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Redesigning academic library spaces for 21st century users with special reference to CPUT Libraries

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Mini thesis submitted in partial fulfillment of the requirement for the degree of Masters in Library and Information Studies, University of the Western Cape

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Date Submitted: March 2017

DECLARATION

I, Sulaiman Majal, declare that the thesis entitled *Redesigning* Aca*demic Library Spaces for 21st century users with special reference to CPUT Libraries* is my own work and that it has not been submitted before for any other degree or assessment at any other university. The sources used or quoted from have been acknowledged by means of complete references.

Signature

Date: November 2016

DEDICATION

To The Almighty who gave me the strength to persevere and complete this work.

I dedicate this achievement to my late parents, **Ismaeel and Bahieya Majal.**

My deepest gratitude for your inspiration

ACKNOWLEDGEMENTS

I would like to express my appreciation to the following individuals:

- My Supervisor, Prof. George Fredericks for all his guidance, dedication and motivation. Your time and effort is greatly appreciated.

- To my co-supervisor, Dr. Lizette King for her dedication, assistance and encouragement.

- I'm grateful to my wife, Faghmia and my kids Layla, Ismaeel and Israa, for giving me the support and time to do my research.

- To my dear friend, Mr Yunoos Omar for your encouragement and assistance.

- To my colleagues at CPUT for assisting me to administer my questionnaire.

- To the lecturing staff at UWC you're caring and nurturing nature towards your students is admirable.

ABSTRACT

The use and design of library spaces in higher education is a theme that has come to the forefront of user needs in the past few years. Academic libraries are redesigning their spaces to accommodate the 21st century user. The 21st century user is often labeled as Generation Y and requires a different set of knowledge and skills. In today's knowledge economy, core skills include creativity, problem solving and collaboration. Libraries are creating space to accommodate the needs of these new users. They are developing group work areas, relaxation or pause areas, technology hubs and discussion rooms.

This study has investigated how to redesign academic libraries, using Cape Peninsula University of Technology (CPUT) Cape Town branch as a pilot study. The researcher used the concept of library "as place" or "3rd place" as a theory. The framework interrogated the ten qualities of a good library space. The researcher used a mixed method research design to conduct this study. A questionnaire of which multiple copies were made, interviews and internal statistics were used to gather data. The results of the study reflected that the library is functional, can be adapted, the space is accessible and varied, it is conducive to motivating and inspiring people, it does promote interactivity between users and library services, and is environmentally suitable, flexible and has a wow factor. All of these characteristics conform to McDonald's ten qualities of a good library space.

Key words

21st century user, Generation Y, CPUT, library design, library spaces, library as 3rd place.

LIST OF ACRONYMS

ACRL	-	Association of College Research Rules
CALICO	-	Cape Library Co-operative
CHELSA	-	Committee of Higher Education Libraries South Africa
CPUT	-	Cape Peninsula University of Technology
IATUL	-	International Association of Technological University Libraries
TEALS	-	Tools for Evaluation of Academic Library Spaces
UWC	-	University of the Western Cape

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CHAPTER 1
INTRODUCTION

1.1 Introduction

The most important component of the 21st century library is the user. The establishment of the 21st century library will be redundant if the library is not meant for use. According to Nwalo (2003:1) the library user is the most important person in any library setting. Aina (2004:1) adds that the library user is the focal point of the 21st century library, as the library exists to satisfy the user.

1.2 Rationale of the study

The purpose of this research is to investigate the design of academic library spaces for 21st century users. Special reference is made to the Cape Peninsula University of Technology (CPUT) libraries, in particular the Cape Town branch library.

Academic libraries locally and internationally have embarked on redesigning their spaces to cater for the needs of the 21st century user. The 21st century user is often labelled "Generation Y" or referred to as the "Net or Digital Generation". Members of Generation Y portray the following four traits: they have great expectations as high achievers, they are ambitious, they expect customization, they are technology veterans and they utilize new communication modes (Gardener & Eng 2005: 405-420).

Howe and Strauss (2000) mentioned that Generation Ys are unique due to their ambition and optimism. They are the most ethnically diverse generation and have different learning styles and values to their predecessors. According to Duck and Koeske (2005:12) Generation Ys are team orientated and tend to be conformists. They grew up with television and video games which make them visually orientated and they easily become bored because of possible short attention spans.

Education in the 21st century requires a different set of knowledge and skills. In today's knowledge economy, core skills include creativity, interdisciplinary thinking, problem solving and the ability to collaborate with others.

These skills can only be acquired through ‘learning by doing’ and social interaction (Sinclair 2007:4-6). Libraries, as a partner of education and learning, have been challenged to reshape their approach to meet these changing needs.

In the last five years, it was found that traditional library services have decreased and libraries have evolved from a place to study and borrow material, to a place of social learning. More and more libraries are sacrificing their book shelves to make way for infrastructure and interior design elements to invite these changing needs and activities. Areas being developed include collaborative work areas, meeting rooms, technology booths and relaxing lounge areas with coffee facilities (Swanson, 2013).

Beyond all the practical uses of libraries as places, such as a place for staff to work, or a place for students to study, use computers or meet to discuss a project or research questions, libraries also serve as the repository of the written historical record of the knowledge of cultures and civilizations (Weise, 2004:6).

Academic libraries internationally, as well as locally and regionally in the Western Cape, have gone through some form of transformation of their library spaces to respond to their current users’ needs. In a recent study where ten academic university libraries were surveyed, they all had the redesigning of spaces to support user output as part of their main thrusts (Shaw 2013). This phenomenon has triggered the need for this research.

The researcher has been working in academic libraries for sixteen years and has been involved in redesigning the library spaces of four libraries in twelve years. This study investigated “libraries as place” and will be used in future designing of library spaces, particularly at the rest of the Cape Peninsula University of Technology (CPUT) branch libraries. Scholars have outlined the significance of libraries as “places” that accommodates social activity (Gaus & Weech, 2008:2), community gathering and meetings (Aabo & Audunson, 2012:138), and social learning (Sinclair 2007:4-6).

1.3 History of CPUT libraries

During March 2001 the then Minister of Education, Kader Asmal, announced the National Plan on Higher Education - a national transformation process that transformed the higher education landscape in South Africa. This plan saw the mergers of various higher education institutions across South Africa and the formation of Universities of Technology.

One of the mergers resulted in the establishment of the Cape Peninsula University of Technology when the Cape Technikon and Peninsula Technikon merged. On 1 January 2005 the Cape Peninsula University of Technology was officially launched and on 1 February 2006, Prof Lineo Vuyisa Mazwi-Tanga was appointed as the first Vice-chancellor of the institution. In May 2008 Dr. Trevor Manuel was elected as the first Chancellor of the University (Cape Peninsula University of Technology, 2013a: History).

The merger was not without logistical problems. Due to apartheid, there were distinct historical differences between the two institutions. The Cape Technikon was a previously advantaged and Peninsula Technikon a previously disadvantaged institution. This meant that two groups of employees which were segregated for decades had to find common ground and work together. This led to major challenges and disparities that had to be harmonized. Ten years later there are still inconsistencies and disparity of policies and procedures between the two merged institutions.

Before the merger, Cape Technikon had four and Peninsula Technikon had three branch libraries respectively. Post-merger the combined number of branch libraries therefore increased to seven resulting in a combined library staff complement (including part-time staff) of 105, a 35% increase in collections, a 30% increase in the online database subscriptions and a 75% increase in student numbers. To address some of the staffing issues, various staff interventions took place to find parity regarding different salary scales and job grades. Numerous libraries and systematic issues were addressed to ensure the least amount of disruptions of the libraries' service delivery.

To accommodate increasing student numbers, currently CPUT library has eleven branches (Cape Peninsula University of Technology: 2013a). Access to CPUT libraries is available at the following campuses: Athlone, Bellville, Cape Town, Granger Bay, George, Mowbray, Media City, Tygerberg, Wellington and Worcester. Because these branches are geographically far apart, additional pressure was put on delivering library services. Students are expecting equitable types of services at all the branches.

A university of technology is characterized not only by the use of technology within the university, but rather the interweaving, focus and interrelation between technology and the nature of the university. At a technological university the focus is therefore on the study of technology from the viewpoint of various fields of study, rather than a particular field of study. By 'technology' is meant the human arrangement of nature with the help of tools for human purposes as well as effective and efficient application of the accumulated know-how, knowledge, skills and expertise that, when applied, will result in the output of value-added products, processes and services (Swanepoel & Van Staden, 2009:4).

Due to the history of the merged CPUT libraries catering for vocational training, the library itself has not been funded adequately to further its growth, or its collections, information technology requirements and space needs. The library had to cater for disadvantaged students whose demands on service were much greater. Due to lower entry level requirements and students coming from disadvantaged areas, students in general needed access to computers, study space and additional academic support including intense information literacy training and guidance.

Currently CPUT library service has developed links with both local and international libraries. It is also a member of the local consortium CALICO, the Cape Library Co-operative. It is a member of IATUL, the International Association of Technological University Libraries (Cape Peninsula University of Technology 2013b).

1.4 Conceptual framework and theory

Swanson (2013) indicated that theories are formulated to explain and understand phenomena and to challenge existing knowledge. He furthermore mentioned that the theoretical framework is the structure that supports and introduces the theory that explains why the research problem under study exists. Kumar (2013:19) defined the conceptual framework as the basis of the research problem. He went further to mention that the conceptual framework describes the aspects you selected from the theoretical framework to become the basis of your enquiry.

The study encompassed the concept of "library as place" or "library as third space" which brings together resources, learning spaces, technology and infrastructure to create an excellent student experience and used the ten qualities/principles of a good library design and space for the 21st century as mentioned by McDonald (2007:16) as a framework to investigate if the re-designing of the CPUT Cape Town branch library in 2012 has met the needs of its students.

In the 21st century, libraries do not only need to establish how they will strategically develop the services they provide, but also need to consider their physical space. The move to electronic collections and services are providing libraries with opportunities to use their physical space in different ways (Bryant, Mathews & Walton 2009:7). Despite predictions about the end of libraries and their collections due to the rapid growth of the internet, e-books and online resources, universities continue to build and refurbish existing library buildings (McDonald 2007:14).

The academic library "as place" holds a unique position on campus. It is at the heart of the academic experience. It should offer adaptable spaces to accommodate different modes of learning. Information technology should form part of the library's internal environment rather than being replaced by information technology. Although all these activities will certainly change the library, the library remains the important "place" where all these essential services can be conveniently provided (Freeman 2005:17).

Oldenburg as referred to by Ferris and Stein (2012) coined the term "third place" in 1989. Oldenburg's theory was used in the context of community buildings to refer to social surroundings separate from the two usual social environments of home and workplace.

Oldenburg (1991) argued that “third places” are important for civil society, engagement and establishing feelings of a sense of place.

Oldenburg went further and emphasized that “third places” are "anchors" of community life and facilitate and foster broader, more creative interaction. Oldenburg suggested the following as the hallmarks of a “third place”:

- It is free or inexpensive.
- Food and drink, while not essential, are important.
- Highly accessible: proximate for many (walking distance)
- It has its regular visitors and those who habitually congregate there
- The space is welcoming and comfortable.
- Both new friends and old should be found in the space.

Memarovic, Fels, Anacleto, Calderton, Gobbo and Carroll (2014:1) explained that coffee shops, bars, and barbershops are some of the typical third places named by Ray Oldenburg in 1989. These places are neither work, nor home, and are places where local communities gather to unwind and discuss a broad range of topics. These places allow for community life to unfold. As mentioned by Oldenburg, third places are low profile, neutral, inclusive, accessible and accommodating, and filled with regulars.

For people who visit the library regularly, the library becomes part of their daily routine. They either use the library to escape their daily challenges or as alternative places to work. By doing this the library can be seen as a “third place”. It becomes a place to socialize and relax. A third place can provide a place to connect with a community, whether through passive observation or active participation. Libraries have proved that they can serve as a third place for a long time (Agresta 2014:7). It is not new for libraries to offer a range of activities from social interaction to community engagement projects and sharing of ideas. These activities connect people, build relationships and enhance a sense of community (Davies & Bolton 1996).

According to McDonald (2007:14) the following are qualities of a good library space in the 21st century. A library has to be a functional space that works well, looks good and lastly the space also has to be adaptable, a flexible space that can easily be changed and adapted for future needs.

A library space must also be accessible as a social space implying it must be inviting, easy to use and varied with a choice of learning, research and recreational spaces and different media. It must also promote independence. McDonald also mentioned that the space should be interactive implying a well-organized space which promotes contact between users as well as between users and staff. It must be conducive with high quality humane space which motivates and inspires people.

It must also be environmentally suitable with appropriate conditions for users, books and computers, while still being cost efficient enforcing the economic use of space, staffing and running costs. The space should also be safe and secure for people, collections, equipment, data and buildings and suitable for information technology with flexibility provision for users and staff.

This framework developed by McDonald (2007) offers a base and guide to measure if the redesign project at the CPUT Cape Town was successful or not. The use of McDonald's framework was motivated by the application thereof in other projects:

This framework by McDonald was used at the Singapore Management University as part of their Social Learning Spaces project. Yeo (2008:53) described the efforts made by the Li Shing Library, in the design, creation and evaluation of its social learning spaces.

A study done as part of the TEALS (Tools for Evaluation of Academic Library Spaces) project evaluating physical library spaces at the different campuses of Deakin University, used McDonald's ten qualities of a good library space to guide the study (Abbasi, Elkadi, Horn, & Owen 2013:236).

McDonald's framework was strengthened when the authoritative Association of College Research Rules (ACRL) declared that libraries are intellectual commons, in other words a space where patrons interact in both physical and virtual environments, and stipulated standards regarding library spaces. The ACRL (2011:6) specifies that an academic library must:

- Create intuitive navigation that supports self-sufficient use of virtual and physical space;
- Provide a safe and secure physical and virtual environments conducive to study and research;
- Have the information technology infrastructure to provide reliable and robust virtual and physical environments needed for study and research;
- Use physical and virtual spaces as intellectual commons, providing access to programs, exhibits, lectures and more;
- Design spaces to facilitate collaboration and learning, and the creation of new knowledge.

McDonald's framework and Oldenburg's theory as library as a third place together with the ACRL standards regarding library spaces guided this research.

1.5 Research problem

Fox and Bayet (2007:14) define the research problem as "narrowing down the general interest in a research topic on a specific research problem that is small enough to be investigated."

The Cape Town branch of CPUT libraries was redesigned and refurnished in 2012 as a pilot project which would subsequently serve as a model or benchmark for all ten CPUT branch libraries. This study explored whether McDonald's ten qualities of a good library space has been achieved with the redesigning of CPUT Cape Town branch library.

1.6 Research questions

The research problems as well as the literature review have led to the following main research questions which will be answered by the study:

i. How functional is the CPUT Cape Town library?
ii. How adaptable is the space in CPUT Cape Town library?
iii. Are the library spaces at CPUT Cape Town library accessible and varied?
iv. How conducive is the CPUT Cape Town library space to motivate and inspire studying?
v. How flexible are the CPUT Cape Town library's information technologies in dealing with growing user demands?
vi. Does the space promote interactivity between users and services?
vii. How environmentally suitable, efficient and secure is the CPUT Cape Town library?
viii. Does the CPUT Cape Town library affect a wow factor?
ix. What are the possible new challenges of a re-designed library?

1.7 Research design and methodology

Creswell (2008:190) described this research approach as involving the use of qualitative and quantitative method, and the mixing of both approaches in a study. The researcher used a mixed methods approach for this research. Interviews with librarians, administered questionnaires completed by students and document analysis were used as information gathering tools. The use of two or more methods of study is broadly defined as triangulation (Denzin 1978:29). Due to the space of the Cape Town branch of CPUT libraries that was redesigned in 2012, this branch was used as the research site. The research design and method will be discussed in more detail in chapter 3.

1.8 Significance of the project

The study explored whether McDonald's ten qualities of a good library space have been achieved with the redesigning of the CPUT Cape Town branch library. The findings of this study will be used in future redesigning of library spaces at CPUT.

1.9 Scope and limitations of the study

The main limitation is that the study focused on one CPUT branch library only. Due to variation in size and space constraints, not all the findings might be applicable to the other CPUT libraries. The focus of the study is linked to academic library spaces and might not be adapted at public and special libraries.

1.10 Ethics statement

Strydom (2000:240) mentioned that ethics is a set of moral principles which is suggested to an individual or a group, is widely accepted and which offers rules and behavioural expectations about the most correct conduct towards experimental subjects and respondents, employers, sponsors, and other researchers, assistants and students. Ethics is about what you believe is right or wrong, proper or improper or good or bad.

Ethical clearance was required because the study involved getting feedback from human subjects therefore the rules and terms of participation had to be applied. The researcher at all times adhered to the ethical guidelines of the Research Committee of the UWC. No names of individuals were recorded on the questionnaires.

In this way, no individual will be linked to a particular completed questionnaire, thus assuring anonymity. Participation in this research was voluntary and the respondents had the right to answer or to withdraw at any time from the study. Consent forms were completed by all participants.

Permission to undertake this study was sought from the Library Director of CPUT Libraries. Permission and guidance to administer this study and questionnaire were also gained from the ethics committees of the University of the Western Cape (UWC) and CPUT (see appendix A & B). Applying for ethical clearance at UWC was seamless and efficient. To receive ethical clearance from CPUT was however a tedious and timeous process and has affected the period when the data gathering was done as well as the completion of this research project.

1.11 Outline of chapters

Chapter 1

Chapter 1 introduces the study and give an overview of the research project.

Chapter 2

The focus of chapter 2 is on previous work done in the field of redesigning academic library spaces.

Chapter 3

Chapter 3 discusses the research method and design, giving details of the research instruments used in collecting empirical data.

Chapter 4

Chapter 4 focuses on presenting the analysed data and interprets the results of the empirical research.

Chapter 5

The final chapter discusses the findings of this study, provides the conclusions reached and offers some recommendations.

1.12 Conclusion

This chapter provided a background to the study in particular the background and history of the research site, CPUT and its libraries, indicating the various changes it has been through and how well it has adapted to the changes. The concepts of library spaces, library as "place" and library as "third space" were defined and explained. The chapter explained the ten qualities/principles of a good library design and space for the 21st century as mentioned by McDonald (2007) as a framework to investigate if the re-designing of the CPUT Cape Town branch library in 2012 has met the needs of its students. The chapter also explained the research design used, which is mixed methods, and listed the significance and limitations of the study.

The following chapter conceptualizes and contextualizes the phenomenon of 21st century library users and spaces.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

This chapter serves to provide a critical evaluation of scholarly perspectives in relation to the themes like the 21st academic library user, library spaces, library spaces as a "place" or "third space", qualities of good library spaces, types of library spaces required by 21st century library users and some national and international studies.

In the literature it clear that the way the academic library is designed should work hand-in-hand with what the focus areas of the university are. It is also important to get the user community involved in the planning and design phase of design projects.

New buildings should encourage creativity. A university library has a role to play in a university, offering staff and students an area to interact in a space that encourages creativity. It is apparent that the current user population is viewing libraries from a different angle than that of the old traditional static library building that stored books and was a quiet place used to study. Librarians who have adopted the third space mentality, such as creating welcoming environments that students and teachers would want to inhabit, have not thrown out all of the benefits of how a library is organized. Instead, they have kept the backbone of how a library is traditionally organized and used aesthetics to make the space more appealing to their users.

2.2 The 21st century user

Current university students are forcing academic librarians to rethink the ways in which they offer basic services. The majority of university students are part of a new generation born between 1987 to 1994 and are often labelled Generation Y or the Net Generation or Millennials (Gardener & Eng 2005:405). Generation Y has great expectations, expect customisation, are technology savvy and use new communication modes. Generation Z (born after 1994) are described as "netgeners", "digital natives" or the Google generation. Whatever their name, this group is characterized as being able to multi-task, constantly communicates, is globally and visually oriented and tends to have short attention spans (Schmidt & Cribb 2011:6).

The 21st century user wants a modern, comfortable, safe, technology-equipped, central space close to services with staff on hand to support. Newly refurbished libraries should have a mix of informal group study areas, booths and technology-equipped rooms, alongside designated quiet spaces and areas with restricted access for research students (Shaw 2013).

According to Lippincott (2010: 3) this younger generation prefers working with or around classmates, using digital content or technology, doing academic work throughout the night, communicating to peers via digital technologies. They also access and use information to create new knowledge and learn while socialising which includes blending formal and informal experiences.

Nwalo (2003:1) defined the 21st century user as anybody who visits the library with the purpose of exploiting its resources to satisfy their information needs. However, Reitz (2005:1) defined the 21st century library as a "Library without walls". Large parts of collections do not exist on paper, but are electronically accessible in digital format requiring 21st century technologies to access it.

Because of typical information behaviour of current academic library users, a growing perception that the physical library is no longer essential to the educational experience since students constantly rely on the internet and technology for their learning and communication, developed. A survey conducted with Generation Y students at the Johns Hopkins University revealed mobility and technology are diverting Generation Y students away from the physical use of the library (Gardener & Eng 2005: 405-420).

Guyana's National library in Georgetown founded in 1909 with Carnegie funding was once a vibrant institution acting as a legal deposit library and serving thousands of users. Previously with long queues of students every week making early visits to ensure entry, the library has evolved to a remnant of past glory with many students not using the facility for research. Attempts like installing computers with internet access to lure students back, were unsuccessful (McPherson: 2016).

Smith (2006:3) predicted that normal evolving library patterns: the displacement of paper to electronic resources, from accessible on-site storage to compact storage, from local to remote centralised storage, from local ownership to subscription based ownership and from active

acquisition to access via the free web. Digital networks wired or wireless make it possible to conduct research anywhere. As a result, traditional functions carried out within libraries are subject to transformation (Mitchell, 2005).

Current students expect the college experience be digitally enabled. De Rosa and Dempsey (2004:4) went further to say whether librarians like it or not, current and prospective students are used to simple Web interfaces to find information themselves. Patrons expect to retrieve and manipulate information without the assistance of library staff.

It is apparent that the current user population is viewing libraries from a different angle than that of the old traditional static library building that stored books and was a place of study. Librarians who have adopted the third space mentality, such as creating welcoming environments that students and teachers would want to inhabit, have not thrown out all of the benefits of how a library is organized. Instead, they have kept the backbone of how a library is traditionally organized and used aesthetics to make the space more appealing to their users (Pennington 2012:9).

2.3 Libraries as third places

Oldenburg (1991) has coined the concept *third place*, as opposed to *first place* (home) and *second place* (work). A third place is a communal (parochial) arena with a low threshold, frequented by regulars, where the main activity is talking, and where it is possible to buy something to drink. Third places or spaces are therefore informal public places where people come together regularly for conversation and camaraderie. Third places are regarded as important for civil society, engagement and establishing feelings of a sense of place. Oldenburg (1991) further emphasized third places as "anchors" of community life which facilitate and foster broader, more creative interaction.

Oldenburg suggested that hallmarks of a third place are that it can be free or inexpensive and that food and drink - while not essential, but important - are available. Although it has regular visitors as well as people who habitually congregate there, it should be a space where both old and new friends are found. The space is welcoming and comfortable. Oldenberg concluded that third places play an important role in building community and social capital – one of the functions of a library (Oldenberg 1991: 61).

Third space can exist in almost any facet of society. The third space can become a place of expanded and heightened learning for all involved. In the classroom environment the teacher uses the third space as an added resource and a place to expose students to different cultural and social situations while making them feel safe and giving them the opportunity to collaborate (Skerrett: 2010: 70).

Ryan Flessner, a fifth grade elementary school teacher, decided to use the theory of third space as a resource in his classroom. He noticed that many of his students did not know each other, were reluctant to share their thoughts or work together in groups and were not comfortable enough in his classroom to make connections between mathematics in the classroom and real world applications. After creating a third space where students brought in their own cultural and life experiences, students felt comfortable enough to instigate mathematical problem solving in small groups (Flessner: 2009: 439).

Although Waxman, Clemons and Banning (2007:427) indicated that coffee shops top the list of third places selected by students, academic libraries can also fulfil that role. One has to ask whether library activities constitute the library as a first, second or third place. The challenges of the third place model for libraries are the lack of purposeful work and learning spaces. The 21st century library needs an organisation that assimilates the third place with the productivity of the second place work and the security and comfort of the first place. Thus and important outcome of library space is to create a space that offers a home away from home that includes comfort, security and productivity.

Weise (2004:9) concluded that libraries have been symbols of learning, just as churches are symbols of religion. Therefore all the practical uses of libraries as places, such as a place of work, or a place for students to study or use computers or meet or discuss a project or a research project, libraries serve as a depository of the written historical record of cultures and civilisation.

Florida (2000: 64) was of the opinion that libraries remain amongst the most socially inclusive and well used places in modern society. Regarded as “third places”, libraries are at the centre of a community’s social vitality. They are neither home nor work but places where people go for social interaction (Florida 2000). It is not new for libraries to offer a range of activities from

social interaction to community engagement projects and sharing of ideas. These activities connect people, build relationships and enhance a sense of community.

The danger around the discussion of a third place model for libraries is that it emphasizes sociality, good conversation but not a purposeful work and learning place. This concept can act as a stimulus of informal space in libraries (Watson & Howden 2013:16) - a phenomenon already happening in the academic environment as discussed later.

It can be concluded that for many regular library users, the library becomes part of their routine. They either use the library to escape their daily challenges or as an alternative place to work. The library can be seen as a place to socialize and relax – a third place providing space to connect with a community, whether through passive observation or active participation.

2.4 Qualities of good library spaces

Ensuring a good library experience should be the main pillar of any library space development initiative. The way users experience the library is dependent on the quality of the space, how it is organised and the types of services provided. Schmidt and Cribb (2011:5) advised that, when designing library spaces, it will be difficult to please everyone. However academic library spaces must work hand-in-hand with the focus areas of the university students and conform to the primary need for a comfortable, quiet work space which inspires learning. Although the creation of a variety of spaces is needed for 21st century libraries, it is important that these spaces interrelate, that there is a flow from one space to another and that refurbishment complements different spaces.

According to Lang (2001:13) the 21st century interpretation of a library as a social space is a flexible learning space providing a hybrid of information resources and collaborative and independent workspace – not only a place to borrow books and study and having to use the catalogue to check for material.

Developments over the last decade have produced principles and guidelines for redesigning library spaces (Glugston 2013:241). The following ten qualities of a good library space should be considered to enhance creative planning of new library spaces to meet the evolving needs users as well as to ensure that all roleplaying factors is considered before implementation.

Functional

A library space must look good and create synergy between the various departments. The space should operate economically and be easy to use. Libraries should look attractive, but functionality should be the first priority. The space should be designed to integrate all the services offered by the library - including its virtual environment (McDonald 2007: 19). As Dowlin (1997:17) confirmed, the magic of libraries in the 21st century is in connecting minds and successful library buildings will enable users and the library space to connect.

Adaptable

A library space must be flexible which can easily adapt to change. When designing a library, one pertinent question to be asked is how far ahead should the library be planned (McDonald 2007: 19). Jones (1999) warned that due to rapid changes in information technology and higher education, academic libraries must not plan for more than fifteen to twenty years. Planning library spaces comes with great uncertainty especially with the changes in user behavior and their interaction with technology. For these reasons it is important for libraries to have a high degree of flexibility to enable changes to happen easily with the least disruption. However, library planners should keep in mind that long term flexibility can be more costly than short term functionality. Therefore, any saving should be assessed against long term flexibility.

Accessible

Spaces must attract users and must be easy to use. At any academic institution the library is the key to leaning, social interaction and research (Shobha 2015:973). The library should be accessible and encourage users to make full use of the services. The library should be centrally situated and easily accessible to ensure optimal usage. It must cater for all types of users whether they are technology savvy, researchers or physically challenged. Its diverse services should offer traditional and electronic modes of delivery (McDonald 2007: 19).

The location of the library is important as it has to be located in an area that captures the flows and movement of its users. The library has to be located close to dormitories, cafeterias, book shops, sports complexes and transport routs – in other words part of the natural flow of its users.

Linking library space with other spaces creates a synergy between work and play (Schmidt & Cribb 2011: 9). Access to the library should be easy for all and students should not struggle to

understand how the library works. Signage should be clear and visible. Electronic noticeboards and plasma screens can also be used.

Access control is becoming more and more visible at academic libraries. Access control systems vary from fingerprint biometric access, swipe cards and proximity scan devices. It is important to ensure that accessibility to the library is in line with all legal requirements especially for physically challenged users, for example wheel-chair bound students. It must be ensured that access control devices serve not only as a security feature, but also as a device able to provide valuable statistics.

Varied

The library should provide different types of learning spaces to suit its diverse body of users. Users should feel free to work and navigate through information at their own pace with a variety of different modes of learning. Spaces should vary from quiet study space to group work and relaxation areas. Information technology areas and library training must also be freely available (McDonald 2007: 19).

Various types of furniture finishes can provide and demarcate the various areas in the library. It varies from single seating for private work or relaxation to multi-use tables for interactive group work. Lounge furnishing is becoming very common in libraries to create an emotional space for users to relax, unwind or read. Different levels or floors can be used to divide the different areas in the library. Although huge opportunities exist in creating spaces, a large amount of funding is needed to achieve the desired effects. Too save costs, Watson (2007:6) mentioned that semi-private and group study areas can be achieved by the use of screens, canopies and pods.

Interactive

The different library spaces need to work in tandem with its services and users. If a library is well organized, the space will be used optimally, will ensure optimal interaction between users and staff and will also encourage the use of services offered. Specific attention should be given to the interactions areas of circulation, information desks and information literacy training (McDonald 2007: 19).

A balance between the space for collections, information technology and physical space must be achieved. Shobha (2015:973) indicated a well-organized library not only optimizes its space, but also creates interaction between its users and the use of its services. To satisfy the needs expressed by Millennials for quiet as well as noisy interactive group work spaces, many different types of library spaces must be provided and carefully marketed. Many libraries have turned central areas into noisy collaborative spaces while reserving separate rooms or floors for quiet activity.

Conducive

The academic library is the heart of the university and should play a vital role by offering quality service and add value to the institution. The environment in the library should convey a sense of quality, value and place (Shobha 2015: 974) that encourages and inspire learning, should be conducive to studying and should offer the user a sense comfort and safety (McDonald 2007: 19).

Environmentally suitable

Conductive environmentally suitable conditions are important for library users and the preservation of library equipment and material. All external conditions like humidity, temperature, air quality, lighting, ventilation and noise control has to be monitored and controlled. All energy controlled building equipment must be maintained and operated in the most environmentally and energy efficient manner possible. Lighting and natural light needs to be used optimally to create the most feasible effect (McDonald 2007: 19). Watson and Howden (2013:14) emphasized the use of lighting technology during the day to enhance the mood and behavior.

Professionals like architects and engineers can offer expert guidance and advice. A study conducted by Watson and Anderson (2008:18) surveyed a number of educational institutions to identify which of these tangible factors proved to be problematic. Most respondents surveyed mentioned ventilation, heating followed by noise as being the most problematic.

Safe and secure: When dealing with buildings, users, collections and equipment, security risks must be expected (Quinsee & McDonald 1991:46). The design of new library buildings must conform to the various health and safety acts. Securing of equipment and user safety should be prioritized (McDonald 2007: 19). Particular attention should be given to the design of

workstation and securing information technology equipment. The library circulation system should include theft detection and tracking devices to ensure security, efficient tracking of materials throughout the library, easy and fast charge and discharge, inventorying, and materials handling.

Effective and suitable for information technology

Special attention should be given to the current information technologies and the planning for future expansions. Wireless technology should be implemented to ensure that users are connected to the network anywhere in the library. Although wireless technology is far more cost effective and will ensure that any space can be converted into a working space, reliability might be questionable (McDonald 2007: 19).

Efficient

It is important for academic libraries to operate as efficiently as possible. Running costs must to be kept to the minimum. Due to budget and space constraints minimum maintenance and staffing cost and effectively space utilization must be enforced (McDonald 2007: 19). Design should be economical and maintained with minimum staff and financial constraints (Shobha 2015:974).

Discussions around the ten qualities of good library spaces concluded that these qualities cannot be regarded in isolation and that functionality and flexibility are not the most crucial factors anymore. Ambiance and aesthetics - the “wow” factor - have successfully claimed that role. The creation and upgrading of library spaces that “speak” to users is crucial for the future growth and sustainability of the 21st century user as environment may affect the emotional behaviour and interaction of users. According to Hisham and Nada (2012:120) the “ability of a subtle stimulus to awaken other contextual factors in our subconscious can affect our conscious thoughts and emotions”.

Quality of space is hard to define but easily recognized. Tangible factors are basic requirements and can be relatively easily measured, however the intangible are more difficult (Hisham & Nada 2012:7). What the space is “saying” is important. Ambiance for example will play a major role. Factors like colour, plants and natural lighting add to the concept of ambiance and can determine the “mood” of the space. It is therefore important to get the user community involved in the planning and design phase of library space projects.

2.5 Variety of library spaces

As mentioned already, libraries need to create a variety of spaces to cater for a diversity of users using library spaces in different ways. Rizzo (2002: 460) provided useful guidance for exploring the expectations of academic library uses namely highly active and engaging communal places, interactive collaborative places for individual research and group work, study and reading rooms and private places for reflection and deep thought.

Since the publication of "Libraries designed for learning" by Somerville and Brown-Sica (2011:679), campus planners have increasingly recognized the importance of developing social study space in libraries. As a consequence, space is often allocated for group study, food services and informal socializing. Some libraries have also incorporated campus teaching and learning activities, such as academic computing services, faculty development centers, and student tutoring office into their (re)design strategies. This type of collaboration is becoming a common practice, whereby the library becomes the central point to service student and staff needs. At CPUT libraries partnerships with the writing centers, Information Technology departments and post graduate support have been investigated.

At universities with students without their own computers and internet access, the setting up of Information or Learning Commons near the reference desk, group study rooms and reference desks staffed by expert support staff in academic libraries has become increasingly popular (Cowgill, Beam & Wess 2001:436). According to Waxman, Clemons and Banning (2007:429) comfortable seating and computers loaded with a variety of software packages popular with students for information searching and completion of academic assessment tasks must be provided in the commons.

New buildings or spaces within buildings should encourage creativity. An academic library must offer staff and students an area to interact in a space that encourages creativity. Equipped rooms, alongside designated quiet spaces and areas with restricted access for research students are needed (Shaw 2013:2).

2.6 Brief exploration of library space projects nationally and internationally

Shaw (2013), a journalist for *The Guardian* interviewed library directors across the world to determine their current main strategic goals. All of them mentioned the designing of library spaces. It was pointed out that academic libraries library space is one of the most important services offered because it acts as a place of social and interdisciplinary exchange. Shaw concluded that libraries continue to be popular places in the institution and because of improvements of work space the frequency of users has increased. It was found that new library buildings with less traditional seating implying more comfortable and mobile chairs and fewer stationary tables were popular with the users. Users also appreciated the choice of study areas, whether working alone or in a group. The need for "smart libraries" with learning devices was emphasised.

The use and design of space in higher education libraries is a theme that has come to the forefront of user needs in the past few years, particularly as an incentive for students to adequately use academic library spaces. It has been accepted that space quality and design impacts on the educational experience of students. The new 21st century librarian not only needs to establish how they strategically develop virtual services and collections provided, but also consider physical space. The move to electronic collections (information stored in digital format and access via a network) is providing libraries with opportunities to adapt their physical space.

According to Bryant, Mathews and Walton (2009:7) the modern physical library is required to accommodate a widening array of services including the provision of computers, collaborative study spaces, wireless laptop areas, and presentation facilities. Their survey has concluded that of the libraries studied those which changed, refurbished and developed their physical spaces experienced sustained increases in usage of new physical facilities (Bryant, Mathews & Walton 2009:11). This phenomenon was captured by Shill and Tonner (2004: 135) and Lang (2001: 13) as well.

According to Ramsden (2011:455) the library at the University of Huddersfield completed a full refurbishment in order to embrace new trends. It included a variety of spaces incorporating discussion and high technology areas. Soft furnishings, technology with plasma screens, smart boards and more computers were added across all five floors of the library. The study

concluded that well organised and designed spaces can only be achieved if there are close collaboration and partnerships with various stake-holders. Designers, information technology experts, builders, colour specialist, architect and library teams should have a close and interactive working relationship.

Waxman, Clemons and Banning (2007: 424-434) as well as Cowgill, Beam and Wess (2001:432-439) reported on renovations of library spaces to set up Learning Commons at academic libraries in order to support students' academic development by providing access to information together with technological tools and expert support staff. Comfortable seating and computers loaded with a variety of software packages popular with students were provided.

Watson and Howden (2013:14) alerted that despite the tough financial climate there have been many new library developments and refurbishing in the United Kingdom, particularly in the university sector. Their main thrusts were to create open plan, technology rich spaces, service integration and developing learning communities (Watson & Howden: 2013:19).

Mathew (2013:21) highlighted that American librarians are intrigued by the transformative power of building space. An ongoing concern is how the interface of the library space and library patron, library space and library collection, library space and library staff creates something new and more valuable (Simon 2013: 21).

In China there is a dramatic rise in urban growth and a growing collection of modern buildings. Most of these new buildings belong to new or expanding university campuses featuring a centrepiece library. However the main Chinese trend has been on the external form with usage of modern material and dramatic shapes to celebrate power, progress and the ability to match what is happening elsewhere in the world (Anderson 2013:37).

In South Africa academic libraries are also reinventing themselves as social spaces to facilitate more people actually visiting the library. In the Western Cape the Universities of Cape Town and Stellenbosch library services went through some major upgrades.

This process began with attractive design and amenities, but later with the creation of space to encourage social interaction. Minor upgrades and cosmetic changes have been done at the University of Western Cape. The Universities of Cape Town, KwaZulu-Natal, Pretoria,

Stellenbosch, Rhodes and the Witwatersrand received funding from the Carnegie Corporation to assist in substantial improvements at their libraries. The Corporation sought to leverage its grants by obtaining commitments from the universities to build new library spaces, specifically research commons (Walker 2011:10).

2.7 The CPUT Cape Town branch project

At CPUT Cape Town branch colour on walls, pillars, furniture and dividers was used to indicate different areas and services. The learning commons for example has a green feature wall and is complemented by green chairs and green and black dividers between each computer. The quiet study areas have orange feature walls complimented by orange chairs. Collaborative group work areas have red walls and pillars complimented with red chairs. Teal coloured chairs were used to indicate laptop areas. The use of colour coded areas indicates to library users the type of area and what activities are allowed in that specific area. The use of different colour chairs is also beneficial to ensure that areas are not mixed and that furniture can be easily returned to parts of the library where they belong.

Photo 1: Graphical signage

At CPUT signage are standardised, clear and visible. Familiar graphics and pictures instead of words are used to communicate information to users. Large pylons with simple graphics were used to indicate to users where they must be quiet, not allowed to eat or where Wi-Fi is available.

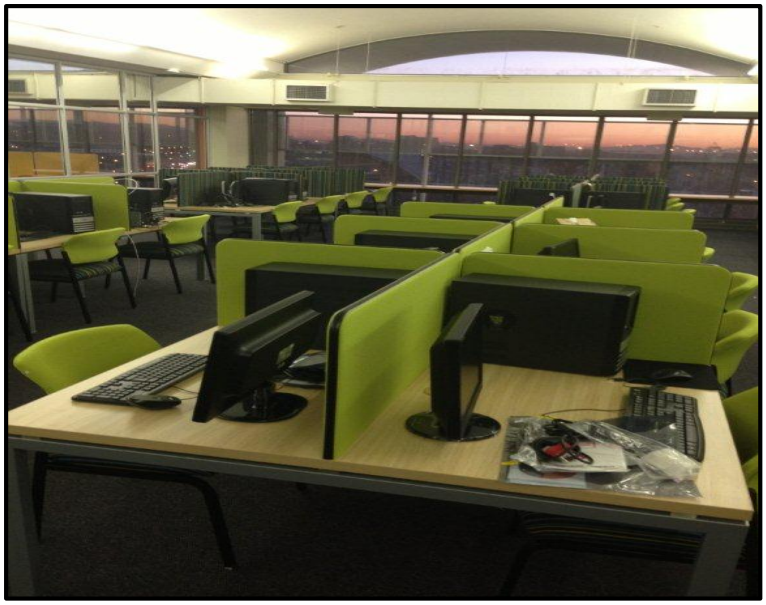


Photo 2: Learning Commons

CPUT's Learning Commons with colour coded chairs and desk dividers. The type of divider used is wood covered with a thin layer of foam and material. Foam is used to buffer and absorb sound. This type of design is an economical way to create privacy.

Photo 3: Wide view of the Learning Commons

This is a wide view of CPUT's Learning Commons. Walls and pillars are painted in the same colour as the chairs. Students and staff know that the green area and chairs identify a computer usage area.

Photo 4: Catalogue and electronic information point

This area is called an electronic information point containing clusters of computers to be used for searching the catalogue and databases. Blue chairs identify an area to search databases and the catalogue whereas the red pillars represent a sit down or lounge area.

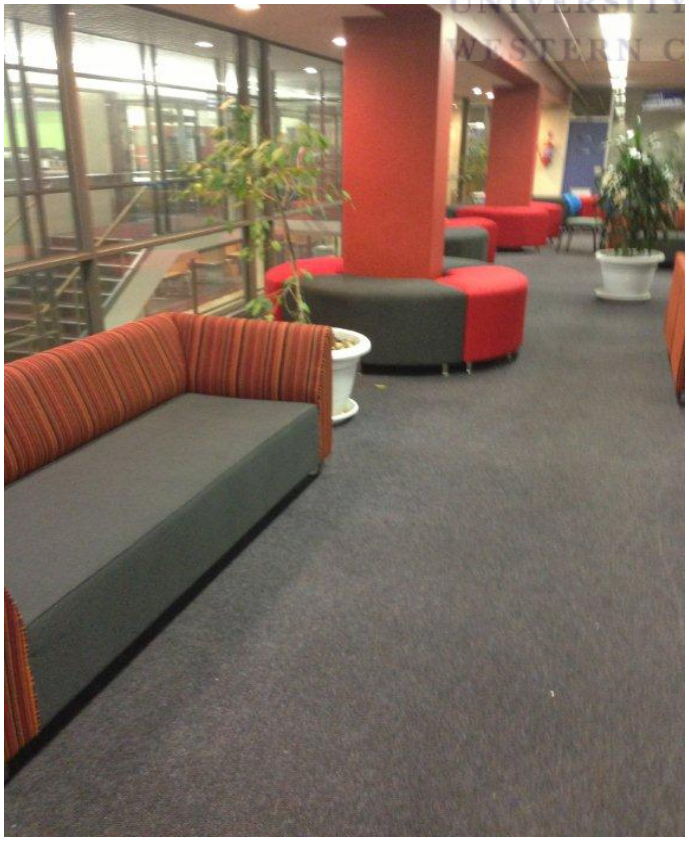


Photo 5: Soft seating reading area

A mixture of soft seating was used. Students may use large couches with black seats and striped backs for relaxation or to catch up with their readings. Some couches were laid out in pairs with a coffee table in the centre. Differently coloured ottomans provide seating for individual students or when placed around pillars, provide group seating with a backrest.

Open group collaborative work areas were populated with hexagon tables to allow a maximum of six users facing one another.

Because plants can be used to decorate and give ambiance to a space, pot plants are scattered throughout the library on tables and in corners. Pot plants were also used to create barriers between different spaces and to close off "dead areas". To enhance the ambiance further, fresh cut flowers are found on transaction desks.

In order to provide a visual satisficing experience, walls were finished with art work. One of the bigger walls was populated with a huge mural of President Nelson Mandela done by one of CPUT's design students.

2.8 Conclusion

The literature sources reviewed for this study reflected that the 21st century academic library still has a major role to play in academic institutions. Academic libraries need to continuously develop as the centre of learning by rethinking the use of space and services to satisfy users. The chapter reviewed the characteristics of a generation Y and Z library user, their requirements for spaces in the academic library, libraries as *third places*, variety of library spaces as well as principles and guidelines to ensure library spaces of quality. It also explored some examples of redesigning by libraries – in particular the CPUT Cape Town branch library. It can be concluded that libraries across the globe are increasingly redesigning or creating new spaces to respond to the current needs and demands of their users.

The next chapter will discuss in more detail the proposed research design and methodology for the study.

CHAPTER 3
RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

In the previous chapter a literature review was conducted to explore how libraries are designed for 21st century users. Both national and international trends, the 21st century user, the concept of "library as a place" and the qualities of a good library space were explored.

This chapter will cover the research design, the information gathering methods and data collection tools used. Validity and reliability as well as ethical consideration when conducting research will be discussed. The chapter will conclude with the limitations of the study.

3.2 Research design

A research design is a roadmap which guides research to find answers to research questions as valid, objectively and accurately as possible. According to Thyer (1993) "a traditional research design is a blueprint or detailed plan for how a research study is to be completed, operationalizing variables so that they can be measured, selecting a sample of interest to study, collecting data to be used as a bases for testing hypotheses and analysing results". Creswell (2003:4) agreed by stating "research design refers to the plan of action that links the philosophical assumptions to specific methods."

This study used a combination of both qualitative and quantitative research methods. These two approaches to research are complementary and by using both will result in an information rich study Creswell (2003:26).

3.2.1 Mixed method research

The research approach used for this study was the mixed method approach as questionnaires were administered, interviews conducted and library statistics interrogated. A mixed method research design is defined as a research design that includes at least one quantitative method and one qualitative method (Creswell & Clark, 2011:2). The mixed method approach in social research has been used for a long time in several disciplines.

Similarly Teddlie and Tashakkori (2009:7) agreed that mixed method research is a less known than qualitative and quantitative research method because it has emerged only over the last twenty years. The use of both approaches allows the researcher to incorporate the strengths of each method (Snyder, 2006:402).

As pointed out by Creswell & Clark (2011:2) various definitions have emerged over the years that incorporate various elements of methods, research processes and research designs. Teddlie and Tashakkori (2009:7) mentioned that mixed methods research present an alternative to qualitative and quantitative traditions by advocating the use of any methodological tools required to answer the research question. According to them mixed method studies are studies that combine both qualitative and quantitative approaches.

There are clear differences between quantitative and qualitative research but for some researchers the lines between the two methodologies have become somewhat blurred. Bauer, Gaskell and Allum (2000:7–10) pointed out that quantitative or 'hard' research deals with numbers and uses statistical models to explain this hard data whereas qualitative or 'soft' research pursues understanding of social constructs, such as ideas, beliefs and values. Quantitative research therefore involves the objective, quantitative and statistically valid measurement of data. Qualitative research on the other hand involves observing what respondents do and say and the data thus collected is analysed and interpreted.

3.2.2 Advantages of the mixed method research

The advantages of mixed method research can be summarized as:

- It enhances the research possibilities, if the researcher wants to achieve multiple objectives and not all objectives can be explored by using one method, the use of multiple methods offers an opportunity to find all the answers to the research.
- It enriches data, you find when you collect data with one method but for its supplementation you need another set of data.

3.2.3 Disadvantages of mixed method research

The disadvantage of mixed method research can be summarized as:

- Using mixed method design can create duplication of research with two or more different study populations;
- Collecting data through two data sets means more data to collect and analyse.

3.3 Triangulation

For this study the researcher used triangulation. Triangulation is defined by Olsen (2004:3) as the mixing of data gathering methods so that a variety of viewpoints or different types of information cast light on a topic. This mixing of data types is known as data triangulation and is used to assist the validation of a research study. Administration of questionnaire of library users and staff members, interviews with library staff and analysis of library statistics and documents were used as triangulation for this study.

3.4 Research site

As discussed in chapter 1, the research site for this study was the Cape Town branch of CPUT libraries. The Cape Town branch is currently the biggest and busiest branch of all CPUT branch libraries. This can be accredited to the fact that the Business faculty - the largest CPUT faculty with close to 9000 students - is stationed on the Cape Town Campus. The other faculties serviced by the Cape Town branch, is the Faculty of Design, Applied Sciences and a small section of Engineering. Due to the main campus having extended hours (08h00 until 22h00) and its centrality to the bus, train and taxi route, the Cape Town Branch Library also services students from the Granger Bay, Mowbray, Media City on the Foreshore and Groote Schuur campuses.

The total population of students on the campus is around 15 000. The registration level of students ranges from Foundation year to Doctoral (D-Tech) students. The Cape Town Campus Library has 23 staff members. The library includes a dedicated post-graduate centre. A more detailed description of the research population and sample size will follow.

Figure 1 below draws attention to the number of students enrolled at CPUT. It also illustrates the different faculties, campuses and libraries and shows the total library staff establishment.

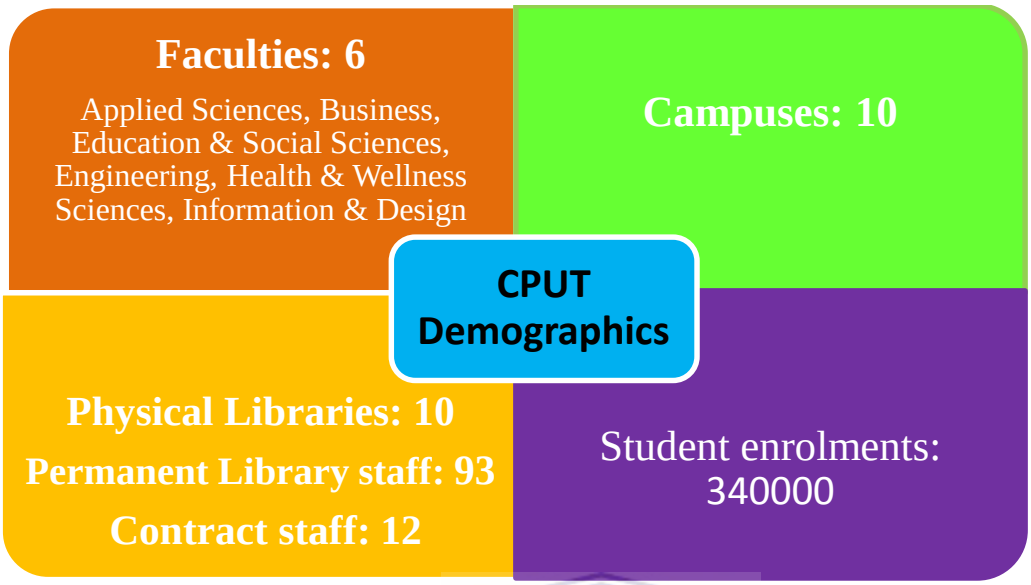


Figure 1: Overall CPUT demographic

Student enrolments for 2014 at all our branches were as follows:

Table 1: Enrolment CPUT branches

Athlone	Bellville	Cape Town	Granger Bay	George	Media City	Mowbray	Wellington	Worcester	Total
650	9 900	15 800	700	100	600	3 100	2 400	100	33 350

3.5 Data gathering tools

As mentioned questionnaires, interviews and document analysis (interrogation of library statistics) were used to gather data. Data was gathered by randomly targeting undergraduate students on the general floor in the library and post-graduate students in the post graduate centre inside the library.

3.6 Questionnaire

A questionnaire can be used to elicit feelings, beliefs, experiences or attitudes of a sample of individuals. It can be structured or unstructured as a data collecting instrument. It's a list of questions and the respondents' answers are recorded. When using a self-administrated questionnaire, the researcher is not present to explain anything to respondents. It is therefore important that questions are clear, structured and easy to understand Kumar (2013:28).

The advantages of questionnaires are that they are economical (not expensive) and it saves time, human and financial resources. Because each respondent receives the same set of questions, uniformity is achieved. Questionnaires also offer anonymity as there is no face to face interaction with respondents Kumar (2013:16). The disadvantages of questionnaires are that the application of questionnaires is limited, it targets only groups that can read and write, it might result in low response rates because people fail to return them and they might lead to lack clarification and misunderstandings if a respondent does not understand a question Kumar (2013:32).

3.6.1 Questionnaire design

The questionnaire developed for this research had to be completed by students. It consisted of 24 closed and open ended questions. Most questions were closed ended where participants had to select relevant answers from the provided list. Participants had however the choice of elaborating on their answers. Each question covered as a theme one of the ten qualities of a good library space as mentioned by McDonald (2007). Each theme had sub-questions which prompted more detail about the main theme (See appendix C for questionnaire).

3.7 Interviews

An interview is a direct face to face, person to person attempt to obtain valid and reliable responses from a respondent. According to Monette, Sullivan, Thomas and De Jong (1986:156) "an interview involves an interviewer reading questions to respondents and recording their answers". Researchers have the option to decide on the format and the content of questions and how and when questions will be asked to respondents.

The advantages of interviews are that they allow the interviewer to clarify questions, they can be used with illiterates and the interviewer has the opportunity to observe verbal and non-verbal

behavior of the respondent. The disadvantages of interviews are that unstructured interviews yield data too difficult to summarize or evaluate.

Library staff of the CPUT Cape Town Branch Library who completed the questionnaire was individually interviewed to follow-up. Each interview lasted around twenty minutes. The researcher asked a question and the respondent could answer in any way that he or she understood or felt about the question (See Appendix D for the interview schedule). The questions asked were open ended. The kind of questions asked was guided by McDonald's qualities of a good library space.

As ten user service staff members were targeted, interviews were scheduled over two days. Questions were recorded by hand by the researcher on an interview guide schedule. Responses were later captured and analyzed using Excel.

3.8 Document analysis - CPUT Libraries statistics

Document analysis is a form of qualitative research in which documents are interpreted by the researcher to give meaning around an assessment topic. To interpret and analyse these documents similar information was coded into themes. (Bowen 2009:31).

The researcher interrogated and compared CPUT libraries statistics as it appears on the CPUT library statistics database. This database was developed by CPUT staff in cooperation with an external programmer. The CPUT statistic database has become one of CPUT libraries flagships projects which have been adopted by all South African libraries belonging to CHELSA (Cape Higher Education Libraries South Africa). It has also been adopted by certain African and International university libraries. The specific statistics used for this study were the number of library users who used the library one year before and one year after the library space was upgraded. This statistic gave an accurate indication of how user visits have changed before and after the upgrade.

3.9 Population

It is important for a researcher to target the correct audience to enable the researcher to obtain the correct desired results. The target population for this research were undergraduate as well as post-graduate students studying at CPUT Cape Town Campus and user service staff members working at the CPUT Cape Town Branch Library. Undergraduate students were selected from the general student population on the general library floor in the library. Post-graduate students were selected from the dedicated post-graduate area in the library. .

As mentioned above, the number of students using the Cape Town Branch Library is 15 000. The target population for the study was all the students who had access to the library. For the interviews, all seven librarians and three senior library assistants employed at the Cape Town Branch Library was targeted.

3.10 Sampling method

Sampling is one of the most important endeavours in the social research process. According to Babbie and Mouton (2001) the main purpose of sampling is to make generalisations to people and events that have not been observed. Babbie and Mouton (2001:202) defined a sample as a "specific subset of a population observed in order to make inferences about the nature of the total population itself". The most important reason for sampling is feasibility (Strydom, Fouchè & Delport 2005:194).

Sampling is a process of targeting a few from a bigger population to predict the outcome of an unknown piece of information. ***Stratified cluster sampling*** was used to conduct this study.

3.10.1 Cluster sampling

Sampling is based on the researcher's ability to identify each element in a population. It is easy to do this if the total population is small; however the population for this study was large. Cluster sampling works well when it is impossible or impractical to target all of your intended population. According to Fox and Bayet (2007:57) units are grouped together to form a cluster. The entire population is divided into a number of groups or clusters and all these clusters will be included in the sample. Three clusters were identified, namely undergraduates, postgraduates and staff.

Cluster sampling is similar to stratified sampling because it uses the principal of grouping populations into units. Due to the size of the population, cluster sampling is more appropriate. Clusters can be formed on the basis of proximity or common characteristics. For this research the population was clustered according to designated areas in the library. The library is divided into postgraduate and undergraduate areas.

3.10.2 Advantages of cluster sampling

The advantages of cluster sampling are that it is cost effective, quick and easy. Instead of sampling a whole population, the researcher can allocate his limited resources to the few randomly selected clusters or areas. The researcher can also increase his sample size very easily with this technique. Considering that the researcher will only have to take the sample from a number of areas or clusters (Fox and Bayet: 2007).

3.10.3 Disadvantages of cluster sampling

The disadvantages of cluster sampling are that from all the different types of probability sampling, this technique is the least representative of the population. The tendency of individuals within a cluster is to have similar characteristics. With a cluster sample, there is therefore a chance that the researcher can have an overrepresented or underrepresented cluster which can skew the results of the study (Fox and Bayet: 2007)

3.11 Research sample and administration of questionnaires

The targeted groups consisted of undergraduate and post–graduate students as well as staff members. On the day of the research, students were randomly selected in the undergraduate area and the closed post-graduate area. The researcher distributed the questionnaires. Each questionnaire was accompanied by a consent letter that had to be completed by the respondent. A total of one hundred completed questionnaires were retrieved at the end of the day resulting in a sample consisting of 0.67% of the population. Respectively sixty and thirty questionnaires were completed by undergraduate and post-graduate students. The remaining ten questionnaires were completed by the user services staff members. In order to gather more qualitative rich data follow-up interviews were later conducted with the ten staff members who completed the questionnaire.

3.12 Validity and reliability

Validity is the ability of an instrument to measure what it is designed to measure. Smith (1991:106) defines validity as the degree to which the researcher has measured what he set out to measure. Validity depends on good craftsmanship in an investigation, which includes continually checking, questioning and theoretically interpreting the findings (Kvale, 2004:309 cited in Henning, 2004:148). Craftsmanship refers to accuracy and the correctness throughout the research process. The researcher has to ensure quality of the work is monitored throughout the process.

Reliability refers to a research instrument that is able to supply similar results when used continuously thus are concerned with the consistency of measures.

3.13 Pilot study or pre-testing the questionnaire

A pilot study involves testing the actual program on a small sample taken from the community for whom the program is planned. The draft questionnaire needs to be handed to the pilot study group. The reason for the pilot study is to gather feedback and advice from a small group. Pilot studies can be based on quantitative and qualitative research methods. The aim of pre-testing of the questionnaire for this was to address the possible issues and misunderstandings that may arise, to test if the researcher used the correct wording and to determine if the order of the questionnaire was correct. Fox and Bayet (2007:102) define a pilot study as a trial run of an investigation conducted on a small scale to determine whether the research design and methodology is relative and effective.

There are certain challenges that can arise when conducting a pilot study. Your sample could be contaminated because participants who have been part of the pilot study may respond differently to those who were not exposed.

For this research study a pilot study was administered before the final questionnaire was presented. A group of staff from the Bellville campus was used as a pilot group. Responses from the pilot group indicated that questions were clear, precise and easy to understand. The questions which were not clear or vague were discussed and changed.

3.14 Data analysis

When using mixed methods studies, the researcher needs to combine a number of data analysis procedures depending on the method data was collected and the way findings are communicated. Data was gathered using three different instruments, questionnaires, interviews and document analysis.

The software package used to analyse the questionnaires was Microsoft Excel. The same software was also used to develop graphs, charts and tables to illustrate findings or summarize gathered data. All the data was captured and analysed using Excel. Responses were totalled and percentages calculated. Excel was used to represent results graphically. Biographical data for staff and students are reflected separately, but the rest of the responses were intermingled

Interview responses were captured in writing by the researcher as respondents answered the questions. Their answers were directly transcribed and analysed using thematic analysis. Each sub-question was tabulated and clustered together to answer the main questions.

Statistical data was taken from CPUT statistical database. This is a closed database and users have to register to be able to scrutinise and view the contents. The statistics taken from the database is a comparison of data over the same period in a different year. The first dataset is twelve months of statistics before the redesign from June to June the following year of gate statistics that captures the amount of users that used the library over that period. The second set of data is for the same period from June to June the following year after redesign of the library. These statistics were analysed using Microsoft Excel.

3.15 Conclusion

This chapter has defined the research design and the process of mixed method research. The chapter also described the process followed to do this research. The following chapter presents the data gathered with the described information gathering tools and provides an interpretation of the findings.

CHAPTER FOUR
DATA PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents and interprets the data generated from CPUT students and staff members using a paper-based questionnaire, interviews as well as gate statistics from the CPUT Cape Town branch library. Against the purpose of the study to investigate the design of academic library spaces for 21st century users, in particular the CPUT Cape Town branch library, this chapter will present responses in the following broad categories: experience of the library environment, effect of furniture, flexibility, use and accessibility of library spaces, provision of equipment, conduciveness to studying and the effects of redesigning library spaces. Text, tables and graphic are used to present the data.

4.2 Questionnaires

Respondents were given time to complete the questionnaire before it was collected. One hundred questionnaires were administered and retrieved from sixty targeted undergraduate students, thirty from targeted post-graduate students as well as from ten staff members. The undergraduate students were targeted on the general library floor while the postgraduate students, who occupied a dedicated post-graduate space in the library, were approached in this area. The ten staff members were the user services staff working at CPUT Cape Town Library. This resulted in one hundred retrieved questionnaires, therefore a response rate of 100%. Data was captured and analyzed using Microsoft Excel. The data from the questionnaires for both the undergraduate and post-graduate students as well as the staff have been reported where appropriately collectively. Biographical data for staff and students are reflected separately, but the rest of the responses were intermingled

The questionnaire was divided into ten sections numbered A to J. Each section was linked to answer a research question. The sections are:

- A. Biographical data
- B. Functionality of library furniture
- C. Space utilization
- D. Flexibility of library spaces

- E. Conduciveness to studying
- F. Library equipment
- G. Interactivity/accessibility of library spaces
- H. Safety and security
- I. General environmental conditions
- J. Color of walls and furniture

4.2.1 Section A: Biographical data

The first section of the questionnaire gathered data about the gender, educational qualifications and job titles or positions of the respondents.

4.2.1.1 Gender

The first question asked the respondents to indicate their gender. Of the eighty five students who responded, 39 (46%) were male and 46 (54%) were female. This ratio corresponded with CPUT statistics indicating that during the year of the study, 54% of CPUT students registered were females. Of the ten library staff members half were male and the other half female. It was important for the researcher to determine the gender of the various respondents to test if the percentage of respondents is on par with the gender enrolment at CPUT as well as to test how the different genders responded to the questions.

4.2.1.2 Educational qualifications or study levels

The second question prompted the students to indicate by clicking on the supplied table, whether they are first, second or third year diploma or undergraduate students or whether they are post-graduate students enrolled for either B-Tech, M-Tech or D-Tech. Of the 90 respondents, 52% were diploma, 20% graduate and 18% postgraduate students.

4.2.1.3 Job title or positions

Staff members who completed the questionnaire were requested to indicate the position they currently held at the library. Respondents were either professional or non-professional staff. Their job titles varied from Librarians (30%) to Senior Library Assistants (40%) and Library Assistants (30%).

4.2.1.4 Gender and study levels

To present a clearer biographical picture of the respondents, their gender and study levels are reflected in Table 2 below. Data reflected are those of the 85 students and ten staff members who indicated their gender on the questionnaire.

Table 2: Gender and level of study

		Level of study				Total
		Diploma	**Graduate**	**Postgraduate**	**Staff**	
Gender	**Male**	20 (23.5%)	13 (15%)	6 (7%)	5 (5%)	43 (44%)
	Female	30 (35%)	8 (8%)	9 (11%)	5 (5%)	51 (56%)
Total		50 (59%)	20 (24%)	15 (18%)	10 (10%)	95 (100%)

A percentage of 56% of respondents are female compared to 44% being male. The majority of respondents were undergraduates and the lowest number was post-graduate students and staff members.

4.2.2 Section B: Functionality of library furniture

The next section of the questionnaire (questions 4–8) was dedicated to determining whether the choice of different types of library furniture met the requirements of the respondents.

Current library users are viewing libraries from a different angle than old traditional library users. New modern libraries are creating a welcoming environment that users want to inhabit. Although the CPUT Cape Town Branch library is traditionally organized, modern aesthetics were used to make the space more appealing to users (Pennington 2012:9).

4.2.2.1 Library couches

Question 4 required the respondents to indicate by answering either yes or no, whether the choice of couches met their requirement. Responses are summarized in Table 3 below. From Table 3 it is clear that the majority (89%) of respondents liked the couches in the library.

Table 3: Library couches meeting requirement

	Level of Respondent				Total
	Diploma	Graduate	Postgraduate	Staff	
Yes	43 (43%)	19 (19%)	14 (14%)	13 (13%)	89 (89%)
No	7 (7%)	1 (1%)	3 (3%)	0 (0%)	11 (11%)
Total	50 (50%)	20 (20%)	17 (17%)	13 (13%)	100 (100%)

The reasons for respondents agreeing with the choice of couches are captured in Table 4 below.

Table 4: Reasons for couches meeting requirements

Theme	%	Response
Comfort	40%	▪ They are comfortable and make you feel at home. ▪ They nice and I feel comfortable in them. ▪ Comfortable to use. ▪ More than enough couches and comfortable.
Conducive to studying	21%	▪ They are a unique variation to the library set up. ▪ Creates the right vibe. ▪ Helps people when we wait in long queues.
Spaciousness of couches	19%	▪ The couches have enough space to accommodate the students. ▪ There is enough space to accommodate more students. ▪ There is a lot of them in the library and it create more space for us to work. ▪ Makes it easy when we work in a group.
Other	19%	▪ They create tranquillity. ▪ It is new and colourful. ▪ It is presentable. ▪ Placed in areas where it is needed. ▪ It is bright thus giving a fresh young look.

The reasons for agreeing with the choice of couches were categorized as comfortable, conductive to studying and spaciousness of the couches. Other reasons were because they contribute to tranquility, are new and colorful, are presentable and are placed where they are needed. This corresponds with Watson and Howden (2013:16) indicating the need for informal spaces in libraries.

The eleven (11%) respondents who disagreed offered as reasons for them not being satisfied, that the couches were too big, not personalized and that the arm rests were too high. One respondent mentioned the couches had to be spread out more widely.

Table 5: Reasons for couches not meeting requirements

Theme	Response
Other	▪ There are too few couches ▪ They are too bulky ▪ Due to having couches in the library it creates noise ▪ Take up too much space ▪ Arm rest too high

4.2.2.2 Library ottomans

Question 5 required the respondents to indicate whether the choice of ottomans met their requirements. Only 78 respondents answered the question. From Table 6 it can be seen that 56 (72%) of the 78 respondents agreed with the choice of ottomans in the library. Detailed responses are reflected in table 6 below:

Table 6: Library ottomans meeting requirement

	Level of Respondent				Total
	Diploma	Graduate	Postgraduate	Staff	
Yes	27 (37%)	18 (23%)	8 (10%)	3 (4%)	56 (72%)
No	10 (13%)	1 (1%)	4 (5%)	7 (9%)	22 (29%)
Total	37 (47%)	19 (24%)	12 (15%)	10 (13%)	78 (100%)

The reasons for respondents responding positively to the ottomans can be categorized mainly as practicality of use, comfort, looks and versatility. Detailed responses are categorized in Table 7 below.

Table 7: Reasons for ottomans meeting requirements		
Theme	**%**	**Response**
Practicality of use	40%	▪ They work well around a pillar. ▪ We can easily make them into a circle so we can have discussions. ▪ It can be moved to next to the couches as an extension. ▪ They are nice to use to sort out your papers.
Comfort	15%	▪ Not only the colour of it but the way it is designed attracts me a lot to chill and lay [lie] on it. ▪ Easy to sit and comfortable. ▪ They are well situated, however they are hard. ▪ A good comfortable waiting spot for a short period.
Other	45%	▪ Goes well with the 21st century library. ▪ Easy to move. ▪ Can be used as a table. ▪ Looks very hip and fresh.

The highest percentage of users who did not agree with the choice of ottomans, were Diploma students (13%) followed by Library staff (7%). Library staff disagreed due to the weight and size of them, the students moving them around, them not being user friendly because only one person [at a time] can sit on them and students using them as a place to rest their feet on. Students mentioned that they are not comfortable or practical. Detailed responses from respondents are listed in Table 8 below:

Table 8: Reasons for ottomans not meeting requirements		
Theme	**%**	**Response**
Practicality	25%	▪ I don't see how they are utilized, no support for your back. ▪ Don't think they are necessary. ▪ I don't know what to use [them] for. ▪ I never use them
Comfort	30%	▪ Not easy to sit and comfortable. ▪ They are well situated, however they are hard. ▪ Not a good comfortable waiting spot for a short period. ▪ They not comfortable, no back rest.
Other	45%	▪ You can't work on it. ▪ Not very stable ▪ Takes too much space.

4.2.2.3 Library chairs

Question 6 required the respondents to indicate whether the library chairs meet the library users' requirements. Only 96 respondents answered the question. Responses are reflected in Table 9 below:

Table 9: Library chairs meeting requirement

	Level of Respondent				Total
	Diploma	Graduate	Postgraduate	Staff	
Yes	41 (43%)	17 (18%)	14 (15%)	13 (14%)	85 (89%)
No	6 (6%)	3 (3%)	2 (2%)	0 (0%)	11 (11%)
Total	47 (49%)	2 (21%)	16 (17%)	13 (14%)	96 (100%)

Eighty five respondents (89%) approved of the type of chair the library introduced. The reasons why they agreed are summarized in Table 10 below and can be divided into four categories, namely that chairs were soft and comfortable, strong and steady, gave support and are designed well.

Table 10: Reasons for chairs meeting requirements

Theme	%	Response
Comfort	34%	▪ The chairs are comfortable ▪ We sit more comfortably now than before. ▪ Comfortable and blends in with the décor [funky]. ▪ Has comfortable cushion support. ▪ More comfortable than the previous plastic ones.
Sturdy	30%	▪ Chairs are solid. ▪ They are built to last. ▪ Won't easily break.
Support	22%	▪ Nice round back so it wraps around your body. ▪ Backrest and seat is soft. ▪ The backrest is big, your back is supported. ▪ Soft seats.
Design	14%	▪ Build to last. ▪ Broad backs and seats.

The main reasons why certain users (11%) disagreed about the choice of library chairs were as follows, chairs are too bulky to use and are not comfortable. Detailed responses are reflected in Table 11:

Table 11: Reasons for chairs not meeting requirements

Theme	%	Response
Design & size	72%	▪ To[o] heavy. ▪ Due to its size it takes up too much space. ▪ Bulky. ▪ They are not well designed. ▪ They are too big. ▪ Too bulky too move around. ▪ Huge and will get dirty.
Comfort	18%	▪ They provide enough support for 2 hours. ▪ Seats are too soft and clumsy.

4.2.2.4. Library hexagon tables

Question 7 required the respondents to indicate whether they found the hexagon tables useful or not. Only 94 respondents answered the question. Responses are reflected in Table 12 below:

Table 12: Library hexagon tables meeting requirement

	Level of Respondent				Total
	Diploma	Graduate	Postgraduate	Staff	
Yes	38 (40%)	16 (17%)	14 (15%)	8 (9%)	76 (81%)
No	10 (11%)	4 (4%)	2 (2%)	2 (2%)	18 (19%)
Total	48 (51%)	20 (21%)	16 (17%)	10 (11%)	94 (100%)

Hexagon tables met the requirements of 76 respondents (81%) whereas 18 respondents (19%) disagreed. The researcher was able to divide the reasons for positive responses basically into three categories, namely practicality, quality and design. Responses that inspired the categories are listed in Table 13 below:

Table 13: Reasons for hexagon tables meeting requirements		
Theme	**%**	**Response**
Practicality	36%	▪ It can accommodate a perfect number of students. ▪ Spacious and can accommodate laptops. ▪ Big enough for at least five students. ▪ Right space and can accommodate many students and can provide group work space. ▪ Works well in the space and we can work in groups.
Quality	32%	▪ They are good quality and the wood is thick. ▪ Built to last. ▪ They are sturdy and they are really just tables. ▪ Solid and won't easily move.
Design	32%	▪ Not a common type of table, but useful. ▪ A very uncommon type of table. ▪ Fits in with the library's décor. ▪ They are different to your normal tables. ▪ Nice colour and expensive.

Reasons indicated for not agreeing includes that tables are too large for a small group or for two people to work at alone. Only 19% of respondents mentioned that the hexagon tables do not meet their requirements. Their responses are captured in Table 14 below:

Table 14: Reasons for hexagon tables not meeting requirements		
Theme	**%**	**Response**
Practicality	51%	▪ A bit too small only a few students can use it. ▪ Cannot be moved around. ▪ We can't put them together to form bigger groups. ▪ A bit too wide.
Quality	49%	▪ Not sturdy, looks like they [are] going to fall. ▪ You can pack your books on it, the table might fall. ▪ A bit shaky.

4.2.2.5 Other type of furniture required

The open-ended question 8 requested participants to indicate the other types of furniture they required. The responses are listed in Table 15 below:

Table 15: Other types of furniture required

Type of furniture	%	Responses
Work tables for groups	18%	We need more tables for group work. Tables too small. Bigger tables for our designs. A place for posters.
Library lockers or storage space	16%	Security doesn't allow our food and drinks, gives us lockers. I have so many books to carry, can't we store [them] somewhere. People steal your textbooks, hard- drives or anything. We need a private place to store our valuables.
Study cubicles	26%	I want a space to study privately. Lots of noise can the library please accommodate us students who want[s] to study on their own. We can't study in the seminar rooms, it is for groups, so where can I get a private place.
Movable walls and furniture	15%	We need to move tables and chairs for bigger groups. But the library has heavy furniture. If I need privacy the library should have walls on wheels to allow us a private spot.
Extra floor space	12%	This library is too small. We are sitting in the aisles and stairs. Need more space. Library is packed.
Power plugs	9%	How must we charge our laptops? All the plugs are broken, pathetic. Please give us a place to charge our devices. Students have a need for power outlets please.
Cushions	4%	When sitting on the floor we need cushions. Colorful cushions will be nice for our backs when we wait for a place.

The main need identified by this question was that students wanted more tables for group work. They did not mind what shape or size the table were as long as they could work in groups.

Another need was a desk with access to a power plug where laptops can be used. Library users also wanted a place where they can store their food and books while they use the library. Some requested cushions so they can sit on the floor. Some users even requested movable walls so they can create their own private space. These needs conform to typical Generation Y characteristics and behavior resulting in preference to learn while socializing (Lippincott 2010: 3) and dependence on technology to communicate (Schmidt & Cribbs 2011: 6).

Many users (32%) felt that the current furniture was sufficient. Respondents indicated that the library looks pretty, the furniture is sufficient and the furniture is of good quality. The different spaces should vary from quiet study areas to group work and relaxation areas (McDonald 2007:19).

4.2.3 Section C: Library space utilization

This section of the questionnaire (questions 9.1 – 9.5) was dedicated to determining whether the different spaces provided by the library were utilized. Respondents had to indicate by clicking either on yes or no whether they used the provided single study carrels, group study areas, seminar rooms and the quiet study areas.

4.2.3.1 Use of single study carrels

Table 16: Single study carrels use

	Level of Respondent				Total
	Diploma	**Graduate**	**Postgraduate**	**Staff**	
Yes	33 (35%)	11 (11%)	13 (14%)	1 (1%)	58 (62%)
No	16 (17%)	9 (10%)	2 (2%)	9 (10%)	36 (38%)
Total	49 (52%)	20 (21%)	15 (16%)	10 (11%)	94 (100%

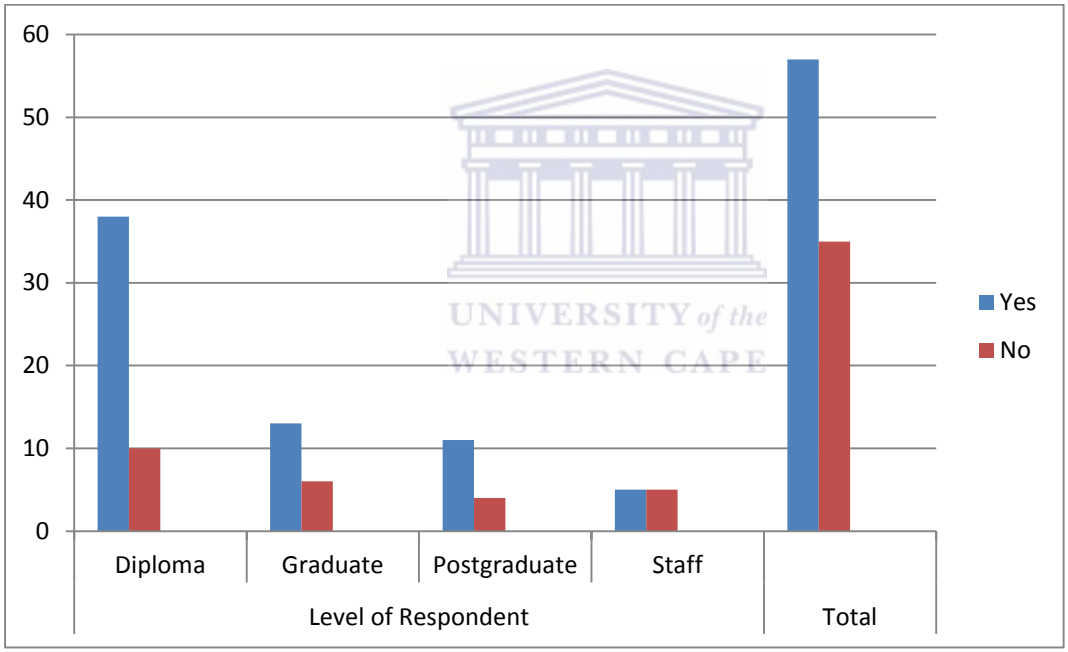
From table 16 above, it is clear that of the 94 students and staff members who answered question 9.1, 58 (62%) of them used the single study carrels. As expected nine (90%) of the

staff members did not have a need to use the study carrels. One staff member indicated the use of a study carrel if a need for private space to work in arises.

4.2.3.2 Use of group study areas

Only 92 respondents completed question 9.2 requesting whether they used the group study areas of the CPUT Cape Town Branch Library. Of the 92, the majority of 57 respondents (62%) made use of the group study areas. This finding corresponds with the relative low utilization of single study carrels as well as with findings by Lippincott (2010: 3) indicating Generation Y students preferably study in a group. Detailed responses are recorded in Figure 2 below:

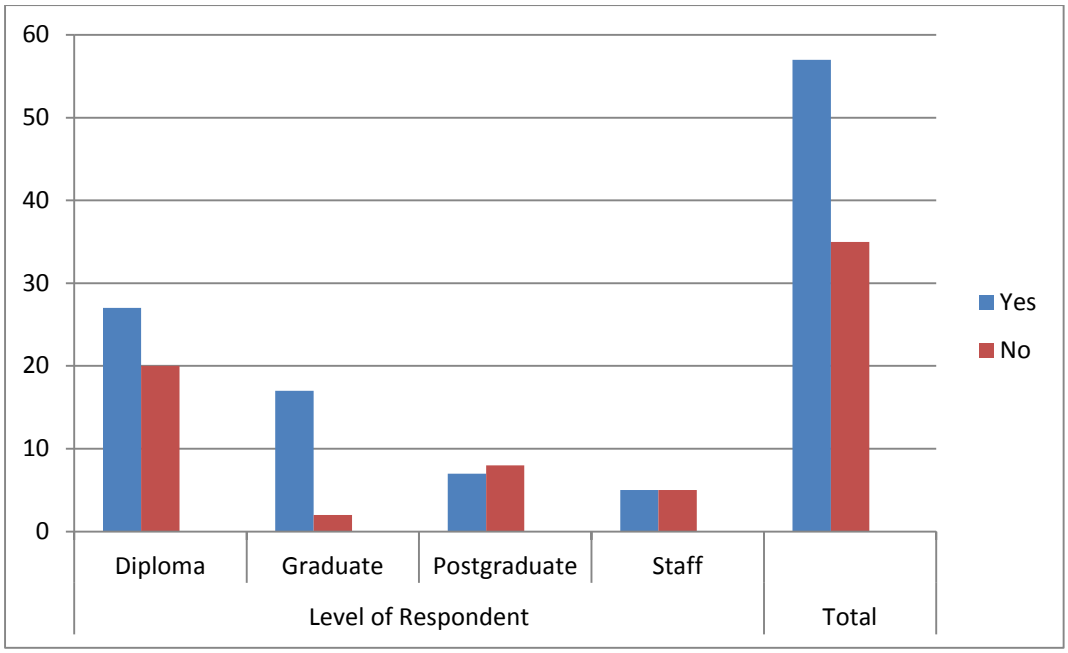
Figure 2: Utilization group study areas



4.2.3.3 Use of seminar rooms

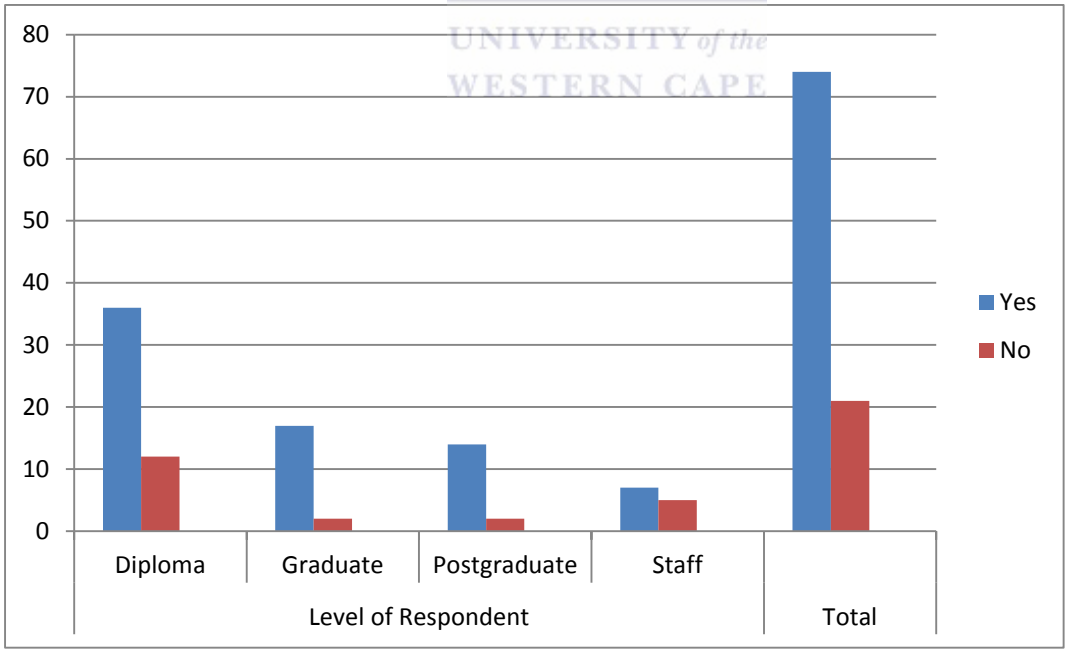
As can be seen from Figure 3 below, seminar rooms were very popular. Of the 92 respondents who answered the question, 57 (61%) used seminar rooms with 35 (39%) of respondents indicating that they did not make use of seminar rooms. This conforms to Generation Y's need to learn while socializing (Lippincott 2010: 3). According to Lang (2001:13) the 21st century library is a flexible learning space providing a hybrid of information sources and collaborative workspace.

Figure 3: Use of seminar rooms



4.2.3.4 Use of quiet study area

Figure 4: Quiet study area



In contrast to the findings regarding the use of group study areas and seminar rooms, Figure 4 above reflects that at the Cape Town campus the quiet study areas were very popular with 78% of the respondents utilized the quiet study areas. The reason thereof might be that libraries are

still seen as places of learning (Weise 2004: 9 and Skerrett 2010: 70) and as Dowlin (1997:17) confirmed, the magic of libraries in the 21st century is in connecting minds and successful library buildings by enabling users and the library space to connect. This phenomenon is especially experienced during examination times.

4.2.3.5 Need for other type of library spaces

Question 9.5 was an open-ended question requesting respondents to indicate other type(s) of library space they would like to see in the library in future. The responses to this question can be related to the need of Generation Ys to work in groups and their dependence on technology (De Rosa & Dempsey 2004:4; Mitchell 2005; Schmidt & Cribb 2011:6 and Shaw 2013) and were as follows:

- A place to do group work on a single computer. We don't all have laptops.
- A bigger computer lab. We have too little [few] computers.
- The study area must be converted into a lab. It is not used all the time.
- Study cubicles.
- More computers available and more study books.
- We stand in long lines to do our work. This wastes our time. We need more places to work.
- More space to study.
- Make level 3 just for computers so we can do our work.

4.2.4 Section D: Flexibility of library spaces

Ninety respondents answered question 10 on the flexibility of the library spaces. Responses on whether participants regarded the library spaces as flexible, in other words, whether the spaces could easily be changed, are recorded in Table 17 below. Sixty nine (77%) students and staff members felt that the library spaces were flexible and that it could easily be changed.

Table 17: Flexibility of library spaces					
	Level of Respondent				**Total**
	Diploma	**Graduate**	**Postgraduate**	**Staff**	
Yes	36 (40%)	12 (13%)	11 (11%)	10 (11%)	69 (77%)
No	9 (10%)	7 (7%)	5 (6%)	0 (0%)	21 (23%)
Total	45 (50%)	19 (21%)	16 (18%)	10 (11%)	90 (100%)

In response to question 10.1 to supply reasons for judging the library spaces to be flexible, participants supplied a variety of reasons. They are recorded in Table 18 below.

Table 18: Reasons for flexibility of library spaces		
Theme	**%**	**Response**
Structure	55%	▪ It has diverse sections for various functions. ▪ Large special area to accommodate many people. ▪ I have observed change, the structure is not permanent. ▪ There aren't too many fixtures. ▪ It is very spacious, everything is accessible.
Other	45%	▪ It is easy to move around because nothing is fixed or mounted. ▪ There is enough space to move things around. ▪ We don't see any cabling or wiring so it should be easy to make changes.

The 21 participants (23%) who rated the library space as not flexible indicated that, the library was not spacious and there were too many pieces of furniture. Responses are recorded in Table 19 below:

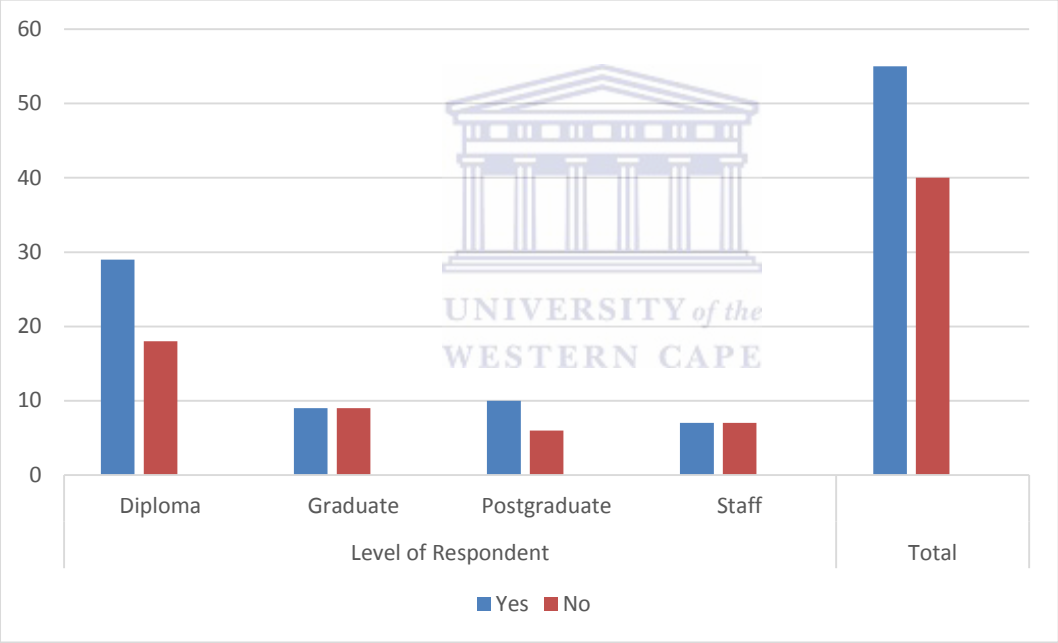
Table 19: Reasons library spaces are not regarded flexible		
Theme	**%**	**Response**
Size of space	45%	▪ Because it is not spacious. ▪ There is very limited space, sometimes I don't bother to come. ▪ The space seemed cramped. ▪ Too many students using the library.
Access to facilities	30%	▪ Lines are too long. ▪ We need less [fewer] tables and more access to computers. ▪ Open space can easily be converted into a lab.
Other	25%	▪ Due to the single entrance and exit, the library can easily be converted into a 24 hour facility. ▪ Open areas can be used for displays and meetings.

4.2.5 Section E: Conducive to studying

Question 11 requested respondents to first rate the CPUT Cape Town Branch Library's conduciveness to studying and then supply reasons for their rating. Of the 95 students and staff members who answered the question, 55 (58%) rated the library to be conducive to study. Reasons provided were: There is enough space for you to study and focus; the library has tables and chairs for studies; the overall conditions allow you to study; the rules in the study halls are strict.

Of the 40 respondents (42%) disagreeing, all blamed the high level of noise as the reason for the library not being conducive to study. Detailed responses are captured in Figure 5 below:

Figure 5: Conduciveness to studying



The environment in the library should convey a sense of quality, value and place that encourages and inspires learning, should be conducive to studying and should offer the user a sense of comfort and safety (Shobha 2015:974).

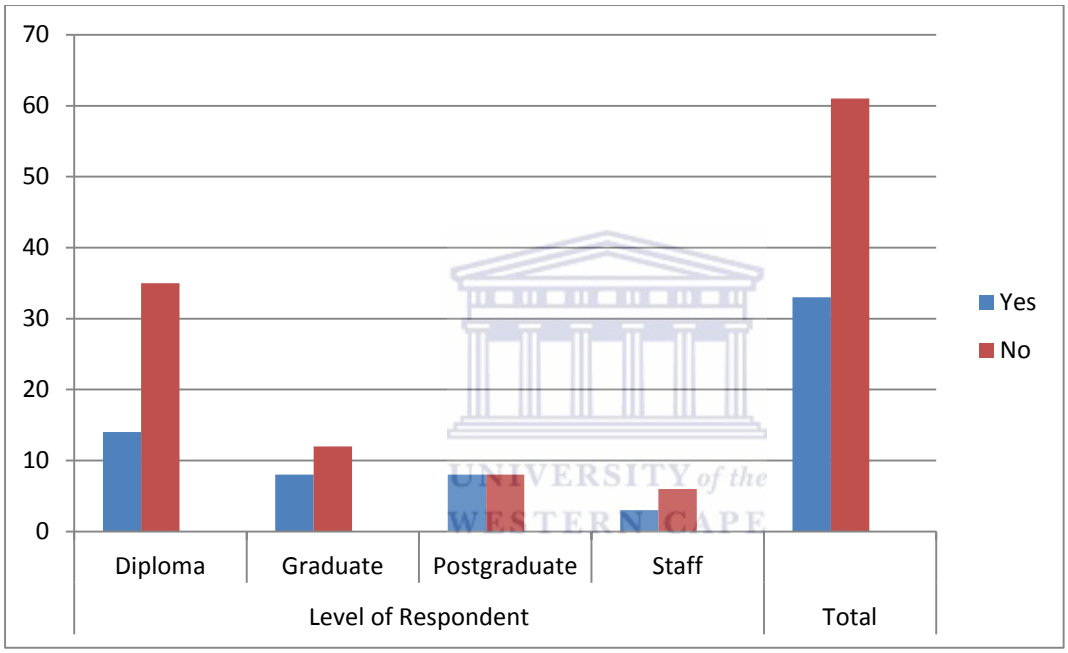
4.2.6 Section F: Library equipment

Several questions (questions 12 – 16) were asked to determine if the library provided enough equipment.

4.2.6.1 Computers

Responses to question 12 whether the library had enough computers for students to do their research on are reflected in figure 6 below:

Figure 6: Access to computers

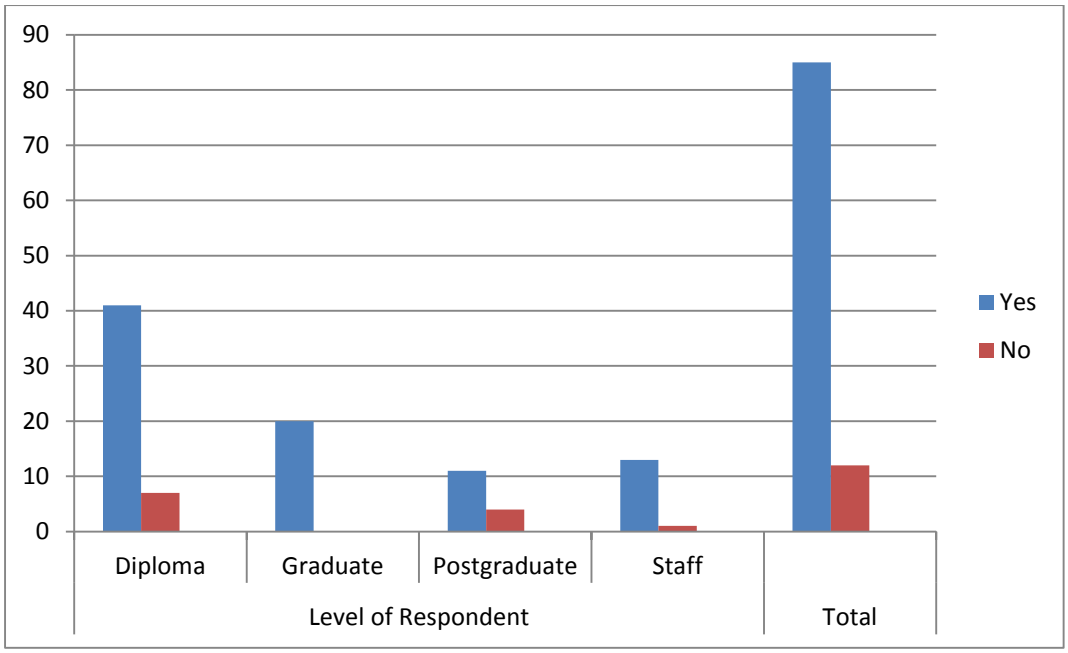


Of a total of 94 respondents, the majority 61 (64%) indicated that the library did not supply enough computers. According to Lippincott (2010:3) this generation prefers working with or around classmates, using technology.

4.2.6.2 Access to wireless network

Responses to this question whether the library provided adequate access to the wireless network was overwhelmingly positive. Eighty five respondents (88%) of the 97 respondents who answered the question indicated that the library provided adequate access to the Internet. Internet connectivity is important to Generation Ys since they prefer digital information (Reitz 2005:1) and use digital networks to conduct research anywhere (Mitchell 2005).

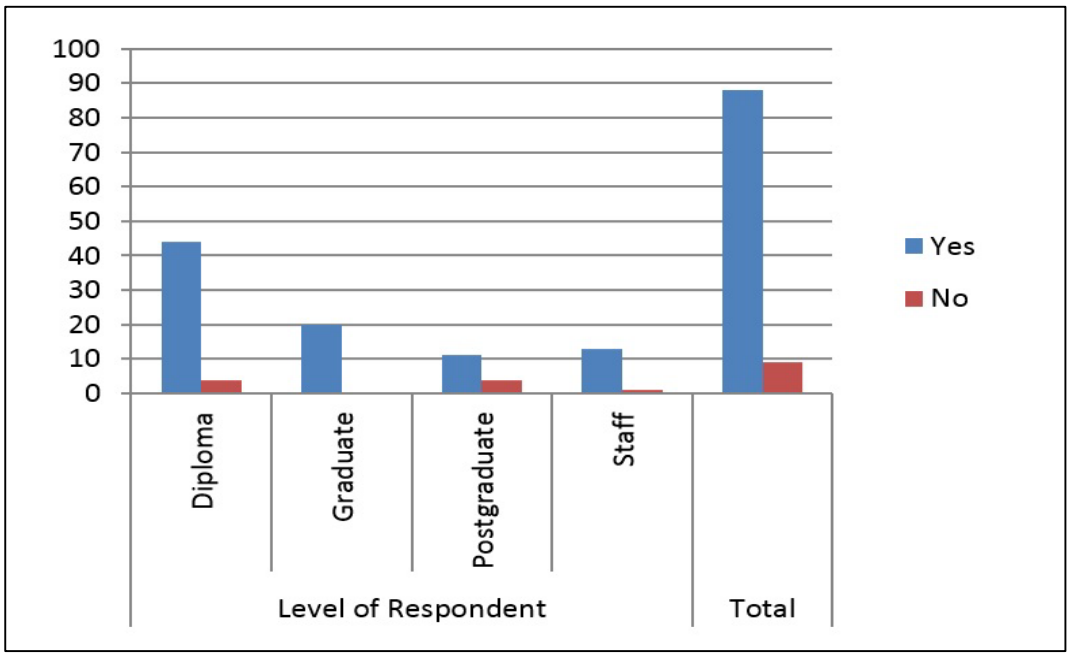
Figure 7: Access to wireless network



4.2.6.3 Response time of wireless network

Ninety seven students and staff members responded to question 14 requesting the rating of the library's wireless network response time. Concurring with the previous question, 88 (91%) of respondents rated the wireless network speed to be adequate. Detailed responses are reflected in Figure 8 below.

Figure 8: Wireless speed



In response to the subsequent question, the 88 respondents who rated the response time to the network to be adequate supplied the following reasons:

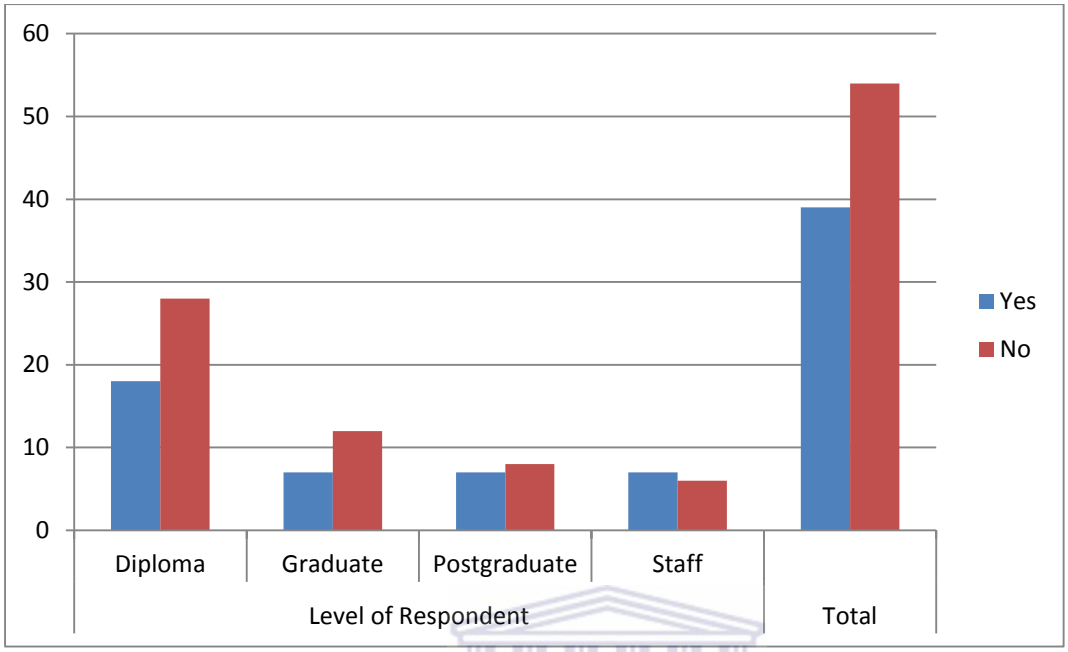
Table 20: Reasons why response time is adequate		
Theme	**%**	**Response**
It is fast or adequate	55%	▪ Fast enough for work. ▪ It's always fast. ▪ We can do our research fast and in less time. ▪ Sometimes fast in a short amount of time.
Network stability	30%	▪ Very little or no downtime. ▪ We can do our work without any interruptions. ▪ Wireless network is always on and fast.
Other	15%	▪ Wi-Fi is more reliable than my cable network in my office. ▪ Wi-Fi connection can be found everywhere in the library.

The nine (9.3%) respondents, who rated the library's wireless network as inadequate, provided the following reasons:

Table 21: Reasons why response time is not adequate		
Theme	**%**	**Response**
It is slow	50%	Very slow, E-Learning department is way better. To load library resources it is very slow, however YouTube is fast. It is slow. Not enough bandwidth to handle all the users. Most of the time slow and not working.
Network stability	40%	Sometimes stops and gets slow. Very unstable and slow after tea-time. No connection at all. Network never stable.
Other	10%	It takes time to connect. Not reliable. Sometimes does not work.

4.2.6.4 Library printers

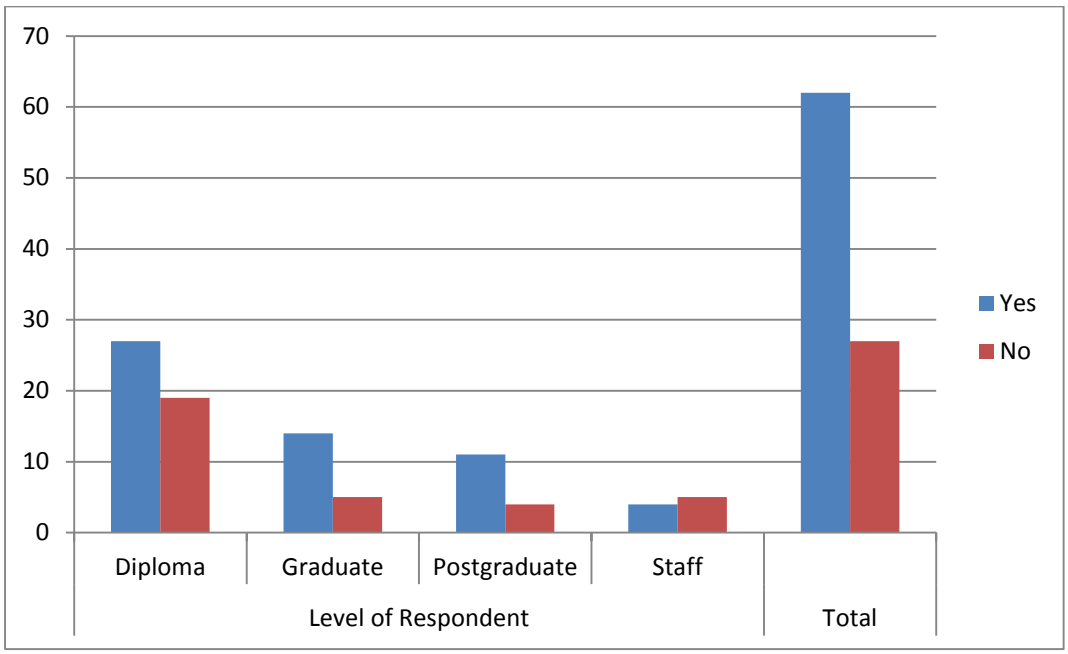
Figure 9: Access to printers



Of the 93 respondents who responded to question 15, 39 (42%) answered that there were enough printers, but the majority 54 (58%) indicated inadequate access to printers

4.2.6.5 Photocopy service

Figure 10: Access to photocopiers



The use of photocopiers decreased year after year. However the demand for printing has increased. This might be the reason why of the 89 respondents who answered question 16, 62 (70%) indicated effective photocopy services, while the minority (37%) experienced ineffective use of photocopiers.

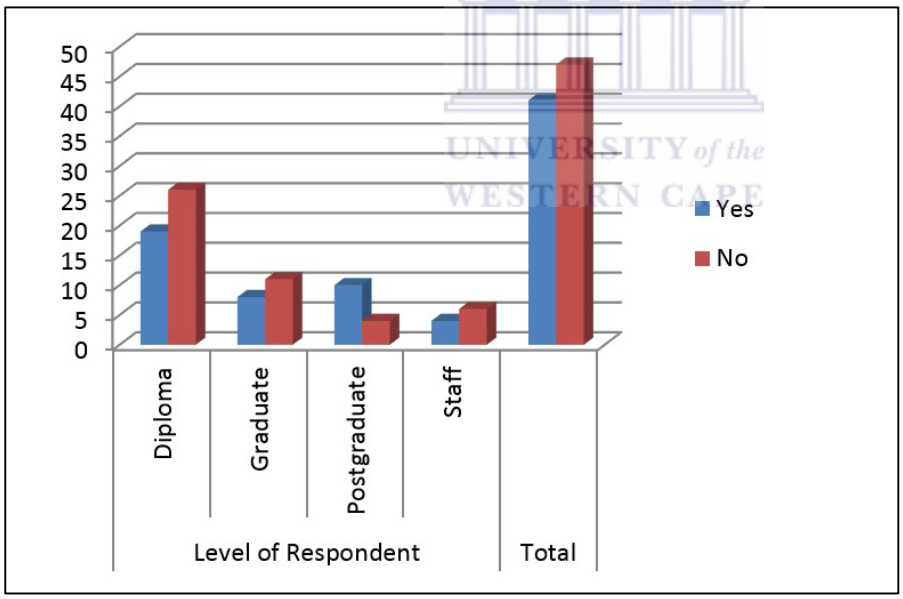
4.2.7 Section G: Interactivity/accessibility of library spaces

Questions 17 – 19 of the questionnaire were dedicated to determining whether different areas in the library were deemed accessible and interactive. Specific attention should be given to the interactions areas of circulation and information desks (McDonald 2007:19).

4.2.7.1 Accessibility of the Faculty Librarians

Faculty librarians should offer assistance to library users. Question 17 requested respondents to indicate how accessible Faculty librarians were. Responses are reflected in Figure 11 below:

Figure 11: Access to Faculty Librarians



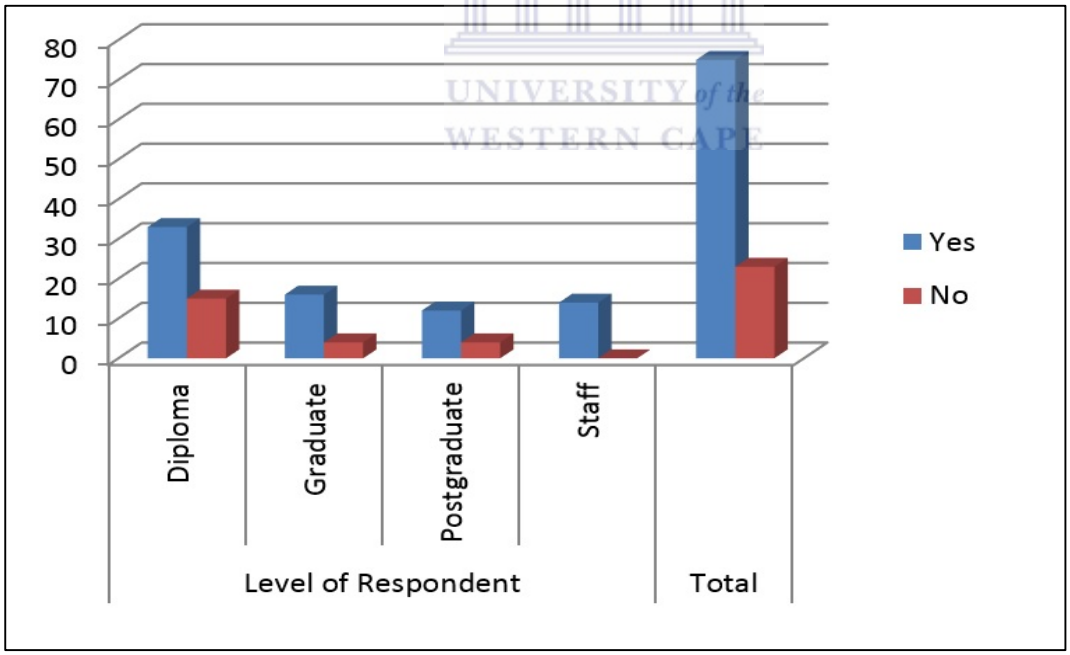
Forty five (53%) of respondents indicated that they had no access to Faculty Librarians. Although De Rosa and Dempsy (2004:4) posited that Generation Ys expect to retrieve and manipulate information without the assistance of library staff, the following responses were given:

- Never heard of them in the library.
- Don't know we even had that option.
- Where do you find them?
- They [are] always in an office.
- I have never used them.

4.2.7.2 Accessibility of the circulation desk

As the circulation desk was always the central point of the CPUT Cape Town Branch Library, it was not surprising that 75 (77%) of the 98 respondents found the circulation desk accessible. Details are reflected in Figure 12 below:

Figure 12: Access to circulation desk



Reasons for accessibility:

- Staff members are friendly and helpful.
- Easy to find.
- Because they are visible.
- There is always some-one willing to assist and help.
- They assist where they can.
- Always available.

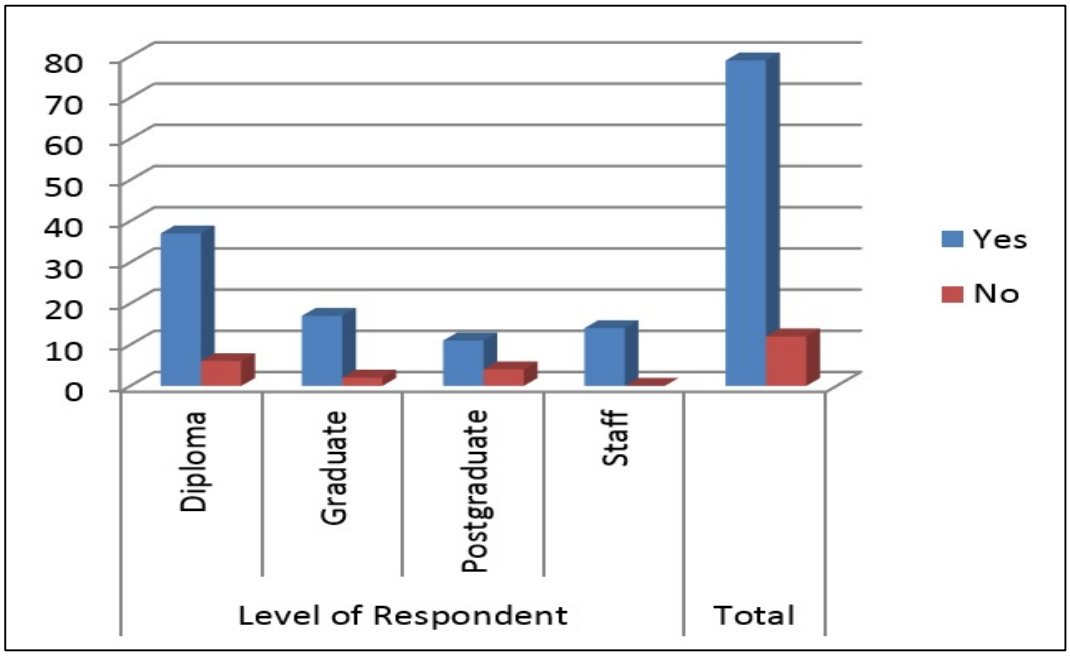
Reasons for not being accessible:

- Don't know what it is.
- Nothing for me at the desk.
- Desk not well designed.

4.2.7.3 Accessibility of the information desk on level 3

The level 3 information desk is an area which is staffed by professionally librarians who answer user queries and offer general information. It was therefore not surprising that of the 91 respondents who answered this question, 79 (87%) indicate that librarians at the information desk were accessible as these librarians are always in the public eye. Details are reflected in Figure 13 below:

Figure 13: Access to information desk on level 3



4.2.8 Section H: Safety and security in library

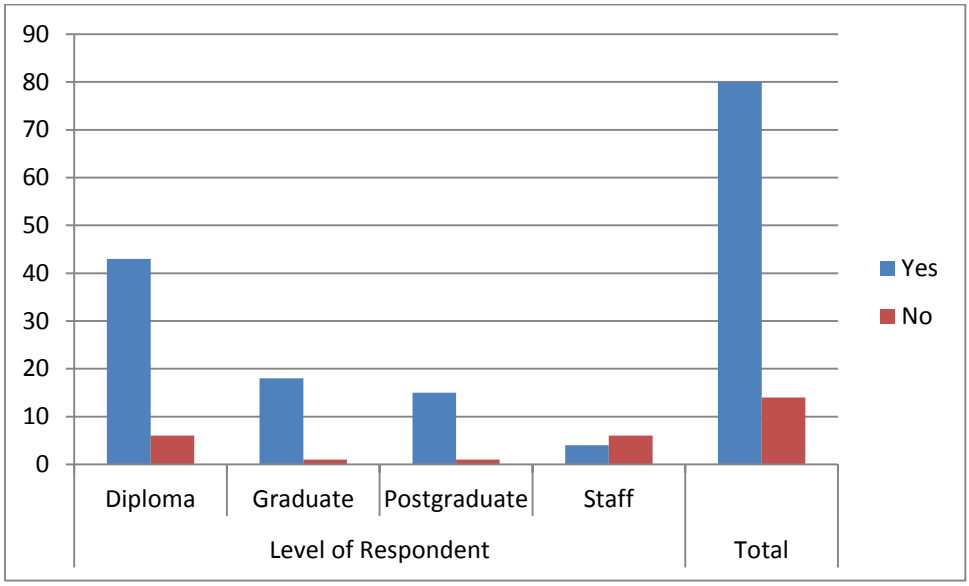
Question 20 required respondents to indicate whether they feel safe and secure in the library. Securing of equipment and user safety should be prioritized (McDonald 2007:19). As can be seen from Figure 14 below, of the 94 respondents who answered the question, 80 (85%) felt safe and secure in the library. Reasons provided were:

- Security is always around.
- Because the library has security guards.
- There are enough guards around and the entrance is always guarded.
- Security is always on patrol.
- Guards take their jobs seriously.
- Cameras around.

It is however a concern that 14 (15%) of respondents did not feel safe in the library. Reasons for this were:

- Library very secluded at night.
- Library does not have proper access control.
- Cameras do not work.
- Security guards too relaxed and don't care about the students

Figure 14: Feelings of safety and security in the library



4.2.9 Section I: General library environment

To determine the general library environment, questions 21 and 22 regarding the air conditioners and lighting were asked.

4.2.9.1 Library air conditioner

In response to question 21 regarding the effectiveness of the air conditioner, respondents had mixed reactions. However the majority (62%) of users felt that the air conditioner was not effective. Respondents mentioned that they regarded the air conditioner as ineffective as it was too cold in certain areas and too hot in other areas of the library. Respondents felt it was broken or too noisy. Reasons for it being regarded as not effective by students and staff members are recorded in Table 22 below:

Table 22: Reasons for the air conditioner not being effective

Theme	%	Response
Never works	65%	▪ Is not always working. ▪ Depends on the weather. ▪ Especially in summer the library is stuffy. ▪ It does not work at all.
Noisy	15%	▪ It makes a strange sound. ▪ The air-con is loud. ▪ It sometimes shakes and vibrates.
Other	20%	▪ It is still being fixed. ▪ It malfunctions, it get[s] cold then very cold like a fridge. ▪ A week ago it was working

A number of respondents (38%) mentioned that they regarded the air conditioner as effective as it was room temperature and cool. Reasons for it being regarded as effective by students and staff members are recorded in Table 23 below:

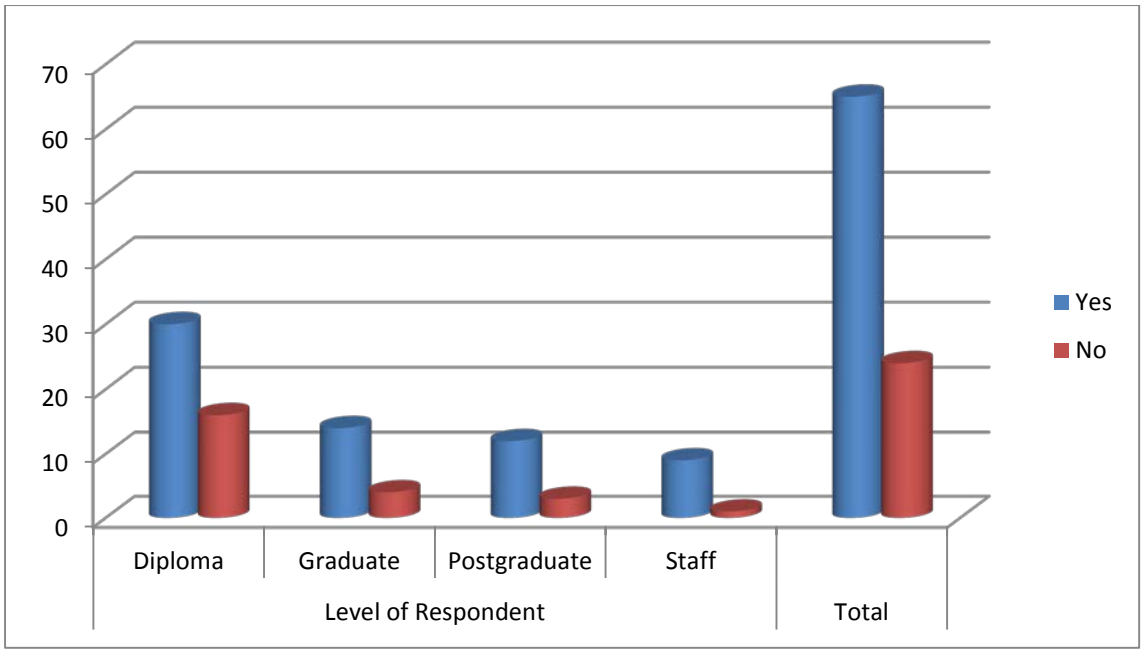
Table 23: Reasons for air conditioner being regarded as being effective

Theme	%	Response
Is working	45%	▪ Air conditioner makes the library cooler. ▪ It works. ▪ Always works. ▪ Some-times it works. ▪ It's on and makes sure the room is cool.
Temperature control	32%	▪ Temperature is always good. ▪ Not too hot or too cold. ▪ Atmosphere is cosy.
Other	23%	▪ It brings in fresh air.

4.2.9.2 Library lighting

Types of lighting and the use of lighting play a major part of the design phase of library buildings. Using the correct lighting can create the type of ambiance you want to create. The use of the correct type of light can also have a major impact on your environmental footprint. Watson and Howden (2013:14) emphasized the use of lighting technology during the day to enhance the mood and behavior of library users. Of the 89 respondents, 65 (73%) indicated that the lighting in the library is bright and adequate enough. However 24 (27%) indicated that the lighting is not bright enough because a lot of the globes are fused. The lights are placed in the wrong places and are not in the centre of the shelves. The furniture blocks the natural light.

Figure 15: Lighting



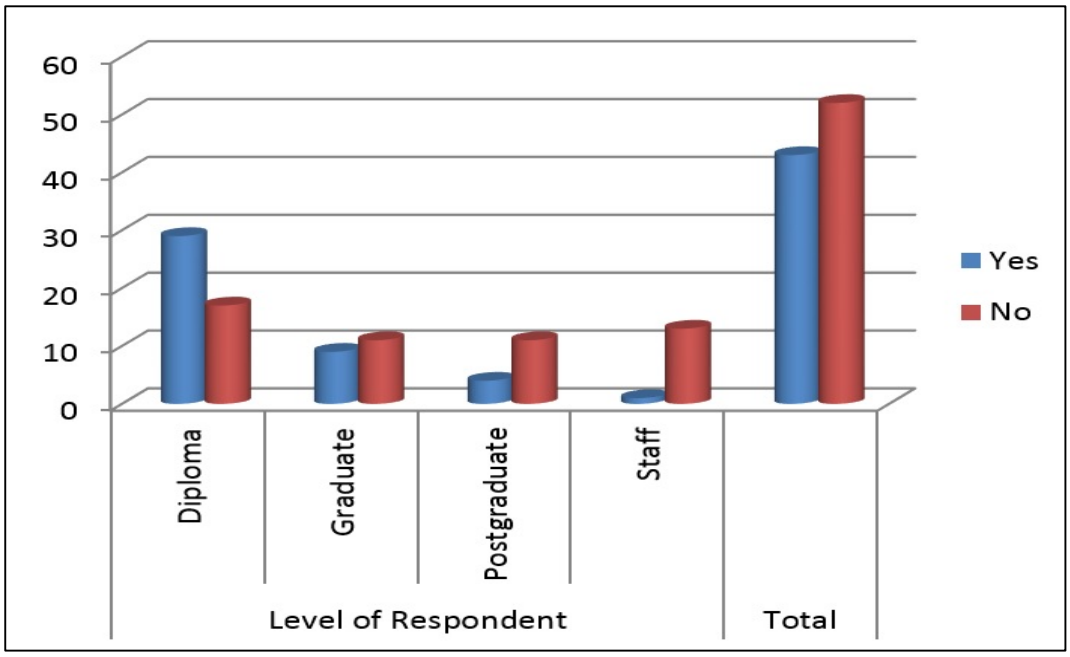
4.2.10 Section J: Colour of walls and furniture

Part of the redesigning project of the CPUT Cape Town branch Library was to change the colors of the walls and furniture to indicate space dedication. According to Hisham and Nada (2012:120) the "ability of a subtle stimulus to awaken other contextual factors in our subconscious can affect our conscious thoughts and emotions".

4.2.10.1 Colour coded painted walls

Of the 95 respondents who answered question 23 requesting them to indicate whether they like the color coded walls, 43 respondents which equates to 45%, indicated that they liked it. In comparison, 52 participants which equates to 55%, responded negatively. Figure 16 below therefore reflects that slightly more respondents didn't like the color of the walls.

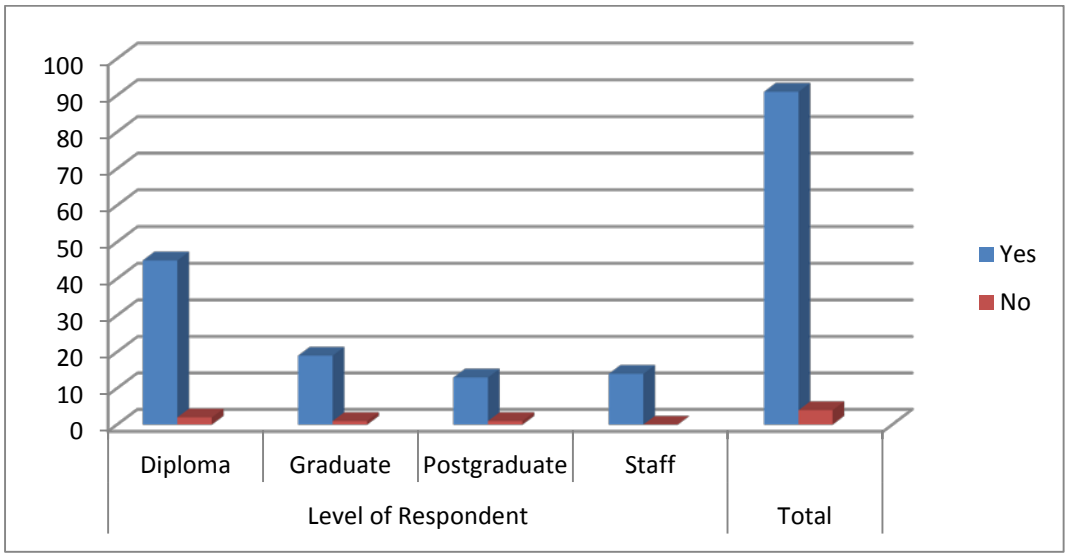
Figure 16: Colour coded walls



4.2.10.2 Furniture colour

Of the 96 respondents an overwhelming 90 (94%) indicated in response to question 24 that they liked the different colored furniture. Only 6 (4%) indicated dislike of the different colored furniture.

Figure 17: Furniture colour



4.2.11 Suggestions by users

The last questions invited respondents to suggest changes to increase the utilization of space in the library. The following suggestions were recorded:

- Remove the furniture and extend the computer lab
- Increase discussion and seminar rooms
- Expand the laptop service.
- Create an eating area
- Ensure more ventilation
- Increase quiet study areas
- Add more photocopiers.
- Upgrade the library building

4.3 Interviews with staff members

Ten staff members were interviewed. Each interview lasted around twenty minutes. User services staff was targeted. Different levels of staff, namely Librarian, Senior Library assistants and Library assistants were interviewed.

4.3.1 Challenges experiences by library staff members

There are two main challenges that have come to fore from library staff members. The one is too much noise in the library due to the type of furniture that was introduced to the library. What makes it worse is the “relaxing atmosphere” and “ambiance”. Staff also felt that better signage and communication modes could be introduced. Differently demarcated areas for example do not have indication as to what the area should be used for as well as the rules and type of activities allowed in the area.

4.3.2 Noise level

It is clear that all staff members interviewed felt that the noise levels had increased. However staff also mentioned that noise levels depended on the time of the year or the academic period. During examination or close to end of term times, the noise levels were higher due to more students using the library to complete assignments or research papers. As current students learn in groups, they want to discuss and interact. This all contributed to the high noise levels. Staff also felt that there was clearly a lack of control. Uncertainty regarding whose responsibility the

control of the noise existed. If the security staff didn't take control of the noise problem, library staff had to step in.

4.3.3 Demand for information

All respondents mentioned that the demand for information had definitely increased. The reasons cited, included that the library was a comfortable area for students, students were free to ask anything, the library had all the facilities students needed, the library hours were suitable, upgrading was attractive and the library was very neat.

4.3.4 Number of library users

All staff members indicated that the number of students visiting the library has increased.

4.4 Statistics

Statistics received from the entrance gate showed the number of users who visited the library in 2012 and 2013. The type of information is purely quantitative.

Figure 18: Gate statistics 2012 and 2013

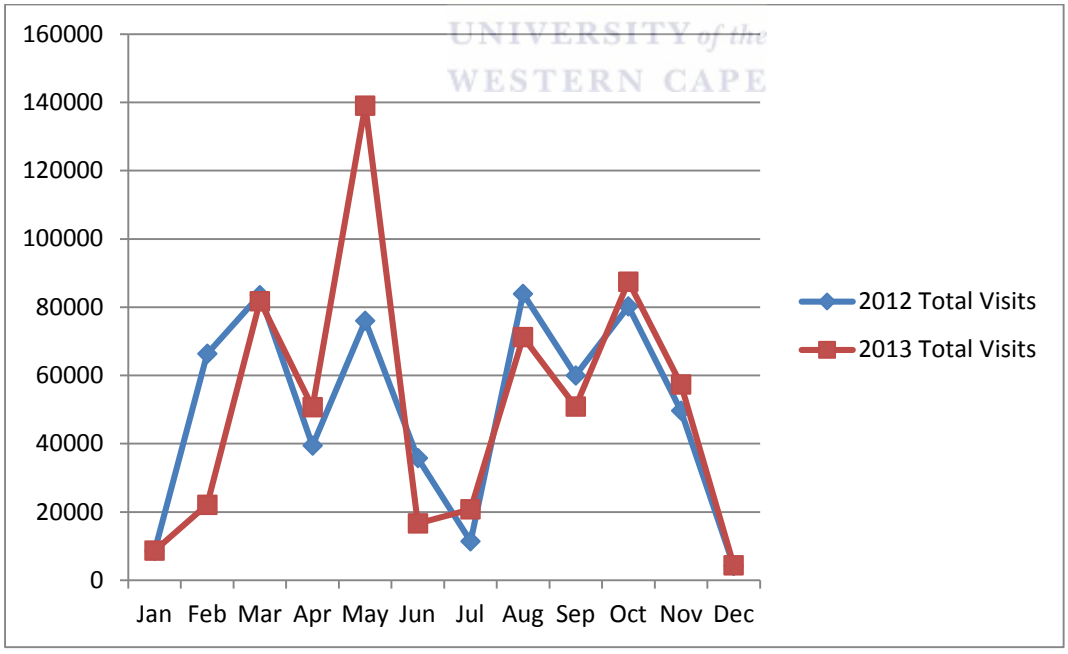


Figure 18 above reflects the number or users who entered and used the library. The comparison is between the numbers of users in 2012 before the library was redesigned and in 2013 after

the redesigning. There was a clear spike in users in 2013 during certain months of the year as well as an overall increase in users after the redesigning of the library in 2012.

Numbers retrieved from the library's statistical database are recorded in Table 23 below. These statistics were gathered electronically from the library's 3M gate. The difference in the number of users who visited the library in 2012 and 2013 was 176 000. One possible reason for the increase might be linked to the redesign of the library in 2013.

Table 24: Monthly library visits for years 2012/2013

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
2012	9000	21000	80000	40000	78000	19000	11000	70000	52000	80000	50000	6000	**516 000**
2013	10000	62000	81000	50000	140000	37000	21000	82000	60000	85000	58000	6000	**692 000**

What came out strong while interviewing staff was that many students came to the library to chat and relax because the environment is very relaxing, comfortable and inviting and that many students since the upgrade visit the Cape Town branch library instead of the other branches.

4.5 Conclusion

This chapter analyzed and interpreted data gathered from the interviews and questionnaires collected from students and staff at the Cape Peninsula University of Technology Cape Town branch library. The respondents' responses were presented in tables where simple computations in the form of percentages and presented in tables and followed with data analysis and conclusions drawn.

The general findings were that user numbers had increased by 176 000, the noise level had risen and the library was used mostly for group work. It can be concluded that the library is responding to user needs and moving in the right direction.

In the following chapter the key findings of the researcher are deliberated upon while conclusions and recommendations will be presented.

CHAPTER 5
CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The previous chapter presented, summarized, analyzed and interpreted the data gathered.

This chapter presents the results of the research as they relate to each of the research questions which were presented in chapter 1. It provides a detailed discussion on possible reasons for the findings.

5.2 Returning to the research questions

The Cape Town branch of CPUT libraries was redesigned and refurnished in 2012 as a pilot project which would subsequently serve as a model or benchmark for all ten CPUT branch libraries. This study explored whether McDonald‘s ten qualities of a good library space have been achieved with the redesigning of CPUT Cape Town branch library.

The research problem as well as the literature review had led to the following main research questions which will be answered by the study:

i. How functional is the CPUT Cape Town library?

ii. How adaptable is the space in CPUT Cape Town library?

iii. Are the library spaces at CPUT Cape Town library accessible and varied?

iv. How conducive is the CPUT Cape Town library space to motivate and inspire studying?

v. How environmentally suitable, efficient and secure is the CPUT Cape Town library?

vi. How flexible is the CPUT Cape Town library’s information technologies in dealing with growing user demands?

vii. Does the space promote interactivity between users and services?

viii. Does the library space effects a wow factor?

ix. What are the possible new challenges of a re-designed library?

5.3 How functional is CPUT Cape Town Library?

An academic library plays a significant role in the context of education and training. The majority of users who were surveyed at the CPUT Cape Town branch library (between 69% and 89%) said that the library is functional. The reason being that the current furniture was judged very versatile, allows users to work in groups, is comfortable and offers places to relax. The color-coding of furniture makes it easy for users to find different demarcated areas. The blend of different colors and types of furniture allows the library to cater for different types of users. Dowlin (1997:32) speaks of "the magic of libraries is in connecting minds and successful library buildings".

5.4 How adaptable is the space in the CPUT Cape Town Library?

A library's space must be flexible and easily adapt to change. Due to the different styles of learning it is pertinent that the library space is flexible in order to easily adapt to changing needs. Jones (1999:15) warned that due to rapid changes in information technology and higher education, academic libraries must not plan for more than fifteen to twenty years.

Most of the respondents (77%) indicated that the CPUT Cape Town branch library space is flexible and adaptable. Respondents mentioned that the library has enough open space to allow the space to be easily changed and adapted. It also has diverse sections and offers various functions. Respondents further indicated that the library was a large special area that accommodates many people as tables and chairs can easily be moved around.

5.5 Are the library spaces at CPUT Cape Town Library accessible and varied?

CPUT library's Cape Town branch is centrally situated on campus in the administration building. The campus is on a My-Citi bus, the train and taxi route. Access to the library from other CPUT campuses is seamless. The different types of spaces in the library are easy to access because all the different areas are on the same floor and next to one another. Access to the different floors is via an internal staircase and lift.

The variety of spaces available to users are quiet study area, laptop access area, collaborative group study work areas, training rooms, group seminar rooms, group viewing rooms and relaxation couches area. These diverse spaces include wireless internet as well as different

technologies like photocopy machines and printers. It can therefore be concluded that CPUT Cape Town branch offers accessibility to a variety of spaces.

5.5.1 How conducive is the CPUT Cape Town Library space to motivate and inspire studying?

The environment in the library should convey a sense of quality, value and place (Shobha 2015: 974) that encourage and inspire learning, should be conducive to studying and should offer the user a sense of comfort and safety (McDonald 2007: 19).

Although the majority of respondents (58%) agreed that the library is a conducive place to learn and study, 40 (42%) respondents mentioned that the noise levels in the library are too high and impacted negatively on those users who needed a quiet place to work and study.

5.5.2 Does the space promote interactivity between users and services?

The different library spaces need to work in tandem with its services and users. According to McDonald (2007: 19) specific attention should be given to the interactions areas of circulation and information desks.

The circulation point is the central transactions point of the library. It is not surprising that 77% of respondents found the circulation point accessible. At this point users can borrow, return and collect material from short loan or on hold. Users can also do their binding, laminating and pay any fines at the circulation point.

The information point on level 3 is the central area where users can ask for any type of library assistance. An astounding 87% of respondents indicated that the information point was accessible. Librarians assist with quick queries to more in-depth research assistance.

The faculty librarian offices are an area for researchers and users to discuss their research needs and conduct research interviews. Access to faculty librarians was low with only 47% of respondents mentioning they had access or used or knew where to find the faculty librarians. In contrast, 87% of respondents indicated access to and interactivity with staff members at the level 3 Information Point. This high rate could be due to the visibility and location of the information point. Seventy seven percent of respondents indicated that they had access to or

interaction with circulation staff. It can therefore be concluded that the information point is a central point of assistance to CPUT users.

5.5.3 How environmentally suitable, efficient and secure is the CPUT Cape Town Library?

It is very important for any library to be environmentally suitable and to secure the safety of their users, collection and equipment. The high cost of electricity and the scarcity of water require efficient library management.

The majority of respondents (89%) indicated that the library's lighting is adequate. CPUT Cape Town Library depends a lot on natural sunlight to enhance and heat up library areas. The layout of shelving ensures that the flow of natural light is not blocked or obscured. Energy saving bulbs that last longer and are cheaper in the long run were installed.

The use of air conditioners plays an important role to ensure the comfort of users. The temperature needs to adapt according to user needs and the climate. The majority (62%) of respondents felt that at the CPUT Cape Town library the air conditioners are not effective. Some respondents said it was too cold, others felt it was too hot. If the temperature is not correctly regulated, it could affect the comfort level of users and consequent learning process.

The library has always been a place of solace and safety for users. A large number of respondents (85%) mentioned general feelings of being safe in the library. However, negative comments were made about the broken cameras, lack of visible security and the inadequate access control.

5.5.4 How flexible is the libraries information technology to deal with growing demands?

The majority of respondents (64%) indicated that the library didn't provide enough computers to supply efficient computer access to everybody. The majority of students at CPUT comes from a poor background and has no access to computers at home.

Access to wireless networks that is essential to students' academic program seemed to be in good stead at CPUT Cape Town Library with 88% of respondents indicating that they had sufficient wireless access. The wireless speed seemed to be adequate with 91% of respondents

indicating that the wireless response time was fast and efficient. However, there were respondents who mentioned that access and speed can be a bit slow at certain times of the day. This could be due to the university doing live streaming of certain important events or large numbers of students, especially during the afternoons, simultaneously used the network which put a strain on the wireless speed.

Access to printers and photocopiers is an essential service rendered by the library. It was clear from the respondents that access to printers was very poor. CPUT Library in Cape Town has lost a number of printers in the past few years due to lack of funding to replace faulty ones or the redeployment of printers from the library to other departments. Photocopiers seemed to be adequate with 62% of respondents being positive about having access to photocopy services. Slightly fewer respondents (58%) rated the number of printers adequate.

It can be concluded that, even though the same machines were used for photocopying and printing, the demand for printing was much more. As hard copies of assignments were needed, the demand for printing during assignment submission times was high.

5.5.5 'Wow' factor?

According to Hisham and Nada (2012:120) the "ability of a subtle stimulus to awaken other contextual factors in our subconscious can affect our conscious thoughts and emotions". When designing a space you must be able to stimulate or capture your audience with something special or captivating.

As part of the redesign project at CPUT Cape Town library color coded walls and furniture to demarcate different areas in the library were introduced. When asked about the different colored walls, 55% of respondents indicated that they didn't like them. With regard to furniture 94% of respondents were in favor of the color and features of the furniture.

5.6 What are the possible new challenges of a redesigned library?

Challenges were recorded when staff members working in the redesigned areas were interviewed. A variety of challenges was mentioned. Some felt that the library offered too much furniture and therefore the library had become an area to relax, socialize and chat with friends resulting in a high level of noise. It was also mentioned that there were too many group areas and this also increased the social chatting and consequent noise levels.

All staff members interviewed indicated that the noise levels have definitely increased after the library was redesigned. There was also a steady increase in the demand for information and the number of library visits by users. All of these factors contributed to the increase of noise levels. It can be concluded that after the library was redesigned, it became a more desirable and inviting place to be used by users.

5.7 Recommendations

Based on findings the researcher recommends the following:

- An in-depth investigation must be conducted on how to decrease and control the high levels of noise in the library.
- Faculty Librarians need to be more accessible and need to spend more time on the open library floor.
- The library's air conditioners need to regulate temperature in the library more adequately to ensure better comfort for users.
- The library needs to provide more computers and/or laptops to ensure adequate access to computers for users.
- The library needs to install more printers to ensure an effective printing service.
- To ensure that the wireless speed is maintained, live streaming of events should be done on a separate dedicated network.
- As part of the library orientation program, the different colour coded walls and furniture and the purpose thereof must be explained.
- To avoid overcrowding, the library floor space needs to be increased.
- To increase feelings of safety the library should improve their access control, maintain and fix all broken cameras and ensure that security guards are correctly trained.

5.8 Conclusion

This chapter was used to answer the research questions of this study and to make recommendations. Redesigning academic library spaces for 21st century users with special reference to CPUT Cape Town branch library explored whether McDonald's ten qualities of good library spaces have been achieved with the redesigning of the library. From the finding it can be concluded that the redesign of CPUT Cape Town branch library has been in line with McDonald's ten qualities of a good library. CPUT Cape Town branch library has managed to add all the elements of a good library space at mentioned by McDonald.

The findings of this study will be used in future redesigning of library spaces at CPUT. Future and more in-depth research can also be done by any interested parties on any of the challenges when designing a library. Further research can focus on noise levels in libraries and/or the need for access to computers and wireless networks.

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APPENDICES

Appendix A: Ethical clearance UWC

UNIVERSITY of the
WESTERN CAPE

OFFICE OF THE DEAN
DEPARTMENT OF RESEARCH DEVELOPMENT

20 April 2015

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape approved the methodology and ethics of the following research project by:
Mr S Majal (Library and Information Science)

Research Project:	Redesigning academic literacy spaces: A case study in CPUT libraries.
Registration no:	14/4/17

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

Private Bag X17, Bellville 7535, South Africa
T: +27 21 959 2988/2948 . F: +27 21 959 3170
E: pjosias@uwc.ac.za
www.uwc.ac.za

Appendix B: Ethical clearance CPUT

Cape Peninsula University of Technology

Office of the Deputy Vice Chancellor:
Research, Technology Innovation & Partnerships
Bellville Campus
P O Box 1906
Bellville 7535
Tel: 021-9596242
Email: NhlapoC@cput.ac.za

4 September 2015

Mr Sulaiman Majal
Cape Peninsula University of Technology
P O Box 652
Cape Town
8001
Email: majals@cput.ac.za

Dear Mr Majal

RE: PERMISSION TO CONDUCT RESEARCH AT CPUT

The Institutional Ethics Committee received your application entitled "Redesigning Academic Library Spaces for 21st century users with special reference to CPUT libraries", together with the dossier of supporting documents.

Permission is herewith granted for you to do research at the Cape Peninsula University of Technology.

Wishing you the best in your study.

Sincerely

Dr C Nhlapo
Chair: Senate Ethics Committee

OFFICE OF THE
DVC
RESEARCH, TECHNOLOGY, INNOVATION & PARTNERSHIPS
04 SEP 2015
Cape Peninsula
University of Technology

PO Box 1906 Bellville 7535 South Africa
086 123 2788

Appendix C: Questionnaire

Title: **Redesigning Academic Library Spaces for 21st century Users with special reference to CPUT Libraries**

This questionnaire is intended to collect data from undergraduate and postgraduate students at CPUT Cape Town Campus.

The goal of the study is to find out if redesign of CPUT libraries meet or do not meet the 10 qualities of a good library space.

Participants' personal details and data collected in this study will remain confidential, guaranteeing the anonymity of the participants.

Section A – Students Biographical data

Please tick appropriate block and fill in where required.

1. Gender:

Male	
Female	

2. Year of study (students only):

Undergraduate	**1st year**	**2nd year**	**3rd year**
Post-graduate	**B-Tech**	**M-Tech**	**D-Tech**

3. Library positions (staff members only)

Librarian	
Senior Library Assistant	
Library Assistant	

Section B - Functionality of library furniture

4. Does the choice of couches meet your requirement **Yes [ ]No [ ]**

4.1. If yes, why?

4.2 If no, why not?

---

5. Does the choice of ottomans meet your requirements? **Yes [ ] No [ ]**

5.1 If yes, why?

5.2 If no, why not?

---

6. Does the choice of chairs meet your requirements? **Yes [ ]No [ ]**

6.1 If yes, why?

6.2 If no, why not?

---

7. Does the choice of hexagon tables meet your requirements? **Yes [ ]No [ ]**

7.1 If yes, why?

7.2 If no, why not?

---

8. What other type of furniture would you like the library to acquire?

Section C - Space utilization

9. Do you use the following spaces?

9.1. Single study carrels **Yes [ ]No [ ]**

9.2. Group study areas **Yes [ ]No [ ]**

9.3. Seminar rooms **Yes [ ]No [ ]**

9.4. Quiet study area **Yes [ ]No [ ]**

9.5 Please indicate space you would like to see in the library in future

---

Section D - Flexibility of library spaces

10. Does the library space allow for flexibility (can it easily be changed)? **Yes [ ]No [ ]**

10.1 If yes, why?

10.2 If no, why not?

Section E - Conducive to studying

11. Is the library conducive to study? **Yes [ ]No [ ]**

11.1 If yes, why?

11.2 If no, why not?

Section F – Library Equipment

12. Does the library have enough computers to do your research? **Yes [ ]No [ ]**

13. Do you have access to a wireless network in the library? **Yes [ ]No [ ]**

14. Is the wireless downloading speed adequate? **Yes [ ] No [ ]**

14.1 If yes, why?

14.2 If no, why not?

---

15. Are there enough printers in the library? **Yes [ ]No [ ]**

16. Do you find the photocopy service effective? **Yes [ ] No [ ]**

Section G - Interactivity/accessibility of library spaces

17. Do you have access to the Faculty Librarians? **Yes [ ]No [ ]**

17.1 If yes, why?

17.2 If no, why not?

---

18. Do you find the circulation desk accessible? **Yes [ ]No [ ]**

18.1 If yes, why?

18.2 If no, why not?

---

19. Do you find the information desk on level 3 accessible? **Yes [ ] No [ ]**

19.1 If yes, why?

19.2 If no, why not?

Section H - Safety and security

20. Do you feel safe in the library? **Yes [ ]No [ ]**

20.1 If yes, why?

20.2 If no, why not?

Section I - General environmental conditions

21. Is the air conditioner effective? **Yes [ ]No [ ]**

21.1 If yes, why?

21.2 If no, why not?

---

22. Is the lighting bright enough? **Yes [ ]No [ ]**

Section J - Colour

23. Do you like the different colour coded painted walls? **Yes [ ]No [ ]**

24. Do you like the different colour furniture? **Yes [ ] No [ ]**

25. Please supply suggestions/changes in order to increase the utilization of the library space

---

Appendix D: Interview schedule with Library staff

1. What are the possible new challenges the library has encountered since the redesign?

---

2. Has the noise level changed since the redesign? **Yes [ ]No [ ]**

2.1 If yes, why?

2.2 If no, why not?

---

3. Has the demand for information increased since the redesign? **Yes [ ] No [ ]**

3.1 If yes, why?

3.2 If no, why not?

---

4. Have the number of users increased after the redesign? **Yes [ ]No [ ]**

4.1 If yes, why?

4.2 If no, why not?

Thank you

Appendix E: Information sheet

RESEARCH TITLE: **Redesigning Academic Library Spaces for 21st century Users with special reference to CPUT Libraries**

CPUT libraries Cape Town branch was redesigned and refurnished in 2012 as a pilot project for all 10 CPUT libraries.
This proposed study will use these 10 qualities of a good library space as mentioned by McDonald as a framework to investigate if the re-design of the CPUT Cape Town Branch Library in 2012 has met or not met the needs of it students.

Consent of Participant

I…… have read the information presented in the information letter about a study being conducted by Sulaiman Majal under the supervision of Prof. G Fredericks of the Department of Library and Information Science at the University of the Western Cape. I have had the opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and any additional details I wanted. I may withdraw from this study at any time during my participation without negative consequences. Should I withdraw; the data will be eliminated from the study and will be destroyed.
This project has been reviewed by, and received ethics clearance through, the Office of Research at the University of the Western Cape and by the Cape Peninsula University of Technology Ethics review board. I was informed that if I have any comments or concerns resulting from my participation in this study, I may contact the Department of Library and Information Science at the University of the Western Cape.
With full knowledge of all foregoing, I agree, of my own free will, to participate in this study

_____

Print Name:_____

Signature of Participant:_____

Dated at: _____

Witnessed_____

Appendix F: Consent form

Redesigning Academic Library Spaces for 21st century users with special reference to CPUT Libraries.

Researcher: Sulaiman Majal

Please initial box

1. I confirm that I have read and understand the information sheet explaining the above research project and I have had the opportunity to ask questions about the project. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without there being any negative consequences. In addition, should I not wish to answer any particular question or questions, I am free to decline. (If I wish to withdraw I may contact the lead research at anytime) ☐

3. I understand my responses and personal data will be kept strictly confidential. I give permission for members of the research team to have access to my anonymised responses. I understand that my name will not be linked with the research materials, and I will not be identified or identifiable in the reports or publications that result for the research. ☐

4. As a participant of the discussion, I will not discuss or divulge information shared by others in the group or the researcher outside of this group. ☐

5. I agree for the data collected from me to be used in future research. ☐

6. I agree for to take part in the above research project. ☐

_____	_____	_____
Name of Participant (*or legal representative*)	Date	Signature
_____	_____	_____
Name of person taking consent *(If different from lead researcher)*	Date	Signature
_____	_____	_____
Lead Researcher	Date	Signature

(*To be signed and dated in presence of the participant*)

Copies: All participants will receive a copy of the signed and dated version of the consent form and information sheet for themselves. A copy of this will be filed and kept in a secure location for research purposes only.

Researcher:	**Supervisor:**	**HOD:**
Sulaiman Majal	Prof GH Fredericks & Dr Lizette King	Dr Sandy Zinn