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**EXPLORING UNDERGRADUATE STUDENTS' USE  
AND EXPERIENCE OF ONLINE LIBRARY  
RESOURCES: A CASE STUDY OF A UNIVERSITY OF  
TECHNOLOGY**

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Lindiwe Eileen Gumede

Supervisor: Dr S. Land  
Co- Supervisor: Dr S. Moyane

## **DEDICATION**

I dedicate this study to my mom Ntombimpela Nzimande and my late dad Siphon Nzimande who sacrificed everything for us to be where we are today. Her constant support and encouragement is appreciated. To my kids Asanda, Langa and Siphosihle and my beloved granddaughter Oni for encouraging me to further my studies.

## **ACKNOWLEDGEMENTS**

I hereby wish to acknowledge the following people for the support and motivation to get this study completed.

God Almighty for keeping me and allowing me the opportunity to fulfill one of my wishes.

My supervisor Dr Sandra Land for her unwavering support and understanding.

Dr S Moyane for her attention to detail and guidance during this journey.

Dr Nonhlanhla Khumalo, Writing centre manager for her input support and guidance, ngiyabonga ka Nxamalala.

Special thanks to my family and my siblings for having faith in me.

All the participants who were willing to share their experiences with me during a very difficult time of COVID-19 national lockdown

# DECLARATION

**I, Lindiwe Eileen Gumede, declare that:**

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## **ABSTRACT**

This study seeks to how undergraduate students at one University of Technology experience, and use or not online library resources. According to Komissarov and Murray (2016) little has been done to investigate why students use or do not use the various types of information resources. These researchers further state that convenience is what drives students to use familiar internet search engines like Google compared to subscribed databases. The study sought to explore the use of online or electronic resources by undergraduate students at the Durban University of Technology, and also to establish the reasons for non-use.

The target population were third year students enrolled for Nursing, Civil Engineering and Education at a South African University of Technology. The study adopted the mixed methods approach combining the quantitative and qualitative methods applied sequentially. A structured online questionnaire was designed using QuestionPro. This was used in collecting numerical data which was analysed using SPSS version 26. Focus group discussions were used to collect qualitative data. Ms Teams was used for focus groups because students were not available on campus during the data collection phase. This all happened during the COVID19 lockdown which saw the University closed down. The recording option on MS teams was used to record the sessions for later transcribing.

Findings of the study reveal that students still prefer to use general search engines like Google and YouTube as opposed to the subscribed electronic databases to find information. This is worrisome considering that when they use only Google and YouTube, students do not get the academic benefit of the electronic resources geared to their fields of study on which the university has spent a considerable amount of money. The study concludes that students are not fully utilising the online library resources that the library makes available to them.

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# **CHAPTER1: INTRODUCTION AND BACKGROUND OF THE STUDY**

## **1.1 Introduction**

This first chapter introduces and provides the background to the study exploring undergraduate students' use and experience of online library resources: a case study of a University of Technology. The Durban University of Technology where the study is conducted has engaged in the process of converting some of the journal subscriptions from print to online to promote accessibility as this is a multi-campus university.

## **1.2 Contextual background of the study**

Digitisation is one activity that has shifted the modus operandi of academic libraries and the manner in which researchers and students access information (Shampa and Singh 2014). Electronic resources refer to the resources such as e-journals, e-books and other electronic resources (Katabalwa 2016). Electronic resources have numerous benefits. They can be accessed whenever, at any place, including at home, in the residence, office or any place as long as there is internet connectivity. This has proved to be true during the COVID19 lockdown where physical access to libraries was not possible. Library patrons have benefited from accessing information online. Digitisation allows access to a wide scope of information and can be saved in various forms such as downloads and print (Katabalwa 2016)

Students from developed countries are commonly sure that they have the essential skill and equipment for access and utilization of electronic resources (Dukić and Strišković 2015), whereas students from less-developed countries point out inadequate ICT infrastructure for access to electronic resources (Dukić and Strišković 2015). This is not necessarily the case in South Africa which is seen as a more developed African nations with a well-developed ICT infrastructure (Tlakula and Fombad 2017). For instance a study that was conducted at a Botswana University on the usage of electronic resources found that students were to a certain extent making use of the electronic

databases that the University subscribed to but that the students were not utilising all of the databases to the fullest (Toteng, Hoskins and Bell 2013).

S.-S. Chang, S.-J. Lou, S.-R. Cheng and C.-L. Lin (2015) state that despite libraries investing in academic online databases, a study conducted in Taiwan found that whilst students still prefer to use the Internet for socialising, they are less likely to use it for academic purposes with less than 50% percent using it for research. “Based upon the reports of the positive effects of user training on the acceptance and use of information technology and systems, the author speculated that formal user education, such as information literacy (IL) courses, might help increase students' acceptance and use of library web portals” (Chang *et al.* 2015: 264). In information literacy students gain the skills of collecting, analysing, organising and critically evaluating information from a variety of sources, including electronic, print, and audio-visual formats and learn how to use the information appropriately and responsibly (American Library Association 2000). Research demonstrates that library use is related to student retention and, ultimately, success (Komissarov and Murray 2016).

However, several challenges like poor ICT infrastructure in Africa, which hampers access and use of electronic journal resources, have been reported by various scholars (Katabalwa 2016; Nwafor, Chika and Nwadike 2018). This study investigates the use of electronic resources by undergraduate students at the Durban University of Technology.

The dependence on web search engines like Google by students can be problematic in an academic setting, where assignments, projects and research require a variety of credible and accurate sources. To encourage students to utilise sound academically acceptable electronic resources, it is essential to first understand the basic reasons behind their selection of online library resources (Soohyung and Namjoo 2015). Librarians are continuously looking for new ways of doing things to make the experience of their patrons a pleasant and successful one. The American Library Association (ALA) produced a framework to guide librarians on information literacy in Higher Education. According to the American Library Association framework,

information literacy is where librarians train users to locate, analyse and critically evaluate information. Information Literacy is the ability to locate, access and use information effectively. Training for undergraduate, postgraduate and researchers on the use of library resources is ongoing at Durban University of Technology (DUT). These training sessions are conducted in the library. Libraries at the DUT have research commons equipped with computers. Research commons are computer labs that are housed in the library. They are equipped with computers. These labs are used by the students to access information for research purposes. Staff and students are encouraged to participate in this programme which is facilitated by librarians.

### **1.3 Research problem statement**

DUT Library currently subscribes to 118 databases / database packages that contain 79 350 e-journals.(DUT library 2019). These include databases to access information such as EbscoHost, Emerald, ScienceDirect and SABINET amongst the many. Marketing of electronic library resources at this University has been happening as an ongoing process. Marketing and awareness campaigns are conducted by librarians to sensitize and encourage staff, students and researchers to use them. Librarians have used various platform like social media, noticeboards during first year orientation programmes to market these developments including training. Librarians in collaboration with lecturers offer training to both staff and students on how to use the library databases.

The library has also recently introduced Libguides. These are online subject specific guides to help students to access information virtually.

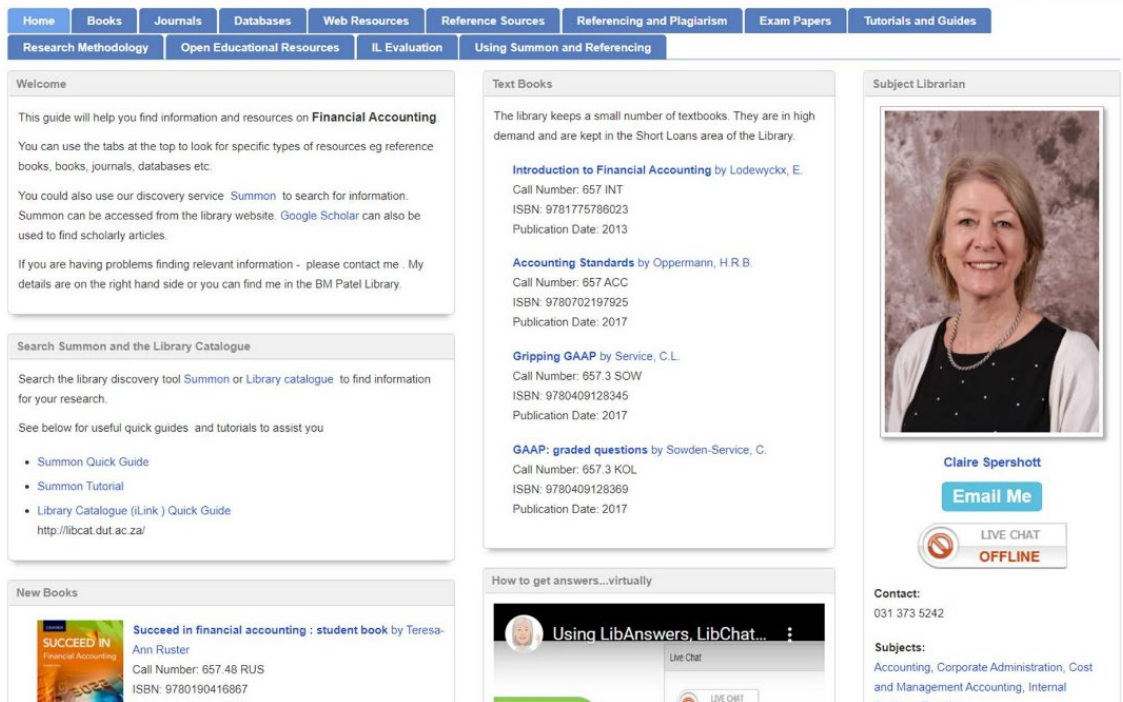


Figure 1: An illustration of the Libguides interface system

LibChat is another online service that has been introduced. LibChat allows students to chat with their librarians online. These guides were introduced in 2014. It is real time and this is one of the library initiatives that the library hopes will help students access library resources without having to be physically in the library, and enhance the students' experience of library services. This service has been extremely useful during COVID-19 lockdown. Library patrons were able to access library resources and chat with librarians online using digital platforms.

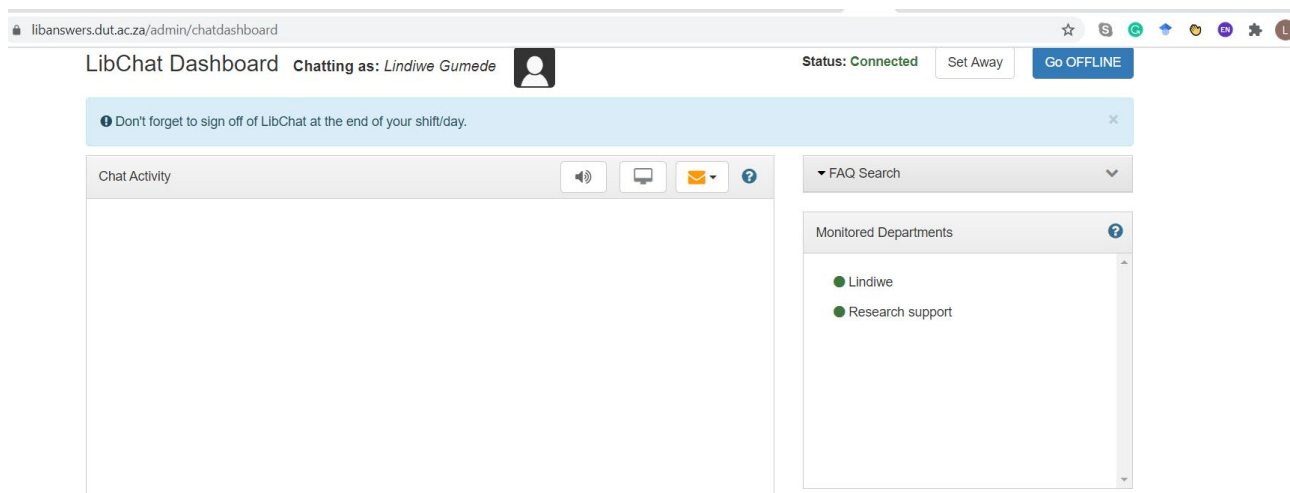
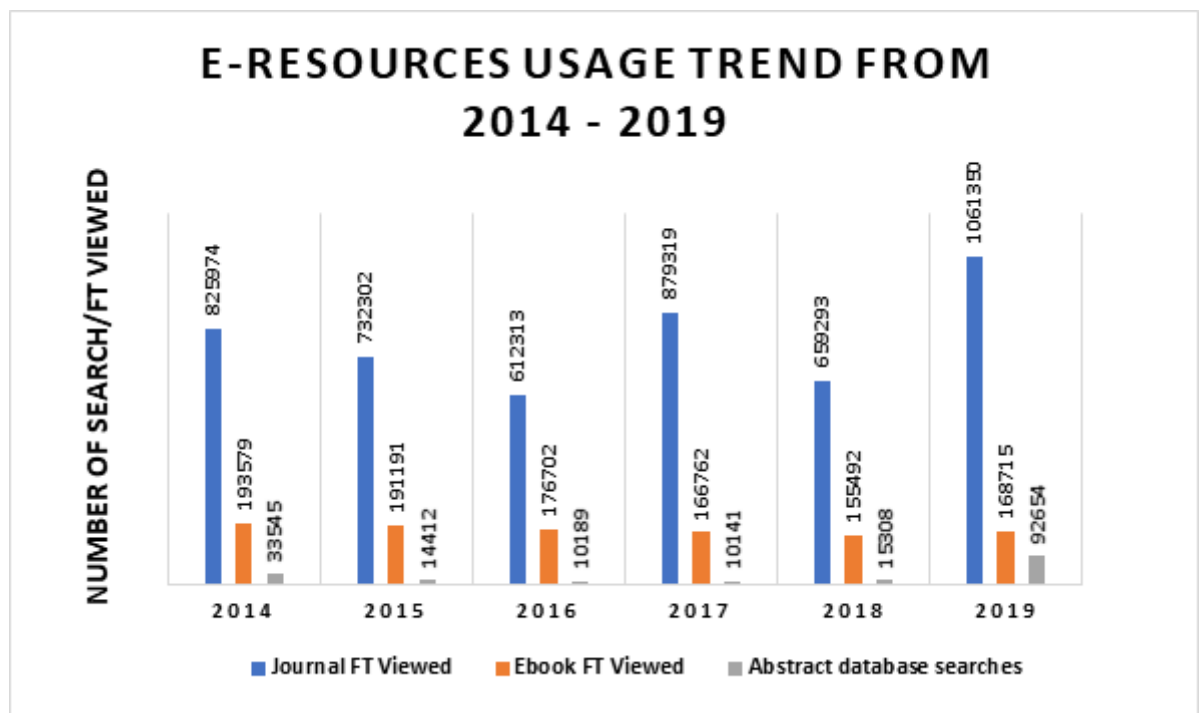


Figure 2: An interface of the LibChat dashboard



Librarians at DUT are of the opinion that the electronic library resources purchased by DUT library are not fully utilised by the students. In 2017 there was an overall decrease of 5.43% in e-book usage when comparing full text views in 2016 (DUT annual report 2017). This has since changed with the table showing a change in pattern during the following years until 2019.

Table 1: Eresources usage trend 2014-2019



In 2020 between January and March 161 102 full text items were viewed. This is an overall decrease of 68.79% compared to the same period last year. A total of 52 407 searches were done in the abstract databases from January to June 2020 which translates into an increase of 42% compared to the same period last year. Full text (subscriptions and purchased titles) e-books viewed decreased by 32.45% in 2020. For the period Jan – June 2020, a total number of 29702 e-books were viewed, compared to 43973 during the same period in 2019. The substantial decrease in e-book usage could be attributed to the decrease in usage in most of the e-book platforms as a result of the COVID-19 lockdown.

This is of particular concern since it suggests that the number of students gaining the benefit of electronic resources at DUT might be decreasing rather than increasing. Considering this factor, and size of the university spend on the shift towards electronic resources, an investigation of students' use and non-use of electronic resources is timely and imperative. According to Komissarov and Murray (2016) little has been done to investigate why students use or do not use the various types of information resources. These researchers further state that their study shows that convenience is what drives students to use familiar internet search engines like Google compared to subscribed databases. As DUT librarians, we are of the opinion that expensive resources invested in by DUT are underutilized. Whilst similar studies have been done in other countries and other parts of South Africa, no similar study has been done at the Durban University of Technology. This study therefore seeks to find out how, from their own perspective, undergraduate students access and utilise these electronic resources.

#### **1.4 Aim of the study**

The study seeks to explore the use of electronic resources by undergraduate students at the Durban University of Technology, and also to establish the reasons for non-use

#### **1.5 Objectives of the study**

To explore the use of online resources of third-year Civil Engineering, Education, and Nursing students.

To understand how Civil Engineering, Education, and Nursing students experience and use online services.

To investigate why students use and do not use online library resources.

## **1.6 Research questions**

1. To what extent do third year students attending Civil Engineering, Education and Nursing lectures use the online library resources?
2. How do students in these departments experience online services?
3. What are the reasons for their using or not using online library resources?

## **1.7 Rationale of the study**

The researcher who is the currently a librarian at the Durban University of Technology was interested in establishing students experience in using online library resources. Various studies have been done on the use of electronic resources by staff and students in South Africa and other parts of the world. No similar study has been done at the Durban University of Technology since the inception of electronic resources in the library. Findings from the study will assist librarians and other stakeholders in improving this service to undergraduate students. The study will add to the body of literature on the subject of experiences of undergraduate students on the use of online library resources. Librarians will be able to develop an Information Literacy module that addresses the needs of undergraduate students at the Durban University of Technology.

## **1.8 Paradigm**

This study is set within the interpretivist paradigm. According to Creswell (2018), this paradigm allows the researcher to understand the significance and meaning that different individuals attach to social or human issues. Interpretivist is chosen as a paradigm as the study seeks to explore the use and experiences of online library resources from the perspective of undergraduate students at a University of Technology.

## **1.9 Scope and limitations of the study**

The study focusses on the three departments, spread across three faculties, these three departments are based at Indumiso campus which is in

Pietermaritzburg which is about 70 km away from the Durban campus, which is the main campus. The study was conducted in 2020 which coincided with the COVID-19 lockdown. COVID-19 dramatically affected data collection for the study since face to face focus groups discussions were meant to be conducted. Students who had no data were not able to participate. Access to some of the research participants was not possible. Hence, MS Teams was used for focus groups discussions which is an amendment of data collection method relevant to the study allowing for adhering to the COVID-19 regulations by not risking the health of the participants and altering the study.

As a librarian interviewing, the students might not have been completely open with me. I constantly encouraged them to be open and to express their real thoughts and opinions on online resources offered by the library.

### **1.10 Definition of terms**

**Electronic resources:** and “online resources” are used interchangeably in the study.

Electronic resources are information materials that need a computer to access, whether through PC, Mainframe or handheld mobile devices and are accessed by the use of the internet or LANs (Uzuegbu *et al.* 2013). Electronic resources provide a spectrum of access to a variety of information formats, ebooks, e-journals, newspaper articles and videos (Yamson, Appiah and Tsegah 2018). Different countries use this term differently to refer to information that can be obtained online

**Information literacy:** According to the American Library Association “Information literacy is a set of abilities requiring individuals to 'recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.’”(American Library Association 2000).

**Digital literacy:** The American Library Association defines digital literacy as “the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills” (Koltay 2011).

**Digital natives:** The Cambridge dictionary defines “a digital native as a person who is very familiar with digital technology because they have grown up with them”(Walter 2008).

### **1.11 Overview of thesis chapters**

Chapter one highlights the background of the study, statement of the problem.

Chapter two discusses views and studies by other researchers in this field

Chapter three presents the methodology and data collection techniques that were used to carry out the study.

Chapter four presents the findings of the study based on data collected and analysed accordingly.

Chapter five discusses the findings based on these discussions, conclusions will be drawn and recommendations for future research will be made.

### **1.12 Summary of the chapter**

This chapter introduced the study providing the background, problem statement as well as the aim of the study. The chapter also gives the rationale of the study. Key concepts used in the study are also defined. The next chapter will present the review of literature based on the topic.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1. Introduction**

The purpose of this chapter is to review literature on the usage of online library resources by students in institutions of higher education. The chapter looks at the literature that is relevant to this study. The researcher seeks to gather and understand literature on usage of online or electronic library resources by students globally and in South Africa. The review of various types of literature will assist in putting the current study into context. This chapter will start by discussing studies that explore the role of libraries within university contexts, then comment specifically at the movement from print to electronic. The review will further focus on academic libraries and how they have dealt with the changes in student information seeking behaviours through e-libraries and information literacy training. The review will also look at the trend of digital libraries and electronic resource usage within the South African context. The discussion of the Community of Practice and Ranganathan's five laws of library science will conclude the chapter through unpacking aspects of the theories that are relevant to this study.

### **2.2 The role of a library in a university and how it serves students**

The library is the heart of any academic institution (Bellary and Surve 2019). The library as an institution dates back to ancient times, particularly pre-Socratic Greece, the availability of information in different formats has changed the way libraries operate (Bellary and Surve 2019). Libraries are no longer just repositories of information but partners in the academic environment. Universities have three important aims these include teaching and learning, research, and serving the community (Bellary and Surve 2019). Libraries achieve a big part of this triple objective by housing various sources of knowledge and skills to meet the challenges of sustainable development goals.

Academic libraries play a critical role in supporting academic and research needs of their users (Rasul and Singh 2010). In the 21st century most of the users are millennials – born between 1980 and 2004. This generation of users prefer digital content compared to the printed media (Soroya and Ameen 2018). Needless to say libraries need to adapt to remain relevant. Studies indicate that about 85 percent of these millennials spend more time on accessing information from electronic gadgets than from printed books (Soroya and Ameen 2018).

Soroya and Ameen (2018) state that libraries play a critical role in encouraging reading. Their study conducted in Pakistan on millennials reveals that millennials want material available electronically and in print (Soroya and Ameen 2018). A recommendation from this study was that students should have 24/7 access to electronic resources including reference chat service (Soroya and Ameen 2018).

The Pakistan government has invested a lot of money on digitizing their material including theses and dissertations and rare material (Soroya and Ameen 2018). The 21st century is experiencing a rapidly changing information environment. More publications are available online. Less material is being published in print (Soroya and Ameen 2018).

A study conducted in the United States found that the usage of library resources by students from low socio economic backgrounds was poor (Soria, Nackerud and Peterson 2015). Literature from other studies on library usage indicates that the usage of library resources has a positive relationship with students' academic performance (Soria, Fransen and Nackerud 2017). De Jager, whose study measured the value or impact of library use on students' academic success at the University of Cape Town, South Africa found that students who read more perform better in their academics (De Jager 2002). The results of a survey conducted on the impact of using library resources on students' progression and subsequent graduation revealed that students who used the library resources at least once a week had greater chances of progressing compared to those who did not use the library (Soria, Fransen

and Nackerud 2017). This affirms previous research that indicates that using the library and its resources has a positive impact on the success of the students at institutions of higher learning. The use of library resources has an important role to play in the success of a students. Students who have been trained on how to use the library tend to cite more peer reviewed scholarly items when conducting research and this indicates that they have read more relevant research and are therefore likely to be better informed.

### **2.3 Conceptualization of online library resources in higher education**

According to Sulieman and Mohammad (2015) several terms, such as electronic library, digital library, virtual library, web library and online library, have been used interchangeably to refer to this new scenario. The distinguishing feature of these libraries is the ever-growing number of items collectively referred as 'online resources'.

As defined in the previous chapter "Electronic resources" refer to those materials that require computer access, whether through a personal computer, mainframe, or handheld mobile device to access. Electronic resources provide a spectrum of access to a variety of information formats, ebooks, ejournals, newspaper articles and videos (Yamson, Appiah and Tsegah 2018).

Umukoro and Tihamiyu (2017) define e-library services as electronic services such as e-reference, e-journal access, bibliographic, current awareness services and others provided by libraries to their user communities using the Internet, through various hardware configurations, including mobile devices, laptops, desktops, and other technologies (Hyman, Moser and Segala 2014).

Advances in the digital environment have made it important and critical that users are aware of, and able to find and use information. The new generation of information users, the Millennial Generation - also referred to as the Net Generation - take convenience as a criterion in deciding and choosing information sources (Liyana and Noorhidawati 2017). These types of users rely on digital or electronic platforms to get information. The Council of Higher



Education of South Africa found that the majority of students enrolled in institutions of higher education fall into this category (Council on Higher Education 2013). The majority of these students are less than twenty-four years old, normally called the “Generation Z”, and have had access to digital media from an early age. According to Joo and Choi (2015), this generation tend to be called “digital natives.” According to the *Oxford English Dictionary*, a digital native is “a person born or brought up during the age of digital technology and so is familiar with computers and the Internet from an early age” (Waite 2012). Most of them learn to use these devices without being formally taught.

In a bid to reflect this ‘demographic transition’, and to take advantage of the flexibility and benefits in digital resources there has been a trend, globally, for academic libraries to digitize their collections (Suliman and Mohammad 2015). This has created a shift in the form and substance of library, with many library institutions occupying even smaller physical spaces while containing a comparatively larger repository of resources.

However, some people still appreciate hard copies and many libraries now offer the combination of print and electronic resources in a new form called “hybrid library” (Frandsen *et al.* 2017: 620). The level of electronic library resource usage differs despite the huge costs universities incur to procure these databases (Yamson, Appiah and Tsegah 2018). Just like print books before them, electronic resources are seen as playing an important role in learning, teaching and research (Srinivasulu, Balu and Narendra 2019).

The advantages brought by electronic resources has necessitated that most academic libraries move to provide access to electronic resources for learning and research purposes (Srinivasulu, Balu and Narendra 2019). A study conducted in the faculty of Engineering at Hyderabad, India found that 91% of users surveyed were using electronic resources daily. The study also revealed 94% of users were aware of electronic resources available in their library (Srinivasulu, Balu and Narendra 2019). While this structural shift has been in response to the ‘demographic transition’ described above, it has also been

based on the reflection of the basic function of a library. The library's primary responsibility has been to assist users find relevant information when they need it. In the last few decades, 'relevant information' has been web-based and digital, and the shift has been to make this information readily accessible to users.

This structural, and ideological shift in the institution has also inevitably meant the shift in the procurement and accessing of information. Blended multimodal learning is becoming the norm and the library has to respond to this change by offering online resources. Now, information users can access libraries any time of the day, and from the convenience of their homes. Timmis and Muhuro (2019) suggests that digital literacy is key for students to be able to locate information from electronic resources, anytime and from anywhere. In the quest to satisfy their users, librarians are continually exploring and looking for ways to meet the users at the point of need. The use of technology is one of the new trends adopted by libraries and librarians to make information accessible. User interface of some of the electronic resources was cited as complicating the process of finding information when navigating to find information which resulted in less usage (Soni, Gupta and Shrivastava 2018). The adoption of electronic resources has expedited this challenge.

### **2.3.1 Value of electronic library resources in academic libraries**

Users can access current and up-to-date information when using electronic sources as they are updated on a continuous basis. They are available around the clock and anywhere at the point of need. This is why some institutions, in their acquisition of library resources, have decided to increase electronic resources in their collections and reduce the amount of print material. With the use of library databases instead of general search engines students are able to source scientific academic content as opposed to general content found on Google (Weber, Hillmert and Rott 2018).

The value of electronic databases to researchers is that the time between publication and access to articles is greatly reduced (Prasad and Baskaran

2018), since articles become available and accessible as soon as they are published online, with none of the delays associated with printing and distribution.

Electronic resources, and E-books in particular are considered to be versatile. Users can download onto their smartphones and access them whenever and wherever they need to use them. However, there are different subscription models offered to libraries. Some allow for multiple access whilst others only give 1 to 5 user licences, which means that students can access the same book or article using different computers and at different locations.

Electronic resources are “invaluable” and most powerful resources that complement the print traditional resources. Electronic resources have been found to be very useful in teaching, learning and research in higher education (Dadzie 2005; Okiki and Asiru 2011; Adeniran 2013). They play an important role in helping libraries to fulfil their mandate in teaching, learning and research, and when a new technology is introduced it is important that adequate training is offered to users for them to fully utilise that technology (Isibika 2018). With the advent of electronic resources students are able to access global literature within a limited time using their laptops or desktop computers.

A study conducted in North Carolina shows that about 80% of their users preferred using electronic resources to print media. Time saving was cited as an advantage of using electronic resources by scientists surveyed (Arshad and Ameen 2018). In the UK electronic journals were popular sources of information (Arshad and Ameen 2018).

Academic institutions are calling for more research output, and, as partners, libraries are sourcing valuable electronic resources to assist researchers and students to easily find scholarly and current information which aids their production of peer research publications (Prasad and Baskaran 2018).

With online resources made easily accessible, researchers are able to find relevant and up to date information for their publications within a limited time frame. Studies conducted in India, and some parts of Africa (Adeniran 2013; Shampa and Singh 2014; Katabalwa 2016), have found a positive correlation between reading comprehension level of users and their use of electronic reading platforms (Hyman, Moser and Segala 2014). This suggests that library users with advanced levels of reading comprehension are more likely to use electronic resources. According to Nwafor, Chika and Nwadike (2018), electronic information resources have much to offer in the academic environment, but their usability depends on the users and the extent of use of this type of resource. It is therefore important for users to acquire the necessary skills for effective reference and information retrieval.

#### **2.4. Competency levels of university students use of online library resources**

Studies reveal that students' level of computer competency does affect the use and uptake of electronic resources (Akuffo and Budu 2019; Ebijuwa and Mabawonku 2019). As such computer literacy plays a critical role in access to and use of electronic resources. South Africa is a country with inequality as a result of the previous apartheid government. Students from rural backgrounds experience various challenges when they enter universities (Timmis and Muhuro 2019). Their lack of exposure or limited exposure to technology puts them at a disadvantage. The call for the introduction of technology whilst not addressing the previous imbalances or lack of exposure will not help. These students are referred to as "digital strangers". Digital strangers are students who have not had access to technology (Czerniewicz and Brown 2013). Access to internet in rural areas is limited compared to urban areas. These students when they enter university tend to lack the necessary skills

to access information for their academic endeavours. There is a digital divide separating digital strangers from digital natives.

## **2.5. Barriers to the use of online library resources in academic institutions**

The section below will discuss the barriers to the use of online resources in academic libraries, various reasons have been cited as leading to non-use of electronic resources by students.

### **2.5.1 Lack of awareness of electronic library resources**

The subject of awareness and usage of online library resources in the academic environment is not a new area of study. Various studies have been conducted to ascertain awareness of electronic resources by students.

In 2017, 50% of students surveyed at UNISA were not aware of electronic databases available to them through the library (Moyo 2017). An interesting observation arising from the studies conducted on this subject is that this happens across the board. Postgraduate students surveyed at the University of Western Cape revealed that there was a need for awareness campaigns by the library staff to promote electronic resources (Nyahodza and Higgs 2017). Various studies were conducted in Ghana, South Africa and Nigeria on staff, undergraduate students, postgraduate students as well as distance education students reveal lack of awareness as a major reason for non-usage of electronic resources (Dadzie 2005; Okiki and Asiru 2011; Isibika 2018)

### **2.5.2 Poor information literacy and digital literacy skill**

For library electronic resources to be used optimally by students, they need adequate information literacy skills. Well-developed information literacy skills have a positive and significant relationship with students' use of electronic resources (Ukachi 2015). Ukachi (2015) found at the University of Makerere in Uganda that 15.4 % of students indicated that they did not know what electronic resources were and hence could not use them, while 14 % indicated

that they had limited ICT skills. Some respondents could not use the resources because they lacked information literacy skills required for the utilization of these resources (Ukachi 2015). Lack of information literacy skills was cited as a barrier to use of electronic resources (Booker, Detlor and Serenko 2012; Arshad and Ameen 2018). These authors found that lack of information literacy skills led to poor searching skills, and concluded that lack of digital skills leads to minimal or non-use of electronic resources (Arshad and Ameen 2018).

### **2.5.3 Poor ICT infrastructure**

Studies conducted in African and Asian countries indicate poor ICT infrastructure as a reason for low or non-use of electronic resources (Zabed Ahmed 2013). A study conducted in Nigeria found students were aware of electronic resources but were hindered by poor bandwidth in using the resources (Nwafor, Chika and Nwadike 2018).

In contrast, Bellary and Surve (2019), found that in a university in India, students were aware of and using the electronic resources. The familiarity of most students with the media and internet in that country, seems to have positively influenced their information seeking behaviours and usage of electronic resources (Bellary and Surve 2019). A study conducted in Vardhaman, India found that 92% of respondents reported using electronic resources daily (Srinivasulu, Balu and Narendra 2019). India is reported to have the cheapest data costs in the whole world (Bottomley 2020) which could be a strong factor in the wide uptake and use of electronic resources in that country.

### **2.5.4 Poor internet connectivity**

Bandwidth and slow internet connectivity has also been cited by some authors as reasons for non-usage of electronic resources in Africa (Katabalwa 2016; Apuke and Iyendo 2018; Nwafor, Chika and Nwadike 2018). In Tanzania it was reported that students resorted to using internet café to access the internet which was much faster than the speed of the connection at the university (Katabalwa 2016).

### **2.5.5 Language as a barrier**

An interesting point was made by librarians from the University of the Western Cape. They noted that language was a barrier to the utilisation of electronic resources. As is the case for most South African students, English is a second language for the majority of students from this Western Cape University (Nyahodza and Higgs 2017).

### **2.5.6 Library anxiety**

Studies reveal that people who have English as a second language may experience anxiety in using the library (Sinnasamy and Karim 2016). A study conducted in China, where English is not dominant, reveals that there are varying degrees of use of the library. Library material including electronic resources is available in English and students who are not competent in reading English are naturally hesitant or uncomfortable in using the library resources because of the language barrier. Other reasons for fearing using the library that were cited are the fear of asking stupid questions, and fear of inability to fully understand answers (Sinnasamy and Karim 2016). This resonates with the South African situation where students tend to fear approaching librarians for help. The majority of students coming to university have never been to the library and tend to be afraid to ask for help from librarians.

## **2.6 Electronic resources and information seeking behaviour of students**

Information seeking behaviour is defined as a purposive process of seeking information as a consequence of a need to satisfy some goals (Liyana and Noorhidawati 2017). Studies reveal that the level of sophistication when it comes to online search strategies in finding information is generally low among university students (Weber, Hillmert and Rott 2018).

In an academic environment where there are both full time and part-time students who cannot always be on campus, the benefit of the virtual resources cannot be over emphasized. The value of accessing information online is huge

since they do not need to be on campus physically to get information. Information is readily available online 24\7.

A study conducted in Minnesota reveals that students who use the library in their study have increased chances of success compared to those who did not use the resources ((Salubi, Ondari-Okemwa and Nekhwevha 2018). However, a study conducted at Central University of Ghana found that despite huge amounts spent on electronic subscriptions students were not utilizing these resources but were opting for Google to look for information. Librarians at this university offer information literacy classes to encourage and manage students' information seeking behaviour and usage of these resources for academic and research work but this has not been effective.

In contrast, Brown, Robinson and Stubberud in (Hyman, Moser and Segala 2014), found that students like using electronic reading platforms as they are easy to use. Electronic resources give access to a variety of information through indexes, books, journals, theses which are constantly being updated to help researchers find what they need (Nwafor, Chika and Nwadike 2018). A study conducted in Croatia by Dukić and Strišković (2015), contended that the information seeking behaviour of students and usage of electronic resources is influenced by several factors, including gender, level of study, enrolment status and field of study.

Shockingly, Prasad and Baskaran's Indian survey (2018) assessing the use of electronic resources by faculty and students revealed that 100 percent of students relied on internet search engines like Google to find information and 97 percent of teachers also used the general internet to look for information. The results revealed that this was partly because the participants were not aware of these subscriptions. Despite the fact that various studies make a case that the internet search engines such as Google were the first option for users, Connaway et al. (in Liyana and Noorhidawati 2017) found that library users in the academic space, who are sophisticated researchers, turn to library online resources. His study found that serious researchers and those who have been exposed to online resources saw benefit in using subscribed online



databases. The benefit of using subscribed library databases is that they give access to scientific and scholarly peer reviewed information.

The various debates on the topic indicate that there are different opinions and findings regarding the usage of library electronic resources. Some studies were conducted looking at postgraduate students to assess usage. Again, there seems to be varying degrees of usage. What is interesting is that this happens across the globe. A study conducted at the University of the Western Cape found that postgraduate masters' students were not fully utilizing electronic databases and the reason given for this was that they were not aware of these resources (Nyahodza and Higgs, 2017).

Yamson, Appiah and Tsegah (2018) have argued that the use of electronic resources in developed countries differs from one developed country to another. The literature suggests that lack of digital skills and information literacy skills could be the reason for low usage of these electronic databases (Weber, Hillmert and Rott 2018). In this context, research has shown that while today's students spend a large amount of time online each day, usually only a small percentage of online activities are related to learning or academic work (Weber, Hillmert and Rott 2018).

Weber, Hillmert and Rott (2018) point to a shortcoming that exists in previous studies regarding student information seeking behaviour. Literature in this study reveals that previous studies have relied on self-reporting from participants rather than looking or observing the way library users search or look for information (Weber, Hillmert and Rott 2018). The challenge is that self-reports may not reflect reality. The researchers were more concerned about how information literacy is taught. An experimental study was conducted to see how students look for information to understand their search behaviour. Students were randomly assigned to experimental groups. After intervention in the form of library workshops students used more electronic databases. They started using scientific journals (Weber, Hillmert and Rott 2018) and cited more references. Students were becoming aware of the difference between scientific and peer reviewed journals and general articles. What came out was

that few students used the advanced search strategies like using the Boolean operators for their research even after attending the information literacy workshops. Interestingly this study also revealed that finding relevant sources still remained a challenge. Their exposure to library workshops did at least show some significant increase in use of databases that the library subscribed to. What was interesting from this study was that even after the workshops students still prefer to use simple search strategies such as using keywords (Weber, Hillmert and Rott 2018).

Some studies reveal that students prefer internet search engines like Google and Yahoo to find information citing reasons like ease of navigation and familiarity of the search engines as the reasons for their choices. Interestingly these students do acknowledge the importance of using credible resources (Joo and Choi 2015).

## **2.7 Information literacy in academic libraries**

Academic libraries have in recent years increasingly engaged in activities intended to help students to become critical thinkers, problem solvers, independent information seekers and lifelong learners through information literacy training.

Studies on information seeking behaviour of students indicate that there may be a need for continuous training to improve skills in seeking and fully utilizing available, particularly the new electronic resources. It has been revealed in some research that continuous training is fundamental in making sure library users, staff students and researchers are constantly being trained so that they see the benefit and value in using these useful resources. This realization has led to the idea of information literacy training. Users who have adequate information literacy perceive the need for information and know how to find, evaluate, use and subsequently communicate information effectively to impart information successfully to tackle specific issues or for research purposes (Ukachi 2015). Students with information literacy skills are able to distinguish reliable information from unreliable sources (Weber, Hillmert and Rott 2018). This is particularly important in this age where we are flooded with fake news. The ability to distinguish reliable and authentic sources is critical in academia.

Booker, Detlor and Serenko (2012) state that one of the benefits of Information literacy (IL) is the adoption and use of electronic resources. Students with IL skills perform better in their academic activities and they use more of these resources which in turn leads to “competent” graduates (Arshad and Ameen 2018).

Increasing the use of electronic resources is an issue of worry for some libraries throughout the world (Frandsen *et al.* 2017), since many library users still prefer to use familiar, general internet search engines like Google. While this is the prevailing position, there is a growing realization in academia that electronic and licensed academic databases provide access to accurate, and updated information from authentic and easily verifiable sources (Salubi, Ondari-Okemwa & Nekhwevha, 2018). The ability to use these electronic resources, to collect valuable online-based sources has become indispensable in research (Weber, Hillmert and Rott, 2018).

Unfortunately, many users do not have well developed information literacy skills, and have not had effective training. Agaba (2005, cited in Frandsen *et al.* 2017) argues that the absence of information literacy training results in the non-usage or low usage of electronic resources, since many users find navigating e-resources challenging. Various studies show that in order for students to fully utilize the various information sources provided they need information literacy skills (Frandsen *et al.* 2017) Offering training to users occasionally is not enough to get users to use the resources and therefore training sessions should be offered frequently to assist users (Frandsen *et al.* 2017). Librarians need to come up with strategies to encourage participation in information literacy training workshops.

In South Africa a positive relationship was found between information literacy (IL) and the use of ERs (Bhukuvhani, Chiparausha and Zuvalinyenga 2012). Various studies reveal that information literacy skills are critical for users to fully utilize the electronic resources offered by libraries (Tlakula and Fombad 2017). Librarians need to come up with strategies to encourage participation

in information literacy training workshops. Many studies reveal that despite the new trends and development in making information accessible online or digitally most students still lack digital skills to fully exploit these valuable resources (Weber, Hillmert and Rott 2018).

The explosion of ICT in higher education has necessitated the inclusion of digital information literacy over and above research methodology. Studies have revealed that this is lacking in Sub-Saharan Africa, and is linked to low research output. Access to and use of electronic resources facilitates research productivity (Bhukuvhani, Chiparausha and Zuvalinyenga 2012). The digital divide between African nations, particularly those in Sub-Saharan Africa and those in the West, is obviously broad, and specialists have indicated that if this gap is not addressed, the sustainable development goals of Agenda 2030 will not be reached (Besseah et al. 2017). Libraries have a fundamental role to play in helping to meet these goals by providing knowledge and skills necessary to meet them. They need to provide information, access to ICT (information and communication technology), and to help people to develop the necessary information literacy skills to effectively use information, and by preserving information and ensuring access (Bradley 2016).

A review of literature on the study conducted by Besseah on postgraduate usage of electronic resources revealed that in general, postgraduate students in Sub-Saharan Africa have not received training in information literacy or it was not embedded in their curricula (Besseah *et al.* 2017), which led to poor or non-usage of academic electronic databases. Digital literacy alone without information literacy does not lead to use of electronic resources by library users. The two should be complimentary to each other (Moyo 2017).

## **2.8 The South African context of electronic library resources**

Electronic resources have challenged the traditional structure of the traditional library. South African libraries have not let the digitization movement pass without being active participants. Libraries in South Africa have been introducing new ways of running systems and providing services in line with the current international trends. One of those is a shift from print to electronic resources. These include a shift from print books to electronic books. To recap, “electronic resources” refer to those materials that require computer access, whether through a personal computer, mainframe, or handheld mobile device.

The South African government, particularly the 6<sup>th</sup> Administration under President Cyril Ramaphosa, has engaged with the phenomenon of the 4<sup>th</sup> Industrial Revolution. The South African National Libraries Consortium (SANLIC) has been assisting a consortium of universities to gain access to electronic resources, by negotiating rates. As a result, a number of South African institutions of Higher learning have had access to relevant databases and equipment.

Although more people are embracing technology, the gap between Black and White South Africans still exists (Modiba and Bopape 2018). According to (Chetty *et al.* 2018) the digital divide is characterized by limited and expensive infrastructure and limited digital literacy in low income communities. Data is expensive in South Africa compared to the rest of the world. South Africa ranked 148 out of 228 in terms of data prices (Bottomley 2020). The average price in 2020 of 1GB is R88 in South Africa. India has the lowest data prices in the world (Bottomley 2020). The competition commission has asked mobile companies to slash their data prices to make them affordable. A study that was conducted by Statistics South Africa in 2015 found that 33% percent of low income household saw no relevance in having internet access (Chetty *et al.* 2018). This shows how marginalised rural communities in South Africa are. They remain excluded from the digital world. With Covid19 lockdown, with majority of countries on lockdown and people working from home, internet

access became one of the basic needs for both students and workers to remain connected via the internet. The report on broadband internet access produced in 2020 found that communities living in rural areas are less likely to use internet compared to those in urban areas (Bahia and Delaporte 2020).

One of the milestones of the country's National Development Plan, a policy that charts the country's development to 2030 (NPC, 2013), is to ensure that high-speed broadband internet is universally available at competitive prices in South Africa. Usage gap on the other hand was six times larger in 2019 with the majority of rural communities citing lack of literacy and digital skills as contributing factors (Bahia and Delaporte 2020). Teaching digital literacy and Information literacy are critical in the South African context if we are to successfully bridge the digital divide (Noll and Brown 2019). The varying degrees of inequality between advantaged and disadvantaged university students together with varying socioeconomic backgrounds in South Africa are some of the challenges librarians are faced with as they move into the digital era (Noll and Brown 2019).

Studies have been conducted in South Africa on the usage of electronic resources by various categories of users (Moyo 2017; Tlakula and Fombad 2017). South African universities enjoy a high level of ICT integration and reasonable ICT infrastructure. Electronic resources serve as an integral part of research, teaching and academic activities. Although South African universities have invested vast amounts of money in the acquisition of electronic resources, there are questions about the usage of these resources (Tlakula and Fombad 2017).

However, various reasons for non-use of these resources have been suggested, and they range from lack of information literacy skills, lack of digital skills as well as exorbitant data costs. The common theme from these studies is that librarians who were surveyed indicate that they offer information literacy training sessions. Results from these studies also do point out that their librarians are offering these information literacy training workshops. A study conducted at UNISA on the use electronic resources by UNISA students

revealed cost of data as a barrier to accessing electronic databases (Moyo 2017). On the contrary 54% of respondents indicated that the cost of data did not prevent them from accessing electronic resources. What was interesting from this study is that 69% indicated that they used internet search engines like Google to find information which they said was easy.

Various studies were conducted on staff, undergraduate students, postgraduate students as well as distance education students. The technique used by Collins to look at varying degrees of library usage by students from different disciplines reveals that there is indeed varying degrees of usage among different disciplines (Collins and Stone 2014). Students in the social sciences were found to be high users of the library resources. The arts on the hand were low users particularly because of the visual nature of the subject content. No significant difference in library usage between engineering students and the social sciences. Law students were found to be less frequent users of library resources. This was attributed to the fact that they rely on core texts for their content (Collins 2014). Higher education accessibility in South Africa is seen as a key driver in addressing the existent inequality amongst students. Research shows that there remains lack of academic achievement from students coming from rural communities (Timmis and Muhuro 2019). Rural students face unique challenges like digital transition when they enter into higher education. According to Timmis and Muhuro (2019) rural students have more difficulty than those from urban areas, as noted above.

## **2.9 Theories framing the study**

This study is framed by the theory of Community of Practice. Students who use technology to access information can be identified as a community of practice. A community of practice is defined as a “group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (Kim 2015).

Communities of practice are viewed as one way of transferring embedded institutional knowledge between staff members and between institutions.

Learning and engagement is critical in the communities of practice (COP) theory. In education, communities of practice are increasingly used for professional development, but they also offer a fresh perspective on learning and education more generally (Wenger 2010). Librarians need to get a perspective from their users about the services they offer by engaging especially with those who are users of electronic resources. This will in turn help in devising new strategies and in turn improve the usage of electronic resources by students.

The study also adopted the Ranganathan's five laws of Library Science (Ranganathan 1931) to guide it. The principles in Ranganathan's five laws still hold true even during the digital era. It is therefore important for libraries to hold to these values. Ranganathan's five laws have been used in studies to evaluate the usability of all resources (Chandel and Rai 2015). Electronic resources can be classified as library collections and hence should be evaluated. According to Ranganathan (1931), librarianship was established on the five laws of library science :

1. Books are for use. When interpreted this means libraries must make sure that books are used and that books are accessible.
2. Every reader his book. This relates to the obligation of government, authorities and library staff to make books available. This refers to the democratization of the library. We need to make sure everybody has access to books.
3. Every book its reader refers to accessibility of books, every book in the library must find its reader. There must be maximum use of books.
4. Save the time of the reader. The location of books, shelf arrangement of books must be taken care of. This encourages excellence of library in meeting the needs of the users quickly and efficiently.
5. A library is a growing organism. The library has the responsibility of adapting to new technological changes. It must not be static but must be constantly changing and adapting to new trends (Cochrane 1992).

These five laws are fundamental to librarianship. They are still relevant even in the digital era. As such, throughout the evolution of the library institution,



these basic principles must be retained. Cochrane (1992) challenges digital libraries in as far as law number 3 (accessibility) is concerned. Law 3 states that every book must find its reader. According to him, “70 years since Ranganathan formulated his laws, the challenge of creating a well-arranged collection of electronic library resources for patrons has made application of the third law problematic” (Cochrane 1992). Cochrane argues that in order for these new electronic platforms to conform to the concept of library, they should make accessing of information easier; and finding information should not be a complicated process. However, in response to Cochrane, Barner (2011) argues that the Ranganathan’s Laws still hold true even in electronic platforms, if the word ‘book’ is replaced by ‘resource’.

## **2.10 Gaps in literature and relevance of current study**

Literature reveals that there is indeed a need to engage and further interrogate the subject of electronic library usage by students. Literature acknowledges the evolution in library practice. While the global movement from print to electronic has been acknowledged in literature, there has also been notice of the low uptake of electronic resources by students in many countries, especially of the global south. This has been noted to be the case even after information literacy training has been offered. Literature on South Africa regarding electronic resource usage has also acknowledged this trend of low usage among different categories of users. It is evident from the literature reviewed that more research on the topic still needs to be done in South Africa, since it is thin on challenges of this print-to-electronic evolution in South Africa.

There is a general assumption in the literature about the characteristics of young people today; there is little appreciation that the so-called “digital strangers” are not a uniform class, but a distinct group disaggregated by socio-economic status and pre-higher education experiences, which often affect the rate at which they take up the use of electronic resources. It is therefore important that when decisions or policies are implemented this group of students is considered and catered for. The post Covid-19 era sees more activities conducted online which might mean integrating digital skills to accommodate students coming from marginalised communities.

## **2.11 Conclusion**

In Chapter two the researcher reviewed literature on electronic library usage. Literature on studies conducted at international and national levels was reviewed. The researcher also looked at behaviour patterns of usage by different categories of users.

Most studies conclude that the use of electronic resources by students is generally low (Weber, Hillmert and Rott 2018). However, if students are exposed and taught how to effectively use electronic resources they tend to use them more often (Toteng, Hoskins and Bell 2013; Weber, Hillmert and Rott 2018).

## **CHAPTER 3: RESEARCH METHODOLOGY**

### **3.1 Introduction**

The chapter preceding this one discussed the various literature relating to the use of electronic resources by undergraduate students in academic libraries. This chapter documents how the study was conducted in detail so that replication by others is possible. The aim of this study was to explore the use of electronic resources by undergraduate students at a University of Technology in KwaZulu-Natal and also to establish the reasons for non-use. The chapter is arranged as follows: first, research methodology, then the research paradigm, research approach and research design adopted are explained. The populations targeted for the study and sampling procedures followed are discussed. The tools used to collect data are presented and were pretested for reliability and validity. Details of the procedure followed for collecting data, the limitations faced in conducting the study and the ethical issues considered when conducting the study are provided. How data was analysed is explained, ending with the summary of the chapter.

### **3.2 Conceptualising research methodology and its processes**

Hesse-Biber and Leavy (2011) argue that research methods are the tools that researchers use to collect data. Conducting research involves a series of steps (Sönmez, 2018). This is supported by Collins and Hussey (2013) who describe methods as an approach to the entire step by step process of investigating a problem or phenomenon, through collecting and analysing available data. The research methodology is a systematic way of solving a research problem and gathering information. Research methodology outlines the research process.

This chapter also presents the methodology used to collect data. To generate data, the study used structured questionnaires and interview schedules. The research approach, design and methodology were based on the objectives and purpose of the study as outlined in chapter 1.

The key research questions which this study sought to answer were:

1. To what extent do third-year students attending Civil Engineering, Education and Nursing lectures use the online library resources?
2. How do students in these departments experience online services?
3. What are the reasons for their using or not using online library resources?

### **3.3 Research paradigm**

A paradigm is a set of assumptions or beliefs about fundamental aspects of reality which gives rise to a particular world view and addresses fundamental assumptions taken on faith, such as belief about the nature of reality (ontology), the relationship between knower and known (epistemology) and assumptions about methodologies (Creswell 2018). Knowledge claims in research are based on research paradigms, which are at times referred to as foundational or philosophical assumptions (Walter 2008). Research paradigm refers to understanding the world and this inevitably depends on certain assumptions (Cohen, Manion and Morrison 2018).

Social constructivism also known as the interpretivist paradigm was used for the study. According to Creswell (2018) this paradigm allows the researcher to understand the significance and meaning that different individuals attach to social or human issues. The researcher decided to use Interpretivist as a paradigm to examine the use and experiences of online library resources by undergraduate students at a university of technology. In this study, the interpretivist approach allows the researcher to understand how undergraduate students view the online library environment and how students use electronic library resources.

### **3.4 Research design**

A research design is a blueprint or map that is developed to guide the research process (Pandey and Pandey 2015). The importance of a research design is that it allows for a smooth flow of the research (Pandey and Pandey 2015). The explanatory mixed design was used to increase confidence in the findings and also better understand the phenomenon being studied.

### **3.4 Research approach**

The study adopts the mixed methods approach combining the quantitative and qualitative methods applied sequentially. The mixed method approach is defined as the intentional use of both the quantitative and qualitative methods to better understand a problem (Creswell 2018). The objective of using both quantitative and qualitative was to gather both subjective and objective points. The benefit of using the mixed methods approach was that the researcher is able to combine different forms of data for the study to get a clear picture of the phenomenon being studied (Creswell 2018).

A mixed methods design was chosen for this particular study. Quantitative data was collected in the first phase and analysed followed by the collection of qualitative data in the second phase where clarity was sought on some issues that came out of quantitative data. Using both approaches combined can lead to better understanding of the research purpose and increased confidence in findings. In this case the researcher wanted to ascertain if the different categories of students such as age groups and different departments had any bearing on the usage patterns.

In this study, collecting both quantitative and qualitative data yielded a clearer and more complete picture of the issues underlying online library usage by students at this institution, as well as reasons for non-usage.

A distinguishing feature of the sequential explanatory approach is the collection and analysis of data in the first phase followed by the collection and analysis of qualitative data in the second phase (Creswell 2018). The two data sets are connected. The researcher chose to use this method in order to get a better understanding and factors leading to the use and non-use of online library resources as well as the extent of usage across the different departments. The choice of either the qualitative or quantitative would not be sufficient to answer the research question in the depth required in this study. The split of data collection is 20 percent quantitative through surveys in the first phase and 80 percent qualitative through focus groups in the second

phase. The researcher wanted to gain a broad picture of the use of electronic resources across the three departments through the quantitative method before venturing into qualitative data collection through focus groups. The survey precedes the focus group. It also gives a better understanding of the research question. The quantitative data sought to establish patterns of usage from the three departments. Whilst quantitative data sought to establish the experiences of students when using electronic library resources.

### **3.4.1 Quantitative**

A structured online questionnaire was designed using QuestionPro. This was used in collecting numerical data which was analysed using SPSS version 26. The survey was used to establish patterns of usage across the three departments and also to see if there were any differences between the three disciplines.

The questionnaire sought to establish:

- if students are aware of electronic library resources,
- if they have used electronic resources,
- challenges they experienced if any.
- how they access electronic resources.
- how students became aware of online resources.
- if students find the library electronic resources useful in their academic endeavours,
- if there was a difference in usage patterns among the different departments.
- which databases students use most often.

### **3.4.2 Qualitative**

Focus group discussions were used to collect qualitative data from students who are active in the online environment. The participant numbers of focus group varied in size. Ten participants were recruited for each focus group but some did not join the groups when they were run. The researcher allotted 10 minutes for people who could join later. The discussions had to continue

without these participants because spending more time online would have depleted data for students who were already online. Students in the three departments on campus, which are Education, Civil Engineering, and Nursing, were selected to participate in the focus group discussions. Snowball sampling was used where class representatives, who are active library users were identified and were asked to recruit other participants for the focus groups. Thus there were three focus groups. Each focus group took at least 60-90 minutes. The researcher was responsible for facilitating the discussions making sure that discussions were not diverted. The same focus group discussion schedule was used for all three focus groups. Ms Teams was used for focus groups because students were not available on campus during the data collection phase. This all happened during the COVID-19 lockdown which saw the University closed down. The recording option on MS teams was used to record the sessions with participant agreement for later transcribing and analysis.

### **3.5 Study setting**

This study was carried out at a University of Technology in KwaZulu-Natal during the national COVID-19 lockdown. With a total student population of approximately 30 000, DUT is one of the largest higher education institutions in KwaZulu-Natal (KZN) It was established in April 2002 as a result of a merger between two technikons; ML Sultan Technikon and Technikon Natal. It was named the Durban Institute of Technology, and later renamed Durban University of Technology in line with the rest of the universities of technology in South Africa. The identity of the institution is made known here to enhance the validity and authenticity of the study. However in line with research ethics, the identity of participants is not revealed.

DUT has six faculties across seven campuses located in Durban and Pietermaritzburg. The five Durban campuses are; Steve Biko, ML Sultan, City Campus, Ritson and Brickfield. Indumiso and Riverside are the only two campuses in Pietermaritzburg; also known as the Midlands campuses. The Durban University of Technology seeks to provide an environment that enhances and supports students' diverse cultural experiences in order to

become graduates that are emotionally and intellectually grounded (Durban University of Technology 2015).

The study focusses on the three departments, spread across three faculties, these three departments are based at Indumiso campus which is in Pietermaritzburg which is about 70 km away from the Durban campus which is the main campus.



### **3.6 The Durban University of Technology Library**

The Durban University of Technology has five libraries servicing students across all faculties based at different sites. DUT students can use any of the site libraries. The availability of information electronically assists students to access information from any of the sites. The library subscribes to subject-specific databases as well as to multidisciplinary databases.

The Durban University of Technology library currently subscribes to 118 databases with access to 77 893 e-journals. 183 110 eBook titles R14 849.500 was allocated for the electronic databases in 2019 and an increase of 12.18% from 2018. The purchase of library resources is guided by the library's information resources policy. With the advent of electronic digital media the DUT library has vigorously worked on shifting the availability of information online.

### **3.7 Study population**

A population is a group of individuals or units from which an inference is to be made (*Encyclopedia of Survey Research Methods* 2008). A population in research as defined by (Mouton 1996: 134) refers to the collection or set of elements which meet a certain or specific criteria for generalization. The target population for this study comprised of third-year students from the Department of Education (301 students), Civil Engineering (231 students) and Nursing (97 students) based at Indumiso Campus, totalling (n=598) of all third-year students at Indumiso. The focus was on students registered for the year 2020. Third-year students were chosen because they would have undergone information literacy training that the library offers during their first-year studies and would have had time to access and familiarise themselves with the library. These students have spent at least two years at the university and in their third- year are as familiar with the library as they will get during their time as students. The library provides library training to all first-year students. This is done in consultation with the departments who allocate a period for library training in their timetable. Library training is not credit bearing but students are

encouraged to attend. The aim is to make sure that all students have access to information literacy which is a lifelong skill.

### **3.7.1 Sampling procedures**

Sampling is defined as the selection of the sub set of the population for the study (Connaway, Radford and Connaway 2017). There are various forms of sampling.

#### **3.7.1.2 Sampling for quantitative data**

Stratified random sampling was selected for the collection of quantitative data. Thirty students (30) were recruited from each of the three departments, Nursing, Education and Civil Engineering, and these departments were treated as the three strata of this stratified sample. Stratified sampling was chosen as it allowed for comparison across the three departments. The questionnaire was distributed to all students, and as soon as thirty positive responses were received from one department the invitation to participate was closed for that department. This sample size of 30 students from each department was used because in sample sizes of 30 and above, sample means approach a normal distribution, which means that they are likely to reflect tendencies of the whole population (Glen 2021).

#### **3.7.1.3 Sampling for qualitative data**

Snowballing was used for qualitative data. Snowballing is a system of identifying one or two participant who are able to give names of other potential participants (Maree 2016). Snowball sampling was appropriate when this study was conducted since trying to get hold of the students during the COVID-19 lockdown was a challenge. Contact with class representatives helped the researcher to locate other students who agreed to participate in the study. The researcher approached the students after getting their details and a time suitable to all the participants was identified and agreed upon. For inclusion in the focus group students had to have used the library, had to be doing the third year of their study at DUT, and consent to participating in the focus group.

## **3.8 Piloting**

### **3.8.1 Questionnaire**

The instruments were piloted before data could be collected. The wording of both the questionnaire and question guides was trialled before the actual collection of data to make sure that instances of ambiguity could be identified and corrected. The questionnaire was trialled by distributing it to Third year Business Management students based at Riverside Campus. These students are comparable to the third-year students in the sample because they have spent two years at the same university and have been exposed to the library. They were not included in the study because the study was based at Indumiso campus only. The age category replaced the level of study question in the latest version after the trialling the questionnaire. There was also a new question that was also included which asked the students where they got information relating to electronic resources. The first set of questions had asked for the level of study. On trialling this questionnaire realised that this question must be removed as it had no significance since only third year students were invited to participate. The gender category was also included after the trial. The researcher wanted the gender distribution in the analysis of the results and had omitted to include a question about gender in the original questionnaire.

### **3.8.2 Focus group**

The process of piloting the focus group discussion schedule took place online with a colleague to check on the flow of questions and also to check whether the schedule would be effective in eliciting information that would be able to answer the research questions. This process of piloting happened before the actual collection of data. During the trialling phase for focus group a new item was added that related to COVID-19 to ascertain how the lockdown has impacted the use of electronic resources by students. When the study was formulated, there was no lockdown or even consideration of it. Some of the information that came out of quantitative data analysis and needed more clarity was highlighted in the revised interview schedule. Students had highlighted

that mobile access would encourage them to use electronic databases and the researcher wanted to know what students meant by mobile access. A new question was added in the schedule asking what do students understand by mobile access.

### **3.9 Data collection tools**

In April 2020, the researcher was given ethical clearance. The collection of quantitative data occurred between April and May of 2020. QuestionPro was used for an online questionnaires. The researcher had to adapt to the COVID-19 lockdown regulations by opting to collect data online only. This was an interesting and challenging development because it was not anticipated. The researcher had initially planned to distribute both print and online questionnaire. The ethical clearance to conduct the study was released when the country on was on level 5 which was very challenging and required the researcher to use only the online version.

#### **3.9.1 Questionnaire**

An online questionnaire was used for the collection of quantitative data. The Durban University of Technology subscribes to QuestionPro. The researcher used QuestionPro to develop the questionnaire. The benefit of using the questionnaire is that it allows for anonymity. The researcher approached the Heads of Departments for permission to conduct the study. This was during the national lockdown and the only option to contact the students was through WhatsApp groups. Names of class representatives were given and the researcher approached the class representatives, and who helpfully added her name to the WhatsApp groups. The researcher approached the students in their WhatsApp groups and explained the study, asked the students to participate, and shared the QuestionPro link to the questionnaire in class groups. Trying to get students to participate was not easy. Several messages were sent reminding students to fill in the questionnaire.

As soon as the researcher received the target number of responses, which was 30 from each department, the link was then made inactive.

The questionnaire was used to get demographic data, so as to get a good understanding and background of the students, as well as to elicit their general knowledge of library electronic resources, and the extent of their use of these resources.

### **3.8.2 Online Focus groups**

A Focus group as defined by Cohen is a planned interview with a group of participants with a similar background on the subject (Cohen, Manion and Morrison 2018). Focus group involves more than one participant for data collection per session (Liamputtong 2011). Interaction is the essence of a focus group discussion (Liamputtong 2011). The researcher is able to gain understanding by listening to discussions and arguments among participants relating a particular topic. The researcher is also able to get insight into different perspectives (Liamputtong 2011). Focus group discussion is a qualitative data collection technique. Focus group schedules were used for collecting qualitative data. The researcher was personally facilitating the online focus group discussions. Qualitative data collection took place in August 2020.

A total of three focus groups were conducted comprising six Civil Engineering (n=6) students, ten Nursing students (n=10) and nine Education students (n=9). Discussions were recorded on MS Teams for the researcher to transcribe and analyse and later identify themes. Consent to record was sought from the participants.

The researcher adopted online focus group discussions in order adapt to the COVID-19 lockdown protocol which limited or prohibited face to face interaction and encouraged social distancing.

Open ended questions were used to stimulate discussion and for the researcher to gain insight into the experiences of students with electronic resources. The facilitator also used probing to get participants to give input. The researcher encouraged participants to participate by informing them that there were no wrong and right answers. The researcher, who was the facilitator

of the discussions, thanked all the participants and assured them that their identity would remain anonymous.

The facilitator had to keep to the time because of the data issues and network connectivity which was a limitation to the discussions. Students complained that they do not have sufficient data. Another concern was that data bundles are quickly depleted and they have been using the midnight packages that they can afford. Some time was spent on giving directions on how to use the chat facility, raising hand and unmuting. The researcher had to go through the house rules before delving into the discussions to make sure all the participants were on the same page.

### **3.10 Addressing reliability and validity concerns**

Joppe (2000) defines reliability as “The extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable”.The researcher personally distributed the questionnaires to the respondents after requesting their cooperation by sharing a link via class WhatsApp groups.

**Reliability** was ensured through the use of clear instructions and by administering the instrument to all participants under standard, well-controlled and similar conditions which was in the online environment. Ms Teams recorder was used during focus group discussions to ensure that all the information given by participants is captured for later transcribing. Students were available online and had received the free data offered by the University.

According to Polit and Beck (2016), the validity of the study is classified into two classifications namely external validity and internal validity. These authors describe internal validity as the degree to which conclusions can be drawn from the study findings and external validity as the extent to which the findings can be generalised beyond the study design and settings (Polit and Beck 2016: 236). The validity of the study was enhanced by the use of the mixed methods

approach. Data was collected from two sources, the questionnaire as well as focus groups. Different groups of students were used. Participants to the study came from different departments. The researcher also used a colleague who is a researcher as an observer when the focus group discussion was conducted. The discussions were recorded and transcribed immediately after the discussions whilst the information was still clear.

To enhance trustworthiness and credibility, the researcher went through the notes several times to make sure all useful data was not left out.

The services of a statistician were engaged for the analysis of quantitative data using SPSS.

Two methods were used to collect data. Information was collected from a survey and focus groups. There was an overlap in terms of information gathered from these two methods, thus triangulating the data.

### **3.11 Limitations of the study**

Only students with access to the internet and had suitable gadgets could participate in the study as the data collection was online. At the time of data collection the distribution of data and gadgets by the institution had not started so students were using their personal data.

The study was done during the national COVID19 lockdown which made it difficult to reach the students. When conducting focus group the researcher could not read body language during the discussions which was a limitation.

The researcher needed a lot of probing to get participants to actively engage. The success was limited because it was online and cameras were off so observing non-verbal communication was not possible. Some participants were not familiar with Ms Teams features like the raising hands and unmuting. The facilitator had to constantly remind participants to use these features. The participants might have been reluctant and not open with the researcher, who

is a librarian. The researcher reassured the participants that they would remain anonymous and that their thoughts and opinions were important for the library.

### **3.12 Ethical considerations**

Ethical clearance of the proposal was received from the Institutional research committee where the study was conducted see APPENDIX F. Extract from the letter of consent.” Confidentiality will be maintained and responses from you will be kept in closed access. Your identity will not be revealed.”

The researcher contacted heads of departments to ask for permission to contact the students. Heads of departments all agreed to me contacting the students.

For the focus group discussions, students were read letters of information about the study. This was done online and those who agreed to participate were asked if they consented. This was done verbally and their consent was recorded on MS Teams. The researcher assured participants that their identity would remain anonymous. Anonymity was ensured by not using the names of the participants in any document related to the study. Participants were also informed that participation in the study was voluntary they could opt out at any time if they were not comfortable.

For the survey, the letter of information was sent out together with the QuestionPro questionnaire. Students were informed of the purpose of the study and were assured that they would remain anonymous.

Permission to conduct the study was sought from the Director of research of the institution. The document giving consent is included as Appendix C

### **3.13 Data Analysis**

For quantitative data a computerised software package SPSS version 26 was used to apply a Chi-square test in order to seek patterns of association between usage and characteristics of students such as age, gender and



department. Data is presented in Chapter 4 of this dissertation. The researcher used the services of a statistician for the analysis of data.

A thematic analysis of data was used to analyse qualitative data collected from online focus groups using transcripts from Ms Team's recordings. This was done by theme analysis where the researcher looked for themes and trends that emerged from the focus groups. The themes and trends identified were:

1. Extent of awareness of electronic resources.
2. Degree of familiarity with digital devices and use of the internet
3. Experiences of students when accessing electronic library resources.
4. Reasons for non-use of electronic library resources.
5. Sources used most often or preferred by students.
6. Strategies used by DUT librarians to encourage usage of electronic library resources by students
7. Effects of COVID 19 lockdown on students' use of electronic library resources.

The research questions were referred to during the identification of themes and analysis of what the students shared with the researcher to make sure all research questions were answered. Creswell and Plano Clark (2018) state that data analysis usually "involves reducing accumulated data to a manageable size, developing summaries, looking for patterns".

The researcher had to listen to the focus group recordings several times to extract common themes that emerged from the three focus groups. The focus groups allowed the researcher to delve into all the issues shared by students about their use and experience of the electronic library resources.

### **3.14 Summary of the chapter**

This chapter looked at the methodology that the researcher followed in order to collect and analyse data. The data analysis will be presented in the next chapter.



# CHAPTER 4: ANALYSIS AND INTERPRETATION OF RESULTS

## 4.1 INTRODUCTION

The study seeks to answer the following questions:

- To what extent do third-year students attending Civil Engineering, Education and Nursing lectures use the electronic library resources?
- How do students in these departments experience electronic services?
- What are the reasons for their using or not using electronic library resources?

This chapter is organised into two sections, the first dealing with quantitative data collected and the second dealing with qualitative data collected. Data was collected in two phases. The first phase was through a questionnaire and the second phase was via focus groups. The analysis and presentation of data from questionnaire is presented first, followed by the section presenting themes that emerged from focus group discussions.

### 4.1.2 Data from questionnaire

This chapter presents quantitative data obtained from the questionnaires and focus group discussions in this study. The questionnaire was distributed to 598 third year students in three departments at Indumiso Campus: made up of 301 third year Education students, 97 third year Nursing students, 200 third year Civil Engineering students.

Data collected was analysed by means of IBM SPSS 26.0. The results were presented utilizing tables and graphs.

This section addresses the first research question which is the extent of usage of electronic resources by third year students from the three departments.

### **4.1.3 Data from focus groups**

The numbers for focus groups varied from 6 to 10 third year students from the three departments Education, Nursing and Civil Engineering. Engineering had 6 students. There were 10 from Nursing and 10 from Education. Thematic analysis was used for the analysis of focus groups. Different themes relating to students' experience of electronic resources emerged from the focus groups.

This section addresses the question on experiences of students' use, as well as reasons for their use and non-use of the electronic resources.

### **4.2 Data collection process**

Data collection involved distributing links to a self-administered questionnaire to the targeted students via WhatsApp groups. The questionnaire was created using QuestionPro. The process involved students completing the questionnaire using their mobile phones. The process provided accessibility and convenience since most students were off-campus due to nationwide lockdown mandated by the State of Disaster Regulations to combat COVID-19 pandemic. The South African nationwide lockdown was initiated on the 26<sup>th</sup> of March 2020.

Ninety one students responded. While 598 students were sampled, I targeted 30 responses from each department, which would make 90 responses. As soon as the targeted number was received the Questionnaire was closed. Some of those students who did not participate in the study cited a lack of mobile data as the reason for non-participation. The class rep who was the liaison informed me that students were struggling to meet the costs of data as the questionnaire was online. Trying to get students to participate during this time was difficult. I had to constantly remind them about the survey in their WhatsApp groups. The departmental distribution of those who responded is shown in Figure 3 below:

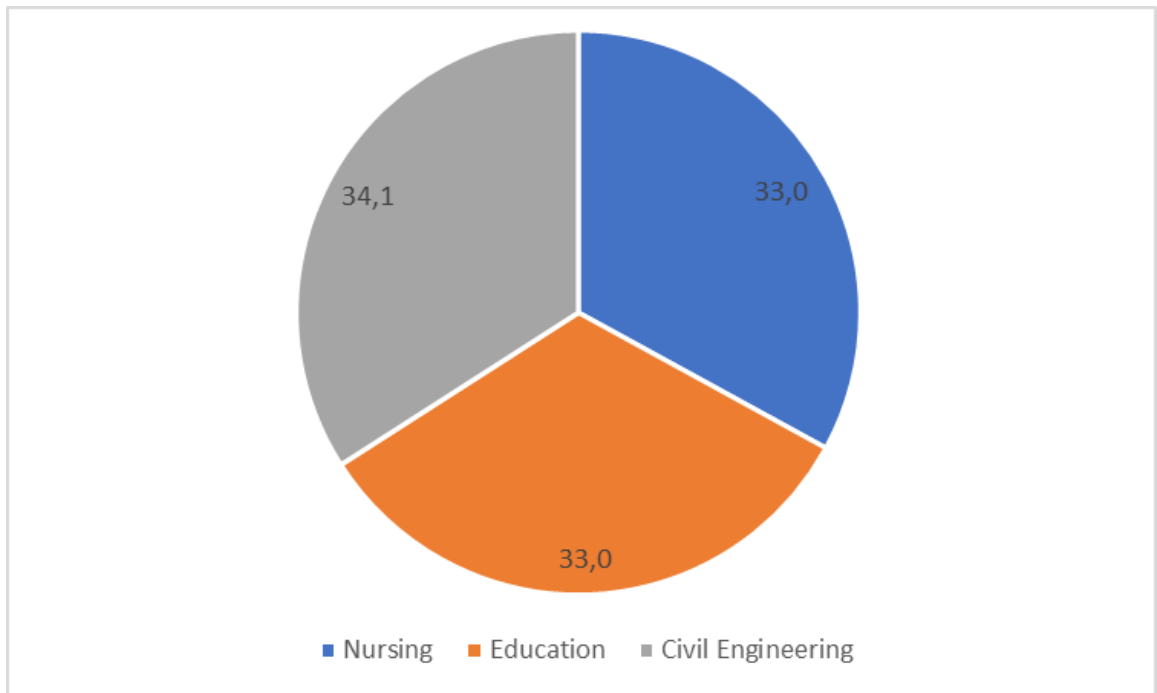


Figure 3: Distribution of respondents by department

As shown in figure 3, the distribution of respondents was even. The departments of Nursing and Education had 30 respondents each while 31 students who responded came from Civil Engineering. While this meant that Nursing had higher response rate among all their third year students (30%) compared with Education (10%) and Engineering (15%), this was by design because the target was to get at least 30 from each of the three departments.

### 4.3 Demographical information

The demographic information presented includes the age and gender of respondents. These were important for exploring patterns of correlation in students' use of electronic library sources.

### 4.3.1 Age and Gender

The table below shows the results of a cross-tabulation between the age and gender of the participants.

Table 2: Age and gender cross tabulation

Age (years)		Gender		Total
		Male	Female	
18 – 25	Count	32	24	56
	% within Age-Group	57.1%	42.9%	100.0%
	% within Gender	82.1%	63.2%	72.7%
	% of Total	41.6%	31.2%	72.7%
26 – 33	Count	5	9	14
	% within Age	35.7%	64.3%	100.0%
	% within Gender	12.8%	23.7%	18.2%
	% of Total	6.5%	11.7%	18.2%
34+	Count	2	5	7
	% within Age	28.6%	71.4%	100.0%
	% within Gender	5.1%	13.2%	9.1%
	% of Total	2.6%	6.5%	9.1%
Total	Count	39	38	77
	% of Total	50.6%	49.4%	100.0%

The cross-tabulation involved measuring response distribution “within the age”, “within the gender”, as well as “% of the Total “respondents. For example, there are 56 respondents of the age-group “18-25” of both male and female gender. Now, within that age-group, 57.1% are males and 42.9% are females. The same goes for “% within gender”, which measures the distribution of age within either male or females. For example, 82.1% of all males in the sample are within the “18-25” age group, while 63.2% of women are within the same age-group. Overall, the ratio of males to females is approximately 1:1 (50.6%: 49.4%), with 39 males and 38 females. Age was categorised in three age-groups; 18-25, 26-33, and above 34 years. Table 4.1 above shows that the majority (72.7%) of respondents were between the 18-25 years old, even when classified according to gender (male =82.1; female =63.2%). There were more

males (57.1%) than females (42.9%) within the 18-25 age-group. The remaining few respondents (27.3%) were distributed between age-groups 26-33 (18.2%) and 34+ (9.1%). This was in line with demographics within the target population since all respondents are undergraduate students, normally between the ages of 18 and 25. This confirms literature that the majority of students who enter university during this period are the so called “digital natives”. This age-group consists of individuals who are comfortable with digital platforms and online interactions – referred to in the literature as ‘digital natives’. There were more females (18.2%) than males (9.1%) in those age-groups older than 25 years. 13 (14.3%) respondents did not give their ages, and 7 (7.7%) did not answer the gender question. This could have been a mistake or a deliberate choice, the researcher could not tell. As a result, this cross-tabulation was done with a total of 77 respondents, who answered both questions (age and gender. This is the group that librarians as well as lecturers in general assume is comfortable in the online or digital environment. As I will show in my analysis below this assumption is a bit optimistic and too readily made regarding this group of students.

#### **4.3.2 Term accommodation**

Respondents were also categorised in terms of their residence during the academic term. They were asked to choose between on-campus (students resident in Indumiso Campus) and off-campus (students resident in one of the out-sourced residences around Pietermaritzburg including private accommodation). Figure 4 below indicates the residence of the respondents.

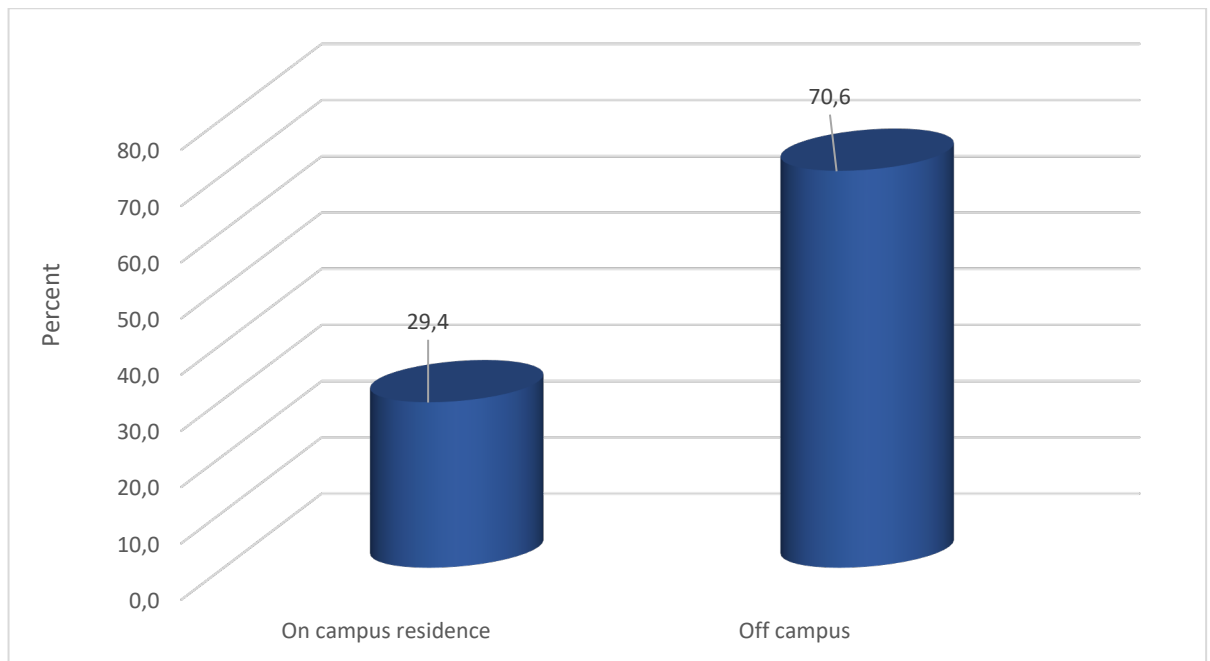


Figure 4: Term residence for respondents

According to Figure 4, the majority of respondents (70.6%) lived off-campus, in one of the out-sourced university residences. This is the reality in the study setting, where most students, from the three departments at Indumiso Campus, reside off-campus. The university has limited on-campus accommodation. For example, the Midlands campus (Riverside and Indumiso) has only one DUT-owned residence, which caters mainly for first years and self-payers. From second year upwards students reside in off-campus residences, most of which are leased by the university from different service providers. These residences are have access to WIFI for the students. The sample was comprised of third-year students, hence the majority of that category reside off-campus.

#### 4.4 Analysis of Survey

The section that follows analyses the scoring patterns of the respondents per variable per section. The results are first presented using summarised percentages for the variables that constitute each section.



#### 4.4.1 Use of electronic sources

This section deals with the types of electronic sources used to access information for academic purposes (assignments or projects). The table below summarises the scoring patterns, with regards to usage of four categories of electronic sources: internet search engines like Google which is a general internet search engine, subscribed ebooks, electronic databases which allow access to a variety of authentic, peer reviewed journal articles, and other which might include YouTube.

Table 3: Electronic sources used by respondents

	What sources do you use to access information for academic purposes assignments or projects	
	Frequency	Percent
Internet search engines like Google	72	79.1
ebooks	18	19.8
Electronic databases	21	23.1
Other	7	7.7

As Table 3 indicates, respondents acknowledged that they frequently used Google search engine (79.1 %) to access information related to their studies. Electronic databases (23.1%) and ebooks (19.8%) were also used with moderate frequencies. Only 7 respondents claimed to have accessed their study materials from other electronic sources. Since respondents were asked to tick more than one source, the frequency bar graph below presents the sources used most, rather than the number of students who used them.

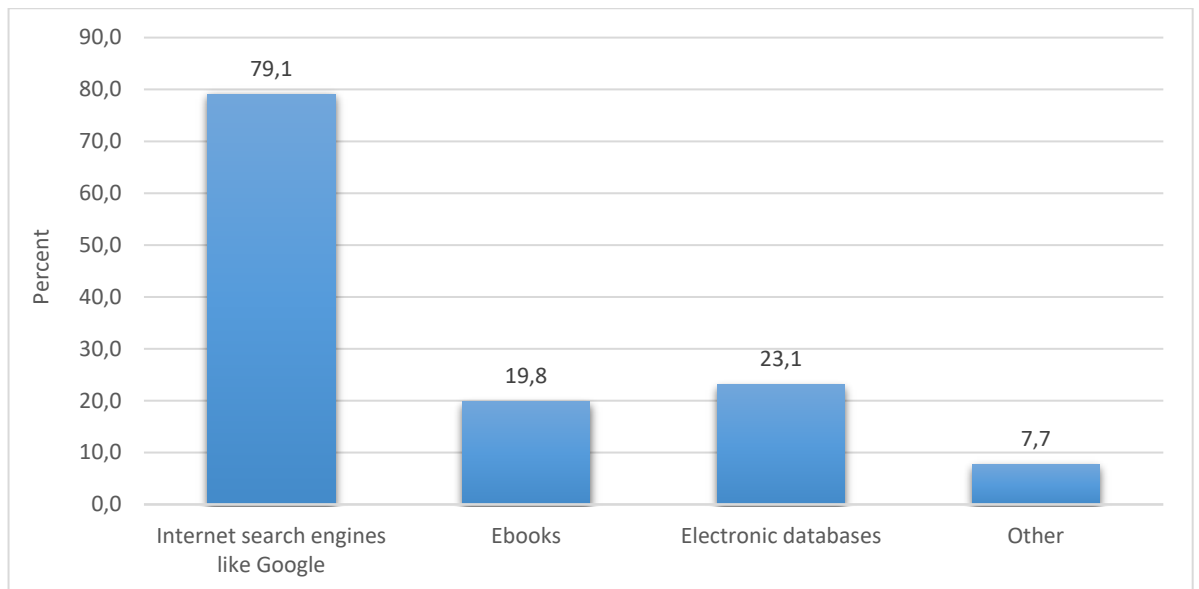


Figure 5: Electronic sources most used by respondents

The following table gives a breakdown of usage per department.

Table 4: Distribution of electronic sources used by department

		Nursing	Education	Civil Engineering	Total
Google search	Count	22	24	26	72
	% within Source	30,6%	33,3%	36,1%	100,0%
	% within Department	73,3%	80,0%	83,9%	79,1%
	% of Total	24,2%	26,4%	28,6%	79,1%
eBooks	Count	7	6	5	18
	% within Source	38,9%	33,3%	27,8%	100,0%
	% within Department	23,3%	20,0%	16,1%	19,8%
	% of Total	7,7%	6,6%	5,5%	19,8%
Electronic databases	Count	6	8	7	21
	% within Source	28,6%	38,1%	33,3%	100,0%
	% within Department	20,0%	26,7%	22,6%	23,1%
	% of Total	6,6%	8,8%	7,7%	23,1%

As shown in Table 4 above, students across all three departments mostly accessed their study materials through online search engines such as Google search (79.1%), the distribution was almost equal across all the three departments, even though Civil Engineering had a higher percentage (36.1%). The use of eBooks is just 19.8% across all departments, with Nursing

respondents showing (38.9%) of usage which is slightly higher than the other two departments. Over 26% of the Education respondents claimed frequent use of electronic databases, compared to 20% of Nursing and 22.6% of the Civil Engineering respondents. There is no significant difference in the distribution of electronic source usage between departments. Generally, Google search is mostly used across all departments, with moderate usage of eBooks and electronic databases. The reason for the usage of the electronic sources is shown in Table 5 below.

*Table 5: Reasons for choice of source*

Why?	Internet search engines like Google		ebooks		Electronic databases	
	Count	Column %	Count	Column %	Count	Column %
Easy to access	53	74.6%	8	44.5%	8	38.1%
Reliable	10	14.1%	6	33.3%	9	42.9%
Convenient	8	11.3%	4	22.2%	4	19.0%

Ease of access scored higher across all sources. However, for eBooks (33.3%) and electronic databases (42.9%), respondents claimed to use these also due to their reliability. Few would use sources due to their convenience. While there is not much conceptual difference between ‘convenience’ and ‘ease of access’, respondents leaned towards ease of access than generally convenient usage, which can also include saving time and simple navigation platforms. In addition, due to challenges with the reliability of internet access in out-sourced residences, most (84.1%) respondents indicated that they accessed the electronic sources on-campus. This is an interesting finding because it also still points to the fact that as librarians we tend to assume that by promoting off campus access will encourage usage forgetting the fact that internet access has financial implications for the students. The high cost of data makes it a challenge for the students to access information.

The table 6 below indicates the location where library electronic resources are accessed.

Table 6: Location of access of sources

	Frequency	Percent
On campus	74	84.1
Off campus	14	15.9
Total	88	100.0

#### 4.4.2 Use of DUT library electronic resources

While the respondents showed frequent access and use of electronic sources, they were also asked about their access and use of electronic sources available through DUT library. The table below reflects the electronic library resources that respondents had used in the last year. The respondents were asked to choose all relevant resources, and therefore there were multiple answers (choices) per respondent.

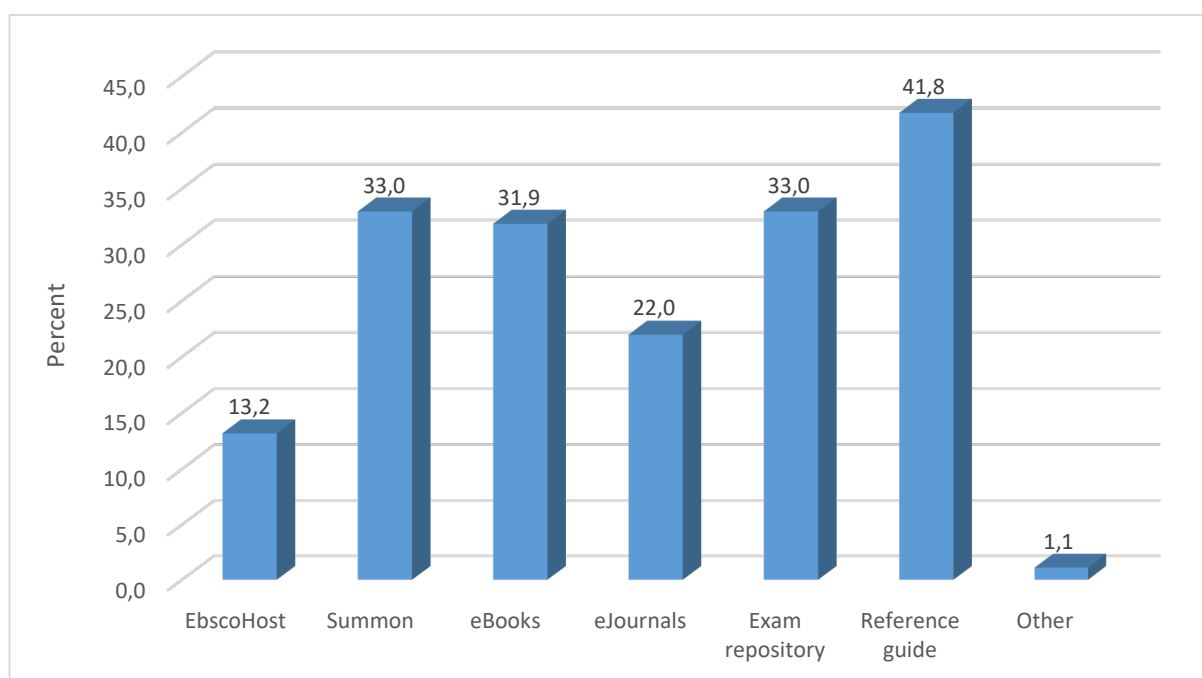


Figure 6: Library electronic resources used in 2019

The most used resources included the following:

- DUT Reference Guide. This is an in-house guide produced by DUT librarians to assist with referencing (41.8%)
- Summon. Summon is a google like engine used by DUT to access information. This allows search across all sources of information (33%),
- Exam Repository. The exam repository has access to previous exam papers. It is available through the library website (33%),
- eBooks (31.9%) and
- E-Journals (22%).
- A few claimed to have accessed Ebscohost (13.2%). EbscoHost is a multidisciplinary database allowing access to a variety of sources.
- Other (1.1%).

Table 7 shows the distribution of these responses by the department.

*Table 7: Electronic resources used from DUT Library in 2019*

		Nursing	Education	Civil Engineering
<b>Ebscohost</b>	Count	5	2	5
	% within Resource	41,7%	16,7%	41,7%
	% within Department	16,7%	6,7%	16,1%
	% of Total	5,5%	2,2%	5,5%
<b>Summon</b>	Count	14	9	7
	% within Resource	46,7%	30,0%	23,3%
	% within Department	46,7%	30,0%	22,6%
	% of Total	15,4%	9,9%	7,7%
<b>Ebooks</b>	Count	10	10	9
	% within Resource	34,5%	34,5%	31,0%
	% within Department	33,3%	33,3%	29,0%
	% of Total	11,0%	11,0%	9,9%
<b>e-Journals</b>	Count	12	3	5
	% within Resource	60,0%	15,0%	25,0%
	% within Department	40,0%	10,0%	16,1%
	% of Total	13,2%	3,3%	5,5%
<b>Exam Repository</b>	Count	14	8	8
	% within Resource	46,7%	26,7%	26,7%
	% within Department	46,7%	26,7%	25,8%
	% of Total	15,4%	8,8%	8,8%
	Count	19	11	8

<b>Reference</b>	% within Resource	50,0%	28,9%	21,1%
<b>Guide</b>	% within Department	63,3%	36,7%	25,8%
	% of Total	20,9%	12,1%	8,8%

As Table 7 indicates Reference Guide was used by 63.3% of third year Nursing students, Exam Repository by 46.7%; Ejournals by 40%; eBooks by 33.3%, and Summon by 46.7%. Education had the second highest usage of library sources, with the usage of near or above 30% per resource. Reference Guide was used 36.7% of Education students; eBooks, 33.3%; Summon, 30%; Exam Repository 26.7%. Civil Engineering seems to have the lowest usage of the library resources, with most respondents claiming usage of less than 25% in each resource, except for Reference Guide (25.8%), Exam repository (25.8%), and eBooks (29%). In each resource, Nursing respondents had the highest usage over the other departments, except in eBooks (where Education also claimed 33.3% usage) and EbscoHost (where Civil Engineering claimed 41.7% of the usage). The high usage of electronic resources by Nursing students could be attributed to the fact that at Third year students are introduced to research which encourages them to start searching vigorously for information.

### 4.4.3 Frequency of use

The respondents were asked how often they used the electronic resources, and their responses are captured in the tables and graphs below. Table 8 presents the frequency and cumulative percentages of usage ranging from “daily” to “never”.

Table 8: Frequency of using sources

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Daily	29	31,9	36,7	36,7
	Once a week	38	41,8	48,1	84,8
	Once a month	8	8,8	10,1	94,9
	Never	4	4,4	5,1	100,0
	Total	79	86,8	100,0	
Missing	System	12	13,2		
Total		91	100,0		

The table shows that almost 85% of respondents claimed to use resources at least once a week.

The same data is graphically depicted below.

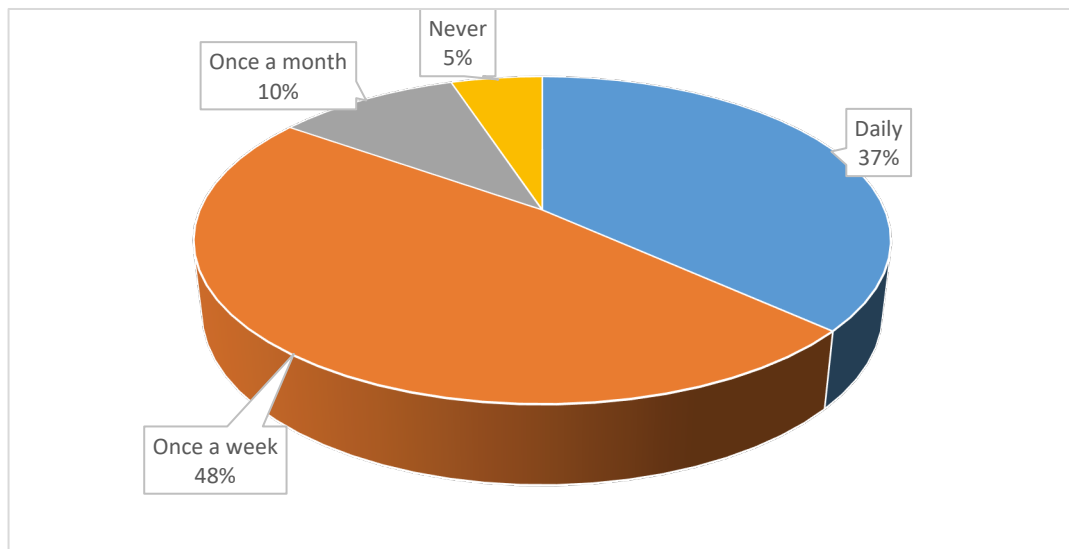


Figure 7: Frequency of usage of electronic resources

A little less than half of the respondents (48.1%) used the resources once a week. A large number of respondents (37%) use the resources on a daily

basis. While 85% of respondents use the resources more frequently, the 15% of the respondents who rarely (“once a month”) or never use the resources still seems to be a worryingly large number given the context of a University of Technology and the level of their study (third year). Ranganathan’s first law states that ‘Books are for use” meaning resources available in libraries must be used by users. This table indicates that this law which is basic in librarianship is not fully active with regards to electronic resources usage at the Durban University of Technology Library.



Table 7 below indicates the frequency of use of library electronic resources per department.

Table 9: Frequency of use in departments

		Nursing	Education	Civil Engineering
Daily	Count	12	10	7
	% within Frequency	41,4%	34,5%	24,1%
	% within Department	44,4%	37,0%	28,0%
	% of Total	15,2%	12,7%	8,9%
Once a week	Count	12	13	13
	% within Frequency	31,6%	34,2%	34,2%
	% within Department	44,4%	48,1%	52,0%
	% of Total	15,2%	16,5%	16,5%
Once a month	Count	2	4	2
	% within Frequency	25,0%	50,0%	25,0%
	% within Department	7,4%	14,8%	8,0%
	% of Total	2,5%	5,1%	2,5%
Never	Count	1	0	3
	% within Frequency	25,0%	0,0%	75,0%
	% within Department	3,7%	0,0%	12,0%
	% of Total	1,3%	0,0%	3,8%
Total	Count	27	27	25
	% within Department	100,0%	100,0%	100,0%
	% of Total	34,2%	34,2%	31,6%

The distribution of frequency of use of library electronic resources does not show much difference between departments, compared with the generic responses in Table 7 above. Across all three departments between 80% (Civil Engineering) and 89.2% (Nursing) of respondents use the library electronic resources at least once a week. However, it is unexpected that 20% of Civil Engineering students had less frequent use, with 12% claiming they never use the library electronic resources. All respondents from Education use the library electronic resources at least once a month, almost similar to Nursing (except for 3.7% of the departmental respondents who claimed “never” to use the library electronic resources).

The frequent use of the library resources is explained by the opinion of students on the usefulness of the resources. As shown in Tables 10 and 11, most respondents claimed that the resources were “helpful/important” and “useful”.

Table 10: Opinion on library electronic resources

What is your opinion on electronic library resources?	Frequency	Percent
Useful	83	92.2
Not useful	4	4.4
None of the above	3	3.3
Total	90	100.0

The inclusion of the two graphs above is an instance of triangulation. Such a high proportion of students responding positively to these similar questions is strong evidence that they see electronic resources positively.

Similarly, a large proportion of the respondents (92.2%) believed that using electronic resources was useful confirming the results from table 4.9 above. However, due to the context and the level of study, it is still worrisome for between 8-10% of respondents to be of the opinion that library electronic resources are not ‘helpful/important’ or ‘useful’. The respondents explained what they meant by “helpful/important” and “useful”. To some, this meant convenience of access and use; *“Electronic resources are better because you can access it on and off campus, making it easier for me as a student to carry on with my school work even if it’s a protest time”*. There was the realisation that apart from convenience, electronic resources are also convenient in the current digital era. *“It is easier to access. We living in a day and age where everything is digital. Most people own at least one smartphone, tablet or laptop. It makes it easier to obtain and utilize information because it is at our fingertips”*. There was a belief that most electronic resources contain up-to-date information; *“I get scholarly, reliable, current and more information on a particular topic that I need information on”*.

#### 4.4.4 Knowledge of library electronic resources

The respondents were asked how they got to know about the library resources. The responses ranged from attending information literacy classes, being informed by a Librarian, to reading it from the Noticeboard. Figure 8 below graphically depicts the responses of respondents.

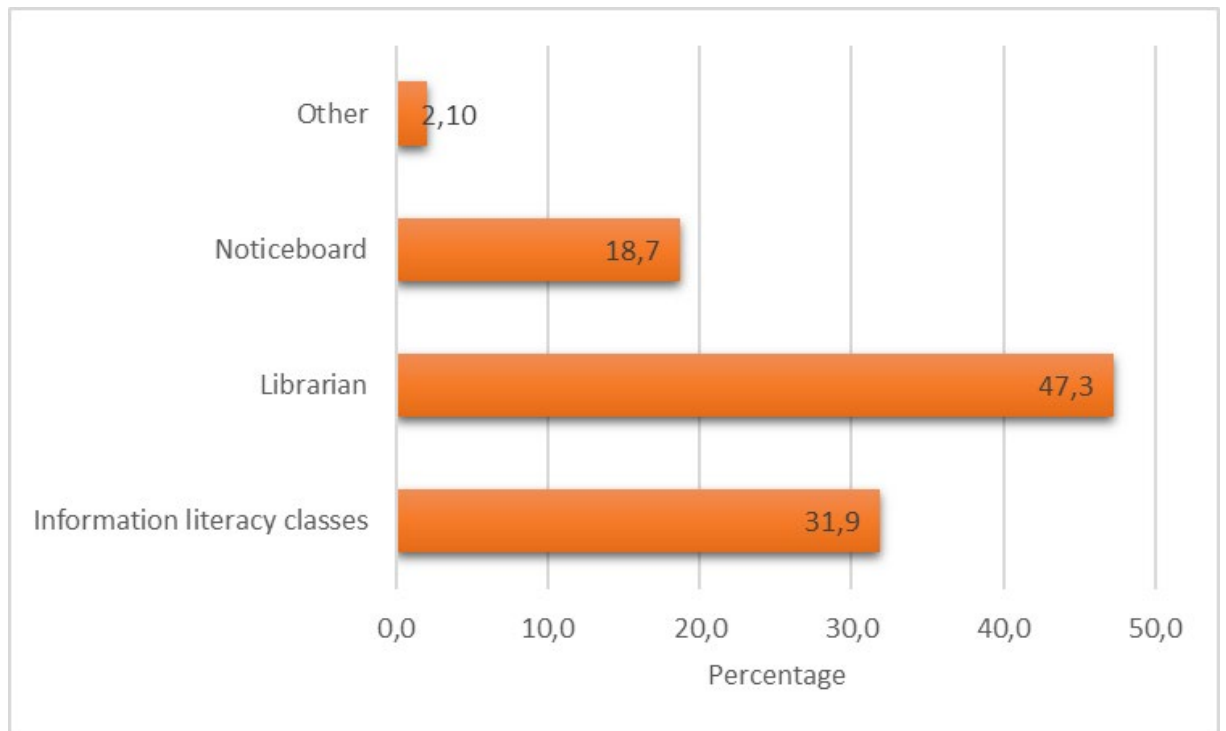


Figure 8: Learning about library electronic resources

Almost half (47%) of the respondents gained their knowledge of the library electronic resources from the librarian. About 32% of the respondents had attended an information literacy class, while 19% read about the electronic resources from the notice board. Others (2%) had either been informed by friends, tutors, other students or their lecturers. While there is a logical distinction between being informed by the “Librarian” and having attended “Information Literacy Classes”, practically the two could mean one and the same, in the case the respondents were informed by the librarian during the Information Literacy classes, since the classes are given by librarians. This is also informed by the fact that over 60% of the respondents attended Information Literacy Classes, organised every year by the Library. Librarians

are allocated a double period at the beginning of the year to teach Information literacy to students and how to access the library and its resources.

*Table 11: Information literacy class attendance*

Did you attend any information literacy training session?	Frequency	Percent
No	31	34.4
Yes	59	65.6
Total	90	100.0

Two-thirds of the respondents (65.6%) had attended an information literacy training session. This shows that most of the students have been to the library and are aware of the services of the library which are highlighted during the information literacy classes.

Table 12: Sources of information of library resources by departments

		Nursing	Education	Civil Engineering
Information	Count	11	8	10
Literacy	% within Information Source	37,9%	27,6%	34,5%
Classes	% within Department	36,7%	26,7%	32,3%
	% of Total	12,1%	8,8%	11,0%
Librarian	Count	17	15	11
	% within Information Source	39,5%	34,9%	25,6%
	% within Department	56,7%	50,0%	35,5%
	% of Total	18,7%	16,5%	12,1%
Noticeboard	Count	3	6	8
	% within Information Source	17,6%	35,3%	47,1%
	% within Department	10,0%	20,0%	25,8%
	% of Total	3,3%	6,6%	8,8%

Most Nursing respondents (93.4%) got to know about the library electronic sources from either the Information Literacy Classes (36.7%) or a Librarian (56.7%), compared to 76.7% of Education, and 67.3% of Civil Engineering respondents who had the same two sources. Over 20% of respondents from the two departments read about the resources from the Noticeboard.

#### 4.4.5 Challenges in accessing electronic resources

While there is significant extent of access to and use of electronic resources generally, and from the library, respondents listed some of the factors that make it difficult to effectively use the resources.

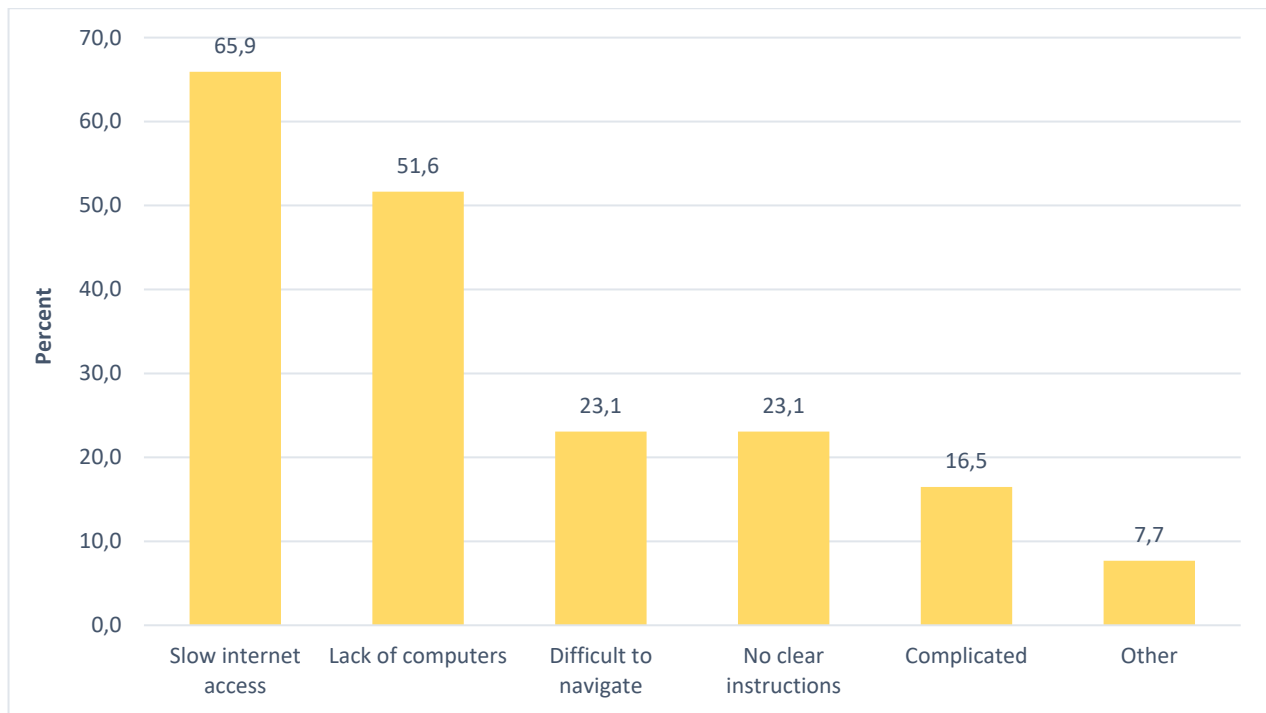


Figure 9: Most common problems experienced when accessing electronic resources

Interestingly most respondents indicated that slow internet access (65.9%) was the biggest problem in accessing electronic resources. Lack of computers (51.6%) was also ranked high among factors resulting in the non-usage of electronic databases. Other factors included “difficulty to navigate” (23.1%), “no clear instructions” (23.1) and “complicated” (16.5%). These challenges are surprising, given that over 84% of respondents said they access the resources on-campus, and almost 80% of them have either attended Information literacy classes or have been informed by the Librarian. One would then assume that they would have reliable internet and access to computers, as well as enough support from librarians on campus to be functionally competent. Yet, if their challenges are genuine, it begs the question to assumptions made about this age-group (18-25) being “digital natives”, who are supposed to be comfortable with technology and the digital environment. One would assume that this group of students should thrive in the digital environment. Ranganathan’s 4<sup>th</sup> law says “save the time of the reader”. As librarians we certainly need to make sure that finding information for our patrons is as simple as possible to save their time if we are to fully comply with Ranganathan’s law of librarianship.

The responses to the question of what would make use of electronic resources more frequent were equally surprising.

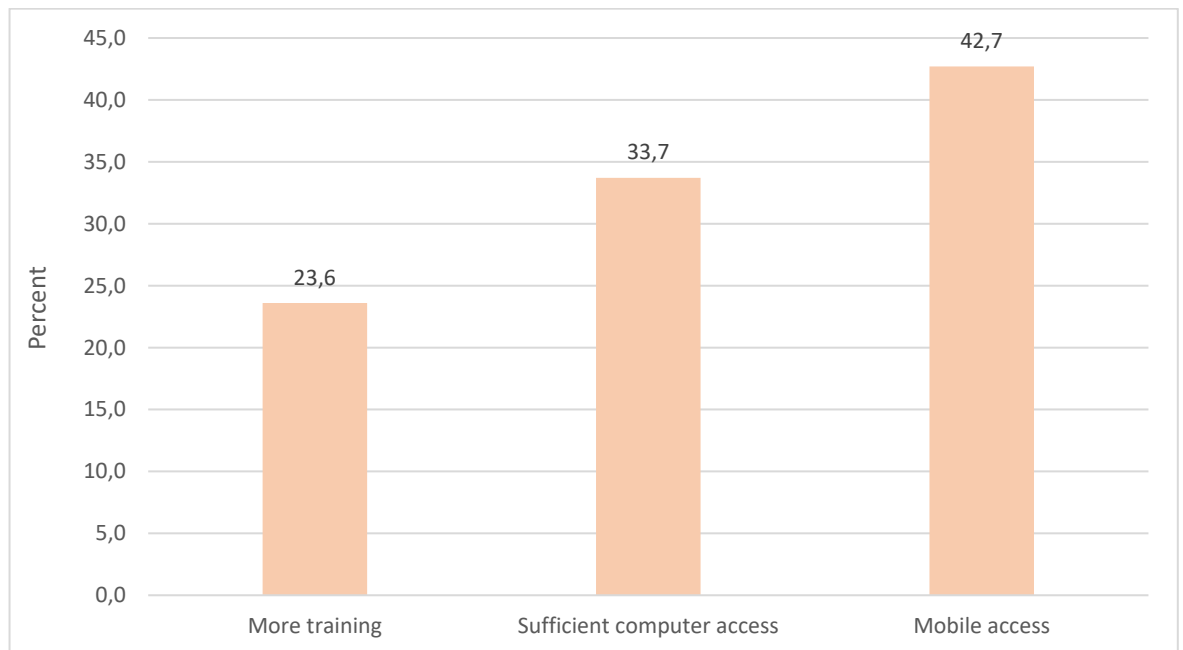


Figure 10: Possible remedies for poor use of electronic resources

Approximately 43% of respondents indicated that mobile access would increase the frequency of use, with lower levels indicating computer access and more training as other factors ( $p = 0.087$ ). This indicates that many students are not aware that electronic resources can be accessed on their mobile gadgets. This also indicates that once off training is not enough. The results indicate that librarians must offer training sessions continuously until students are fully competent in using electronic resources. About 24% indicated the need for more training which means there is some interest in wanting to learn to use the electronic resources. Again looking Ranganathan's fifth law which states that "a library is a growing organism". Libraries and librarians have the responsibility of always adapting and embracing new changes. We need to fully implement this law by changing the way we do things, adapting to meet the needs of our clientele.

## 4.7 Qualitative data collected in phase 2: Emerging themes from focus group discussions

This section focusses on analysing themes that emerged from focus group discussions. These groups came from third-year students from the Department of Nursing, Education, and Civil Engineering

Identified themes	Identified Sub-themes
1. Awareness of electronic resources	1.1 Role of Information literacy Basic library skills acquired 1.2 Useful Introduction to finding information and using the library 1.3 Varying degrees of awareness from different departments
2. Familiarity with digital devices and use of the internet	2.1 Communities of practice as a community of students using the library 2.2 WhatsApp groups used for information sharing
3. Experiences of students when accessing electronic library resources	3.1 Difficulties in navigating the website Challenges of downloading 3.2 Using smartphones/ access to devices 3.3 ebooks a preference
4. Reasons for non-use	4.1 Lack of digital literacy skills 4.2 Varying backgrounds affecting the use of electronic library resources 4.3 Lack of devices 4.4 Lack of clear instructions



5. Sources used often or alternative sources students prefer	5.1 Availability of information from Google, Wikipedia and YouTube 5.2 ebooks
6. Strategies to encourage usage of electronic library resources by students	6.2 Vigorous marketing of library resources  6.2 Departmental collaboration 6.3 Continuous training 6.4 Development of mobile apps that is more user friendly
7. Effects of COVID 19 lockdown	7.1 The shift to online learning 7.2 No access to the physical library 7.3 Poor network infrastructure 7.4 Expensive data

#### 4.7.1 Awareness of electronic resources

The discussions revealed that the level of awareness was not uniform among different groups of students. While some students were aware of electronic resources and some had limited knowledge of the various resources. One student indicated during the discussions that

*“It is the first time I am hearing of such resources in this discussion. I only use exam papers available in the library website”*

#### **4.7.1.1 Role of information literacy training**

Respondents indicated that information literacy training played an important role for them because they had no prior knowledge of how the library operates. Some students indicated that they became aware of library electronic resources when they attended information literacy training. When asked how they felt about information literacy one student stated:

*“Very useful, learnt about how to access the library website, very useful”*

*“Helped – I am more careful of sources of information I am using for assignment, I am able to evaluate information”*

It appeared from the discussions that some students had managed to form relationships with the subject librarians. There were instances where subject librarians were mentioned by name and were praised for how they managed to assist and teach students on how to use electronic resources effectively and the library in general.

#### **4.7.1.2 Useful introduction to finding information and using the library**

When students asked about the benefits received from attending information literacy, most indicated that they found information literacy useful. The sentiment expressed was that it should be done for all levels of study because they only attended when they were doing their first year of study and they tend to forget some of the things taught.

#### **4.7.1.3 Varying degrees of awareness from different departments**

Most students from Civil Engineering were not familiar with the library electronic resources. They indicated that the textbooks have the information they require for their study.

It also came out that their lecturers supply them with useful and very substantial notes.



Figure 11: Sample of engineering notes given to students

One responded noted that

*“Not everyone uses the library electronic resources others still think Google has the information”*

#### **4.7.2 Experiences of students when accessing electronic library resources**

It also came out that students had different experiences when trying to access the library electronic resources through the library. Some had positive experiences whilst some were negative experiences. The excerpts below show experiences from the respondents:

*“I am technical, navigation was easy but the only difficulty was network coverage. Other than that no issues, everything is great.”*

##### **4.7.2.1 Difficult in navigating the website**

Other respondents indicated that the library website is difficult to navigate. *“There is too much information which makes it difficult to decide which one to choose”* was the sentiment expressed by another respondent. Another respondent had this to say:

*“When I tried to access the articles from home the system did not recognise my password.”*

*“It wasn’t easy the first time because I found the sites a bit challenging to navigate. As soon as I got the hang of it I got used to it.”*

What also became evident was that teaching how to access online resources and experiencing using them or experiencing the process are two different things. Having personally experienced being a student and a librarian at the same time made me realise that we need to be cognisant of the challenges our users are faced with. We need to constantly monitor usage and devise feedback platforms from our users so as to improve on our service. For instance it was during this period that I discovered that some databases work better with certain browsers. Bloomsbury drama online, which is a database for drama, only works with Firefox browser. I only discovered this during lockdown. With the World Global Style Network (WGSN) database you can only update login credentials on campus when your access expires.

#### **4.7.2.2 Challenges of downloading**

One responded that they had experienced challenges in downloading a book onto their devices. Some phones do not allow for downloading of ebooks.

#### **4.7.2.3 Using smartphones to access the library**

The majority of students indicated that they use their cell phones to look for information. Some phones do not allow them to download. Students resorted to using screenshots from pages they needed to use.

#### **4.7.2.4 Ebooks used more**

When asked which sources they used most, students commented that they used ebooks more. The reason being that they are used to books compared to articles.

One responded commented that *“The good thing when accessing eBooks via DUT library means you are not asked to pay for use unlike on Google where you are sometimes asked to pay”*. This is the benefit of using the library’s subscribed databases. The university pays for subscription and access and the university community can access without having to pay.

### **4.7.3 Familiarity with digital devices and use of the internet**

Familiarity with the internet was cited as a reason why some students prefer using electronic resources. The respondent said:

*“I prefer electronic reading especially because of my background – I am used to online from when I was in high school”*

#### **4.7.3.1 Communities of practice as a community of students using the library**

Learning from their peers also encouraged some students to use the library electronic resources. The respondents also indicated that having some of their peers who were familiar with electronic resources encouraged them a great deal in making them use electronic resources especially when they encountered challenges. A Community of practice is defined as a “group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.”(Chandel and Rai 2015; Kim 2015). Wenger’s theory explains what happens in online and blended learning where students rely on each other for support. They have class WhatsApp groups which make it easy for them to share information and communicate especially during a lockdown. It came out of the discussions that students are using the group feature on WhatsApp to share everything related to their studies including study notes. If they need help they ask their classmates in the group including finding information for assignments.

### **4.7.4 Reasons for non-use of electronic resources**

Several reasons were also given for the non-use of electronic resources.

#### **4.7.4.1 Lack of digital literacy skills**

Some students felt that they do not have the skills to operate in digital environments. They found accessing information a bit complicated compared to just walking through to the library and browsing through the shelves. Browsing through the shelves has its shortcomings where a user can miss important information compared to searching digitally. These students are

missing out on so much information that is available in electronic books and journal articles. The library has access to several ebook packages. These students are stuck in the print era. Ranganathan's third law states "every book it's reader" which basically refers to accessibility of books for the readers. In this case electronic books should find their readers. Students should be encouraged and assisted to embrace the digital era. Ranganathan was of the opinion that users should be assisted and librarians must be efficient and make sure collections are used maximally.

*"Difficult paging through ebooks and I was unable to save."* Ranganathan's fourth law "save the time of the reader" stipulates that readers should not struggle with accessing information. Librarians have a responsibility to make sure that their collections are accessible in any format.

#### **4.7.4.2 Varying backgrounds affecting the use of electronic library resources**

Coming from a rural background is challenging. The students who came from rural backgrounds cited a lack of exposure to technology as a challenge for them when it came to using electronic resources and other online learning platforms.

#### **4.3 Lack of devices**

The students who do not have laptops are relying on their phones to read emails and also connect on social media like WhatsApp for updates which poses a major challenge when it comes to writing assignments. Other respondents indicated that they do not have devices to access electronic resources. Another student commented that some of her classmates do not have smartphones and laptops to be able to utilise electronic resources and access online content. This is one of the biggest challenge students experience with online learning. Some of the smartphones that students own do not have sufficient memory and are not ideal for academic work. There was an indication from the group that reading from the phone is strenuous and they find it difficult to make notes.

Network connectivity was another challenge that students experience one student living in the rural area of uMsinga indicated that she leaves the house to access the network. She has actually identified a spot when she can sit on a rock and access the network signal.

#### **4.4 Lack of clear instructions**

Lack of clear instructions when trying to access the electronic databases was also mentioned as a reason for non-use of electronic databases

*“It was difficult – I was not sure which one to choose from the A-Z list and that was time-wasting. Unlike going to a specific title that is on print”*

One respondent indicated that when going through the list they get confused

*“Not sure which one to choose”.*

*“Not comfortable – it is easy to use print books because of network issues, load-shedding affects deadlines.”*

When lockdown started we received a lot of queries from both staff and students who were struggling to access articles off campus. One example was the PressReader which is an online database of national and international newspapers. Challenges to accessing electronic resources were mainly due the authentication via the Open Athens application. This requires that you provide the “DUT” login credentials to avoid use of library resources by unauthorised users. There were no clear instructions on how to access databases off campus. Another challenge was that some student numbers needed to be activated for them to work because they had not been used. In some instances we discovered that students were not using their institutional email which is what is required when accessing DUT resources off campus.

#### **4.7.5. Sources used often or alternative sources students prefer**

Students also indicated that they were able to find information from other sources without going to the library website.

##### **4.7.5.1 Availability of information from Google and YouTube**

Students indicated that Google and YouTube are information resources they used more often to find information. It came out clearly from the respondents that Google was easy to use.

*“Google and YouTube they are easy to find information, Summon is delaying you don’t understand how to use”*

*“prefer YouTube to watch videos, it is visual you look and listen”*

Wikipedia was another source that students indicated that they use for their research and assignments. This revealed that librarians are competing with the general search engines in the digital space. It is worrying that students find Google easy to use compared to subscribed databases from the library. These resources have authentic information and peer reviewed articles compared to some information freely available. Also, using subscribed databases protects students from falling prey to fake news.

#### **4.8 Strategies to encourage usage of electronic library resources by students**

When asked what can they suggest be done to make sure students use electronic resources, students suggested a few strategies that the library could use to encourage the use and awareness of library electronic resources.

##### **4.8.1.1 Marketing of library resources**

Students felt that the library must engage in vigorous marketing of electronic resources to create awareness amongst the student population. Some of the suggestions were

*“There must be Friday activities to promote library resources.”*



#### **4.8.1.2 Departmental collaboration**

Respondents felt that there should be close relationship between academics and librarians. Electronic resources need to be integrated into courses to encourage usage. The following were some of the ideas suggested.

*“Share links with our lecturers”*

*“have links in our study guides”*

#### **4.8.1.3 Continuous training**

Respondents felt that follow up sessions could help more in encouraging them to use the electronic resources.

*“After a while, we tend to forget because we are only told about them at the beginning of the year - when it is assignment time we have forgotten”.*

#### **4.8.1.4 Development of mobile applications that are more user friendly**

Respondents also felt mobile access would encourage students to use electronic resources more. They felt that these databases should be available as mobile apps.

### **4.9 Effects of COVID-19 lockdown**

It emerged from the focus groups that the COVID-19 lockdown seems to have had an impact on the way students use electronic resources. It appeared from the discussions that students used the online library more than they had before lockdown to access information.

#### **4.9.1 The shift to multi modal learning**

The students were also asked if online learning has made them use library electronic resources. The respondents all responded that because of the COVID-19 lockdown they have had to look for articles available via Summon which is the library’s discovery tool to find relevant information.

*“NM: currently for us to be able to complete our studies is to use online resources. I think you cannot separate online learning from electronic resources”. “We cannot go to campus so the only place to get information is through the library website.”*

*“Yes we have assignments and only online resources can help us access information.”*

#### **4.9.1.2 No access to the physical library**

Students also indicated that because of working remotely and not having access to the physical library they started to use the electronic resources. The lockdown has forced them to use the various sources available online. The following are some of the comments from respondents when asked how lockdown has affected their use of the electronic resources.

*“Library access limited because of lockdown”*

*“Use electronic resources more now”*

*“I think we are using them sufficiently because available even at night 24|7”*

*“Can use them anytime so there is no due date to return the books, no fines”*

The virtual service was able to assist users who were locked in their homes. The chat service and online resources supported the multi modal teaching and learning that was introduced in the institution due to the pandemic. When the university decided to offer multi modal learning students were provided with data and gadgets so that they can carry on with their studies. Unfortunately not all students received laptops to be able to continue with their academic work. The majority received data only which was a challenge because they had to rely on their smartphones to continue with their academic work.

#### **4.9.1.3 Expensive data**

Respondents also expressed that because of expensive data they were having challenges with accessing electronic resources remotely. *“MN - lack of data is an issue for most of us.”*

## 4.9 Conclusion

This chapter has presented and discussed quantitative data collected from questionnaires as well as the analysis of data from focus groups. As per the summary of the stats, it is evident that students see value in electronic databases. The various challenges are what makes them not to use them. The reliability of data is highlighted by the fact that many students gave the same information. Data also shows that poor mobile access and slow internet speed are hindering factors. Students are aware of, and do value the electronic resources. It is evident from the responses that the main reason for the underutilization of electronic databases is mainly the difficulty in navigating the databases as well as lack of understanding on how to access electronic databases. There is no significant difference in terms of usage of electronic resources between the different departments.

The results also reveal that despite the possibility of accessing of electronic resources off campus, students still prefer to access databases on campus. The thematic analysis reveals the experiences and challenges that students encounter when accessing electronic resources. The results show or indicate positive and negative experiences that students experience when accessing electronic resources. Suggestions to encourage sufficient usage of electronic resources emerged from the focus group discussions.

The themes were presented and guided by the theoretical framework of Ranganathan's five laws and Wenger's theory of Communities of Practice where students who have used the electronic resources were recruited explore their experiences in the use of electronic resources. Students' statements on their experiences of the electronic resources were used to formulate themes.

The results support Wenger's theory of Communities of Practice which plays a pivotal role in the online environment. Peer learning is one instance which came out from the focus group discussions. Students form Communities of Practice s using social networking tools to come together and assist each other and share experiences. The critical role of social media especially WhatsApp needs to be highlighted in the digital space. This has proved true during COVID-19 lockdown where connections were through WhatsApp because of the need to adhere to social distancing.

Ranganathan's five laws of library science play a crucial role in the daily operations and management of libraries. When extracting the themes the researcher was cognisant of the five laws which are still relevant in the era of electronic resources. These five laws were considered to investigate the use of electronic resources. It is the responsibility of librarians to make sure that resources purchased are used by the patrons (Adegoke 2016).

The quantitative data was used to establish patterns of usage from the three departments. In turn qualitative data was used to establish the experiences of students when using electronic library resources.

Both data sets indicated that:

- students do value and see benefit in library subscribed electronic databases.
- students in all three departments experienced difficulty in navigating academic electronic resources
- Google was the most commonly used source of information by students in all three departments.

The high cost of data limits the use of electronic resources by students in all three departments.

This is triangulation of data.

# **CHAPTER 5: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

## **5.1 Introduction**

The previous chapter analysed, presented and discussed the results of the study. This chapter will present the summary of findings, conclusions and recommendations. The summary is based on the research questions of the study.

The objective of the study was to establish the extent of the use of the electronic resources by undergraduate students at the Durban University of Technology by answering the following questions:

- To what extent do third-year students attending Civil Engineering, Education and Nursing lectures use the electronic library resources?
- How do students in these departments experience electronic services?
- What are the reasons for their using or not using electronic library resources?

Conclusion of the findings as well as recommendations will also be presented.

## **5.2 Summary of the findings**

This section is the summary the findings of the study based on the research questions. Ranganathan's five laws of library science play a crucial role in the daily operations and management of libraries. When extracting the themes the researcher was cognisant of the five laws which are still relevant in the era of electronic resources. These five laws were considered to make sure that electronic resources are being utilised. It is the responsibility of librarians to make sure that resources purchased are used by the patrons (Adegoke 2016). Ranganathan's five laws of library science are

1. Books are for use
2. Every reader his or her book
3. Every book it's reader

4. Save the time of the reader
5. A library is a growing organism

### **5.3 Use of the online library resources**

The Durban University of Technology library subscribes to various electronic databases to assist staff, students and researchers find reliable and authentic information for academic purposes. The results from this study reveal that students still prefer to use general search engine like Google and YouTube as opposed to the subscribed electronic databases to find information. This is worrisome considering that when they use only Google and YouTube, students do not get the benefit of the electronic resources on which DUT has spent a considerable amount of money. Electronic resources geared for academic use provide peer reviewed, and scholarly information. In contrast, information provided by Google and YouTube can be much less than what they could be getting from electronic databases. Information on Google and YouTube is often superficial even when it is correct, and therefore students cannot expect to gain an in-depth understanding from these sources. The benefits of using academic electronic databases is that they are peer reviewed, constantly being updated and available around the clock. Information from academic electronic databases can be trusted.

With regards to students' attention the library is in competition with the general search engines in terms of providing information. Librarians have a bigger role to convince their users of the value and importance of the electronic databases in finding information. Libraries are competing with other sources of information. We need to be able to convince our users of the benefits of using subscribed databases, since many students are missing the benefit of these resources. As the first law of Ranganathan states that "books are for use". We need to make sure that library resources purchased by the library for the users are fully utilized. Librarians take time to evaluate and source databases that have credible information. This helps users save time looking for information.

The outbreak of COVID-19 has accelerated the shift from physical to the digital space. DUT libraries made their services available online. During lockdown physical libraries were shut down which left online access the only viable option for patrons.

The study concludes that students are not fully utilising the online library resources that the library subscribes to. However, it was revealed that there are barriers to the access and use of these resources. Students do appreciate the benefit of library online resources. The challenges associated with accessing and using them efficiently is what leads to poor usage. It is therefore the responsibility of librarians to make sure that users have full access to information. Ranganathan's law states that "every book its reader" which means books must be read. Findings from the study show that despite the fact that some users are not using the resources at least 23% are using the resources. Books are finding their way to some users. It is therefore a challenge for librarians to try new strategies to increase usage. It is important to publicise these resources so that every book or resource finds its reader as stated by Ranganathan.

"A library is a growing organism" Ranganathan's fifth law states. Findings from the study also reveal that mobile access would make students use the library more. Students felt accessing library on their mobile devices in the form of a mobile application would encourage usage. The library as a growing organism should embrace and introduce new technology to encourage usage of its resources. Libraries should not be left behind in the digital transformation agenda. The students who are 'digital natives' enjoy working on their mobile phones. It would be interesting to see if having electronic resources as mobile applications would increase usage. The majority of students are using smartphones on a daily basis, so having electronic resources available and accessible on smartphones would encourage students to start using academic databases and appreciate their benefits. Having it on their phones might also stimulate curiosity. They can start playing around and in the process discover easier ways of using it and even encourage reading not only for academic purposes only but for recreation as well.

## **5.4 Students experiences of online library resources**

The study reveals that students were experiencing different challenges when accessing electronic resources. Some indicated that navigating the library's website was challenging. Others mentioned that there were no clear instructions on how to download and access information. During the process of this study it also became apparent that accessing electronic resources off campus was a major challenge not only for students but for staff as well, since librarians received numerous queries from academic staff who were struggling to access the library's online resources. Ranganathan's fourth law states 'Save the time of the reader". In a nutshell this law encourages efficiency of libraries for users in accessing information. There should be no hindrances. It is important to make sure that library systems are efficient and reliable.

In trying to address these challenges brief write ups were introduced by librarians detailing step up step guide on how to access a particular online resources. We also discovered that some electronic databases work better with certain browsers. Findings from the study reveal that students prefer to access electronic resources on campus rather that off campus. The reason they gave was that the price of data was expensive. The speed of the internet on campus was also highlighted to be quicker than off campus especially for students residing in rural areas. One student who participated in the focus group discussions reported that she had to leave her house which is in the rural area to secure signal to access the internet. She had identified a spot somewhere outside her home when she could get the signal. Network connectivity was a challenge from her home.

Lack of digital skills was another challenge highlighted by participants during focus group discussions. Lack of digital skills makes it difficult for the students to navigate the online environment. Participants from the study indicated that when accessing an Ebook they struggled to print on paper, save and highlight areas that were of interest to them. During the study students were studying online because of COVID-19 lockdown and had no access to printers so relied heavily on their mobile gadgets. Students indicated that when using print or



hard copies they are able to highlight or even use bookmarks which they found difficult with ebooks.

## **5.5 Communities of Practice as a community of students using the library**

A community of practice is a group of people who come together in “collective learning”. They share a concern or passion for something (Wenger 2011). Students are forming communities of practice in the digital space. They share experiences and skills within the digital environment. This emerged from the findings of focus group discussion where participants indicated that they relied on each other for help in accessing information. Class WhatsApp groups allowed students to share frustrations and challenges and those who were au fait would assist those who are struggling. In these groups they are able to share tips and discoveries. A group of students from the Education department were using this group to share ideas on how to tackle assignments and any other issues relating to their academic work. Lecturers also post messages on these class WhatsApp groups. If there any challenges students can post questions and their colleagues are able to assist.

## **5.6 Reasons for non-use of electronic library resources**

Several challenges were highlighted as reasons for non-use of electronic resources. Challenges experiences by students at DUT were similar to challenges experienced by students in Botswana (Toteng, Hoskins and Bell 2013). These included slow internet access and lack of computers.

Some students indicated that because of their rural background, using computers and the internet was difficult. They are still trying to master the skill of searching despite being in their third year of study. These respondents indicated that they were exposed to using computers only when they came to university. They do not have the necessary confidence to function in the digital space. Their internet and computer skills are not fully developed.

The results reveal that students tend to forget what have been taught therefore information literacy (IL) should be taught continuously to encourage usage To encourage usage and for the students to fully utilize the electronic resources information literacy training should not be a once off event. Students need to be constantly reminded about the library electronic databases. The benefits of using these databases needs to be highlighted. Librarians have a responsibility to include digital literacy skills when training users how to use online resources. It became evident from the study that the two cannot be separated.

## **5.7 Conclusions**

As per the summary of the quantitative data, it is evident that students see value in electronic databases. The various challenges are what makes them not to use them. The reliability of databases is highlighted by the majority of respondents.92% indicated that databases were useful sources of information. Data also shows that poor mobile access and slow speed are hindering factors. Students are aware of and do value the electronic resources. It is evident from the responses that the main reason for the underutilization of electronic databases is infrastructural with the slow internet connectivity ranking highest. There is no significant difference between the different departments.

The results also reveal that despite the possibility of accessing of electronic resources off campus, students still prefer to access databases on campus. This could be attributed to the high cost of data as revealed by the results.

The study reveals that students are using online electronic resources but for them navigating the library website was problematic. This became evident as I was doing my study during COVID-19 lockdown. During that period all the queries were online. The majority of the queries received during that period related to online access.

It was interesting to also note that accessing information off campus had challenges compared to accessing resources on campus. During this period of the study the library had introduced Open Athens for Authentication which confused many of our users and made accessing databases off campus a challenge as mentioned in the discussion section earlier. This system requires the use of students' numbers to access the library electronic resources. The use of different language and navigation by different databases was making accessing online resources a challenge.

The researcher is of the opinion that as librarians we need to be aware of the challenges our users experience when accessing our resources including online resources. The lockdown played a major role in alerting and revealing the challenges associated with online resources because we were able to experience them first hand. During this period as librarians we were able to grow and learn new skills like using MS Teams to assist our users who were struggling to access the library resources.

The value of online resources cannot be under estimated. But more needs to be done by librarians to assist our users appreciate and value these resources and benefit from using them. Challenges have been identified and the situation is being managed. The availability of librarians on the chat service is helping users at the point of need.

The findings also reveal that students attend information literacy skills training where they are introduced to various forms of library resources including online library resources. Librarians collaborate with lecturers to timetable the library training sessions.

Findings also reveal that librarians need to work closely with departments in order to ensure that staff and students are able to gain maximum benefit from services offered by the library. The library is part of the University. Libraries are heart of an academic institution. They cannot operate in isolation. Collaboration with academic departments and forming partnerships will assist in promoting the library's resources.

## **5.8 Limitations of the study**

Data collection for the study took place during the national COVID-19 lockdown. During that period no personal contact was allowed because of social distancing that had to be maintained. For the quantitative data only students with access to data and gadget could participate. For the qualitative data collection the researcher relied on using Microsoft Teams to conduct focus group discussions. This limited the non-verbal communication. The researcher is the librarian at the university where the study was conducted, so students might not be saying all their opinions regarding electronic resources though the librarian assured them that it nothing would be used against them. The researcher constantly assured the participants that they would remain anonymous.

## **5.9 Recommendations**

These recommendations are based on the findings of the study:

- Vigorous promotion of the use of electronic databases should be done in order encourage usage. It is only through awareness that students will start using electronic databases more. A suggestion from one of the participants was to have activities on Fridays where the focus is on showcasing library resources including electronic resources. This will work because students will have a platform where they can raise their issues and concerns regarding anything related to the library including electronic resources.
- Run information literacy sessions on a continuous basis so that students master the skill of using electronic resources as the results indicate that students tend to forget what was taught.
- Incorporate digital skills training in information literacy to assist students who are struggling with technology.
- This study focussed on undergraduate students. More research still needs to be done to explore the use of online resources by other categories of users, postgraduate students, researchers and staff.

- Partnerships / collaborations should be formed with other university departments to promote the library's electronic resources.
- Detailed instructions on how to access databases should be developed. This could be a YouTube channel or video tutorials
- Improve the website for ease of navigation with clear instructions and invest in a user friendly interactive website to promote usage of the library resources.
- There must be strategy to provide students with data and devices to access online material for their studies.
- Develop a mobile application for the library so that students can easily access the services provided by the library on their smart phones. Students are using mobile application for almost everything including banking and shopping. Having an app for the library on their phones could increase the likelihood of their use of academic electronic resources.
- Employ and train tutors from each department to support students with library related matters. These students will be the go between the library and students. This could be done through identifying library champions.

## REFERENCES

- Adegoke, K. A. 2016. Ranganathan's law of library science: A guiding principle for marketing library services. *Review Pub Administration Manag*, 4: 178.
- Adeniran, P. 2013. Usage of electronic resources by undergraduates at the Redeemers University, Nigeria. *International Journal of Library and Information Science*, 5 (10): 319-324.
- American Library Association. 2000. *Information literacy competency standards for higher education*. Available: <https://repository.arizona.edu/handle/10150/105645> (Accessed 16 October 2021).
- Apuke, O. D. and Iyendo, T. O. 2018. University students' usage of the internet resources for research and learning: forms of access and perceptions of utility. *Heliyon*, 4 (12): 34.
- Arshad, A. and Ameen, K. 2018. Academic scientists' scholarly use of information resources in the digital environment Perceptions and barriers. *Global Knowledge Memory and Communication*, 67 (6-7): 467-483.
- Bahia, K. and Delaporte, A. 2020. *The state of mobile internet connectivity 2020*. Available: <https://www.gsma.com/r/wp-content/uploads/2020/09/GSMA-State-of-Mobile-Internet-Connectivity-Report-2020.pdf> (Accessed 29 January 2021).
- Barner, K. 2011. *The library is a growing organism: Ranganathan's fifth law of library science and the academic library in the digital era*. Available: <https://digitalcommons.unl.edu/libphilprac/548/> (Accessed 26 September 2019).
- Bellary, R. N. and Surve, S. K. 2019. *E-Resources are boon for the teaching and research work of an academic institute: A survey on usage and awareness of e-resources by the NMIMS (Deemed University) engineering faculties, Mumbai*. Available: <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=5953&context=libphilprac> (Accessed 25 September 2019).
- Besseah, B., Achiro, D., Mhando, J. and Salau, S. A. 2017. Embedding digital and research-literacy support program into postgraduate studies curriculum: A proposed program for sub-Saharan African postgraduate schools. *Library Review*, 66 (8/9): 586-594.
- Bhukuvhani, C., Chiparausha, B. and Zuvalinyenga, D. 2012. Effects of electronic information resources skills training for lecturers on pedagogical

practices and research productivity. *International Journal of Education and Development Using ICT*, 8 (1): 16-28.

Booker, L. D., Detlor, B. and Serenko, A. 2012. Factors affecting the adoption of online library resources by business students. *Journal of the American Society for Information Science and Technology*, 63 (12): 2503-2520.

Bottomley, E.-J. 2020. *SA has some of Africa's most expensive data, a new report says – but it is better for the richer*. Available: <https://www.businessinsider.co.za/how-sas-data-prices-compare-with-the-rest-of-the-world-2020-5> (Accessed 17 November 2020).

Bradley, F. 2016. 'A world with universal literacy': The role of libraries and access to information in the UN 2030 Agenda. *Ifla Journal-International Federation of Library Associations*, 42 (2): 118-125.

Chandel, A. S. and Rai, A. 2015. Revisiting contributions of Ranganathan in collection development. *Annals of Library and Information Studies*, 62 (4): 217-221.

Chang, S.-S., Lou, S.-J., Cheng, S.-R. and Lin, C.-L. 2015. Exploration of usage behavioral model construction for university library electronic resources. *The Electronic Library*, 33 (2): 292-307.

Chetty, K., Qigui, L., Gcora, N., Josie, J., Wenwei, L. and Fang, C. 2018. Bridging the digital divide: measuring digital literacy. *Economics: The Open-Access, Open-Assessment E-Journal*, 12 (2018-23): 1-20.

Cochrane, P. A. J. L. 1992. Information technology in libraries and Ranganathan's Five laws of Library Science. 42 (3): 235-241.

Cohen, L., Manion, L. and Morrison, K. 2018. *Research methods in education*. Eighth ed. New York: Routledge.

Collins, E. 2014. Understanding patterns of library use among undergraduate students from different disciplines. *Evidence based library and information practice*, 9 (3): 51.

Collins, E. and Stone, G. 2014. Understanding Patterns of Library Use Among Undergraduate Students from Different Disciplines. *Evidence Based Library and Information Practice*, 9 (3): 51-67.

Connaway, L. S., Radford, M. L. and Connaway, L. S. 2017. *Research Methods in Library and Information Science, 6th Edition*. Santa Barbara, California: Libraries Unlimited.

Council on Higher Education. 2013. *A proposal for undergraduate curriculum reform in South Africa: The case for a flexible curriculum structure*. Council on Higher education Pretoria.

- Creswell, J. W. 2018. *Qualitative inquiry and research design: choosing among five approaches*. 4th ed. Los Angeles: SAGE Publications.
- Czerniewicz, L. and Brown, C. 2013. The habitus of digital "strangers" in higher education. *British Journal of Educational Technology*, 44 (1): 44-53.
- Dadzie, P. S. 2005. Electronic resources: access and usage at Ashesi University College. *Campus-Wide Information Systems*, 22 (5): 290-297.
- De Jager, K. 2002. Impacts and outcomes: searching for the most elusive indicators of academic library performance. In: *Proceedings of Proceedings of the 4th Northumbria International Conference on Performance Measurement in Libraries and Information Services*. Association of Research Libraries Washington, DC, 291-297.
- Dukić, D. and Strišković, J. 2015. Croatian university students' use and perception of electronic resources. *Library & Information Science Research*, 37 (3): 244-253.
- Durban University of Technology. 2015. *DUT strategic plan 2015-2019*. Available: <https://www.dut.ac.za/wp-content/uploads/2016/09/DUT-strategic-plan-2015.pdf> (Accessed 22 October 2019).
- DUT library. 2019. *Library annual report 2019*.
- Encyclopedia of Survey Research Methods*. 2008. Thousand Oaks, California: Sage Publications. Available: <https://methods.sagepub.com/reference/encyclopedia-of-survey-research-methods> (Accessed 20 May 2020).
- Frandsen, T. F., Tibyampansa, D., Ibrahim, G. R. and von Isenburg, M. 2017. Library training to promote electronic resource usage: A case study in information literacy assessment. 118 (11/12): 618-628.
- Glen, S. 2021. *Welcome to Statistics How To: Elementary statistics for the rest of us*. Available: <https://www.statisticshowto.com/> (Accessed 3 March 2021).
- Hyman, J. A., Moser, M. T. and Segala, L. N. 2014. Electronic reading and digital library technologies: Understanding learner expectation and usage intent for mobile learning. *Educational Technology Research and Development*, 62 (1): 35-52.
- Isibika, I. S. 2018. Utilisation of subscribed electronic resources by library users in Mzumbe university library, Tanzania. *Global Knowledge, Memory and Communication*, 67 (1/2): 109-125.



Joo, S. and Choi, N. 2015. Factors affecting undergraduates' selection of online library resources in academic tasks Usefulness, ease-of-use, resource quality, and individual differences. *LIBRARY HI TECH*, 33 (2): 272-291.

Joppe, M. 2000. *The research process*. Available: <http://www.ryerson.ca/~mjoppe/rp.htm> (Accessed 27 February 2019).

Katabalwa, A. S. 2016. Use of electronic journal resources by postgraduate students at the University of Dar es Salaam. *Library Review*, 65 (6/7): 445-460.

Kim, J.-A. 2015. Intergrating Communities of practice into Library services. *Collaborative Librarianship*, 7 (2): 47-55.

Koltay, T. 2011. The media and the literacies: media literacy, information literacy, digital literacy. *Media, Culture & Society*, 33 (2): 211-221.

Komissarov, S. and Murray, J. 2016. Factors that influence undergraduate information-seeking behavior and opportunities for student success. *The Journal of Academic Librarianship*, 42 (4): 423-429.

Liamputtong, P. 2011. *Focus group methodology: principles and practices*. Los Angeles, Calif: SAGE.

Liyana, S. and Noorhidawati, A. 2017. How graduate students seek for information: Convenience or guaranteed result? *Malaysian Journal of Library & Information Science*, 19 (2)

Modiba, M. T. and Bopape, S. 2018. Users' Perspectives on Computers and Internet Services Offered by Public Libraries in Bridging the Digital Divide in Ngaka Modiri Molema District. *Mousaion*, 35 (4): 16.

Mouton, J. 1996. *Understanding social research*. Pretoria: Van Schaik.

Moyo, M. 2017. Awareness and usage of electronic library resources in open distance learning by third-year students in the School of Arts at the University of South Africa.

Noll, S. D. and Brown, C. 2019. Re-thinking information literacy in a postgraduate class at a South African Higher Education Institution. 36 (2): 1-26.

Nwafor, M. C., Chika, O. J. U. and Nwadike. 2018. Extent of use of Electronic Information Resources for Reference and Information Services in Nnamdi Azikiwe Library University of Nigeria, Nsukka. *Journal of Applied Information Science and Technology*, 11: 1.

Nyahodza, L. and Higgs, R. 2017. Towards bridging the digital divide in post-apartheid South Africa: a case of a historically disadvantaged university in

- Cape Town. *South African Journal of Libraries and Information Science*, 83 (1): 39-48.
- Okiki, O. C. and Asiru, S. 2011. Use of electronic information sources by postgraduate students in Nigeria: Influencing factors.
- Pandey, P. and Pandey, M. 2015. *Research methodology: Tools and techniques*: Bridge Center.
- Polit, D. F. and Beck, C. T. 2016. *Nursing research: generating and assessing evidence for nursing practice*. 10th, international ed. Philadelphia: Wolters Kluwer.
- Prasad, M. and Baskaran, C. 2018. Use of Electronic Resources on Scholarly Information Access by the Faculty Members of State Universities in South Tamil Nadu. *Journal of Advances in Library and Information Science*, 7 (4): 275-283.
- Ranganathan, S. R. 1931. *The five laws of library science*. Madras Library Association (Madras, India) and Edward Goldston (London, UK).
- Rasul, A. and Singh, D. 2010. The role of academic libraries in facilitating postgraduate students' research. *Malaysian Journal of Library & Information Science*, 15 (3): 75-84.
- Salubi, O. G., Ondari-Okemwa, E. and Nekhwevha, F. 2018. Utilisation of library information resources among generation Z students: Facts and fiction. *Publications*, 6 (2): 16.
- Shampa, P. and Singh, S. P. 2014. Digitization initiatives and special libraries in India. *The Electronic Library*, 32 (2): 221-238.
- Sinnasamy, J. and Karim, N. H. A. 2016. Library anxiety among non-native speakers of English: A reappraisal. *Information Development*, 32 (5): 1621-1630.
- Soni, N. K., Gupta, K. K. and Shrivastava, J. 2018. Awareness and Usage of Electronic Resources among LIS Scholars of Jiwaji University, Gwalior: A Survey. *DESIDOC Journal of Library & Information Technology*, 38 (1)
- Soohyung, J. and Namjoo, C. 2015. Factors affecting undergraduates' selection of online library resources in academic tasks: Usefulness, ease-of-use, resource quality, and individual differences. *Library Hi Tech*, 33 (2): 272-291.
- Soria, K. M., Nackerud, S. and Peterson, K. 2015. Socioeconomic indicators associated with first-year college students' use of academic libraries. *The Journal of Academic Librarianship*, 41 (5): 636-643.

- Soroya, S. H. and Ameen, K. 2018. What do they want? Millennials and role of libraries in Pakistan. *Journal of Academic Librarianship*, 44 (2): 248-255.
- Srinivasulu, P., Balu, C. C. and Narendra, A. 2019. Awareness and usage of e-resources by faculty members at Vardhaman College of Engineering (Autonomous), Hyderabad: A Study. *Library Philosophy and Practice* 1-16.
- Sulieman, A. M. and Mohammad, A.-M. S. 2015. Electronic library services acceptance and use: An empirical validation of unified theory of acceptance and use of technology. *The Electronic Library*, 33 (6): 1100-1120.
- Timmis, S. and Muhuro, P. 2019. De-coding or de-colonising the technocratic university? Rural students' digital transitions to South African higher education. *Learning, media and technology*, 44 (3): 252-266.
- Tlakula, T. P. and Fombad, M. 2017. The use of electronic resources by undergraduate students at the University of Venda, South Africa. *The Electronic Library*, 35 (5): 861-881.
- Toteng, B., Hoskins, R. and Bell, F. 2013. Use of electronic databases by Law students at the University of Botswana Library. *African Journal of Library, Archives & Information Science*, 23 (1)
- Ukachi, N. B. 2015. Information literacy of students as a correlate of their use of electronic resources in university libraries in Nigeria. *The Electronic Library*, 33 (3): 486-501.
- Umukoro, I. O. and Tihamiyu, M. A. 2017. Determinants of e-library services' use among university students: A study of John Harris Library, University of Benin, Nigeria. *Journal of Librarianship and Information Science*, 49 (4): 438-453.
- Uzuegbu, C. P., Igwe, K., Nwosu, M. C. and Nwokocha, U. 2013. Cloud Computing: Today's Hope for Information Security in Networked Libraries. *MiddleBelt Journal of Library and Information Science*, 11
- Waite, M. *Paperback Oxford English dictionary* 2012. Oxford: Oxford University Press. Available: <https://search.ebscohost.com/login.aspx?direct=true&db=cat08969a&AN=dut.635c5b3c.afba.4ff3.8d5a.528bb09ddd5f&site=eds-live> (Accessed 15 October 2021).
- Walter, E. *Cambridge advanced learner's dictionary* 2008. Cambridge: Cambridge University Press.
- Weber, H., Hillmert, S. and Rott, K. J. 2018. Can digital information literacy among undergraduates be improved? Evidence from an experimental study. *Teaching in Higher Education*, 23 (8): 909-926.

Wenger, E. 2010. Communities of practice and social learning systems: the career of a concept. In: *Social learning systems and communities of practice*. Springer, 179-198.

Wenger, E. 2011. *Communities of practice: a brief introduction*. Available: <https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/11736/A%20brief%20introduction%20to%20CoP.pdf> (Accessed 15 October 2021).

Yamson, G. C., Appiah, A. B. and Tsegah, M. 2018. Electronic vs. print resources: a survey of perception, usage and preferences among Central University Undergraduate students. *European Scientific Journal, ESJ*, 14 (7)

Zabed Ahmed, S. 2013. Use of electronic resources by the faculty members in diverse public universities in Bangladesh. *The Electronic Library*, 31 (3): 290-312.

## APPENDIX A

### QUESTIONNAIRE

Dear Participant You are invited to participate in a survey. Exploring undergraduate students' use and experience online library resources: a case study of a University of Technology. It will take approximately 10 minutes to complete the questionnaire. The programme automatically makes the answers anonymous. Your participation in this study is completely voluntary. There are no foreseeable risks associated with this project. However, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point. It is very important for us to learn your opinions. Your survey responses will be strictly confidential. Your information will be coded and will remain confidential. If you have questions at any time about the survey or the procedures, you may contact Lindiwe Gumede at 0844911135 or by email at [lindiweg@dut.ac.za](mailto:lindiweg@dut.ac.za). Thank you very much for your time and support. Please start with the survey now by clicking on the Continue button below.

1. Please indicate the name of the Department in which you are registered

1. Nursing
2. Education
3. Civil Engineering

2. What age are you?

- 1.

Are you

1. Male

2. Female

Where do you stay?

1. On campus residence
2. Off campus

What electronic sources do you use to access information for academic purposes, assignments or projects

1. Internet search engines like Google
2. ebooks
3. Electronic databases
4. Other \_\_\_\_\_

Why?

1. Easy to access
2. Reliable
3. Convenient

Where do you access library electronic resources?

1. On campus
2. Off campus

Choose electronic library resources that you have used in the last year

1. EbscoHost
2. Summon
3. ebooks
4. Ejournals
5. Exam repository
6. Reference guide
7. Other \_\_\_\_\_

How often do you use electronic resources to find information?

1. Daily
2. Once a week
3. Once a month
4. Never

How did you come to know about electronic library resources offered by the library?

1. Information literacy classes
2. Librarian
3. Noticeboard
4. Other (Please specify)

In your opinion do you think accessing information using electronic resources is helpful / important?

1. Yes
2. No

Explain:

What is your opinion on electronic library resources?

1. Useful
2. Not useful
3. None of the above

Name two or three most common problems experienced in accessing electronic resource

1. Slow internet access
2. Lack of computers
3. Difficult to navigate
4. No clear instructions
5. Complicated
6. Other \_\_\_\_\_

Did you attend any information literacy training session?

1. Yes
2. No

What would make you use electronic resources more often?

1. More training
2. Sufficient computer access
3. Mobile access



APPENDIX B



**INTERVIEW SCHEDULE FOR ALL FOCUS GROUP DISCUSSIONS**

1. What course are you enrolled for at DUT?

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2. What level of study are you in?

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3. Can you share your ideas about whether the students you know are aware of online resources?

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4. In your opinion what makes students use online library resources?

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5. How often do you use the library subscribed databases to access information? Why?

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6. Can you share with the group some of your experiences when you tried to use these resources?

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7. Are the students that you know of comfortable with the online resources? Please elaborate

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8. Which online resources do students often use and why?

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9. Did you attend any information literacy classes offered by the library staff?

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10. Would you say these helped in teaching some of the skills in searching for information using online resources? Please give reasons

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11. What can you suggest can be done to improve the use of library online resources at DUT?

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12. In your opinion, would you say online resources are used sufficiently or not? Please give reasons to support your opinion

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## APPENDIX C



07 November 2019

Prof K. Duffy

Acting Director: Research and Postgraduate Support

The Durban University of Technology

### Request for Permission to Conduct Research

My name is Lindiwe Gumede, an M Ed in A&CE student at the Durban University of Technology, and a DUT, and a staff member at Indumiso library. The research I wish to conduct for my Masters dissertation thesis involves **Exploring undergraduate students' use and experience of online library resources: a case study of a University of Technology.**

The purpose of the study is to establish the use of electronic resources amongst undergraduate students in three departments, and to explore their experience in relation to electronic resources offered by the library.

I am hereby seeking your consent to collect information through a questionnaire and interviews from third year Nursing, Civil Engineering and Education students on Indumiso campus.

I have provided you with a copy of my proposal which includes copies of the data collection tools and consent and/ or assent forms to be used in the

research process, as well as a copy of the approval letter which I received from the Institutional Research Ethics Committee (IREC).

If you require any further information, please do not hesitate to contact me 0844911135, alternatively email [lindiweg@dut.ac.za](mailto:lindiweg@dut.ac.za)

Thank you for your time and consideration in this matter.

Yours sincerely,

Lindiwe Gumede  
Durban University of Technology

## APPENDIX D



### LETTER OF INFORMATION

**Title of the research study:** Exploring undergraduate students' use and experience of online library resources: a case study of a University of Technology

**Principal Investigator/s/researcher:**

Lindiwe Gumede M Ed in A&CE

**Supervisor/s:**

Dr. S. Land (PhD), Dr S Moyane (PhD)

**Brief Introduction and Purpose of the Study:**

The study will seek to establish the extent of use and non-use of electronic resources by undergraduate students at a University of Technology. Furthermore, it will seek to establish if you are using the online resources, and are seeing any benefits or if not, what the challenges are.

There is a perception by librarians that these online resources are underutilized by the students

The purpose of the study is to explore the experience of University of technology undergraduate students in relation to electronic resources offered

by the library. The key questions that will be asked in this study are: How are you using the library online resources? How do you experience online services? What factors influence your experience of library online services?

**Outline of the Procedures:** The target population of the study are third year students from DUT, Indumiso campus. A self-administered and online questionnaires will be used to collect data from the participants. The questionnaire will take approximately 5 minutes to complete. Focus group discussions will also be conducted. Three focus groups, each consisting of 10 students from one of the three departments viz. Education, Nursing and Civil Engineering will be facilitated by the researcher to get more information on students' experiences when using library electronic resources. Data collected will be used for research purposes only.

**Risks or Discomforts to the Participant:** You will not be exposed to any risks since they will only be filling in the questionnaire. Focus groups will be facilitated by the researcher who will make sure discussions are managed properly.

**Benefits:** There will be no direct benefits to you as a participant. However, the study may assist policymakers at DUT in decision making in terms of budgeting for library resources. An article on the study will also be published. Participants will also have an opportunity to freely express their experiences of electronic library resources which will in turn inform the library staff on how and what they should improve regarding the electronic resources.

**Reason/s why the Participant May Be Withdrawn from the Study:**

There will be no negative consequences should you decide to withdraw from participating

**Remuneration:** There will be no monetary incentives and participation in this study is voluntary.

**Costs of the Study:** There will be no charge for participating in the study.

**Confidentiality:** Confidentiality will be maintained and responses from you will be kept in closed access. Your identity will not be revealed.

**Research-related Injury:** You will not be exposed to any injury risks as you will not participate in any experiment.

**Persons to Contact in the Event of Any Problems or Queries:** Supervisor and details) Please contact the researcher 0844911135., my supervisor Dr S. Land (033 8948045) or the Institutional Research Ethics Administrator on 031 373 2375. Complaints can be reported to the DVC: Research, Innovation and Engagement Prof S Moyo on 031 373 2577 or moyos@dut.ac.za.



## APPENDIX E



## CONSENT

### Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Mrs Lindiwe Gumede about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number:
- I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

\_\_\_\_\_

**Full Name of Participant   Date   Time   Signature**

I, \_\_\_\_\_ (name of researcher) herewith confirm that the above participant has been fully

informed about the nature, conduct and risks of the above study.

\_\_\_\_\_  
**Full Name of Researcher   Date   Signature**   \_\_\_\_\_

\_\_\_\_\_  
**Full Name of Witness (If applicable)   Date   Signature**   \_\_\_\_\_

\_\_\_\_\_  
**F**   \_\_\_\_\_   \_\_\_\_\_

## APPENDIX F



Institutional Research Ethics Committee  
Research and Postgraduate Support Directorate  
2nd Floor, Berwyn Court  
Gate 1, Steve Biko Campus  
Durban University of Technology  
P O Box 1334, Durban, South Africa, 4001  
Tel: 031 373 2375  
Email: [lavishad@dut.ac.za](mailto:lavishad@dut.ac.za)  
[http://www.dut.ac.za/research/institutional\\_research\\_ethics](http://www.dut.ac.za/research/institutional_research_ethics)  
[www.dut.ac.za](http://www.dut.ac.za)

23 April 2020  
Mrs L E Gumede  
1A Bradley Road  
Winston Park

Dear Mrs Gumede

Exploring undergraduate students' use and experience of online library resources: a case study of a University of Technology

Ethical Clearance number IREC 165/19

The Institutional Research Ethics Committee acknowledges receipt of your notification regarding the piloting of the data collection tool.

Kindly ensure that participants used for the pilot study are not part of the main study.

In addition, the IREC acknowledges receipt of your gatekeeper permission letter.

Please note that FULL APPROVAL is granted to your research proposal. You may proceed with data collection.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the IREC according to the IREC Standard Operating Procedures (SOP's).

Please note that any deviations from the approved proposal require the approval of the IREC as outlined in the IREC SOP's.

Yours Sincerely,