:

- library intervention projects/ practices;
- work integrated (WIL) programmes;
- curriculum planning and design;
- challenges of information literacy;
- successes of information literacy;
- digital or open access initiatives;
- postgraduate programmes; and
- the challenge of intervention programmes.

The questions were utilized to explore these thematic issues in light of the objectives of the research.

4.7.6 Pilot Study

The survey instrument was subjected to a pilot test to ascertain whether it was clear, unambiguous and capable of soliciting responses that could be analyzed. The pilot study was administered to five DUT subject librarians and the ex-director of the DUT Library. As a result of the pilot test, amendments were made to the wording, sequence and layout of the survey instrument before its use for the full survey.

4.8 Research Ethics

Ethical considerations apply to each stage of the research process, regardless of the methodologies adopted and applied. The most prominent principles in research ethics, according to Silverman (2010: 153-154) are:

- voluntary participation and the right to withdraw;
- the protection of the research participants;
- the assessment of potential benefits and risks to participants;
- obtaining informed consent; and
- doing no harm.

It is a requirement when conducting research under the aegis of DUT that the proposal is scanned for ethical issues. Every proposal, regardless of the topic, instrument to be used, or groups to be studied has to demonstrate that the DUT guidelines, which are based on those of the Human Sciences Research Council (HSRC), have been followed and for it to be approved by the relevant Faculty Research Ethics Committee.

Moreover, most South African academic institutions seek to protect staff and students from unauthorized approaches by researchers from outside the institution. It was necessary for the researcher to obtain clearance from the Research Ethics Committees in all six UoTs participating in the study. Obtaining permission from the committees required evidence that the researcher has applied moral principles which prevent harm to the research respondents, to promote the good, to be respectful and to be fair (Leedy, 2010: 101).

The researcher made applications to each institution through the Office of the Deputy Vice-Chancellors / Research Directors for permission to conduct the research survey.

The applications were supported by the following documents:

- letter of intent and request for permission to conduct the research (Appendix 1);
- the research proposal;

- a text copy of the questionnaire (Appendix 2); and
- approval and confirmation to conduct research from the DUT Institutional Research Ethics Committee (Appendix 3).

The letter of intent was drawn up to inform the research subjects more fully about the purpose, methods and possible intended uses of the research and what participation in the research might imply for academic libraries and the library profession in South Africa (Silverman, 2010: 155).

The researcher gave due attention in the covering letter to the need to draw upon respondent willingness to participate in the study. The importance of a good cover letter is outlined by Salkind (2003: 143 -144) who states that a sense of authority can be established and the importance of the project be conveyed by it.

The researcher also gave the potential respondents a live link: (https://www.surveymonkey.com/s/DTechresearch) in the letter of intent to allow them to access and participate in the survey.

According to Markham (2011) the internet is often chosen as a method of collecting information because of the ease with which researchers can gain access to groups of participants in the field. The ethics associated with internet research are complicated because researchers come from all disciplines, and norms for research practices are hotly contested (Silverman, 2010: 122). The researcher provided assurances to potential respondents that they were free to choose not to respond, to withdraw at any point during the survey and that any answers would be treated as confidential to the researcher, being summarized in the thesis in ways that would make it impossible to deduce the identity of any respondent.

Turning to the other ethical consideration of making the results available, the researcher will upload the final thesis on the DUT institutional repository. It is envisaged that no embargoes will be placed on the study in

the best interests of widening access to this research, which promotes teaching, learning and research in higher education.

4.8.1 Validity and reliability

The validity of a study refers to its ability to measure what it sets out to measure (Newell, 1993: 99); reliability refers to how consistent the measurement of a factor is across similar respondents or across repetitions of the survey.

Since the present survey was of a single group, with no expectation of repetition, the reliability of the instrument across repetitions cannot be established, except in the special case of comparing the responses from the pilot study with those of the main study. This was done, albeit it in a cursory fashion, and no noteworthy differences in the types of response were detected. However, this cannot be regarded as a full check on reliability.

The validity of the present study derives from the composition of the respondent group, the type of questions employed and how they are worded. The principal consideration was whether members of the respondent group had sufficient knowledge to be able to respond to the questions - to understand them. Since they are all designated as subject librarians or the equivalent, and have been appointed on consideration of qualifications and experience, it was considered reasonable to assume that they had the requisite knowledge to offer an informed view.

Likewise, the vocabulary chosen for the questions reflected terminology in use in the UoT sector and found in the literature. Again, it was judged reasonable to expect that respondents would understand the questions. Care was taken to ensure that the instructions for completing the survey were clear and unambiguous. This was tested during the pilot phase and changes made where the wording of an instruction or question was considered unclear.

A factor that should be taken into account in this study is sensitivity and bias which leads to subject librarians over-reporting what they perceive as desirable strategies or programmes for academic integration in which they do not engage. To counteract this bias, the researcher followed up on each institutional academic integration programme offered by the library and tested the claims against what was included in the formal descriptions of the programmes. This required a more in-depth reading of the content data on academic integration practices emergent in UoT libraries and re-reading of the data prior to coding to ascertain validity of the study. It is entirely possible however, that what is formally recorded in the programme descriptions is a poor or misleading representation of what is actually accomplished. To some degree, the interviews planned with the directors of each UoT library could have provided a degree of triangulation but, for reasons already outlined above, these could not be completed in a systematic fashion, so this matter cannot be completely validated.

Silverman (2010: 155) stated that "research participants must participate in a voluntary way, free from coercion. Consent has to be freely given for the research to be valid". This condition was guaranteed, as part of the process of securing ethical clearance. The imposition of a deadline for respondent participation was intended to assist the researcher to collate the responses as soon as possible.

4.9 Response Rate

SurveyMonkey revealed a response rate of n=42 completed questionnaires from a targeted total of N=68 indicating a response rate of 62%. Although participation in this study was voluntary, the researcher appealed to potential respondents via e-mail to undertake the survey.

The initial response rate was low: 30%. The researcher conducted a follow-up with each institution and made telephonic requests to each UoT Library Director for subject librarians to complete the survey. An appeal was also made to non-respondents with an extended due date. Follow-up

requests by the researcher boosted the response rate initially from thirty to forty-two respondents. The response rate increased to 62% as a result of the researcher conducting this vigorous follow-up with each institution.

4.9.1 Table showing the response rate per institution

UoT	*No. of SLs per Institution*	*Response no.*	*Response rate %*
CPUT	18	14	33.3
CUT	4	3	7.1
DUT	15	13	30.9
MUT	4	4	9.5
TUT	21	7	16.7
VUT	6	1	2.4
TOTAL	**68**	**42**	**100**

Forty-two subject librarians responded, with nine respondents failing to answer most of the questions. '"Skipping"' is recorded in the analysis of each question: a follow-up focus interview might have persuaded reluctant respondents to answer or to explain the reason for the absence of a reply. This was not done due to time and funding constraints which adversely affected the quality of responses. For the purpose of this study, these responses are reflected in the tables but excluded from the data analysis and interpretation in Chapter Five, because skipping of the questions denotes a non-response.

4.10 Data Analysis

Data collected is presented in the next chapter. An understanding of the range of academic integration practices was elicited from the data collected across all six UoTs. Data analysis was tabulated by SurveyMonkey and for subsequent analysis SPSS was used. According to Maree, "literature on qualitative data analysis documents a range of approaches, processes and procedures whereby researchers extract some form of explanation, understanding or interpretation from the qualitative

data collected or the people and situations that they are investigating" (2007: 99). It must be noted, also, that because not all those included did respond, there can be no expectation that the answers received are necessarily reflective of the range of opinions of the study population.

The researcher found that, during the analysis, this happened several times: that a set of answers provoked the need for further questions. It would have been desirable to go back to the respondents to conduct focus interviews around such points but lack of time and resources precluded this step. Had it been possible to conduct a more comprehensive set of interviews with the UoT Library Directors this, too, might have resolved some of the latent questions.

4.11 Summary

This chapter detailed the research design and methodology employed in this study to address the research objectives on academic integration practices in South African UoT libraries.

The researcher obtained permission to conduct this study from all six UoT Executive Academic Managers/ Research Offices in 2012. A covering letter with a direct link to the online survey was e-mailed to the sixty-eight subject librarians employed across all six UoTs. The research data collected via SurveyMonkey from subject librarians employed in UoTs provided a holistic view of the role of academic libraries in collaborating with faculty in fulfilling the core business of promoting teaching, learning and research in South African universities.

Chapter Five discusses the findings of the study. Based on this discussion, conclusions are drawn and recommendations are made by the researcher.

CHAPTER FIVE – DATA ANALYSIS AND INTERPRETATION

5.1 Introduction

The purpose of this chapter is to present, analyze and interpret the data collected by the researcher on academic integration in UoT Libraries in South Africa. The findings are chronicled against the Gilchrist study (2007) because of the relevance and the synergy, the researcher established in the literature review with regard to this study and library academic integration programmes that enhance teaching and learning.

The findings are analysed and interpreted by the researcher in accordance with the specific objectives that the study attempted to address on academic integration in UoT libraries in South Africa.

The following section presents the findings which are discussed under the broad themes as contained in the questionnaire pertinent to academic integration practice discussed in the literature reviewed. The themes discussed in Chapter Three are: involvement of the library in curricula planning and design; liaison and partnerships to enhance teaching and learning; learner-centred services and facilities; training programmes provided by the library, including WIL; and research programmes pertinent to enhancing teaching, learning and research in the university.
The introductory section of the questionnaire outlined the demographics of the population in the study.

5.2 Questionnaire Results

Twenty seven questions on academic integration were designed on SurveyMonkey. The findings of the data are presented according to the online survey questionnaire themes set out by the researcher. Each question with the sub-headings, tables or charts, and the analysis will follow sequentially in the body of this chapter.

5.3.1 Question 1- Biographical Data

The researcher requested biographical data consisting of institutional name and respondents' e-mail addresses. Details of subject librarians were available on the institutional webpage.

5.3.2 Question 2 - UoT Libraries represented in the Institutional Strategic Documentation

5.3.2.1 Table 2 - The importance of the Library

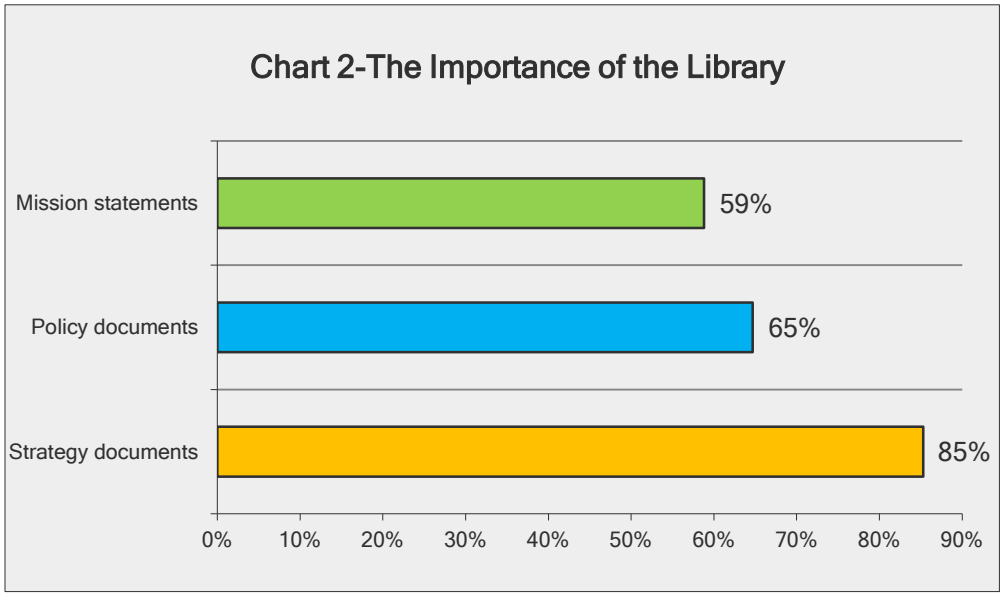
The table below shows the participants responses from N=68, 34 participants who answered this question. 8 respondents skipped the question.

Table 2- Does the University make explicit the importance of the Library in teaching, learning and research?

Answer Options	Response Percent	Response Count
Strategy documents	85%	29
Policy documents	65%	22
Mission statements	59%	20
Answered Question		34
Skipped Question		8

Representation of the library in the university strategy documents was high (85%). Strategic planning was considered crucial by the researcher for enhancing the role that the librarians play in teaching, learning and research.

5.3.2.2 Chart 2 - The strategic documents in which the library features in the institutional plan



29 respondents (85%) indicated that their library was represented in the institutional strategy documents. This suggested that the library is well represented in teaching and learning in the university. Studies by De Jager, Nassimbeni and Underwood, (2007); Brophy (2007b); Gilchrist (2007); Zhong (2007); OakLeaf (2010); Whitehurst (2010); Derakhshan and Singh (2011) support the prominence of the library in the institution and advocate the changing role of academic libraries as elaborated above.

The results indicate that 20 participants (59%) of UoT institutions included the library in their mission statements and 22 participants (65%) indicated that libraries were represented in policy documents. 60% of the respondents indicated library representation in all three institutional documents. This denotes significant representation of the library in strategic documents in UoTs in South Africa. Individual UoT documents stated as follows:

Central University of Technology (CUT) Library

The Central University of Technology Library vision is of an information environment for technological excellence and intellectual growth. The mission is to be an innovative partner in the technological university:

- through effective information management;
- by fostering self-paced learning and creating lifelong self-directed learners through the development of information skills; and
- to provide specialized and customized services to researchers.

Cape Peninsula University of Technology (CPUT) Library

The Library provides resources, information and information literacy programmes to support the learning and research programmes at the various campuses.

Durban University of Technology (DUT) Library

The DUT Mission is a student-centred library that enhances learning, teaching and research through the provision of information services, access policies and instruction programmes in line with the objectives of the institution.

The goals involve**:**

- embedding library activities within teaching, learning and research;
- developing information skills for life-long learning;
- providing equitable access to information facilities; and
- engaging in flexible delivery modes.

Mangosuthu University of Technology (MUT) Library

The mission statement of MUT library is “to provide access to information in support of teaching, learning, and research needs of students and staff of the University and the broader community” (Mangosuthu University of Technology, 2013).The Library vision is: “to be a hybrid library that will empower stakeholders to reach their potential in their learning, teaching and research needs”.

According to the MUT library website (2013) the library will: “be accessible and end-user friendly to our stakeholders; stimulate innovation and keep the library on the cutting-edge of technology; foster professionalism, teamwork, productivity, flexibility, and the on-going development of staff and students; enhance our interaction with the community and be reliable and financially sustainable”.

Tshwane University of Technology (TUT) Library

A vision or mission statement for TUT Library is not available on the institutional website. However each of the campuses or learning sites has a library which offers client services similar to the other five UoTs.

5.3.3 Question 3 - Ways in which UoT libraries evaluate subscribed information resources

5.3.3.1 Table 3 - Information Resources

The table reflects 33 responses with regard to collection development and evaluation methods used in UoT libraries to determine their relevance for teaching, learning and research in the institution. Total respondents were N=42, including 9 respondents who skipped questions.

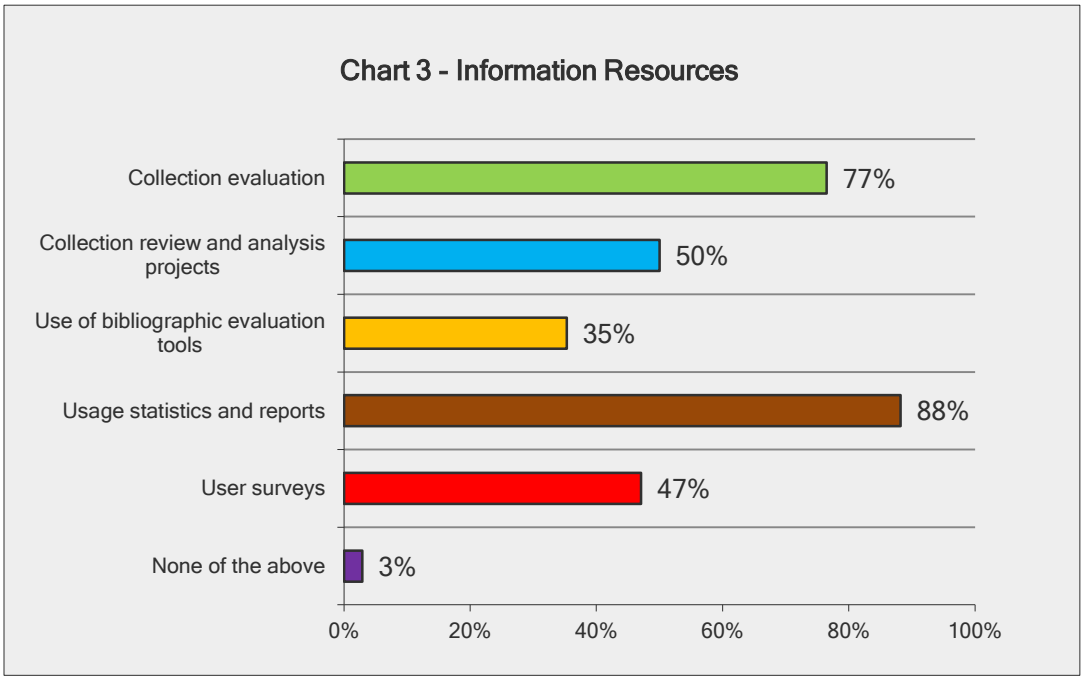
Table 3 - How does the Library ascertain that the subscribed information resources meet the needs of teaching, learning and research in the institution?

Answer Options	Response Percent	Response Count
Collection evaluation	75.8%	25
Collection review and analysis projects	51.5%	17
Use of bibliographic evaluation tools e.g. OCLC	36.4%	12
Usage statistics and reports	87.9%	29
User surveys	48.5%	16
None of the above	3.0%	1
Answered question		33
skipped question		9

5.3.3.2 Chart 3 - Information Resources

This chart depicts the ways in which UoT libraries attempted to evaluate the relevance

of information resources in the university.



Respondents n=42 rated usage statistics and collection development reports as the highest (87.9%) used by UoT libraries to ascertain the relevance of the library's resources in teaching, learning and research in the university. Library collection evaluation ranked second in importance (75.8%). Collection review and analysis projects rated 51.5%, with user surveys ranking lower (48.5%) in UoT libraries.

Libraries in the survey did not engage substantially in the use of bibliographic evaluation tools (36.4%) to determine the relevance of institutional subscriptions. Bibliographic evaluation tools provide modern technological trends to ascertain relevance and usage value. The researcher fell short of probing this question further to ascertain the reasons why UoT libraries did not engage in use of bibliographic evaluation tools.

While bibliographic evaluation tools are costly, they give an overall qualitative and quantitative value of institutional collections for teaching and learning needs which helps the library in promoting the "age of the user-experience" as well as contributing to student-centred learning in the university. Improving the methodologies employed in assessing the relevance of UoT library collections for teaching, learning and research

provides a good platform for libraries to start engaging in academic integration strategies in the university. The use of bibliographic management software tools are however ranked fairly low presumably due to cost or priority of service implications per institution.

According to Price and Fleming-May (2011: 197) the university is constantly faced with difficult decisions due to shrinking budgets and rising costs so that one cannot easily prove to stakeholders that libraries are successfully meeting university needs except when the true value and benefit to the user is in evidence. Statistical measures alone are not enough to prove that libraries are contributing to the educational mission in the university. The researcher also acknowledges that while usage statistics are important for generating data to ascertain information needs in UoT libraries, measuring the use of electronic resources is complex because usage takes place outside the physical library. Vendor-supplied data can exhibit fluctuations in usage and multiple logons for a number of reasons, including server issues.

5.3.4 Question 4 - Teaching, Learning and Research

5.3.4.1 Table 4 - Participant responses for academic intervention programmes in the university

n=42, 33 respondents answered this question.

Table 4 - Please give examples of academic intervention projects in which you promoted the use of the Library services or resources for:

Answer Options	Response Percent	Response Count
Teaching	93.9%	31
Learning	66.7%	22
Research	87.9%	29
Answered question		33
Skipped question		9

5.3.4.2 Chart 4 – Library Promotions

depicts 33 subject librarians' responses in library promotions, n=42.

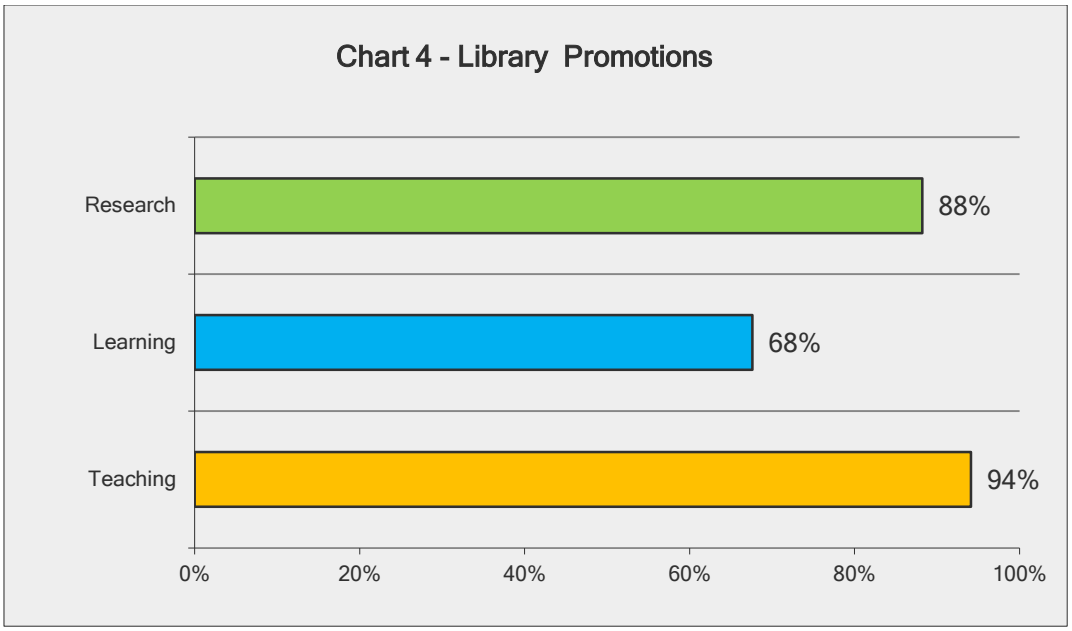


Chart 4 suggests that a high percentage of subject librarians employed in UoT Libraries were involved in teaching (93.9%), followed by a fairly high level of involvement in research programmes/services (87.9%). Learner based programmes scored lower, with a 66.7% response rate across all six UoT libraries in South Africa.

The chart indicates that UoT libraries are keen to engage in the teaching, learning and research needs in the university. The above 50% score underlines the shift in academic libraries' focus from serving as custodians of information resources to becoming proactive in teaching in the university.

University management and library management are therefore clearly placing a greater emphasis on the value of the library in teaching, learning and research. This is substantiated by Dale, Holland and Matthews (2006), Corrall and Keates (2011). Similarly the Association of College and Research Libraries Planning and Review Committee (2010) indicate that subject librarians are keen to enhance teaching, learning and research through partnerships with faculty in order to create an enabling environment for lifelong learning and student success. Library teaching programmes also contribute to student-centred learning in the university.

The findings indicate the significance given to incorporating the UoT library into the university teaching programmes as advocated in the literature, in particular the ACRL Research, Planning and Review Committee (2010) and the Gilchrist study (2007).

5.3.5 Question 5 - Library collaboration to promote teaching, learning and research

5.3.5.1 Table 5 – Library Collaboration

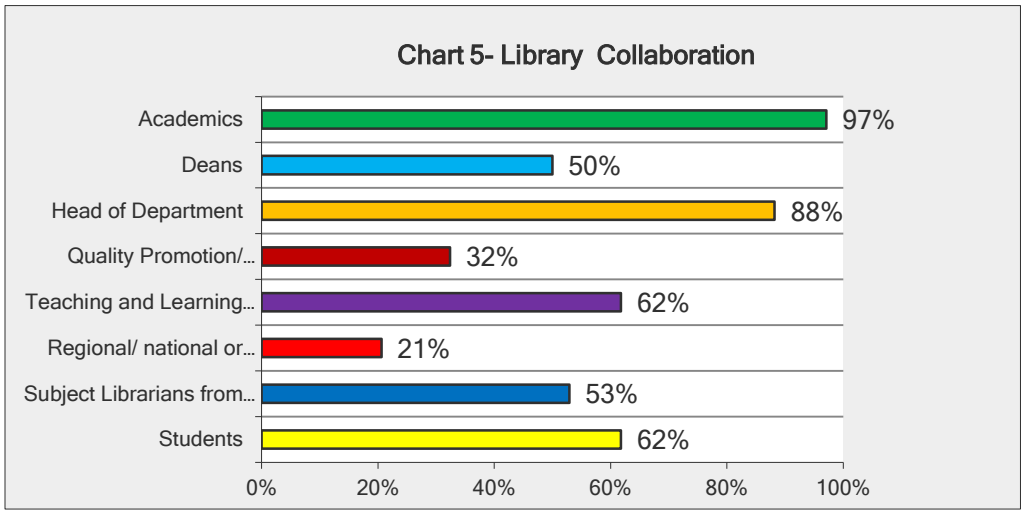
The table shows the responses for faculty collaboration.

Table 5 - Who do you collaborate with to promote teaching, learning and research in the University?		
Answer Options	**Response Percent**	**Response Count**
Academics	97.0%	32
Deans	48.5%	16
Heads of Department	87.9%	29
Quality Promotion/ Assurance Unit	30.3%	10
Teaching and Learning Center in the university	63.6%	21
Regional/ national or international teaching and learning partners	21.2%	7
Subject Librarians from other libraries	51.5%	17
Students	60.6%	20
Answered question		**33**
Skipped question		**9**

Subject librarians n=42 indicated that there was close collaboration with academics and a fair degree of involvement in teaching and learning centres. These findings suggest that there is an opportunity for UoT libraries to develop stronger integration with the faculty to enhance teaching and learning. Student-centred learning pedagogies, and the need for close partnership with faculty is supported by the Gilchrist study (2007: 79-80).

5.3.5.2 Chart 5 – Library Collaboration

The chart represents responses with regard to subject librarian and faculty partnerships designed to promote teaching, learning and research.



The survey n=42 revealed that most subject librarians enjoyed excellent collaboration with academics (97%), followed by strong interaction with Heads of Department (87.9%), and fairly strong connections to Teaching and Learning Centres (63.6%), and students (60.6%), respectively.

Collaboration between the subject librarians and the Deans recorded a lower response (48.5% response N=42). Collaboration with Quality Promotion/Assurance Departments recorded only 30.3% and national/ international partnerships a mere 21.2%.
The data show an average score on subject librarian liaisons with other subject librarians, be it local, national or international collaboration. This indicates that overall good models for academic integration are not yet available or recognized institutionally or nationally in South Africa, nor is there a culture of UoT Libraries linking with international universities to enhance their services via partnerships or exchange models. Developing quality library services will require detailed evaluation at each institution prior to any library collaboration with international institutions for benchmarking quality in the university.

5.3.6 Question 6 – Invitation by Faculty to participate in Curriculum Planning

5.3.6.1 Table 6 - Invitation by Faculty to participate in Curriculum Planning

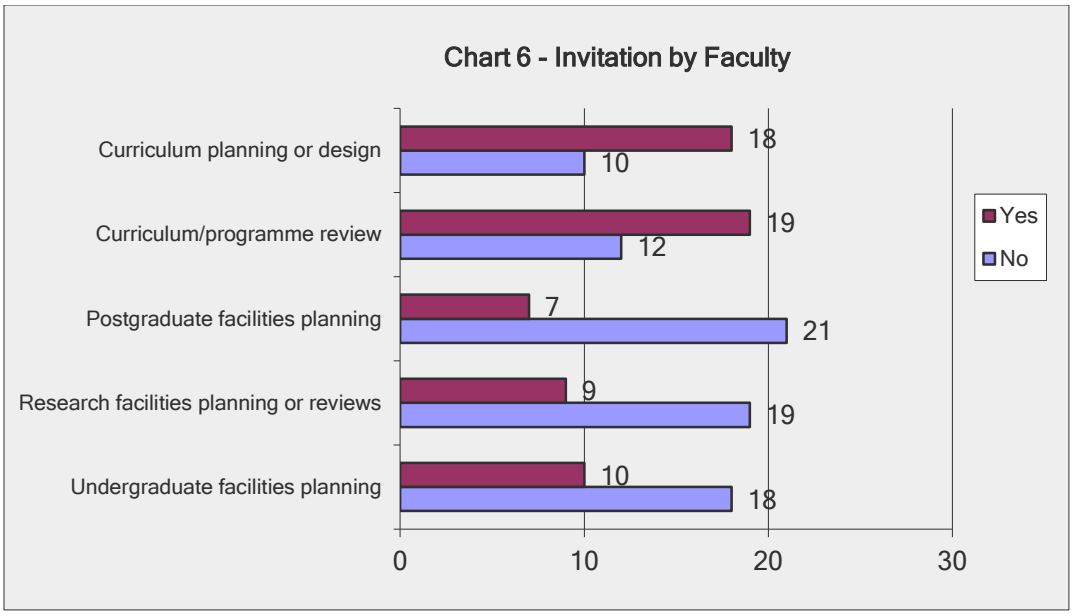
The table shows the extent to which subject librarians, n=42, were invited by faculty to participate in curriculum planning.

Table 6 - Were you invited by Faculty to participate in:			
Answer Options	**Yes**	**No**	**Response Count**
1. Curriculum planning or design	17	10	27
2. Curriculum/programme review	19	11	30
3. Postgraduate facilities planning	7	20	27
4. Research facilities planning or reviews	9	18	27
5. Undergraduate facilities planning	10	17	27
Other (please specify)			5
Answered question			**32**
Skipped question			**10**

The data show that good collaboration exists between the subject librarians and the faculty for curricula planning and programme reviews. This suggests that curricula planning or programme review teams recognize the importance of the library in promoting teaching and learning in the university. The data suggests that varying levels of academic integration are prevalent in UoT libraries, with the least collaboration indicated in planning or designing better teaching and learning facilities to embrace student-centred learning.

5.3.6.2 Chart 6 – Invitation by Faculty

This chart gives the responses to the subject librarian being invited by the faculty to become part of the teaching or learning programme planning or design in the university.



The responses revealed that subject librarians were involved most often in curriculum programme reviews (19 responses) followed by curricular planning or design (17 responses). Programme reviewers clearly recognize the importance of the library in promoting teaching, learning and research in the university. The provision of quality library resources and facilities support pedagogic theory and student-centred learning for academic success. The provision of quality library resources and facilities helps in addressing some of the challenges such as the need for blended learning; student under-preparedness; inadequate reading and writing skills; “Google Generation” student demands and “the age of the user-experience”, all of which are relevant to this study.

However, not much engagement (below 10) was noted in the inclusion of the library or subject librarians in the planning of facilities for undergraduates, postgraduates or researchers in the university. This indicates that the library as a learning space was not considered highly by university administrators.

5.3.7 Question 7 – Departments that invited the Library for Curricula Planning Meetings

5.3.7.1 Table 7 – Departments that invited the Library for Curricula Meetings

Teaching and Learning with Technology Department
Chiropractic and Somatology
Dental Services
Electrical, Chemical Engineering
Environmental Health
Humanities Faculty
Faculty of Management Sciences- Public Administration department.
Education Faculty
Postgraduate and Research Department
Industrial Engineering; Town & Regional Planning
Faculty of Engineering
Education Management
Consumer Science Department
Legal Services and Police Science Department
Management Sciences - HRM, Applied Law, Hospitality and Tourism and Economics
Management Faculty
Nursing Sciences

Thirty-three respondents (n=42) answered this question, indicating a range of academic and support departments illustrated above which included the library in their curricula meetings. The data suggest that the Library is well represented and participates in curriculum meetings across a wide variety of departments in the university.

5.3.8 Question 8 – Liaison Relationship with Academics

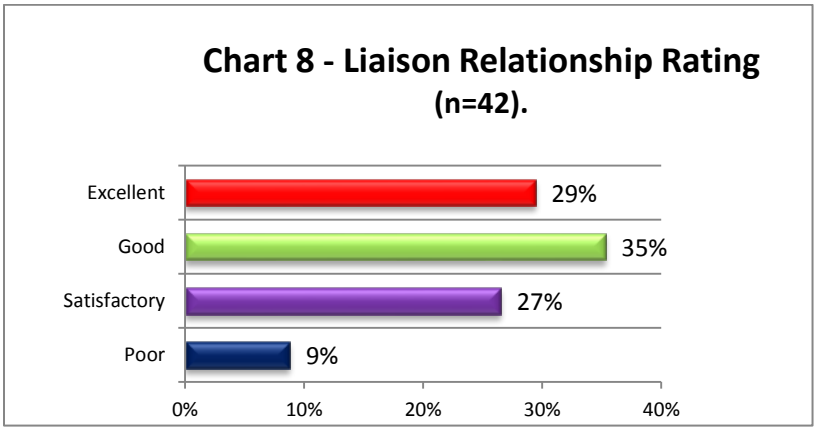
5.3.8.1 Table 8 - A summary of the Liaison Relationship with Academics

This table shows the various levels of effective liaison that subject librarians perceived themselves to have with academics.

Table 8 - How would you rate your liaison/relationship with academics engaged in Library intervention programs?		
Answer Options	**Response Percent**	**Response Count**
Poor	9.1%	3
Satisfactory	27.3%	9
Good	33.3%	11
Excellent	30.3%	10
Answered question		**33**
Skipped question		**9**

The findings revealed that good to excellent liaisons exist between subject librarians and academics across most of the institutions in the study. Improving library collaborations and fostering partnerships with academics are manifestations ascribed to in the Gilchrist study (2007) for best practices in leading instructional change in the university.

5.3.8.2 Chart 8 - UoT subject librarian liaison relationship with Academics



The data reveal that the majority (63.6%) of subject librarians in UoT libraries enjoyed good to excellent liaisons with academics in their university. The issue of an excellent professional liaison relationship is crucial for effective academic integration practices. A good professional relationship encourages subject librarians to become proactive in promoting teaching and learning. The notion of a subject librarian being recognized by academics for contributing to the educational mission in the university will help to uplift the standing and integration of the library.

5.3.9 Question 9 – Learner Facilities provided by the Library

5.3.9.1 Table 9 – Learner Facilities

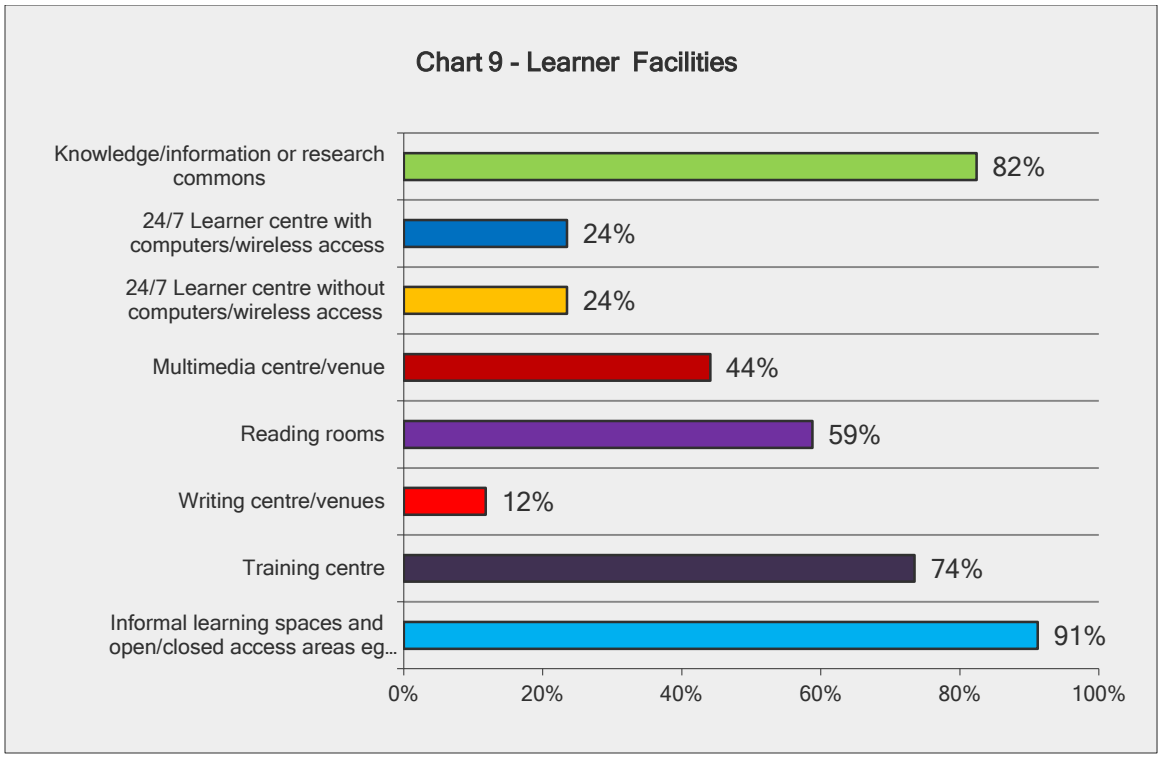
This table provides the 33 respondents' answer options for learner facilities (n=43).

Table 9 - What learner facilities do you provide in the Library?		
Answer Options	**Response Percent**	**Response Count**
Knowledge/information or research commons	81.8%	27
24/7 Learner Centre with computers/wireless access	21.2%	7
24/7 Learner Centre without computers/wireless access	21.2%	7
Multimedia Centre/venue	42.4%	14
Reading rooms	57.6%	19
Writing Centre/venues	12.1%	4
Training Centre	75.8%	25
Informal learning spaces and open/closed access areas e.g. group-rooms	90.9%	30
Other (please specify)		7
Answered question		**33**
Skipped question		**9**

Learner facilities assist in self-directed learning and bring constructivist change in learner behavior postulated by this study. Since the theories (process based theories, the ISP and scaffold learning) view the learner as central to learning, UoTs must provide opportunities for enhancing these learning processes, especially catering for diverse student learning needs which present a major challenge for higher education in South Africa.

5.3.9.2 Chart 9 – Learner Facilities

The chart affirms the importance accorded to learner facilities in UoT libraries.



Informal learning spaces (for example, group rooms) were rated most important (90.9%) in UoT libraries in South Africa, followed by knowledge or research commons (81.8%), and training centres (75%), with reading rooms (57.6%). Multimedia centres for enhanced learning rated 43.4%; twenty-four hour access to learner centres with or without Wi-Fi (21.2%) and writing centres (12.1%).

The data reveals that “knowledge commons” facilities are in high demand in UoT libraries. Students and academic staff prefer an informal “smart” space to optimize teaching and learning. Such a “smart space” constitutes ergonomic work or learner facilities with technological learning aids such as Wi-Fi, smart-boards, multi-media usage including business facilities such as printing, scanning or fax facilities with laptop/ computer access, catering and leisure facilities and formal or informal group rooms or interactive study cubicles conducive to optimal learning.

The advantage of “smart space” learner facilities supports the independent or the group learner which enhances constructivist and collaborative learning advocated by the

researcher. “State of the art” venues in the library entice learners to optimise the use of learning resources, which again promote research-based pedagogy in UoTs.

The data concurs with Somerville and Collins (2008: 819) that the learning commons have enabled libraries to become relevant in the academic lives of students and that they guarantee a user-centric interdisciplinary, learning focused environment on campus which is advocated.

Other responses (7), n=42, include the provision of an electronic resource centre or conferencing/video-conferencing facilities for e-learning, twenty-four hour study facilities and learner centres equipped with electronic facilities for enhanced teaching and learning. There exists a significant correlation between state of the art teaching and learning venues to student-centred learning.

The Council on Higher Education in South Africa (2004) states that course design, including the use of educational technologies, teaching approaches and learning outcomes and literacies designed for a diverse student population is important teaching and learning strategies in higher education in South Africa. The strategies taken by libraries for promoting student-centred learning ought to be analysed in tandem with faculty based teaching and learning methodologies employed in UoTs in South Africa.

5.3.10 Question 10 - Designing Learning Materials

5.3.10.1 Table 10 – Designing Learner Materials

The table below reflects how frequently subject librarians were involved in designing learning materials.

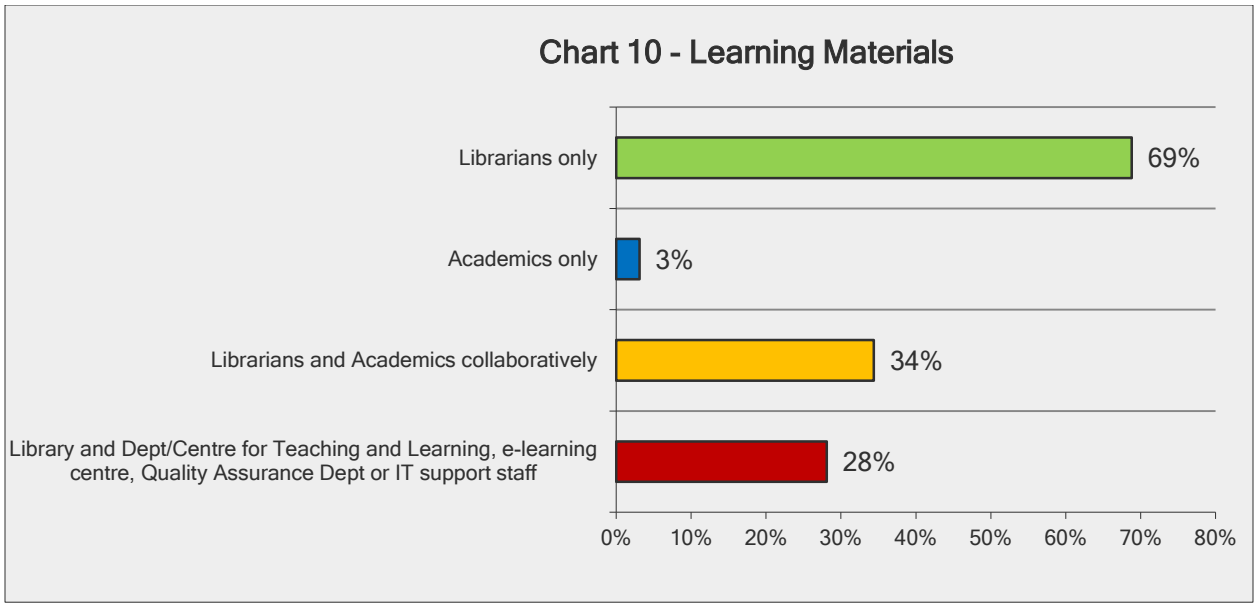
Table 10 - Designing Materials	Response	Response

Answer Options	Percent	Count
IL learner guides	81.8%	27
OPAC training guides including online tutorials	78.8%	26
Research guides	63.6%	21
Subject guides	66.7%	22
Digital or Web-based learning/ training materials	69.7%	23
Open source learning/training materials	15.2%	5
Social networking learner guides/materials	18.2%	6
Other (please specify)	12.1%	4
Answered question		**33**
Skipped question		**9**

Information literacy learner guides were compiled by most subject librarians (81.8%) because all UoT libraries engaged in teaching information literacy in the undergraduate programme. Online public access catalogue guides (OPAC), including online tutorials on how to use the library catalogue were accorded 78.8% scores.

This suggests that the library is keen to ensure that UoT stakeholders are familiar with, and know how to use, the library and information resources. Optimal usage of the library resources for curricula and research is firmly rooted in the constructivist theory for student-centred learning and academic success.

5.3.10.2 Chart 10 – Designers of Learning Materials



Learning materials were designed solely by librarians in 67.7% of cases with some collaboration between librarians and academics indicated in 35.5% of cases and librarians with the Department of Teaching, Learning and e-Learning Centre, Quality Assurance Department or the IT support staff in only 29% of cases.

The findings suggest that greater co-operation and collaboration is required in designing learner materials for student-centred learning in UoTs. Although high interaction and liaison were recorded in the results displayed in earlier graphs, librarian and academic collaboration in designing learner guides for students reflected poorly at 35.5%.

5.3.11 Question 11- Design of Learning Materials

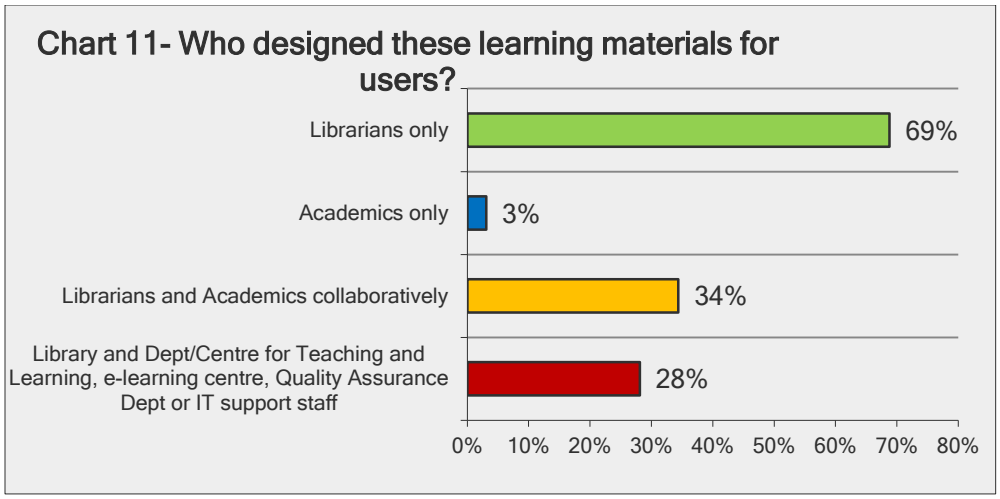
5.3.11 Table 11- Designers of Learning Materials in UoTs

Table 11- Who designed these learning materials for users?		
Answer Options	**Response Percent**	**Response Count**
Library and Dept/Centre for Teaching and Learning, e-learning centre, Quality Assurance Dept or IT support staff	28%	9
Librarians and Academics collaboratively	34%	11
Academics only	3%	1
Librarians only	69%	22
Other (please specify)		4
Answered Question		**32**
Skipped Question		**10**

22 respondents indicated that the librarians are solely responsible for learning materials for academic integration programmes in the university, n=42 and 10 respondents skipped this question. 4 respondents outlined the following in the “other option” column in the questionnaire: librarians create content with limited assistance by lecturers, this is then converted by an instructional designer librarian into PowerPoint and video tutorials assisted by the Teaching and Learning Department; some presentations are obtained from the library vendors; and some from the Academic Development Unit.

5.3.11.2 Chart 11- Designers of Learning Materials

The chart on the next page shows who designed the learning materials.



22 responses indicated that Librarians (69%) mainly designed library academic integration programme learning materials for students in the university. Learner materials such as student guides and handouts which help students become familiar with the academic discourse involve information literacy guides, advice on the issue of plagiarism and research guides including e-learning.

5.3.12 Question 12 – Training programmes provided by the Library to promote Academic Success

5.3.12.1 Table 12 – Training programmes

The table describes the training programmes that UoT libraries were engaged in. Respondents were able to select multiple categories of student and academic staff, so the ‘Response Count’ column displays the overall number of respondents who answered this question.

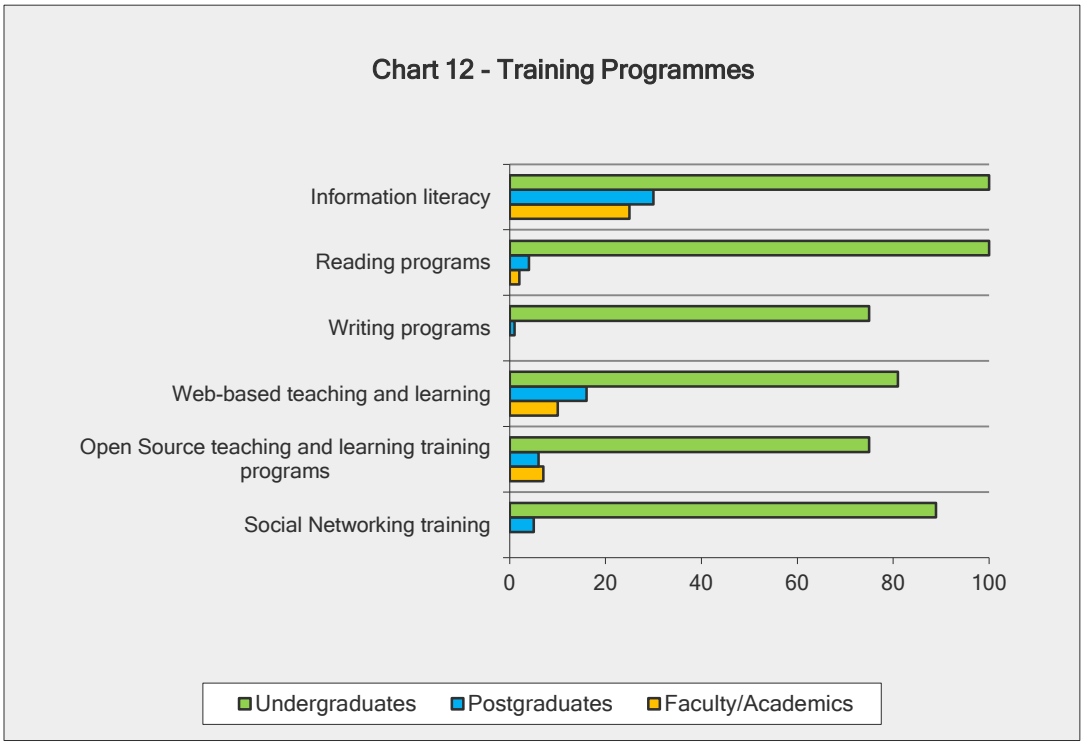
Table 12- What training/ programmes does the Library provide to promote academic success?				
Answer Options	**Undergraduates**	**Postgraduates**	**Faculty/Academics**	**Response Count**
Social Networking training	8	5	0	9
Open Source teaching and learning training programmes	6	6	7	8
Web-based teaching and learning	17	16	10	21
Writing programmes	3	1	0	4
Reading programmes	5	4	2	5
Information literacy	34	30	25	34
Other (please specify)				3
Answered Question				**34**
Skipped Question				**8**

Information literacy programmes (34 responses) n=42, focused predominately on undergraduate students. Reading and writing programmes (5 responses) were minimally offered in UoT libraries. Initiatives to promote open source teaching and learning (8 responses) in UoTs are aimed at enhancing research output in UoTs.

A new theme emerging in UoT libraries is the use of social networking sites (9 responses) to promote teaching and learning, including the use of the library resources. The data, however, show little engagement (response count of 8 from 33 respondents who answered the question) in social network training. Student-centered strategies for effective communication and feedback can be integrated with social networking sites. Social networking sites are known to be a popular medium of communication for the Google-generation student.

5.3.12.2 Chart 12 – Training Programmes provided by UoT libraries for academic success

This chart shows the various programmes that UoT Libraries engage in.



Information literacy programmes were the most common (33 responses) n=42 academic intervention offered by all six UoT libraries, followed by web-based teaching interventions. Open Source teaching and training initiatives, which represent a new direction for promoting the scholarship of research, are offered mostly to undergraduates. This anomaly is perhaps related to library services mainly targeting undergraduate students or subject librarians addressing the millennial student information need for quick access to peer reviewed full text resources.

Libraries offering reading and writing programmes to enhance academic success are a relatively new concept in South African Libraries. Most libraries internationally have embraced reading and writing programmes in higher education. In South African higher education the lack of academic skills (under-preparedness) of students presents a

major challenge and therefore reading and writing skills are particularly important here for promoting academic success in higher education. UoT libraries have a role to play in promoting reading and writing skills along with better integration strategies to address curricular specific programmes. Subject expertise and advanced skills in reading and writing essentially underpin critical thinking and provide the foundations for knowledge creation.

5.3.13 Question 13 - Programmes for Work Integrated Learning in the Library

5.3.13.1 Table 13 - WIL Programmes

This table summarizes the 33 subject librarian responses for WIL.

Table 13 - WIL
Work orientated induction: Circulation, Subject Librarians Portfolios overview, Inter-library loans procedures, Collection Development overview
We have student assistants who assist in the library but whatever we provide to them it does not benefit them towards their career path. They benefit on the financial front. I also feel that only a few benefit from the research skills as they train IL.
For IT and LIS students -Student internship programme - one year
We have learnership's which I feel is misdirected.
Take students for in-service (LIS) and employ them as student assistants
Library staff trains library and information students from other institution for their in-service training.
The library takes students from LIS department
Blackboard
A structured programme for WIL Students
Public Relations
On-job training of the WIL student on all Library operations
We accommodate students from the Department of Library and Information Studies who require doing their in-service training. They shadow the library staff allowing them to experience the kinds of queries that are encountered and assistance students need
Public Relations Students (B.Tech)
We work with LIS Students
Specific LIS work integrated training programmes are drawn up for these students
On the job training for students
Information literacy
For Informatics and Design I, forward information about student competitions on design projects

The Library takes on two Public Relations students every year.
We welcome students from other institutions for in-service and employ our students as student assistance
Students also assist with community projects initiated by the library

Most UoT libraries employ Library and Information Studies students for the purpose of work integrated learning (WIL). Generally senior students are employed in UoT libraries. Public relations and Information Technology students were identified in the WIL programmes. Students were accorded library orientated tasks/duties with an overview of the subject librarian job portfolio. Information literacy training formed part of the WIL programme across all six UoTs. The degree of IL training or the length of time allotted to WIL across all six UoTs in South Africa was not investigated by the researcher.

5.3.14 Question 14 – The Provision of Library Academic Programmes

5.3.14.1 Table 14 – Academic Integration Programmes in UoTs

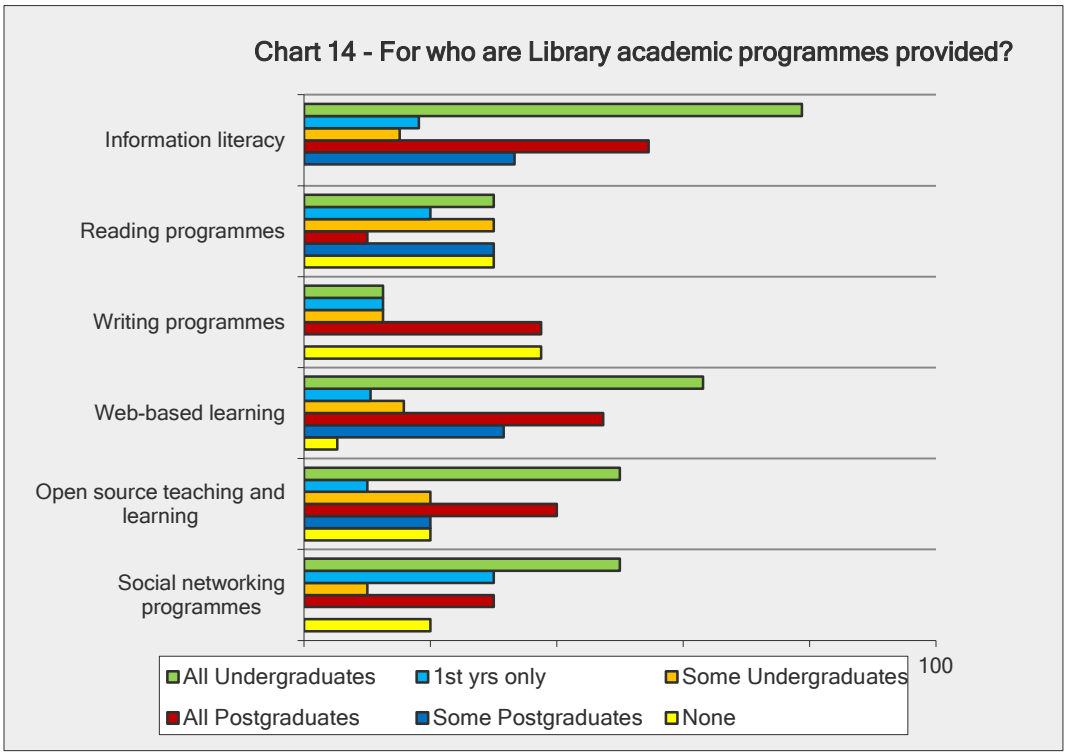
Respondents were able to select multiple categories of student and academic staff, so the “Response Count” displays the overall number of respondents who answered this question.

Table 14 - For who are Library academic programmes provided?

Answer Options	All Undergraduates	1st yrs only	Some Undergraduates	All Postgraduates	Some Postgraduates	None	Response Count
Social network programmes	5	3	1	3	0	2	10
Open source teaching and learning	5	1	2	4	2	2	10
Web-based learning	12	2	3	9	6	1	19
Writing programmes	1	1	1	3	0	3	8
Reading programmes	3	2	3	1	3	3	10
Information literacy	26	6	5	18	11	0	33
Answered Question							34
Skipped Question							8

5.3.14.2 Chart 14 – Academic Programmes in UoTs in South Africa

The chart reveals Academic Programmes prevalent in UoTs



The chart reflects that UoT library programmes are generally provided for all undergraduates. Web-based learning also ranked highly in UoT libraries while information literacy ranked above any other academic integration programme. The researcher is of the opinion that UoT librarians placed emphasis mostly on teaching information literacy. This should ideally be strengthened by interventions involving embedded information literacy strategies which are a more student-centred strategy providing strong support for lifelong learning skills.

5.3.15 Question 15 – Provision of Information Literacy Programmes in the University

5.3.15.1 Table 15 - represents the way information literacy programmes are presented in UoTs

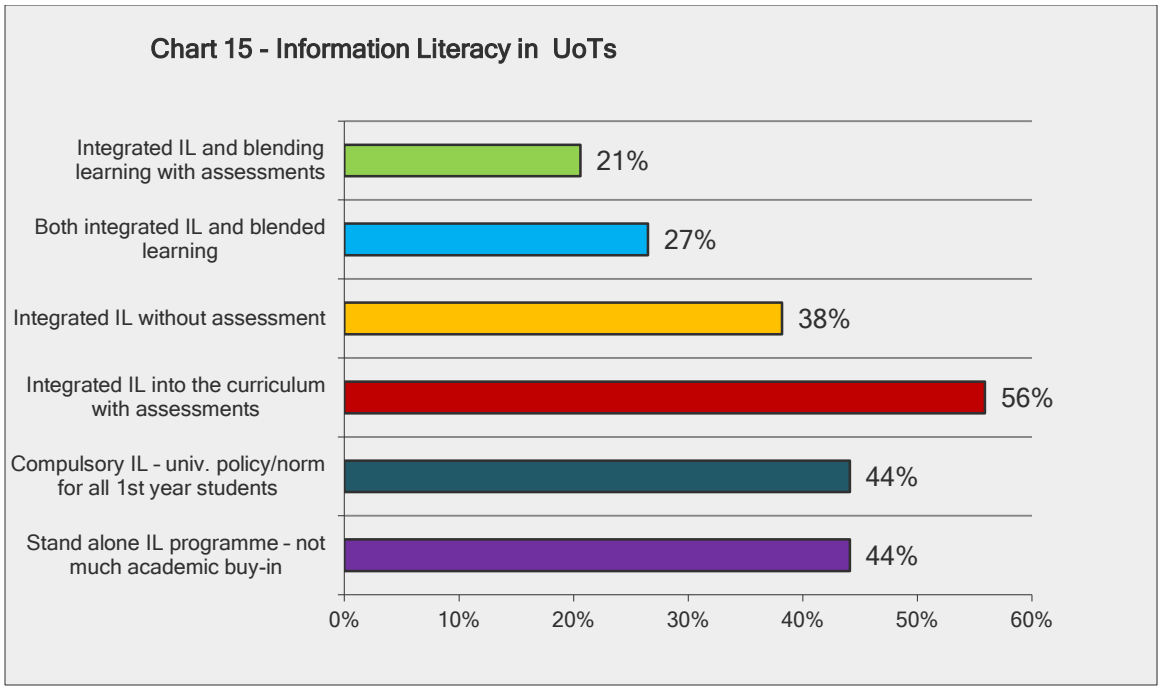
Table 15 - How does the Library offer information literacy in the university?		
Answer Options	**Response Percent**	**Response Count**
Stand alone IL programme – not much academic buy-in	44%	15
Compulsory IL – univ. policy/norm for all 1st year students	44%	15
Integrated IL into the curriculum with assessments	56%	19
Integrated IL without assessment	38%	13
Both integrated IL and blended learning	27%	9
Integrated IL and blending learning with assessments	21%	7
Answered Question		**34**
Skipped Question		**8**

19 responses (56%) indicated that UoTs offer information literacy programmes which are embedded into the curriculum with assessments.15 respondents (44%) n=42 indicated that IL was a compulsory programme for all first year students and the same number 15 responses (44%) was recorded for IL being a stand-alone programme in the university.

De Jager, Nassimbeni and Underwood (2007); Hart and Lynn (2011); and Bruce (2012) describe information literacy as the overarching literacy essential for 21st century living. According to Bruce (2001: 107) “information literacy is conceivably the foundation for learning in our contemporary environment of continuous technological change and information literacy is generally seen as pivotal in the pursuit of lifelong learning”. Ideally IL programmes should include critical thinking skills that will enable students to evaluate information.

5.3.15.2 Chart 15 - Information literacy programmes in UoT libraries

The chart below shows how IL is offered in UoTs in South Africa.



The results show that information literacy is embedded into the curriculum (57.6% of n=42 responses) with IL being offered as a compulsory module (45.5%) for all first year students, including assessed IL. Stand-alone models offering information literacy are still very prevalent in UoT libraries (45.5%). The data suggests there should be increased commitment to migrate from the stand-alone models to embedded IL programmes. Compulsory models of IL offerings constitute less than 50% (15 responses) in UoT and within these most are stand-alone offerings thus failing to assist in promoting integration in curricula. In addition credit bearing modules of IL are not reflected highly, considering that IL is compulsory for all 1st year students.

5.3.16 Question 16 – Challenges that Impact on Teaching the Information Literacy Programme

5.3.16.1 Table 16 – Challenges of Information Literacy

The table below shows the responses to the challenges that subject librarians face in teaching IL in UoTs.

Table 16.1 - What challenges/barriers impact on information literacy?		
Answer Options	**Response Percent**	**Response Count**
1. Teaching	97.0%	32
2. Learning	66.7%	22
3. Research	57.6%	19
Answered question		**33**
Skipped question		**9**

32 (97%) subject librarians indicated that they faced challenges in teaching information literacy in the university. The responses are outlined in detail below.

5.3.16.2 Table 16.2 - Challenges in teaching information literacy in UoTs

The table below gives a synopsis of the challenges subject librarians face in teaching IL.

Table 16.2 – Teaching
Insufficient staff, training and technology access via PC's etc.
Not all faculties participate
Student turn-out falls after enrollments
Lectures don't use our resources frequently
None in the faculty of Arts and Design
Lecturers not enforcing the usage of the library / references from the library when giving assignments. Shortage of resources e.g. enough computers and labs.
IL not a credit bearing course
Large classes
Not a credit bearing module
Teaching spaces, staff training and motivation
Academic staff reluctant to bring students for IL training
IL not fully integrated into all DUT programmes
Question not clear in line with answers.
Librarians are not always afforded the time to teach students information literacy skills

Capacity, facilities and manpower
Class sizes and venues
Students don’t always come for classes
Too many classes
Inadequate venues, bandwidth problems
To be afforded enough time for IL sessions by academics.
Large groups, small venues
Academic do not always have class time available
Classes are big and librarians must deal with the whole faculty with thousands of students
Time to schedule and buy in from academics
Lecture times and size of classes
Restricted lecture time available
Some of the academic departments do not want to be part of library activities
Quality control of IL interventions for 2nd year, collaboration with academics to ensure adequate IL integration and teaching, availability of IL staff, delivering IL teaching at "the point of need", clarity amongst CPUT training librarians on IL strategy and a uniform IL learner guide, Assessments background and training, Pre- and post-testing.

The table above constitutes teaching challenges encountered by subject librarians, including: how to handle large classes of students; academic timetables which do not include any library programmes; teaching venues without adequate facilities (for example Wi-Fi); subject librarians lacking pedagogical skills; and the uneven distribution of embedded information literacy across the faculties.

5.3.16.3 Table 16.3 – Learning

The table gives a synopsis of respondent n=42 answers for Learning.

Table 16.3 – Learning
Insufficient staff, training and technology access via PC's etc.
Space, electronic facilities
Poor coordination between role players/hence students don't perform to the levels of expectation
Shortage of resources
Few sessions for most programmes
Insufficient computers
Relevance gap, history of lack of exposure to library use
Academics do not see it as important compared to exam subjects
We have a diverse group of students which results in diverse information needs
Needs to be contextual & at point of need
Academics reluctant to participate
Students are of different levels
Network problems
Earlier in the first year students might not understand how crucial information literacy is, until they get to do research projects.
Students do not have computer skills
It is better to do integrated information lit. with the lecturers support
Relevance and timing
Class space with or without PC's
Restricted lecture time available

Information literacy learning is hampered in UoT libraries by inadequate access to computers; poor technological infrastructure (network or band-width problems); students who lack computer or library skills; the relevance and timing of the IL programme and lack of academic support or buy-in to the information literacy programme. Subject librarians attempting to teach diverse students with varying levels of academic skills including skills in computer literacy appears to represent the greatest challenge to successful learning.

5.3.16.4 Table 16.4 – Research

The table shows respondent answers for library research programmes

Table 16.4 – Research
Insufficient staff, training and technology access via PC's etc.
Remote students who cannot present themselves for in-class sessions
Researchers are introduced to IL late in their programs
Shortage of resources
Time
Lack of writing and reading skills
One training venue shared with the whole university. Inadequate training venues
Students reach research level but have never been exposed to information literacy skills. They are clueless about the services and facilities
Students does not understand research process
Older students finding it difficult to grasp learning of new concepts
Network problems
Some supervisors do not see a need to send their candidates for IL
Convenient time to schedule
Non-interest
The research department want to do their own things which end up both departments do the same thing
IT barriers - off campus access problematic at time, Services to distant students

Challenges posed in the category of research services in UoT libraries indicate that inadequate information literacy training, or its absence, in undergraduate study is common across institutions and across faculties. Older students struggle with new technologies and new concepts. There is difficulty with access to the library resources or website along with a lack of reading and writing skills. Also more systematic co-ordination is needed between the research office and the library in order to promote research in most institutions.

5.3.17 Question 17 – Successes of Information Literacy in UoTs

5.3.17.1 Table 17.1 – Successes of IL in UoTs

The table below represents successes noted in information literacy programmes in the university.

Table 17.1- What successes are notable in information literacy?		
Answer Options	**Response Percent**	**Response Count**
1. Teaching	92.6%	25
2. Learning	63.0%	17
3. Research	37.0%	10
Answered question		**27**
Skipped question		**15**

While teaching posed the greatest challenge for subject librarians, it was interesting to note that the data reflected that the most notable success was attained in teaching information literacy in UoTs.

5.3.17.2 Table 17.2 – Teaching

The following responses were outlined in the survey. Table 17.2 outlines 25 (92%) responses.

Table 17.2 - Teaching
We do not aim at improving teaching with our Info Lit modules
Students receive life skills
Increase in through-put rates
Lecturers who participates in the IL provide lifelong learning skills
Buy-in from the Faculty
Students become independent searchers
Improvement on assignments
Greater impact in many programs, with Blackboard integration
Managed to get communications dept. to include some sections of IL in their subject/teaching.
Research has found that students that were exposed to IL have higher academic success records as compared to that that did not attend IL classes
That librarians have made an impact on the improvement of the throughput rate in some departments
Outcomes and Academic buy-in
After attending training students are able to write better assignments
Comprehension takes place
Academic staff getting an understanding of IL and its purposes.
Being able to apply what they have learnt to their studies
Academics is seeing the value it has in the course
Integrated Info. literacy in Mechanical Engineering/ Nursing Extended Programme
Increase in statistics due to our IL Policy
Number of integrated IL undergraduate courses, Use of blackboard, openness of academic staff to acknowledge librarians as part of the teaching staff and provide guidance with IL instruction

Successes noted in teaching IL in UoTs in South Africa consisted of: promoting lifelong learning in the institution; contributing positively to graduate throughput rates in the university; promoting academic integrity and quality; successful collaborative learning

models between the subject librarians, academics and students and enhanced teaching and learning models in particular the use of learning management software and blended learning for optimizing teaching and learning. While the successes noted in IL teaching are in the main based upon subject librarian perceptions, studies by Bruce (2001); Tiemensma (2012); Stoffberg and Blignaut (2008) describe the IL frameworks known as the Big Six model, developed by Eisenberg and Berkowitz in 1990 and ISP proposed by Carol Kuhlthau (2001), as contributing effectively to the educational mission in universities.

5.3.17.3 Table 17.3 – Learning

The Table summarises 17 subject librarian (63%) responses for enhancing learning in the university.

Table 17.2 - Learning
We do not cover learning - only use of information sources
improved learner performance
it's a pre -requisite for all levels
Students developing a culture of learning.
students can reference properly
Proven success of students who have shown information literacy success
Obtained management support and approval on integrating IL to communication.
Students have reported that their information literacy skills have improved and those students who have been exposed to multiple information literacy training sessions assist those that have only had basic once of training sessions
Outcomes are achieved
Test results, assignment marks
Students applying what they have learned in their assignments -correct referencing
Student's recognizing the need for IL skills to help with projects lifelong learning
Students express their appreciation and feel comfortable to come back if they don't understand certain aspect.
Students achieved and below average in their pre-assessment and way above average after post-assessment. They show appreciation of the role of library.
More awareness and co-operation with faculty, Increased library usage

In promoting learning in the institution, subject librarians indicated that improved learner performance was noted via the IL programme. Greater academic success of students who have attended the IL module/course, and a marked difference in the quality of students' academic writing and referencing techniques were also noted. Students are encouraged to develop a love for learning, thus promoting a learning culture with an appreciation of the value of the library in enriching their professional and personal lives.

5.3.17.4 Table 17.4 – Research

The Table below summarises the 27 responses collected on research initiatives:

Table 17.4 - Research
Improved techniques due to training on databases and scholarly internet sites.
Those who participates produce quality and they know the do's and don'ts in research
Compulsory for all MTech , D.Tech students
Becoming independent searchers of information
Postgraduates and undergraduates can do research using appropriate research material
IL is part of Teaching and Learning Committee and put the IL issue high on university agenda
There has been an increase in the number of students obtaining their Masters qualifications
Outcomes based education
Most of those who attended IL come back to thank the librarian for hard work. Librarian acknowledged in their theses

Researchers also benefit from the IL programme by becoming independent searchers of relevant information, and a marked difference in the quality of research output was noted by postgraduate librarians. This statement is in alignment with the ISP model of student learning. Students also accorded appreciation for the library resources, support and services offered by the subject or postgraduate librarian across all six UoTs. The

value of the Subject Librarian or the Postgraduate Librarian is recognized by students with many including librarian acknowledgements in their theses.

Researchers also benefited from the IL programme by becoming self-paced independent learners. Students who attended postgraduate programmes showed a greater ability to use core library and research resources effectively. Postgraduate librarians noted a marked improvement in the research output and quality of research.

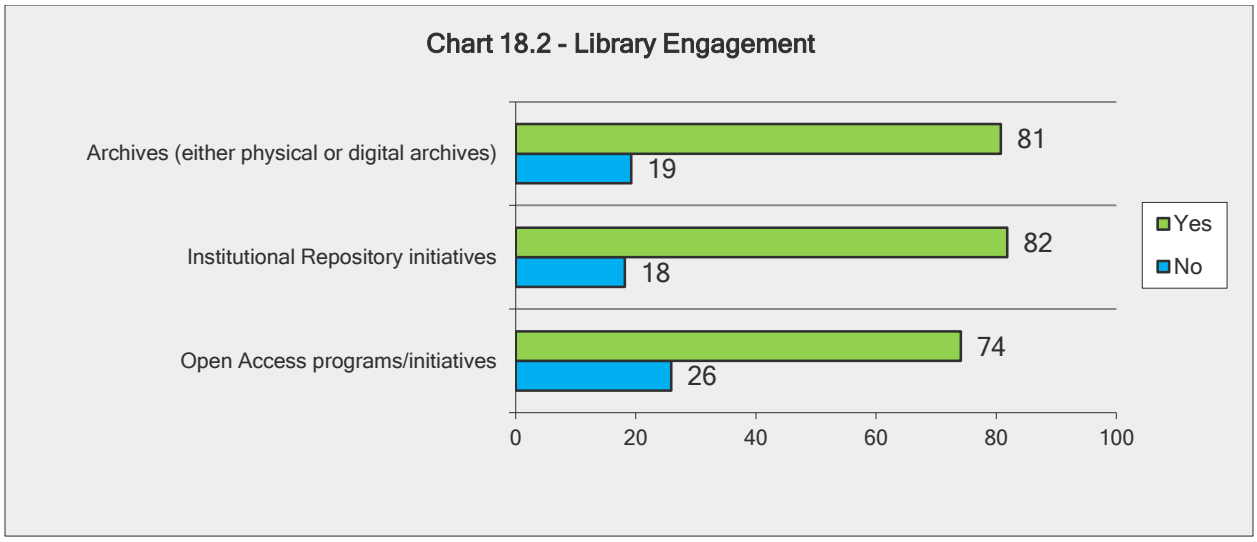
5.3.18 Question 18 - Library engagement

5.3.18.1 Table 18 - Library engagement

Table 18 - Does the Library engage in:			
Answer Options	**Yes**	**No**	**Response Count**
1. Open Access programs/initiatives	19	7	26
2. Institutional Repository initiatives	27	5	32
3. Archives (either physical or digital archives)	21	4	25
Answered question			**33**
Skipped question			**9**

5.3.18.2 Chart 18 – UoT Library engagement in Open Access

The chart below outlines UoT library engagement in Open Access initiatives.



UoT libraries engaged in the institutional repository (27 respondents), n=42 while 21 respondents indicated that their libraries engaged in archives collection and 19 respondents indicated that open access programmes/initiatives were part of the library's academic intervention. A few UoTs did not engage in open access or the institutional repository/ archives. In these cases institutional repositories and archive collections were controlled by some other department in the institution such as the research office.

Engagement in promoting the IR or institutional archives in UoTs encourages researcher or postgraduate scholarship and publications. This contributes to institutional research output which has the potential to increase the university research rankings.

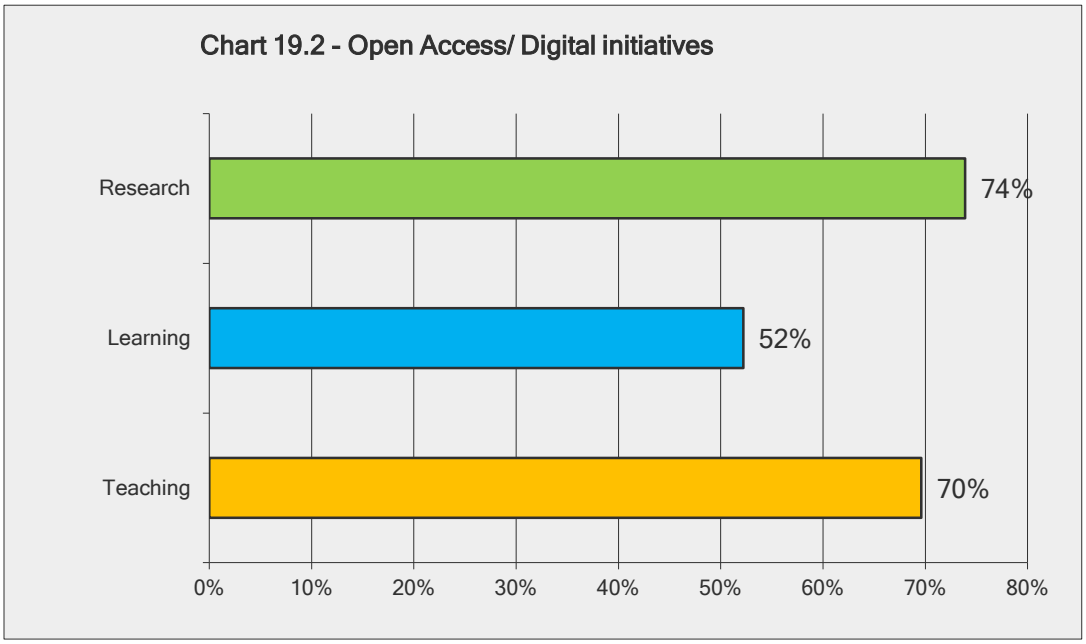
5.3.19 Question 19 – Open Access/ Digital Initiatives

5.3.19.1 Table 19.1- Open Access/ Digital Initiatives

The table below provides subject librarian responses on open access and digital initiatives in UoTs.

Table 19.1 - Please give details of Open Access/ Digital initiatives		
Answer Options	**Response Percent**	**Response Count**
1. Teaching	68.2%	15
2. Learning	54.5%	12
3. Research	77.3%	17
Answered question		**22**
Skipped question		**20**

5.3.19.2 Chart 19 – UoT Library involvement in Open Access/ Digital initiatives



A majority, 77.3%, of responses indicated that Open Access and Digital Archives promoted research initiatives in UoT libraries but no details were given by the participants of initiatives taken by institutional libraries in academic integration. The literature indicates that there is a significant correlation between access to digital archives, databases including Open Access and quality research output.

5.3.20 Question 20 – Postgraduate Library Interventions

5.3.20.1 Table 20 - Postgraduate Library Interventions

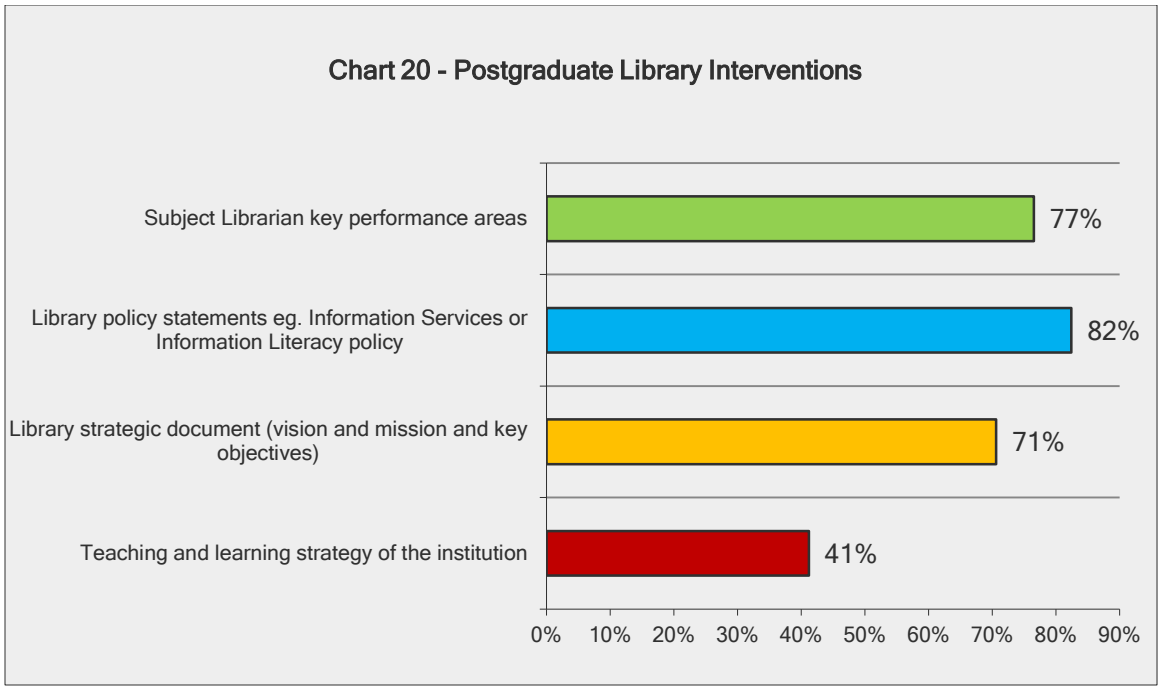
The Table shows how postgraduates are represented in institutional strategy and policy.

Table 20.1 - How are postgraduate Library interventions represented in strategy or policy?		
Answer Options	**Response Percent**	**Response Count**
Teaching and learning strategy of the institution	42.4%	14
Library strategic document (vision and mission and key objectives)	72.7%	24
Library policy statements e.g. Information Services or Information Literacy policy	81.8%	27
Subject Librarian key performance areas	75.8%	25
Answered question		**33**
Skipped question		**9**

33 respondents answered this question, n=42 and 9 respondents skipped this question. Various answer options indicated above were given by the researcher.

5.3.20.2 Chart 20 – Postgraduate Library Interventions

The chart below shows postgraduate representation in institutional strategy or policy**.**



Postgraduate library interventions are most often represented in library policy statements (81.8% of responses), subject librarian key performance portfolios (75.8%), thirdly by library strategic directions and lastly by the teaching and learning strategy of the institution.

This suggests that postgraduate programmes are an important focus in UoT institutions. The library provides support and academic intervention programmes for postgraduates and researchers which form part of subject librarian key performance areas. Strategic library directions in research initiatives and customizing postgraduate services in the university are key drivers in responding to higher education needs in South Africa.

5.3.21 Question 21 – Library Programmes offered to postgraduates or Researchers

5.3.21.1 Table 21.1 - Library Programmes

The table below depicts the role of the library in research.

Table 21.1 - Please give details of the Library programmes offered to postgraduates or researchers in the university.		
Answer Options	**Response Percent**	**Response Count**
1. Teaching	87.9%	29
2. Learning	57.6%	19
3. Research	81.8%	27
Answered question		**33**
Skipped question		**9**

Teaching and research programmes accounted for 87.9% and 81.8% responses respectively where n=42, in library strategy for promoting postgraduate studies in UoTs in South Africa.

5.3.21.2 Table 21.2 – Postgraduate Programmes

The table below depicts subject librarian responses for postgraduate intervention.

Table 21.2 -Teaching
Research and Referencing Methods
Information Literacy Modules
information literacy: advanced
IL or Information management programme
Workshops, training sessions
Advanced information literacy
Library participated in the institution induction for all postgrads
EndNote
Bibliographic, Plagiarism and Statistical Software
Utilizing Turnitin and Referencing properly
Information Literacy
Refresher courses
Topic Analysis, Databases, discovery tools, Library catalogue usage, Boolean searching, ILL
Thesis and essay writing imposes a high demand in postgrads
Researchers Information Centre responds to Student needs
Research Methods: training sessions in this module.
IL training (databases and EndNote)
EndNote, Turnitin
Training sessions on databases and referencing programs.
Information Literacy
Research information support services provide specialized information support to academics
Refworks, Harvard Reference Guide, Database training
Training in referencing, use of EndNote; Awareness of resources, searching e-resources
IL teaching
Similar to first undergraduates, especially those that return to academic study
Information searching training
We have the laboratory for them
IL training or instruction on request
Assistance with originality checks on Turnitin and staying up-to-date with alerts, RSS feeds

Teaching programmes as drawn from the survey results indicated that teaching reference skills, information searching or database searching, use of plagiarism

software and bibliographic management software were common programmes which UoT libraries provided to postgraduates. Refresher information literacy training courses also formed part of research support for postgraduate students.

5.3.21.3 Table 21.3 – Learning

The Table is a summary of activities conducted by subject librarians to promote Learning in the university.

Table 21.3 - Learning
Research and Referencing Methods
SUMMON, I-LINK
Database navigation
Workshops, training sessions.
Turnitin
Information literacy training; individual support
Advanced information retrieval for PG
Hands-on use of the various facilities
Conduct information Literacy session
Research Information Centre responds to their needs
EndNote, Turnitin
Long distance assistance
Research information support services provide specialized information support to academics
Refworks, Harvard Reference Guide, Database training
Based on IL standards
Information searching training/self-help materials
We have the learning commons

An overall improvement in student learning would appear to be indicated by the above research capacity building workshops/ seminars and subject librarian training sessions

offered. Subject librarians/postgraduate librarians also provided learning materials, either printed or online for enhanced postgraduate learning.

The researcher is of the opinion that research interventions should become part of an embedded learning programme in each UoT leading into ‘knowledge creation’ initiatives which are recommended by the Department of Education and supported within the South African Education Policy documentation. The researcher is also of the opinion that continuous evaluation should be part of the academic integration measures undertaken in the library.

5.3.21.4 Table 21.4 – Research

The Table is a summary of the 27 respondents (81.8%) for research activities conducted in UoTs.

Table 21.4 – Research
Database training
Research and Referencing Methods
Online databases training [searches]
Internet research and databases navigation and also referencing technique
EndNote and SPSS
Workshops, training sessions.
Reference tools such as EndNote
Research Capacity Building Workshops, Literature Reviews,
Writing for publication (partnering with the Research Directorate)
Research management tools training
EndNote, SPSS, N'Vivo, WoS
Offered by librarians that have done accredited train the trainer programmes
Use of electronic resources
Researchers Information Centre responds to their needs
Research Methods: training sessions in this module.
Research process
EndNote, Turnitin
EndNote training, database training
Active member of a Masters Research Colloquium
Research unit focusing on assisting postgraduates.
Research information support services provide specialised information support to academics
Refworks, Havard Reference Guide, Database training
Training in referencing and use of EndNote; Awareness of resources, searching e-resources, staying up-to-date with alerts;

Researcher assistance was provided mainly in the advanced use of the library resources, bibliographic management software-EndNote, anti-plagiarism, learning management software and refresher IL modules or advanced database training customized to researcher needs.

5.3.22 Question 22 – Challenges of Library Academic Interventions

5.3.22.1 Table 22.1- Challenges of Academic Interventions in UoT Libraries

The Table below shows responses for challenges in teaching, learning and research.

Table 22.1 - What are the challenges/barriers for effective Library academic interventions in:		
Answer Options	**Response Percent**	**Response Count**
1. Teaching	95.8%	23
2. Learning	54.2%	13
3. Research	54.2%	13
Answered question		**24**
Skipped question		**18**

5.3.22.2 Table 22.2- Subject Librarian responses to Teaching in UoTs

Table 22.2 - Teaching
Lack of buy-in by most departments
Academic buy-in
Lack of passion from the policy makers
Lack of resources
In some instances, department want once off sessions
Buy-in from academics
Time involved, Referencing style not integrated with DUT
Budget constraints and adequate training venues
Poor integration from few programmes
Whole university acceptance
The academic staff is not always progressive and prefers to work in silos, although library could improve the teaching outcomes of the institution. Time constraints is also a challenge
Academics don't have time to allow their students to come for training
Evaluating the effectiveness of the programme
Many students do not avail themselves, as Masters are not course-based
Students not attending classes
Getting the buy-in from the Faculty
Academics do not understand the term Information Literacy
Supervisors do not send their candidates to the library sometimes
Lecture time
Not compulsory
Most of them are working but we are trying as we have the night librarian now

A lack of buy-in from academics, as well as time constraints were cited as the major barriers in promoting library academic intervention programmes for the faculty. This issue is also flagged in the literature review (Chapter Three) as a challenge for embedded academic integration in universities.

5.3.22.3 Table 22.3 – Subject Librarian responses to Learning in UoTs

The Table below reveal 24 subject librarian responses (n=42) for learning.

Table 22.3 - Learning
Lack of buy-in by most departments
Space and facilities
Lack of capacity and resources
Lack of e-learning, graphic design and relevant IT skills within the library. Depend on other people to assist or deliver what we need.
Space constraints and limited WIFI
The diversity of students means that the library has to include blended learning methods and understand the student population and their needs better
Evaluating the effectiveness of the programme
Academics do not participate
Candidates sometimes come unprepared for research without topics and expect librarian to give them topics
Not compulsory

The lack of space; inadequate WiFi access; diversity of student needs and the lack of blended learning initiatives were some of the issues that apparently need to be addressed to optimize learning in UoTs.

5.3.22.4 Table 22.4 - Research

The Table below is a summary of respondent feedback (n=42) for research**.**

Table 22.4 - Research
Lack of full support from academic
Lack of buy-in by most departments
Remote students and e-proxy capabilities
No uniformity within the institution when it comes to research
Lack of resources.
Lack of communication, time for part-time students, number of different projects
Academics see it as an extra burden. Bandwidth problems and Internet connectivity
Not all students know about the research facilities available to them. The postgraduate students are also part time students and thus not always exposed to any library interventions
Evaluating the impact of the programme
We do not have access to all the databases
Not compulsory
Online assistance and availability

Participants cited a lack of buy-in; non-compulsory attendance; inadequate access to computer facilities and bandwidth problems; constricted academic timetables precluding independent learning; diverse student needs and inadequate IT skills as barriers to effective academic integration initiatives in UoT Libraries in South Africa. All of the above are recognized by authors in this field as significant issues.

Young, & Gibson (2000); Hill (1980) and Lonka (2012) advocate engaged, active learning as required within process learning theories.

5.3.23 Question 23 - Assessments for Academic Integration

5.3.23.1 Table 23.1 - Assessments

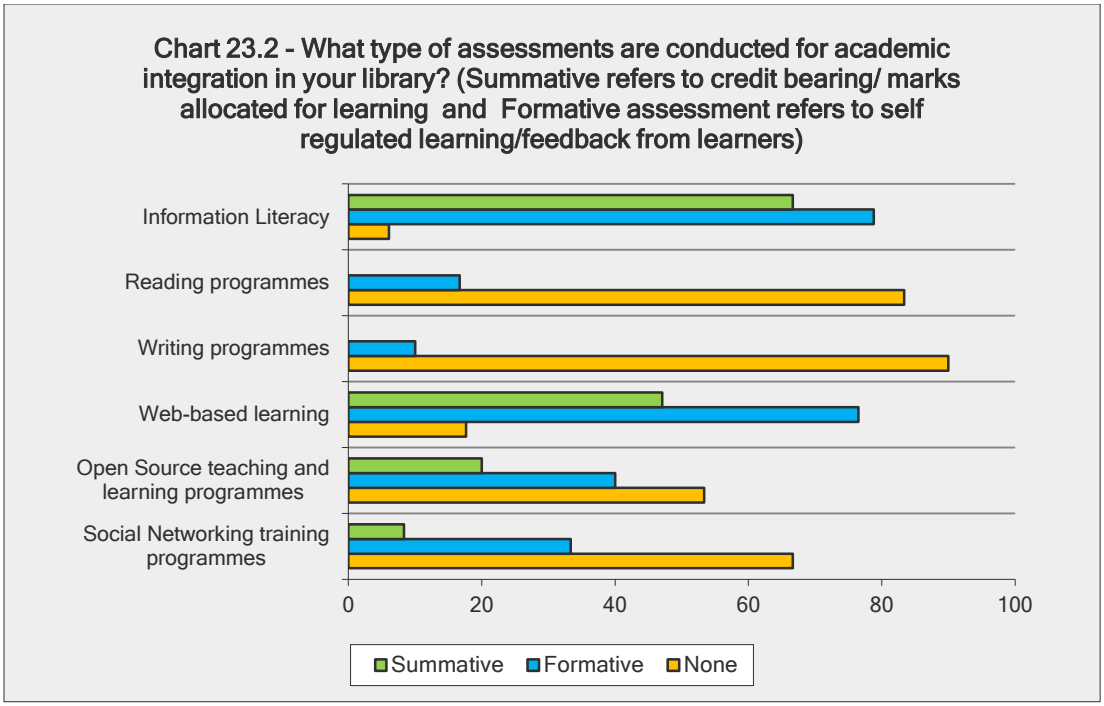
The table provides the various types of assessments provided by UoT libraries.

Table 23.1 - What types of assessment are conducted for academic integration in your library? (Summative refers to credit bearing/ marks allocated for learning and formative assessment refers to self-regulated learning/feedback from and to learners)				
Answer Options	**Summative**	**Formative**	**None**	**Response Count**
Information literacy	22	26	1	32
Reading programmes	0	2	9	11
Writing programmes	0	1	8	9
Web-based learning	8	13	2	16
Open Source teaching and learning programmes	3	6	7	14
Social Networking training programmes	1	4	7	11
Answered question				**33**
Skipped question				**9**

Respondents were able to select multiple categories of student and academic staff, so the 'Response Count' column displays the overall number of respondents who answered this question (n=42).

5.3.23.2 Chart 23.2 – Assessments conducted in UoT Libraries

The chart shows the 33 responses (n=42) for assessments for academic integration practices.



Formative assessment rated higher than summative in IL programmes in UoTs in South Africa. Except for IL and Web-based learning programmes, no assessment was indicated for reading, writing and open source teaching and learning programmes, or for social networking programmes.

Campbell and Maggs (2006: 111) stated that the library has to be mindful of the need for clear assessment techniques in IL. They advocate that the library must employ as many communication channels as possible to get feedback from users including a range of formative and summative assessment strategies and a suggestion board.

5.3.24 Question 24 – Assessments

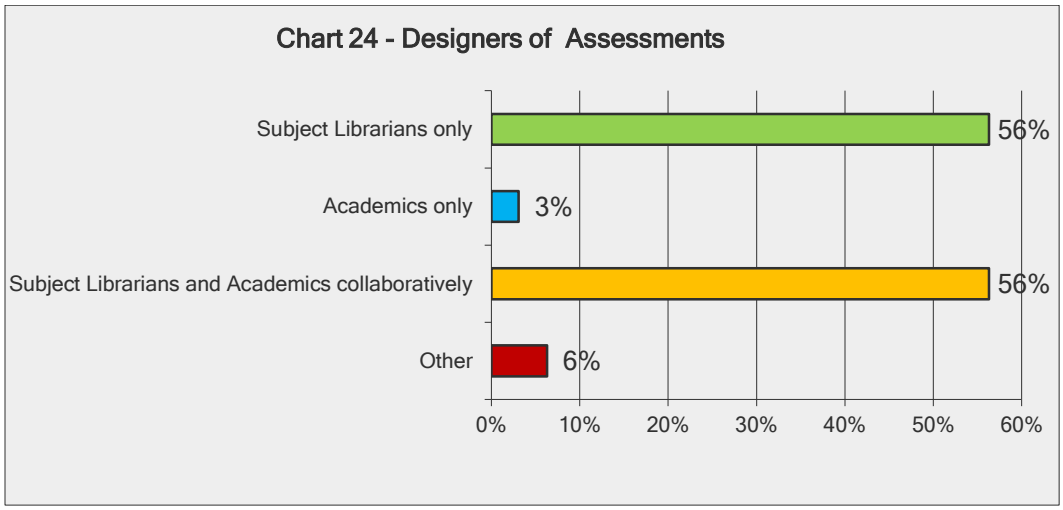
5.3.24.1 Table 24.1 – Who is responsible for designing the assessments?

The Table below depicts the response rates (n=42) for designing of the assessment in academic integration programmes in UoTs in South Africa.

Table 24.1 - Who is responsible for designing these assessments?		
Answer Options	**Response Percent**	**Response Count**
Subject Librarians only	58.1%	18
Academics only	3.2%	1
Subject Librarians and Academics collaboratively	54.8%	17
Other	6.5%	2
Other (please specify)		4
Answered question		**31**
Skipped question		**11**

5.3.24.2 Chart 24.1 - Collaborative engagement for designing assessments

The chart shows who engaged in assessments of the academic programmes offered by UoT Libraries.



Over half of the respondents 17 (58.1%), stated that subject librarians were responsible for designing assessments for all academic integration programmes offered by the library, followed by 16 responses (54.8%) for collaborative designing of assessments with academics. A significant percentage (56%) indicated that subject librarians and academics worked collaboratively which is positive for academic integration.

In the questionnaire, four other suggestions revealed the following:

5.3.24.3 Table 24.2 - Other responses for Assessments

Table 24.2 – Other Responses

1. Training Librarians and Information librarians
2. Training coordinator Librarians
3. In some courses we work with lecturers, in some we work alone were the lecturer who is not willing to collaborate
4. Information Literacy librarian

The data reflect that the training or the Information Literacy Librarian were responsible for designing assessments for academic integration programmes.

Campbell and Maggs (2006:111) state that the library is at the heart of the student learning experience in terms of information literacy teaching and therefore should be able to demonstrate internal quality assurance processes measuring quality at the point of delivery to improve standards and efficiency.

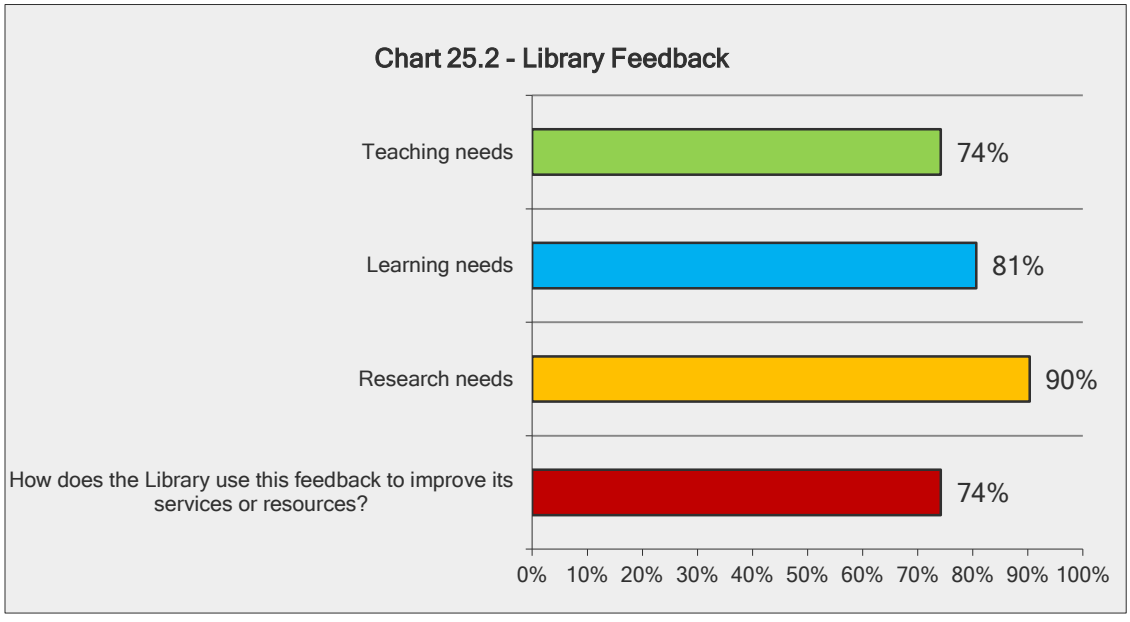
5.3.25 Question 25 – Library Feedback

5.3.25.1 Table 25.1 – Library Feedback in UoTs in South Africa

The table shows the responses per category for teaching, learning and research needs.

Table 25.1 - Does your University or Library conduct surveys/feedback on:		
Answer Options	**Response Percent**	**Response Count**
Teaching needs	74.2%	23
Learning needs	80.6%	25
Research needs	90.3%	28
How does the Library use this feedback to improve its services or resources?	74.2%	23
Answered question		**31**
Skipped question		**11**

5.3.25.2 Chart 25.2 - Subject librarian responses for library feedback



Subject librarians in UoTs indicated that most feedback was received on research needs (90.3%), learning needs (80.6%) and that teaching needs were lower at 74. 2%. How this feedback was gained and how it was used was not explored.

5.3.26 Question 26 – Successes of Library Interventions

5.3.26.1 Table 26.1- Successes of Library Interventions

The Table below summarises 33 subject librarian responses (n=42) for successes of library interventions.

Table 26.1 - What are the notable successes of Library interventions for the following?

Answer Options	Response %	Resp. Count
Academics	78.8%	26
Students	90.9%	30
Researchers/Postgraduates	69.7%	23
Answered question		**33**
Skipped question		**9**

Subject librarians have clearly been recognized for their role in enhancing the teaching, learning and research needs in the institution. Partnerships and collaboration between subject librarians and academics promote academic success for UoT graduates.

5.3.26.2 Table 26.2 – Library Interventions for Academics

The Table outlines 33 responses (n=42) for successes in academic integration practices for academics.

Table 26.2 - Academics
More open to the library and the services
SUMMON, EndNote
Recognition of the library services
Referral of students to the library. Invitation to teach library related information to class.
Recognition of the role of the library in academic endeavor
Academics are now part of the deal
BlackBoard integration and great awareness of and participation in Information Literacy.
Bigger Knowledge commons room, more e-resources, improved support from librarians team, improved communication with the library
Increased academic integration, Library strategic goals are aligned with university goals.
Positive feedback
Acknowledge the impact of the library intervention
Collaboration with academics and involvement of faculty librarians in their meetings
Library usage
Academics indicated that they have noticed improvement in students assignments
Comments and acknowledgements of assignments
More interest in the library and collaboration with subject librarian
When they understand and use library resources they encourage their students to follow
Being aware of resources available for their personal research and knowledge for teaching purposes
Academics invite us to their Blackboard now. We also get invited to Faculty Boards to do presentations
IL policy, Information Literacy Committee
awareness and promoting use of library information sources
Information Literacy/information supply liaison
Library becomes important academic partner who is integrally part of teaching and learning. Better quality assignments, results/throughput, and higher usage of information resources.

The above responses suggest that the educative role of the library is valued.

5.3.26.3 Table 26.3 - Academic integration for Students

Table 26.2.2 - Students
Less are using the Librarian as they are independent researchers
Independent students
SUMMON, EndNote, Turnitin
Those that participate passes their exams and they become independent learners
Able to find information independently
Repeated visits of students to the librarians' offices.
Improved pass rate
Improved academic capacity
Students are also attending classes in numbers
Online Info lit and Information Literacy as part of every course
More facilities for individual and group study. Acquired more PC's in the library, enhanced access by extending business hours.
Increased utilization of resources
Positive feedback
Better understanding of the literature review process
Exposure of faculty librarians
Library literacy
Database training
Have become independent
Excitement over excellent assignment results
Increased library usage statistics
Awareness of available resources and a wide choice to use.
Knowledge of sources to use when conducting research and how best to use those
Better performance
Students feel more comfortable finding information relating to their assignments.
Though we need to improve on gauging the success of the program on students, students that attended the programme show much more appreciation for the program than those who did not.
IL integration
Using Library information sources
Information Literacy/consultation/information supply

The above responses indicate that students were seen as becoming independent

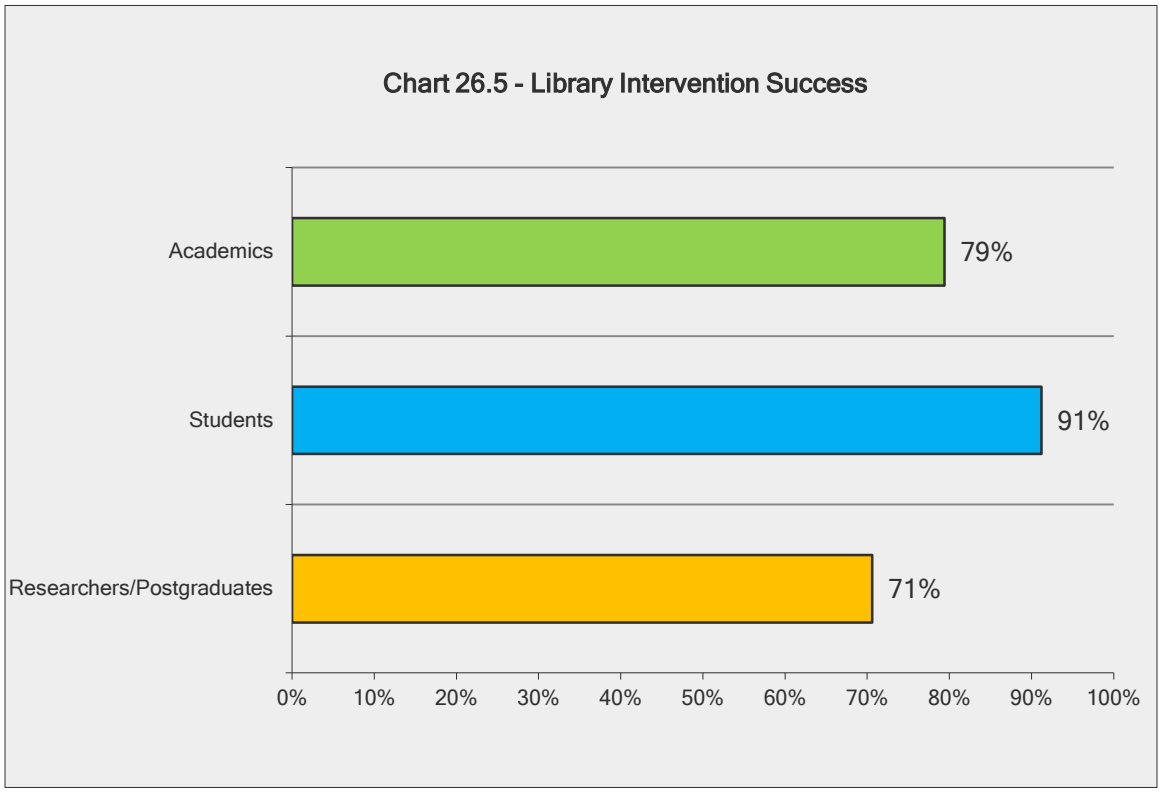
and lifelong learners, when exposed to the library academic integration programmes. Graduate success is also attributed to the intervention of the library in curricula and research in partnership with academics. It appears that collaborative partnerships are increasingly being formed with the aim of enhancing teaching, learning and research in the university.

5.3.26.4 Table 26.4 – Indicates postgraduate/researcher assistance programmes conducted by UoT libraries

Table 26.4 - Students
Positive feedback with regards to their good marks on their assignments and research projects
Less are using the Librarian as they are independent researchers
Independent students
SUMMON, Endnote, Turnitin
those that participates passes and they become independent
able to find information independently
repeat visits of students to the librarians' offices.
improved pass rate
improved academic capacity
Students are also attending classes in numbers
Online Infolit and Information Literacy as part of every course
More facilities for individual and group study. Acquired more computers in the library, enhanced access by extending business hours.
Increased utilisation of resources
Positive feedback
Better understanding of the literature review process
Exposure of faculty librarians
Library literacy
Database training
Have become independent
Excitement over excellent assignment results
increased library usage statistics
Awareness of available resources and a wide choice to use.
Knowledge of sources to use when conducting research and how best to use those
better performance
Students feel more comfortable finding information relating to their assignments.
Though we need to improve on gauging the success of the program on students, students that attended the program show much more appreciation for the program than those who did not. They also tell me that I changed their lives
IL integration
Using Library information sources
Information Literacy/consultation/information supply

The acknowledgment of the subject librarian's role in teaching, learning and research is documented in the above responses in this study.

5.3.26.5 Chart 26.5 - Shows the responses for notable library interventions.



Notable successes identified in the survey, were accorded to students (90%) followed by academics (80%) and then researchers/postgraduates. The graph shows the importance of libraries in leading change for enhanced teaching, learning and research in South African higher institutions. The concomitant result of this intervention leads to academic success and promoting a culture of lifelong learning in the institution.

5.3.27 Question 27 – Library Academic Interventions

The following tables describe participants' other recommended library academic interventions in teaching, learning and research, as elicited from the survey results.

5.3.27.1 Table 27.1- Effective Teaching

Table 27.1 - Teaching
Attending Faculty meetings/ Faculty Board
BlackBoard
Information Literacy
Marketing library resources outside the library because they don't come to the library as often as librarians would like to have them.
Academic roadshow
Greater integration with LMS
Ongoing training sessions for various groups
Plagiarism
E-resource Fair
Collaborations between academics, students support units and librarians
Information literacy classes
Online teaching tools
Involvement in curriculum planning
Database training to academic staff
Lecturers online learning tool e.g. BlackBoard
IL on BlackBoard
Rural school interventions/School outreach projects
Close collaboration with IT to ensure seamless 24/7 access to our resources on and off campus. Incorporation of mobile technologies, new technologies Social networking training included in IL programs. Closer collaboration with faculty in building collections that support curricula and greater adoption of e-books due to accessibility.

5.3.27.2 Table 27.2 – Learning

The Table below reveals subject librarian responses (n=42) with regard to other effective academic integration practices for learning in UoT libraries.

Table 27.2 - Learning
Moodle, Safe-assign
Marketing library resources outside the library.
Online learning
Information Literacy
Introduction of Embedded Librarianship
Referencing
Collaborations between academics, students support units and librarians
Having a learning commons within the library help facilitate learning
Leisure reading programme

5.3.27.3 Table 27.3 – Research

The Table below shows 33 participant responses with regard to research integration practices for UoT libraries in South Africa.

Table 27.3 - Research
Online tutorials
More demonstrations
Marketing library resources outside the library.
Library roadshows
Induction programmes
Publications Workshop by vendors
IR/ Open Access seminars
Research commons hosting research activities
Collaborations between academics, researchers and librarians
Let researchers know of latest purchases in areas of research.
Researcher / librarian collaboration
Working with an academic writing Centre
Publication of papers/presentations at seminars, conferences
Librarians fully trained as research librarians to effectively assist and support researchers. Participate in research projects/services and actively partner with Research support departments or centres for postgraduate studies

The above teaching, learning and research academic interventions indicate the pathways to enhance academic success in UoT institutions recognized by librarians. The above findings are particularly significant as to the appropriate range of interventions which subject librarians envisage. Academic integration appears to be gaining momentum in teaching, learning and research in UoTs. This is important for improving throughput rates in UoTs.

5.4 Summary

Chapter Five chronicles the online survey results of subject librarians employed in UoT Libraries in South Africa. The changed role of the academic library in teaching, learning and research is demonstrated by the research findings and subject librarian responses to the research objectives posed in this study. However, it is also clear that significant barriers to integration still exist and that the encouraging findings are rather the aspirations and insights of those who did respond. The respondents who skipped most questions may be seen as negative indicators along with the prevalence of vacant posts within the positions of subject librarians noted above.

The researcher is of the opinion that UoT libraries have taken some bold steps towards "academic integration" indicating, whether intentionally or not, a desire to be at the forefront of educational leadership in the university. The findings reveal that library academic integration has gained momentum in teaching, learning and research in UoTs in South Africa and the findings concur with the Gilchrist study (2007) in many ways.

The dominant themes of academic integration in UoT libraries in South Africa are information literacy programmes, Web-based learning interventions, and Open Access initiatives. Information literacy is the predominant programme in the teaching sphere of UoT libraries. IL programmes gleaned from the literature review indicate the possibilities for better academic integration in the university.

The results reflect that varying modes of information literacy programmes are already operating in academic intervention initiatives in UoT libraries. Credit bearing and

assessed IL programmes remain a challenge in South African universities. The role of the library in UoT is changing and librarians clearly recognize that it should be changing in the kinds of integrative ways which this study espouses from support service based to impact based interventions which impact on promoting teaching, learning and research in the university.

Subject librarian responses on various academic integration initiatives, challenges and successes are outlined in this chapter. Subject librarians were mostly engaged in teaching and training in advanced bibliographic management software. They also provided customized research services for postgraduates and researchers such as trouble-shooting, setting up alert or RSS feeds, installing and using referencing packages, and optimizing e-resources for helping students with their literature reviews.

Marketing the library to give greater impetus for teaching, learning and research initiatives in the university provides an opportunity for subject librarians to contribute positively to graduate success.

E-learning and new technologies are changing the way the academic library functions in the university. There is a call for greater and closer collaboration and partnership with faculty and students to promote the goals of UoTs. Although the study did not address the issue of staff development and training of librarians for improving academic integration practices in the university, it is important to note that subject librarians have to possess the essential competencies for teaching, being at the cutting edge of learning styles of the millennial student development and having research competency skills to impart to academics or students.

Subject librarians also need information and communication technology training and development in order to keep abreast in providing library leadership to academics and students. Continuous evaluation of academic integration programmes are another issue for review in the university. The issues identified in the findings of this study have direct synergy with the findings and recommendations postulated by the Gilchrist research

(2007) and supported by many other authors identified in the research literature review. Conclusions with a summary concerning academic integration programmes prevalent in UoT libraries in South Africa are discussed in Chapter Six.

CHAPTER SIX - SUMMARY OF THE FINDINGS, CONCLUSIONS, RECOMMENDATIONS AND FUTURE AREAS OF STUDY

Academic libraries in South Africa share a rich heritage in realizing their universities' mission statements and in inculcating an ethos of lifelong learning. The demands upon them in the twenty-first century however require significant transformation if they are to retain their central role. The transformed higher educational landscape in South Africa which saw the emergence of Universities of Technology provided an impetus for the (UoT) libraries to lead the change process by becoming the nexus of teaching, learning and research in these new universities. The study was undertaken in order to build upon initiatives for library participation and integration focused on the scholarship of teaching and learning in UoTs in South Africa.

I have argued that the characteristics which set UoT institutions apart equip the library to stand at the centre of teaching, learning and research within a knowledge society. The changing role of the subject librarian; different teaching and learning methodologies; e-learning technologies and tools; together with electronic library resources and services provide the impetus for greater academic integration in UoTs in South Africa.

The distinguishing features of these libraries include a tradition of collaboration and engagement with academics in the provision of resources and services designed to supplement the scholarship of teaching and learning in the university. According to Du Pre (2009: 14-15) UoTs differ from other universities in their stronger focus on technology and the complexity of their interrelations with the concept of a university.

A summary of the findings with recommendations is outlined in this chapter.

6.1 Summary of the Findings of the Study

Research was conducted across all six UoTs in South Africa. A summary of the most important findings is presented in this chapter.

6.1.1 Library Representation in the University Mission

UoT libraries seem to be well represented in the teaching and learning strategy in the institutions that they serve. The results reflect that a pivotal role is assigned to the library in advancing the educational mission in the institution. While UoT libraries were well represented in the institutional strategy documents, it was clear that the onus lies with the library to lead academic integration in the university. This concurs with the opinions of authors Brophy (2007); Gilchrist (2007); Zhong (2007); Oakleaf (2010); Whitehurst (2010); and Bowles-Terry (2012) as discussed in the literature review (Chapter Three).

6.1.2 Determining the Relevance of Library Resource Collections in the University

The issue of seeking evaluation measures for resource collections and determining their relevance presented opportunities for the library to work with academics in supporting the curricular and research needs as well as upholding the concept of “building knowledge via information provision” required for the realization of a knowledge society.

The findings show that determining the relevance of library resources was heavily dependent on usage statistics and reports. It is therefore recommended that UoTs make more effective use of technology and evaluation tools to ascertain the relevance of their collections in order to enhance and support in direct and nuanced ways the teaching, learning and research in the university.

The issue of “usage” in the digital environment has changed the way students use the library. The understanding of the concept of “use” is now different. A library’s true worth to its students is no longer based merely on statistics of readership, but upon the return-

on-investment and demonstrations of non-monetary value in learning and knowledge creation. Statistical data however do not disclose motivation for use. Understanding student motivation for use of the collection is an important factor for library decision making for the design of a student-centred UoT (Price and Fleming-May, 2011: 197-199).The issue should be flagged for due attention by library management who are serious about determining the relevance to the curricula, student needs and helping promote research-based pedagogy in the university.

6.1.3 Teaching Initiatives in UoT Libraries

There is a shift in the role of academic librarians from being custodians of information resources to becoming proactive in teaching and learning. The literature review and the documents produced by the library profession indicate that libraries must become teaching libraries to advance this educational mission.

While the findings reflect that subject librarians were mainly involved in teaching, the concept of “teaching” was construed by most subject librarians simply as offering information literacy programmes in the university.

The aim of the researcher was to probe subject librarians’ involvement in teaching beyond mere information literacy. It is recommended that in advancing the concept of a “teaching library” subject librarians involved in teaching should seek to embrace academic preparedness more widely and to participate in co-operative teaching with academics or other academic support units, the research office or the international student office. The primary focus would be on information literacy or, to use the new term, “information fluency” but this now entails a wider focus than in the past including promoting academic integrity, curricular preparedness, academic literacies, and reading and writing programmes to instill the lifelong learning abilities and academic skills which underpin student success. These can be argued to be especially needed in South Africa on account of problems within the schooling system which leads to a disproportionate number of underprepared students entering universities, and especially UoTs.

As is characteristic of UoT teaching emphasis, all libraries in the study targeted undergraduates in the promotion of information literacy programmes in the university. Teaching referencing skills, information searching or database searching, the use of anti-plagiarism software and use of bibliographic management software were common teaching programmes identified in the study. The above training programmes were designed to help students to prepare for curricular requirements and to instill some independent lifelong learning skills.

Refresher information literacy training programmes formed part of research interventions and support for postgraduate students. While librarians involved in undergraduate programmes may be able to cope with less advanced technical skills, the researcher is of the opinion that it is essential for subject librarians engaged in postgraduate programmes to possess advanced bibliographic management software teaching/facilitation skills, proficient information retrieval abilities, computer troubleshooting skills and competencies. Excellent ability and knowledge of library customization and high technology teaching skills are also valuable skills for UoTs librarians to possess in South Africa.

These recommendations concur with the opinions of authors Dale and Holland (2006); Gilchrist (2007); Brophy (2007); Dale,Beard and Holland (2011); Bell and Shank (2011); and Gwyer, Stubbings and Walton (2012), who believe that subject librarians must be qualified to engage with the teaching, learning and research environments now existing globally. It is recommended that they engage in team teaching with academics thus strengthening academic integration in the quest to promote student success.

6.1.4 Liaisons with Faculty

The data show that subject librarians across all UoTs in South Africa have developed strong partnerships with academics and that all participate to some degree in departmental curricula programmes.

Both graduates and academics can benefit from close collaboration with transformed academic libraries where these are enabled to take a leadership role in keeping abreast of the formidable changes affecting higher education in the 21st century. Kirkwood (2011) alluded to the close collaboration between the subject librarian and the academic to help the institution adapt to the changing needs within a technological era – an opinion which is applicable to this study.

The findings also point to the opportunity that exists for the subject librarian to be proactive in enhancing academic integration in the university by developing curricular related programmes as proposed in the Gilchrist model (2007) for library leadership in instructional programmes.

All of this suggests that UoT subject librarians are in a position to lead change in developing effective partnerships with academics in order to promote graduate success. These partnerships with academics can allow librarians to play a more cohesive, collaborative educational role in the university and by collectively responding to the needs in higher education, academics and librarians can promote a culture of lifelong learning which will contribute to the creation of a genuine “knowledge society” in South Africa.

This has many positive implications for universities striving to keep abreast of the formidable changes affecting higher education in South Africa.

6.1.5 Research Facilities

The findings of the research indicated that the executive management of UoTs do not engage with librarians in the planning of facilities for undergraduates, postgraduates or researchers in the university. This indicates that the concept of the library as a “learning space” is not as yet considered by the university authorities as significant for UoT library policy in South Africa. However the literature is clear about the advantages of “smart space” learner facilities promoting independent or group learning. To entice students

and academics to use the library facilities and resources optimally, state of the art teaching and learning venues are being developed in many UoT libraries..

The findings in this study concur with Dowler (1997) and Dale, Holland and Matthews (2006) that the need for enhanced learning facilities such as the “knowledge commons” are in demand by students. Students and academic staff indicate a preference for an informal “smart” space to optimize teaching and learning. A “smart space” consists of ergonomically-designed learner facilities with technological teaching and learning tools and aids such as iPads, Wi-Fi, smart boards, multi-media usage including business facilities’ such as printing; scanning or fax facilities with laptop/ computer access; catering and leisure facilities; formal or informal group rooms or interactive study cubicles.

The literature also indicates the value of an electronic resource centre or conferencing/video-conferencing facilities for e-learning, twenty-four hour study areas and learner centres equipped with electronic facilities to support process based or constructivist learning in the university. A lower score was noted in the survey for the popularity amongst students of twenty-four hour learner centres, than for the virtual or electronic library. This may have something to do with high crime levels in South Africa and indicates that solutions need to be context-specific.

6.1.6 Information Literacy

Information literacy programmes were the most prevalent academic intervention across all six UoTs. These focused primarily on undergraduates and the data reveal that while information literacy is embedded into the curriculum, with IL being offered as a compulsory programme for all first year students, stand–alone IL models are still the most prevalent in UoT libraries. Also below fifty percent of these IL programmes are formally assessed. This shows a missed opportunity for more cohesive and coordinated academic integration programmes such as the General Education Programme or other curricula renewal programmes offer. Collaborations have been proven to be effective and have increased critical thinking and lifelong learning abilities

in students. According to Brophy (2007: 65) collaboration, coordination, and networking are inherent within the culture of librarianship and can be fostered by information literacy programmes where these collaborative elements are deliberately advanced.

The dilemma lies in the fact that while the IL offering is compulsory, stand-alone library programmes without credit bearing assessments do not increase the value of academic integration in UoTs in South Africa. This presents a lost opportunity for the library to be perceived as a full instructional partner in promoting lifelong learning in the institution. Further, IL design and development of the programmes should be staggered from first year to postgraduate levels in UoTs. The researcher advocates for IL programmes including e-learning, within the construct of the theories presented in this study as an advanced model for academic integration practices in UoT libraries.

The IL programme of DUT is an example of an institutional focus designed to promote student success. The DUT library collaborated institutionally in embedding the IL programme into a formal module called the “first year student experience” pilot project. This project was transformed into the “General Education” programme for undergraduates in 2011. This module initiated by executive management, is shaped by international models for graduate preparedness and lifelong learning. The module attempts to build critical thinking, lifelong learning, and graduate preparedness. Local history, information literacy, liberal arts and humanities, non-violence and HIV and Aids are some of the elective programmes involved. The library is an active player in the General Education module. The General Education programme will be accredited and is expected to be formalised in the 2015 curriculum for all undergraduates in DUT (Neerputh, 2012).

There are many opportunities for offering information literacy to academics and postgraduates across all six UoTs. The results reflect that academics do not receive much IL training from subject librarians. Perhaps the shift should be that the library sets up partnerships with academics first when offering academic integration programmes in order to ensure effective buy-in and ownership across the university.

The use of VLEs by subject librarians varies both between and within institutions. Corrall and Keates (2011: 29-30) posit that factors affecting the involvement of subject librarians usage of VLEs include the subject area, co-operation of academic staff and attitudes of librarians towards technology-based teaching. Recognition by academic staff of the teaching role of subject librarians has a critical impact on their involvement with VLEs with implications for the teaching and learning role of academic libraries in South African universities.

6.1.6.1 Assessments

As noted above credit bearing IL programmes are not common in UoTs. The design of credit bearing and assessed IL programmes remains a challenge for South African universities. Assessments were mainly designed by the training librarian or the Information Literacy Librarian. Opportunities exist for assessments to become faculty driven, credit bearing and offered online across all UoTs in South Africa. This approach is supported by Oakleaf (2007).

6.1.6.2 Successes in IL

The findings revealed that teaching IL in UoTs in South Africa was perceived by subject librarians as able to:

- promote lifelong learning;
- contribute positively to graduate throughput rates;
- promote academic integrity;
- improve the quality of academic achievement; and
- promote engagement in collaborative teaching and learning models between the subject librarians, academics and students for academic success in the university.

Subject librarians across all six UoTs noted student appreciation of the library's efforts in contributing to their academic success.

6.1.7 Institutional Repository

Most UoT libraries act as institutional repositories on campus, while fewer engage in open access initiatives or the custodianship of archives. Open Access programmes are however an emerging trend in UoTs although only a few have signed the Berlin Declaration of Open Scholarship Initiative.

Library engagement in promoting open access, institutional repository or institutional archives in UoTs constitutes a strategy for adding value in research and scholarship in the university and beyond.

6.1.8 Library Interventions for Postgraduate Students

A key driver in academic libraries today is the support of researchers through customized postgraduate learning facilities and services. This is reflected in library policy statements, subject librarian key performance indicators and in library strategic directions in UoTs.

Subject Librarians also provided research assistance to a diverse postgraduate student population in the following academic integration programmes:

- bibliographic management software, for example EndNote;
- academic integrity;
- learning management software;
- refresher IL modules;
- advanced use of library resources;
- advanced database training; and
- e-learning partnerships.

Based on the findings, the researcher reinforces the view of Simons, Young and Gibson (2000: 125) that programmatic partnerships within a constructivist theoretical framework lead to curricula integration, so that the library's resources and instruction become essential elements for student success.

6.1.9 Work Integrated Learning (WIL)

In view of the specific focus of Universities of Technology these institutions are all engaged in WIL programmes, with most UoT libraries supporting WIL. The survey data indicates that intern professionals are given library orientated tasks with an overview of subject librarian job portfolio training. Information literacy programmes teaching formed an important component of WIL activities in most UoTs enhancing the preparedness of students for WIL.

WIL programmes promote the LIS profession and empower the student. It is recommended that UoT library participation should be mandatory and that a WIL library assessment be designed by both the subject librarian and the LIS academics for continuous improvement and quality purposes. Subject librarians must lead by setting new standards and trends and should empower themselves with pedagogical skills, in creating a professional peer learning culture for promoting the university goals in this area.

6.2 Revisiting the Objectives of the Study

The objectives of the empirical study were achieved by means of the online survey conducted across all six UoTs in South Africa. The findings of this survey are reflected in detail in Chapter Five and the salient points highlighted. This represents the quantitative element of the study. However as explained in Chapter 5 and also in Chapter 1 the project as a whole is an exploratory study involving an in-depth review of the literature and the relevant theories, with the object of providing a nuanced description of an emerging field not previously explored, its challenges and its potential.

Thus the contribution which the study makes to the field is predominantly a qualitative one.

The researcher envisaged the library as a gateway to enhancing teaching, learning and research in the university, in setting the objectives for this study. The study investigated library academic integration in UoTs based upon the theoretical framework provided by the Gilchrist study (2007) in library leadership for instructional change in the university. This involved: supporting the curriculum and research; improving institutional outcomes; improving collaborations; building intellectual or knowledge centres and providing access within the parameters of an emerging knowledge society.

The study concluded that the perceived role of the library in UoTs has already changed from support service based to value based through the promotion of teaching, learning and research. The role of the library is thus already changing to meet diverse needs and, more importantly responding to the specific higher education needs of South Africa, despite formidable barriers in the form of limited resources both human and material.

The objectives of the study were supported by identifying and emphasizing the following key academic integration programmes all of which can help UoT libraries towards becoming a significant spoke in the wheel of teaching, learning and research in the university:

- embedded information literacy programmes;
- resource collection and development;
- faculty collaboration and partnerships to promote academic success;
- research scholarship and open access initiatives;
- social media networking; and
- reading and writing programmes.

With regard to the final bullet, the data indicated that reading and writing programmes were not popular in UoT libraries. These skills and competencies are generally being addressed in separate programmes with little synergy with library programmes. This must be considered a major current failing, because reading and writing skills determine academic success especially in societies where students entering university are underprepared by the schooling system. Academic developmental skills help overcome the problem of the "underprepared" student in South African universities.

Another new possibility in UoT libraries is the use of social networking sites to promote student-centered teaching and learning in the university. The findings show that there was little engagement as yet in the use of these, and yet the "Google Generation" student uses social networking very widely as a mode of communication and to engage with other students/peers. Greater focus on this is therefore indicated for the future.

According to Simons, Young and Gibson (2000: 124) an approach to academic integration includes active partnerships, curricular integration, sustained interactions among the constituent groups, and the extension of influence in a "multiplier effect". The library as an information resource and gateway can be a primary catalyst for cognitive, behavioral, and affective changes in students. The university library is therefore a powerful potential agent of change in students' lives and is indicated by the theoretical framework discussed in this study to be in an ideal position to engage actively with the educational mission of the university.

6.3 Limitations of the Study

The scope of the study was confined to examining academic integration programmes/practices prevalent in South African UoT libraries and their potential for positive expansion.

The study did not delve into the social integration of libraries in teaching and learning. In universities, social integration features prominently with academic integration in enhancing student teaching, learning and research experiences.

The scope was also limited in its investigation of detailed individual institutional academic integration practices. The researcher did not probe the varying degrees and levels of academic integration programmes that subject librarians conducted in their institutions. The questionnaire fell short of detailing for instance the number of times or the percentage of time spent by subject librarians in conducting integration measures in teaching, learning and research. The research also did not compare academic integration practices between UoTs in South Africa. It was felt that comparisons between institutions posed ethical, and potential legal, challenges and was therefore best omitted.

Subject librarian skills and competencies for effective academic integration services was also not factored nor listed in this study. Nonetheless, the researcher is of the opinion that these will need to be systematically upgraded.

Neither the perspective of the academic nor of the student was considered in the study due to time and budget constraints. A follow-up study could include these important stakeholder perspectives.

6.4 Recommendations

Conclusions drawn from the study revealed that varying degrees of library academic integration are currently supporting teaching, learning and research in UoTs in South Africa.

The researcher is of the opinion that the goal of UoT libraries should be to maintain and develop this relationship by realigning academic integration strategies with the university goals. The involvement of other key stakeholders (students and academics) in a future study as mentioned above could lead to a more definitive evaluative of the effectiveness of academic integration programmes in promoting academic success in UoTs in South Africa.

6.4.1 What academic integration means for UoT Libraries in South Africa

The perception of academic integration as a service framework was articulated by the University of Villanova (2009), which integrates library collections, resources and services with the learning and research priorities of the university through instructional activities, research consulting, collection development and web access, which are explored in this study. The framework is regarded as providing an appropriate strategy for UoT libraries to lead change and add value in a knowledge society.

The main point argued by Dale, Holland and Matthews (2006: 13-14) is that the library "be seen as a central element in an institution's response to the learner of the future and the best library services will succeed where they become an integral part of the learning process and where the subject librarian is more involved with course planning". The UoT library would then become a partner in transforming learning in the university. This perspective provides a foundation upon which the research objectives were designed.

The academic library necessarily forms an integral part of the academic experience of students. However, the researcher notes that at present there is no direct recognition of the connection between library programmes and academic success. The library assumes that responsibility when it becomes proactive in driving a sense of pedagogical purpose and mission beyond its more traditional roles within the institution that it serves.

Academic integration programmes are in an ideal position to provide an avenue for libraries to instill a culture of lifelong learning within a "student-centred" learning culture as discussed above. This interdisciplinary and self-motivated discovery of knowledge is facilitated by effective library academic integration strategies which simultaneously help universities to strengthen their teaching, learning and research strategies to improve pass rates.

The research data indicate that while academic integration has gained momentum in UoTs in South Africa, a greater effort is needed in collaboration with academics in:

blending learning; open access and scholarship; reading and writing programmes; and collaboration in postgraduate interventions.

Marketing the library has taken a new dimension within e-learning and new technologies are changing the role and function of the library in higher education fundamentally. Marketing the UoT library to give impetus to the educational mission of the library could provide a springboard for subject librarians to launch a suite of professional services in teaching, learning and research. As argued throughout the study, collaboration with academics in designing academic integration learner materials must be strengthened in the university.

The researcher's suggestion is supported by the ACRL Research Planning and Review Committee (2010: 289-290) that library efforts will continue to diversify in the following ways:

- collaborating with faculty to integrate library resources into the curriculum and seek opportunities for information literacy instruction;
- working with scholars to enhance access to their data, projects, research papers in virtual research environments and digital repositories;
- collaborating with information technology experts to develop online tutorials and user friendly interfaces for local and digital collections;
- collaborating with student support services to provide integrated services for students; and
- collaborating with librarians at other institutions to improve open source software, share resources, purchase materials, and preserve collections.

These arguments have relevance for UoT libraries in South Africa and are further strengthened by the findings of this study.

Academic libraries are fundamentally affected by the technological changes in higher education. According to ACRL Research Planning and Review Committee (2010: 289-290), exciting developments exist in OCLC's new cooperative web-scale library

management services and in their discovery tools, which provide a single interface to multiple resources using a centralized consolidated index that promises faster and better search results than federated searching. While social networking tools can help libraries go where their users are, many librarians see new challenges in determining which tools to use, how many resources to devote to them, and how to assess their effectiveness. This difficulty has slowed the pace of growth in social networking implementation in UoT libraries, as reflected in the survey findings. Nonetheless librarians are now monitoring the success of open source integrated library systems software which offers cutting edge technological services, including sustainability and "green" libraries in higher educational institutions. UoT libraries in South Africa have embraced technologies such as these in their quest for integrated support in the scholarship of teaching and learning.

The data indicated that subject librarians provide customized research services for postgraduates and researchers such as trouble-shooting; setting up alert or RSS feeds; installing and using referencing packages; and optimizing usage of e-resources for helping students with their literature reviews.

However, perhaps ironically, library programmes at the level of the basic and arguably more significant need to develop academic reading and writing skills, are extremely rare in UoT Libraries in South Africa while most libraries internationally have embraced reading and writing programmes in promoting academic success in higher education.

Although the study did not address the issue of librarian training and staff development for improving academic integration practices in the university, it is clear that subject librarians have to possess the essential competencies for teaching, being at the cutting edge of learning styles of the millennial student, and having research knowledge and competency to impart knowledge to academics or students. Subject librarians also need information and communication technology training and support to keep abreast in providing library leadership to academics and students.

The continuous evaluation of library services and specifically of academic integration programmes are also crucial for developing and promoting library leadership and quality services advocated in this study with the ultimate goal of the promoting a genuine knowledge society in South Africa.

6.4.2 Challenges in UoT Libraries

The Association of College and Research Libraries (ACRL) Research, Planning and Review Committee (ACRL Planning and Review Committee, 2010:289-290), identified the following challenges, each of which is mirrored in the findings of this study:

1. changes in higher education will require that librarians possess diverse skills. As technological changes continue to have an effect not only the way libraries are used but also the nature of collections, librarians need to broaden their portfolio of skills;
2. digitization of unique library collections will increase and require more resources;
3. many academic libraries are required to demonstrate the value they provide to their institution;
4. increased collaboration will expand the role of the library within the institution and beyond;
5. libraries will continue to lead efforts to develop scholarly communication and intellectual property services;
6. technology will continue to change library services and skills. Cloud computing, augmented and virtual reality, discovery tools, open content, open source software, mobile technologies and new social networking tools are important technological changes affecting academic libraries today; and
7. the definition of the library will change as physical space is repurposed and virtual space expands (ACRL Planning and Review Committee, 2010).

These indicate how the concept of the academic library has evolved in shape and design in the twenty-first century higher education. They also indicate aspects which have been illuminated further in this study.

6.4.3 The UoT Subject Librarian

The potential role of subject librarians in leading change in higher education as explored in this study is best described by Bell and Shank (2007:151):

> As librarians we serve the needs of faculty, and as higher education evolve, our faculty will increasingly be searching for ways to enhance their teaching and learning experiences. We can also see exciting new technologies developing, and in many ways they can be thought of as instructional technologies with applications for improved pedagogy. As new generations of students come to our institutions as native users of the latest digital technologies and electronic gadgets, blended librarians must understand those technologies and develop ways to integrate them into traditional ways of educating students about research methods.

The study concentrated upon the potential for specific library instructional programmes to be designed and interwoven into the teaching, learning and research agenda in UoTs. These in turn were seen as key vehicles in engendering academic success in the current context of UoT students in South Africa.

The study thus places the library at the heart of the university as it has ideally been understood for centuries – only now within a transformed role suited to the twenty-first century.

According to Gilchrist (2007: 23) the academic library is:

> often referred to as the heart of an institution, yet paradoxically, they are rarely perceived as core to the teaching, learning and research outcomes in the university. Neither is the academic library perceived as a full instructional partner in higher education. This situation persists in spite of the fact that the library's educational role, and specifically a library's instruction programme, now forms a significant spoke, if not indeed the hub, of many college library missions.

The researcher provided an avenue for UoTs to revitalize their role and value in the university. According to Price and Fleming-May (2011:197-199) libraries can effectively construct useful, multifaceted assessment tools. With clear extensive assessments, libraries can present robust evidence of their contribution to the desired outcomes. Most importantly, libraries can communicate their irrefutable worth within UoTs in South Africa.

Research conducted on academic integration programmes in this study indicates the importance of UoT libraries and their changing role in moving towards becoming full instructional partners uniquely able to respond to the higher education challenges and the needs of a knowledge society in South Africa. Before this can happen however subject Librarians' teaching and pedagogical skills will need to be strengthened by taking up the training opportunities which their institutions provide.

The researcher contends that competent subject librarians able to contribute to the teaching and learning processes will be highly valued and will be in a uniquely appropriate position to integrate the library in the teaching and learning mission in the university. The correlation between an information literate student and notable success in higher education has not been sufficiently explored in South African studies. This leaves a gap for further research.

6.5 Future Research

The current research provided a unified model of academic integration programmes prevalent in UoTs in South Africa. In light of the findings in this study, future research is recommended on:

- an integrated best practice model for information literacy for UoTs in South Africa. This model should target undergraduate teaching for promoting graduate success;
- an investigation into open access and scholarship in UoT libraries in South Africa, with a view to increasing research output;
- a strategic plan for the adoption of social networking and other media into the library in light of better communication, promotion and becoming student centred in teaching and learning; and
- an investigation into examining assessment practices of academic integration programmes in UoT libraries.

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Appendix 1

To: The Library Director, Subject Librarians/Training/Postgraduate Librarians (Tshwane
University of Technology)
From: Ms S Neerputh (Library Manager: Academic Services)
Date: 28 August 2012

Invitation and Consent to participate in D.Tech research entitled - Academic integration of libraries in teaching, learning and research in Universities of Technology in South Africa.

Dear Colleague

You are kindly invited to participate in a research study designed to examine academic integration practices of subject librarians/ training or postgraduate librarians in Universities of Technology (UoT's) in South Africa.

'Academic integration' refers to the active partnership between the library and academics which engenders student academic success. "The academic integration service framework integrates library collections, resources and services with the learning and research priorities of the university through instructional activities, research consulting, collection development, and web access" (Villanova University Library. 2009. Academic integration. Available at http://library.villanova.edu/about/departments/academicintegration/ (accessed 27 August 2012).

I am a staff member at the Durban University of Technology currently pursuing a Doctor of Technology degree (D.Tech) in Library and Information Studies. I appreciate your assistance in completing an online questionnaire which constitutes data for research study across all six UoT's in South Africa. Confidentiality is assured in terms of research ethics and your responses will remain completely anonymous. E-mail addresses are optional and will be used for clarification purposes only. Respondent feedback is voluntary.

Please click on the following link to complete the survey which will take approximately 30 minutes: https://www.surveymonkey.com/s/DTechresearch
I appreciate your responses by the 25 November 2012.
If you have any questions please contact me telephonically on 031 3735197 or 0832602512, e-mail: neerputs@dut.ac.za. It is a compulsory requirement for the final thesis to be made available on the DUT open access repository.

Thanking you for your co-operation and time.
Shirlene Neerputh

Appendix 2

To: The DVC: Academic; Director of Research and Postgraduate Studies; Director: Library Services
From: Ms S Neerputh (Library Manager: Academic Services)
Date: 20 October 2012

Permission and consent to undertake research in your University for a D.Tech study.

Dear Deputy Vice-Chancellor/ Directors: Library and Research

I seek your kind permission and consent to undertake research for my D.Tech study entitled: Academic integration of Universities of Technology Libraries in South Africa.

I am a Library staff member at the Durban University of Technology currently pursuing a Doctor of Technology degree in Library and Information Studies.

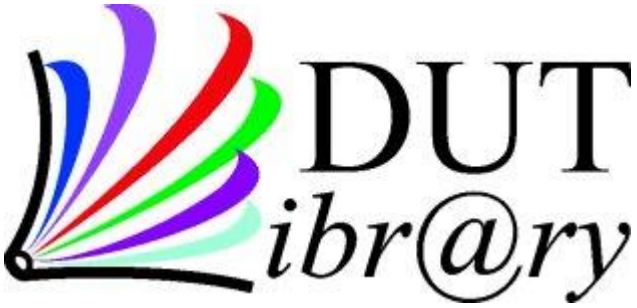
The purpose of the research study is to examine academic integration practices of subject librarians/ training or postgraduate librarians across all six Universities of Technology (UoT's) in South Africa.

I plan to invite subject librarians/ training or postgraduate librarians/ library manager/s to participate voluntarily in an online survey at your University in November 2012. Confidentiality is assured in terms of research ethics and all responses will remain completely anonymous. The researcher will abide by the ethics and code of conduct as pledged to the Durban University of Technology research department and ethics committee.

Please feel free to contact me telephonically on 031 3735197 or 0832602512, e-mail: neerputs@dut.ac.za should you have any queries. I would appreciate a written response from your office.

Thanking you for your kind permission and co-operation.

Shirlene Neerputh



***1. Please complete your biographical details.**

Institution

Email Address:

Academic integration practices in Universities of Technology libraries in S...

The purpose of this questionnaire is to ascertain what academic intervention practices/programs are prevalent in Universities of Technology Libraries in South Africa.

*2. Does the University make explicit the importance of the Library in teaching, learning and research?

- [ ] Mission statements
- [ ] Policy documents
- [ ] Strategy documents

*3. How does the Library ascertain that the subscribed information resources meet the needs of teaching, learning and research in the institution?

- [ ] Collection evaluation
- [ ] Collection review and analysis projects
- [ ] Use of bibliographic evaluation tools eg. OCLC
- [ ] Usage statistics and reports
- [ ] User surveys
- [ ] None of the above

*4. Please give examples of academic intervention projects in which you promoted the use of the Library services or resources for:

Teaching

Learning

Research

5. Who do you collaborate with, to promote teaching, learning and research in the University?

- [ ] Academics
- [ ] Deans
- [ ] Head of Department
- [ ] Quality Promotion/ Assurance Unit
- [ ] Teaching and Learning centre in the university
- [ ] Regional/ national or international teaching and learning partners
- [ ] Subject Librarians from other Libraries
- [ ] Students

6. Were you invited by Faculty to participate in:

	Yes	No
1. Curriculum planning or design	◯	◯
2. Curriculum/programme review	◯	◯
3. Postgraduate facilities planning	◯	◯
4. Research facilities planning or reviews	◯	◯
5. Undergraduate facilities planning	◯	◯

Other (please specify)

*7. Which academic departments invited you for curriculum planning or curriculum design workshops/meetings?

*8. How would you rate your liaison/relationship with academics engaged in Library intervention programs?

- ◯ poor
- ◯ satisfactory
- ◯ good
- ◯ excellent

*9. What learner facilities do you provide in the Library?

- ☐ Knowledge/information or research commons
- ☐ 24/7 Learner centre with computers/wireless access
- ☐ 24/7 Learner centre without computers/wireless access
- ☐ Multimedia centre/venue
- ☐ Reading rooms
- ☐ Writing centre/venues
- ☐ Training centre
- ☐ Informal learning spaces and open/closed access areas eg grouprooms

Other (please specify)

*10. What learner support materials do you provide for students and staff?

- ☐ IL learner guides
- ☐ OPAC training guides including online tutorials
- ☐ Research guides
- ☐ Subject guides
- ☐ Digital or Web-based learning/ training materials
- ☐ Open source learning/training materials
- ☐ Social networking learner guides/materials
- ☐ Other (please specify)

11. Who designed these learning materials for users?

- [ ] Librarians only
- [ ] Academics only
- [ ] Librarians and Academics collaboratively
- [ ] Library and Dept/Centre for Teaching and Learning, e-learning centre, Quality Assurance Dept or IT support staff

Other (please specify)

*12. What training/programs does the Library provide to achieve academic success?

	Undergraduates	Postgraduates	Faculty/Academics
Information literacy	☐	☐	☐
Reading programs	☐	☐	☐
Writing programs	☐	☐	☐
Web-based teaching and learning	☐	☐	☐
Open Source teaching and learning training programs	☐	☐	☐
Social Networking training	☐	☐	☐

Other (please specify)

13. What programs does the Library engage in for work integrated learning or in-service learning?

14. For whom are Library academic programs provided?

	All Undergraduates	1st yrs only	Some Undergraduates	All Postgraduates	Some Postgraduates	None
Information literacy	☐	☐	☐	☐	☐	☐
Reading programs	☐	☐	☐	☐	☐	☐
Writing programs	☐	☐	☐	☐	☐	☐
Web-based learning	☐	☐	☐	☐	☐	☐
Open source teaching and learning	☐	☐	☐	☐	☐	☐
Social networking programs	☐	☐	☐	☐	☐	☐

*15. How does the Library offer information literacy in the university?

- [ ] Stand alone IL program – not much academic buy-in
- [ ] Compulsory IL – univ. policy/norm for all 1st year students
- [ ] Integrated IL into the curriculum with assessments
- [ ] Integrated IL without assessment
- [ ] Both integrated IL and blended learning
- [ ] Integrated IL and blending learning with assessments

*16. What challenges/barriers impact on information literacy?

1. Teaching	
2. Learning	
3. Research	

17. What successes are notable in information literacy?

1. Teaching	
2. Learning	
3. Research	

18. Does the Library engage in:

	Yes	No
1. Open Access programs/initiatives	☐	☐
2. Institutional Repository initiatives	☐	☐
3. Archives (either physical or digital archives)	☐	☐

19. Please give details of Open Access/ Digital initiatives

1. Teaching	
2. Learning	
3. Research	

20. How are postgraduate Library interventions represented in strategy or policy?

- [ ] Teaching and learning strategy of the institution
- [ ] Library strategic document (vision and mission and key objectives)
- [ ] Library policy statements eg. Information Services or Information Literacy policy
- [ ] Subject Librarian key performance areas

*21. Please give details of the Library programs offered to postgraduates or researchers in the university.

1. Teaching	
2. Learning	
3. Research	

22. What are the challenges/barriers for effective Library academic interventions in:

1. Teaching
2. Learning
3. Research

23. What type of assessments are conducted for academic integration in your library? (Summative refers to credit bearing/ marks allocated for learning and Formative assessment refers to self regulated learning/feedback from learners)

	Summative	Formative	None
Information literacy	☐	☐	☐
Reading programs	☐	☐	☐
Writing programs	☐	☐	☐
Web-based learning	☐	☐	☐
Open Source teaching and learning programs	☐	☐	☐
Social Networking training program	☐	☐	☐

24. Who is responsible for designing these assessments?

- ☐ Subject Librarians only
- ☐ Academics only
- ☐ Subject Librarians and Academics collaboratively
- ☐ Other

Other (please specify)

25. Does your University or Library conduct surveys/feedback on:

- ☐ Teaching needs
- ☐ Learning needs
- ☐ Research needs
- ☐ How does the Library use this feedback to improve its services or resources?

*26. What are the notable successes of Library interventions for the following?

Academics

Students

Researchers/Postgraduates

*27. Please recommend any other Library academic interventions which promote:

1. Teaching
2. Learning
3. Research

Thank you for your feedback and time taken to complete this questionnaire. The researcher appreciates your responses.