

The use of Internet-based information sources by postgraduate students: a survey of three universities in the Eastern Cape, South Africa

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Declaration

This dissertation is being submitted in fulfilment of the requirements of the Master's degree in Library and Information Science, in the Department of Library and Information Science, Faculty of Social Sciences and Humanities, University of Fort Hare. I hereby declare that this dissertation is my own original work, and that sources of information used have been duly acknowledged. I also declare that none of this work has been previously submitted for any award of a degree in any other university.

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Abstract

The study investigated the use of Internet-based information sources by postgraduate students at three universities in the Eastern Cape province of South Africa. The main aim of the study was to determine the factors that affect the use of Internet-based information sources by postgraduate students. The study sought to fulfil the following objectives: to determine factors which affect the use of Internet-based information sources by postgraduate students at the three universities in the Eastern Cape, South Africa; to establish the Internet-based information sources available among universities in Eastern Cape; to identify the pattern of postgraduate students' use of Internet-based information sources; to find out the level of postgraduate satisfaction with Internet-based information sources available for their information needs, and to suggest ways of stimulating the use of Internet-based information sources by postgraduate students at universities in the Eastern Cape, South Africa.

A review of the literature revealed a growing reliance on electronic resources by higher education institutions worldwide to suffice the information needs of academic researchers and that usage of these is influenced by various factors. The factors identified in the reviewed literature as affecting the use of Internet-based information sources among students include: academic discipline affiliation, age, level of study, gender, information and communications technology (ICT) literacy, institutional support, relevance of available information resources, accessibility, marketing and publicity of information sources available, and training.

The researcher employed a survey research methodology to achieve the study objectives, through data collection on three fronts. Firstly to investigate the factors

that affect the use of Internet-based information sources from the perspectives of postgraduate students, self-administered questionnaires were distributed to a sample of 200 study participants obtained using quota sampling of the population of students from the three universities. A response rate of 66.5% was achieved. Secondly, data on the organisational factors influencing the use of Internet-based information sources were obtained by conducting semi-structured interviews with selected librarians at the three universities. Lastly, documentary analysis was also used to corroborate data obtained from the survey with postgraduate study participants, as well as from interviews with selected librarians.

The findings include that the use of Internet-based information sources is increasingly becoming important for postgraduate students at the selected universities in the Eastern Cape, South Africa. Postgraduate students believe that Internet-based information sources are useful in their academic work. There was moderate use of subscription e-databases and e-journals. Level of study and age were found to affect the use of Internet-based information sources, with older, Masters and PhD students utilising e-databases and e-journals more frequently. Postgraduate students predominantly use search engines to gain access to Internet-based information sources, while Online Public Access Catalogues (OPACs) and library websites were unpopular gateways to Internet-based information sources. Universities in the Eastern Cape were found to be supportive of the use of Internet-based information sources with budgets of libraries and future plans tipped in favour of electronic resource provision. From the findings of the study the key recommendations suggested for improving the use of Internet-based information sources by postgraduate students in the Eastern Cape province of South Africa, include that Information literacy training programmes at the three universities may be

tailor-made to cater for the information needs of postgraduate students at varying levels and academic disciplines of study. It was also recommended that the universities incorporate the use of federated searching and searchable journals management software on their library websites, in order to increase the visibility of Internet-based information sources among postgraduate students.

Table of Contents

Declaration	i
Acknowledgements	ii
Abstract	iii
Table of Contents	vi
List of Acronyms	xii
List of Appendices	xiv
List of Figures	xiv
List of Tables	xvi
Chapter One: Background to the study	1
1.1 Introduction	1
1.2 Background of research sites.....	11
1.2.1 Nelson Mandela Metropolitan University	12
1.2.2 Rhodes University	13
1.2.3 University of Fort Hare.....	14
1.2.4 South African National Library and Information Consortium	15
1.3 Statement of the problem	16
1.4 Research aim and objectives	17
1.5 Research questions	18
1.6 Significance of study	18
1.7 Scope and limitations	19
1.8 Definition of terms	20

1.9	Structure of the dissertation	21
1.10	Chapter summary	22
Chapter Two: Literature review		23
2.1	Introduction	23
2.2	Definition and purpose of the literature review	23
2.3	User studies	24
2.3.1	Digital information-seeking behaviour.....	24
2.3.2	The development and use of digital libraries	25
2.4	Internet-based information user studies	28
2.4.1	Studies from the Western countries.....	28
2.4.2	Studies from the developing countries.....	37
2.4.3	Findings peculiar to developing Countries	46
2.5	Factors affecting academic use of digital libraries.....	47
2.5.1	Individual factors.....	47
2.5.2	Organisational context factors	52
2.6	Patterns of student use of Internet-based information sources	57
2.7	Theoretical framework on technology adoption.....	59
2.7.1	Diffusion of innovations (DOI).....	60
2.7.2	Theory of reasoned action (TRA)	61
2.7.3	Technology acceptance model (TAM)	62
2.7.4	Application of TAM in information systems research	65
2.8	Chapter summary.....	70

Chapter Three: Research methodology	72
3.1 Introduction	72
3.2 Survey research methodology.....	72
3.2.1 Advantages of surveys	73
3.2.2 Disadvantages of surveys.....	75
3.3 Methodological approach	76
3.3.1 Triangulation.....	77
3.3.2 Quantitative approach.....	78
3.3.3 Qualitative approach.....	78
3.4 Study population	79
3.5 Sampling	81
3.5.1 Sampling frame	81
3.5.2 Sampling methods.....	82
3.5.3 Sample size	88
3.6 Research instruments	89
3.6.1 Self-Completion questionnaires.....	89
3.6.2 Face-to-face interviews.....	93
3.6.3 Document analysis	96
3.7 Pilot study.....	97
3.8 Ethical considerations	98
3.9 Data analysis.....	99
3.9.1 Data coding	99

3.9.2	Data entry	100
3.9.3	Reliability and validity	100
3.10	Limitations from data collection.....	101
3.11	Chapter summary	102
Chapter Four: Data analysis and presentation		103
4.0	Introduction	103
4.1	Presentation of data from E-Resource Use Survey.....	103
4.1.1	Response rate	103
4.1.2	Demographic characteristics	104
4.1.3	Internet use patterns.....	108
4.1.4	Individual factors affecting Internet-based information resource use..	126
4.1.5	Organisational factors affecting e-resource use	139
4.2	Interview results	157
4.2.1	Profile of Interviewees	157
4.2.2	Numbers of postgraduate students served by university libraries.....	157
4.2.3	Accessibility to the Internet and e-resources	158
4.2.4	Financial resources allocated to e-resources	159
4.2.5	Human resources: e-Resources management	160
4.2.6	E-resource marketing and publicity efforts.....	162
4.2.7	Postgraduate e-resource user satisfaction	163
4.2.8	E-resource service achievements.....	163
4.2.9	E-resource services challenges.....	164

4.2.10	E-resource service improvement plans	165
4.2.11	The future of digital libraries at the universities	165
4.2.12	Recommendations towards improving e-resource use.....	166
4.3	Chapter summary.....	167
Chapter Five: Interpretation and discussion of findings		168
5.1	Introduction	168
5.2	Factors affecting postgraduate students' use of Internet-based information sources	168
5.2.1	Individual factors.....	169
5.2.2	Organisational factors.....	177
5.3	Internet-based information sources available among the universities in the Eastern Cape.....	187
5.4	Patterns of postgraduate students' use of Internet-based information Sources	188
5.4.1	Use of the Online Public Access Catalogue (OPAC).....	189
5.4.2	Use of e-databases and e-journals.....	189
5.4.3	Use of search engines.....	190
5.4.4	Use of libraries' websites	191
5.4.5	Use of document delivery and current awareness services.....	191
5.4.6	Use of discussion lists and newsgroups.	192
5.5	The level of postgraduate students' satisfaction with Internet-based information sources available for their information needs.....	193

5.6	Chapter Summary	194
Chapter Six: Conclusion, recommendations, and areas of future study		196
6.1	Introduction	196
6.2	Conclusions.....	196
6.2.1	What factors affect postgraduate students' use of Internet-based information sources?.....	197
6.2.2	What Internet-based information sources do the selected universities avail for postgraduate students' use?.....	201
6.2.3	What are the patterns of postgraduate students' use of Internet-based information sources?.....	202
6.2.4	Are postgraduate students satisfied with the Internet-based information sources available for their information needs?.....	203
6.3	Recommendations	203
6.4	Suggestions for future research	206
6.5	Final conclusion	207
6.6	Chapter summary.....	211
References.....		212

List of Acronyms

ACRL	Association of College and Research Libraries
ARL	Association of Research Libraries
CLIR	Council on Library and Information Resources
CURL	Consortium of University Research Libraries
DLF	Digital Library Federation
DOI	Diffusion of Innovations
EIS	Electronic Information Sources
EJC	Electronic Journal Centre
e-JUST	Stanford e-Journal User Study
E-lib	Electronic Libraries Program
ERDS	Electronic Resources Discovery System
ICT	Information and Communications Technology
IS	Information Systems
IT	Information Technology
JISC	Joint Information Systems Committee
NMMU	Nelson Mandela Metropolitan University
ODLIS	Online Dictionary for Library and Information Science
Ohio LINK	The Ohio Library and Information Network
OPAC	Online Public Access Catalogue
PCs	Personal Computers
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
RIN	Research Information Network
RU	Rhodes University
SANLiC	South African National Library and Information Consortium
SEALS	South East Academic Libraries Consortium
TAM	Technology Acceptance Model
TEEAL	The Essential Electronic Agricultural Library

TRA	Theory of Reasoned Action
UFH	University of Fort Hare
UK	United Kingdom
USA	United States of America
WWW	World Wide Web

List of Appendices

Appendix A: University of Fort Hare subscription e-databases and e-journals.....	234
Appendix B: Nelson Mandela Metropolitan University subscription e-databases and e-journals	236
Appendix C: Rhodes University subscription e-databases and e-journals	238
Appendix D: Ethics clearance from the University of Fort Hare.....	243
Appendix E: Ethics clearance from Nelson Mandela Metropolitan University	244
Appendix F: Research clearance from Rhodes University	245
Appendix G: E-resource Use Survey questionnaire	246
Appendix H: Interview schedule for interviews with university librarians	251
Appendix I: Map of the Eastern Cape Province, South Africa	258

List of Figures

Figure 1: Diffusion of Innovations (DOI), (Adapted from Kanat 2009:8)	61
Figure 2: Theory of Reasoned Action (Adapted from Sirgusa and Dixon 2009:970) 62	
Figure 3: Technology Acceptance Model (TAM), (Adapted from Davis 1989:476)...	64
Figure 4: Gender profile of respondents.....	105
Figure 5: Age profile of respondents	106
Figure 6: Respondents' level of study	106
Figure 7: Respondents by University.....	107
Figure 8: Respondents by faculty	108
Figure 9: Period of Internet Use	109
Figure 10: Use of online public access catalogue	111
Figure 11: Use of e-Databases and e-Journals.....	112
Figure 12: Use of e-databases & e-journals by age	113

Figure 13: Use of e-databases & e-journals by gender	114
Figure 14: Use of e-databases & e-journals by level of study	115
Figure 15: Use of search engines	117
Figure 16: Use of search engines by age range.....	118
Figure 17: Use of search engines by gender.....	119
Figure 18: Use of search engines by level of study	120
Figure 19: Use of library websites	121
Figure 20: Use of document delivery and current awareness services	122
Figure 21: Use of discussion lists and newsgroups.....	124
Figure 22: Non-academic use of the Internet	126
Figure 23: Computer self-efficacy	127
Figure 24: Information literacy skills	129
Figure 25: Academic disciplinary culture of e-resource use	131
Figure 26: Academic discipline culture of e-resource use by faculty	132
Figure 27: The effect of e-resource use on study tasks.....	135
Figure 28: The effect of e-resource use on quality of work.....	136
Figure 29: The level of understanding on how to use e-resources.....	137
Figure 30: The level of ease of access to relevant e-resources	138
Figure 31: Learning how to use e-resources	139
Figure 32: Organisational and departmental support	140
Figure 33: Organisational and departmental support by university	141
Figure 34: Availability of relevant e-resources.....	143
Figure 35: Accessibility to e-resources at convenient times.....	145
Figure 36: E-resource access from a convenient location.....	147
Figure 37: Provision of computer terminals.....	149

Figure 38: Availability of information literacy training.....	151
Figure 39: Availability of technical assistance	152
Figure 40: Postgraduate students' level of awareness of available e-resources	155
Figure 41: Supervisor recommendations for specific e-resource use.....	156

List of Tables

Table 1: Sampling Frame of Postgraduate Students.....	82
Table 2: Postgraduate Students' Sample by University.....	86
Table 3: Postgraduate Students' Sample by Faculty	87
Table 4: Likert Scale Statements	93
Table 5: Computer self-efficacy by gender.....	127

Chapter One: Background to the study

1.1 Introduction

The emergence of information and communications technology (ICT) has significantly impacted on the information landscape throughout the world. Libraries of all sizes and types are embracing digital collections, with new purchases of journals, magazines, abstracting and indexing services being heavily weighted towards digital formats (Tenopir, Hitchcock & Pillow 2003: 1). According to Varghese (2008), the information environment is now greatly distributed and

“is populated by silos of: full text repositories maintained by commercial and professional society publishers; preprint servers and Open Archive Initiative (OAI) provider sites; specialised Abstracting and Indexing (A&I) services; publisher and vendor vertical portals; local regional and national online catalogues; web search and meta search engines; local e-resource registries and digital content databases; campus institutional repository systems; and learning management systems” (Varghese 2008:85).

Academic libraries have been at the centre of this change, as there is a shift in the focus of their collection development practices from print information sources to electronic information sources (Finlayson 2010). These libraries are investing heavily in digital collections where some or all their holdings are now available in electronic formats and accessed through the Internet (Rosenberg 2005).

In Africa, university libraries have also joined the digital bandwagon. Enormous progress has been made to ensure that staff and students in African institutions of higher learning can access the growing quantities of electronic information sources (Rosenberg 2005). Rosenberg (2005) asserts

that support has been provided to African university libraries to enable them to set up the necessary networked infrastructure and providing requisite hardware and software; while negotiations with publishers have resulted in journals and databases being made available for use by their user communities. It is within this context that South African academic libraries are moving towards digital collections, with substantial financial and human resources being channelled towards provision of Internet-based collections of electronic journals (e-journals), online databases and electronic books (e-books) among many others (Finlayson 2010).

Such a dramatic switch from print collections to digital, has an impact on library users and users' perceptions of the library (Tenopir *et al.* 2003: 1). Radical changes can be seen in the information-seeking behaviour of users as well as their expectations concerning library resources, with the advent of electronic information sources. Researchers increasingly find it important that all materials and sources of information should exist in digital formats while user demand for these types of information sources is rising rapidly (Songhui 2008; Marcum 2003). Users are now in most cases able to access digital content immediately, directly and unrestrictedly, with accessibility to online information sources available at numerous locations around the globe, at any time. This enables users to conduct research from their personal computers, located in their homes, offices and laboratories (Zimmerman & Paschal 2009; Sheeja 2010). Research findings can now be brought to light more rapidly through e-journals, listservs and e-mail (Marcum 2003). Thus this dramatic shift towards the provision of digital library services in academic environments, presents many advantageous opportunities for users.

However, there are also challenges presented by digital library innovations for the intended users. The reality of information-seeking behaviour among users in the electronic age is that they now have to interact with complex information systems, which hold much information and different ways to obtain it (Nycyk 2010). Zimmerman and Paschal (2009) suggest that it is challenging for librarians to create interfaces that are user centric, intuitive and easy to use. Diverse students and academics who use digital collections also have a variety of research needs and experiences with web-based information sources (Zimmerman & Paschal 2009). Thus the major challenge for the users is that they need to possess appropriate information literacy skills in order to be able to successfully utilise Internet-based information sources.

Despite challenges that may come with providing electronic information sources, academic libraries throughout the world continue to devote substantial resources towards providing Internet-based information sources to their academic user communities, with an underlying assumption that students would readily use electronic information sources in satisfying their information needs (Selwyn 2008). However, information science researchers have noted that digital libraries can easily remain unnoticed or are at best underutilised by students, in spite of their availability (Hammond 1994). Within the South African context, previous research has also revealed that significant numbers of students neither used e-journals or e-books, as well as there being a low usage of online databases and subject portals by students from the University of Zululand and the Durban University of Technology (Finlayson 2010; Nkomo 2009). Majid and Abazova (1999), also observe that the mere availability of sophisticated hardware and access to a variety of electronic

information sources would not be enough to actualise these innovative inventions. It is therefore important for institutions to identify critical factors that influence the use of digital libraries by users, as this has implications on how to maximise use of such libraries, and realise returns on investment. Understanding the factors affecting the digital information seeking behaviour of graduate students in the Eastern Cape, South Africa is therefore the bedrock of this study.

Studies that have been carried out reveal that the extent to which a university student will successfully interact with Internet-based information sources, is influenced by individual and organisational factors surrounding them (Davies 1997; Hong *et al.* 2002). Thus it is argued that the individual characteristics of an intended user of a digital library system and the organisational environment within which they operate are vital determinants of whether or not a user will embrace and successfully use electronic information sources.

With regards to individual factors, some studies indicate that individual characteristics such as a person's level of ICT literacy skills, Information literacy skills, their age or gender may determine whether or not they can use digital libraries. Cotten & Jelenewicz (2006) suggest that even within a population of college students, divisions in students' Internet use may well be found along demographic lines of gender, race, background or technological exposure. In their study Majid and Abazova (1999) tested if there were significant differences in academics' use of electronic information sources by focusing on the individual's characteristics of computer literacy; age and gender. They found out that majority of faculty members with very good and

excellent computer skills, were frequently using electronic information sources, while among those members with low ICT literacy skills, the use of these resources was minimal. Thong, Hong and Tam (2002) hypothesised and subsequently confirmed from their study that computer self-efficacy and computer experience can help users to gain more confidence in using the digital library. Therefore it can be argued that the level of ICT literacy skills of graduate students, may determine how effectively they may be able to use Internet-based information sources.

Some studies however indicate that while student users of a digital library may possess general computing skills, they often lack information literacy skills which are necessary to access quality electronic information sources offered by their libraries (Wong *et al.* 2009; Connaway & Dickey 2010). This may mean that in addition to ICT literacy skills, users need to have information literacy skills which would enable them to successfully; search for, access and use Internet-based information sources.

The study by Majid and Abazova (1999) also revealed that the age of academics had a direct bearing on their Online Public Access Catalogue (OPAC) use, with respondents between the 31-50 years age bracket using the OPAC, while those above the 50 years age bracket were not. Elsewhere, researchers have also argued that the younger generation of student populations are more likely to embrace digital libraries, than their more mature counterparts (Bar-Ilan, Peritz & Wolman 2003; Hinson 2006). Thus it was deemed useful to find out if differences in age among graduate students in

the Eastern Cape, has any bearing on their use of Internet-based information sources.

Several studies also indicate that there are significant differences along gender lines, on users' adoption of electronic information sources. Kim (2010), argues that males have higher levels of computer self efficacy, which enables them to utilise technology to access information more than their female counterparts. Some studies have however indicated that there are no differences in the use of electronic information sources along gender lines of users (Tenopir *et al.* 2003). This study sought to discover if there were any significant differences along gender lines in the use of Internet-based information sources.

The academic discipline to which a particular student is affiliated, has also been discovered to affect students' patterns of use of networked information resources (Al-Aufi 2006). A study carried out by Talja and Maula (2003), indicated that scholars in the science-based academic disciplines were heavy users of e-journals and electronic databases (e-databases), unlike their colleagues in the humanities. Some argue that the reason for these differences, is that users in the hard science disciplines started using ICT's well before their social science colleagues, therefore would have more experience with technology and are naturally more favourably disposed to using electronic information sources. Discovering disciplinary differences in the use of digital libraries has practical implications on decisions academic library managers make concerning electronic services (e-services) for specific groups of library users, as one size does not fit all (Whitmere 2002). Therefore

in this study, academic discipline was considered as one of the variables that possibly influences the use of Internet-based information sources by graduate students.

User attitudes have also been revealed to be among the contributory factors towards the use or non-use of Internet-based information sources. Barry and Squires; Pare and Elam (cited in Davies 1997:385) suggested that personal beliefs about computer use and its perceived consequences may be the strongest factors determining discretionary use of technology among academics. Several other studies have also demonstrated that users perceptions of use and usefulness of digital library, will also affect their levels of interactions with them ((Hong, Thong, Wong & Tam 2002; Thong, Hong & Tam 2002; Cheung & Huang 2005). This study sought to discover graduate students' perceived ease of use and perceived usefulness of Internet-based information sources provided by the universities in the Eastern Cape.

The organisational context within which a university student learns is another category of external variables that is increasingly recognised as a vital determinant of their use of Internet-based information sources (Davies 1997). These include institutional and faculty support, where for example the level of institutional and faculty resourcing can potentially enhance or inhibit Internet-based information use among users (Eynon 2005). Thus those institutions with policies that encourage e-learning and actively provide financial, human and infrastructural resources towards digital library development, create an environment where users can access and use electronic information sources.

Ajiboye and Adeyinka (2007), observed that a major challenge faced by most tertiary institutions in Africa, is the provision of infrastructural facilities such as Internet connectivity. They also noted that, even in those universities where Internet facilities were available, there was still a limitation in terms of access to the students. It can therefore be argued that poor infrastructural Internet facilities can inhibit access to electronic information sources by users. Agaba (2005) also suggests that as university libraries invest more in Internet-based information sources, sufficient computers are necessary for patrons to be able to access information. The technological infrastructure available also affects the location from which users can access Internet-based information sources. Users may prefer to access electronic information sources anywhere on campus, other than the library or off campus. According to Thong *et al.* (2002) location of access can determine the success or failure of a digital library, from the users' perspective. It was therefore necessary to investigate the quality of technical infrastructure provided by the universities under study, and to find out whether or not this affects graduate students' access and use of Internet-based information sources.

An important organisational variable that has been identified to affect use of a digital library by university students, is the relevance of the sources offered by the system, towards meeting the users' information needs. Thus some researchers argue that users may be more inclined to use Internet-based information sources if they find them to be relevant for their research requirements. (Thong *et al.* 2002; Tenopir *et al.* 2003). Relevance of the information sources is therefore seen as a strong motivating factor towards

use. In this study, the perceptions of graduate students of the relevance of available Internet-based information sources, were sought.

Another set of organisational variables that have been revealed in literature to affect use of Internet-based information sources by intended users are the visibility of the digital library; information literacy training as well as technical support. Nkomo (2009), recommended that in order for libraries at institutions of higher learning to encourage use of Internet-based information sources, they must employ proper marketing strategies; offer appropriate web literacy training and effective technical support. Several studies indicate that users may fail to use electronic information sources relevant for their research needs because they lack awareness of the existence of these sources (Radford & Connaway 2008:9; Connaway & Dickey 2010). The study sought to discover the level of graduate students' awareness of Internet-based information sources available for their information needs.

Academic libraries can help improve the information literacy skills of users by offering effective information literacy training programs. As previous studies have revealed that users of digital libraries lack information literacy skills, information literacy teaching is therefore considered as a core library role towards helping to increase usage of these resources (Consortium of University Libraries [CURL] & Research Information Network [RIN] 2007:47). Recommendations of different information literacy strategies that university libraries can employ to improve digital library usage have been offered by various researchers(Nkomo 2009: 143; Finlayson 2010: 76; Wong *et al.* 2010:

24). This study sought to establish if graduate students had received any formal training from their university libraries.

The nature of digital libraries is such that users may encounter technical problems which may prevent them from accessing and using Internet-based information sources. Availability of quality technical support is therefore considered of utmost importance for the successful use of digital libraries, by researchers. Davies (1997) argues that poorly trained staff on technical aspects of a digital library will tend to discourage users from using electronic information sources, because if something goes wrong, they cannot fix it. Nkomo (2009) also discovered that unfriendly computer laboratory officials deterred students' use of World Wide Web (WWW) information resources. It is therefore necessary to have trained library staff, who are able to promptly respond to technical user queries.

From the above literature, it is evident that there are various individual and organisational factors that have been identified as affecting the use of Internet-based information sources. This study sought to identify the particular factors influencing postgraduate students' use of Internet-based information sources at universities in the Eastern Cape Province of South Africa. Discovering the influencing individual and organisational factors affecting use of electronic information sources in this region has implications on how libraries at the institutions of higher learning under study can improve their e-service delivery, to specific groups of their user populations.

1.2 Background of research sites

The three institutions chosen for this study: Nelson Mandela Metropolitan University (NMMU), Rhodes University (RU) and University of Fort Hare (UFH) exist in the broader context of Africa and from a national context recovering from political, social and economic injustices brought about in the apartheid era. At institutional level, the three universities are regional members of the South African National Library and Information Consortium (SANLiC), the organisation responsible for the provision of scholarly electronic resources to institutions of higher learning, and research organisations in the country.

According to a study conducted by Rosenberg (2005), on the status of the incorporation of digital libraries in African institutions of higher learning, despite all the plethora of actions and projects it is difficult to obtain a good overview of the status of electronic and digital initiatives in African higher education. Rosenberg (2005) further says that where there is evidence, it suggests that progress made by libraries is uneven, both between and within countries. Her research revealed that some university libraries had embraced new mediums and made them available to users; others do not have the necessary infrastructure to access these e-resources now available on country-wide licences; while those that have advanced down the digital road do not yet appear to have explored user needs in the digital world and the possibilities of a more dynamic interaction with Information and Communications Technologies (ICT's). When compared to the rest of African universities, South African institutions of higher learning are according to Nkomo (2009), better off in their technological advancement, but their development is overshadowed by the historical legacy of apartheid, which still reveals disparities in resource allocation and infrastructure among the different universities in South Africa. The democratic

government is however taking measures to address these imbalances. It was envisaged by the researcher that by incorporating these three different institutions in the study, it would avail an overview of the status of digital library use by postgraduate students at three different South African universities. It was also possible to explore the differences in progress made towards provision of Internet-based information sources by academic libraries in the Eastern Cape region of South Africa.

1.2.1 Nelson Mandela Metropolitan University

Nelson Mandela Metropolitan University (NMMU) was established in 2005, as a result of a merger of three different institutions, namely PE Technikon, the University of Port Elizabeth and the Port Elizabeth campus of Vista University. This union came about as a result of the democratic government's countrywide restructuring of higher education intended to deliver a more equitable and efficient academic system (Nelson Mandela Metropolitan University [NMMU] 2012).

A brief history of the three institutions before the merger reveals that the PE Technikon traces its roots to the PE Art School that was founded in 1882, which later became the College for Advanced Technical Education (CATE) and then became the PE Technikon in 1979. At the time of the merger, PE Technikon had more than 10000 students (NMMU 2012).

The University of Port Elizabeth (UPE) was established in January 1964, and was the first dual-medium residential university in the country. The campus was built on 830 hectares of land and was declared a nature reserve in 1983. At the time of merger, UPE had more than 9000 contact students and approximately 5000 distance education students (NMMU 2012).

Vista University (Vista PE) was founded in January 1982, with seven decentralised contact tuition campuses, near the township areas. Vista PE's focus was on providing accessible and affordable higher education to students from socially and financially disadvantaged backgrounds. At the time of the merger, Vista PE had approximately 2000 students (NMMU 2012).

According NMMU 2009 Annual Report (2009), the university had a total of 25580 registered students, of which 3453 were postgraduate students and 22127 were undergraduate students. It offers degrees, diplomas and certificates from seven faculties which include Arts; Business and Economic Sciences; Education; Engineering, the Built Environment and Information Technology; Health Sciences; Law and Science. The university is located on seven campuses in the Nelson Mandela Metropole and George.

1.2.2 Rhodes University

Rhodes University (RU) is a small, prestigious university located on 203 hectares of land in Grahamstown, which is a small town within the Eastern Cape in South Africa. Rhodes University traces its origins to the establishment of Rhodes University College, which was founded by an act of parliament in May 1904 (Rhodes University 2011). In 1918, the Rhodes University College then became a constituent college of the new University of South Africa, in a bid to save the college from the threat of dissolution due to dwindling finances (Rhodes University 2011). In 1947, Rhodes opted to become an independent university, and in 1949 a Rhodes University Private Bill was passed (Rhodes University 2011). Rhodes became an independent university, and was inaugurated in March 1951, with the help of financial donations from well-wishers including the government, the Grahamstown City Council, Rhodes

Trustees, directors of De Beers Consolidated Mines and numerous other private and public organisations as well as other individuals (Rhodes University 2011).

Since its inception RU has maintained its culture of being a small university. It has approximately 6000 students of which 1612 are postgraduate students. Fifty-five per cent of the students live in the university residences. Rhodes is a cosmopolitan university drawing students from across South Africa, the Southern Africa Development Community (SADC) region and overseas. It boasts of a lecturer-student ratio of one lecturer to fifteen students. It is also a comparatively a well-resourced institution of higher learning in South Africa, and is rated amongst the best research institutions in the country.

Rhodes offers degrees from six faculties, namely Commerce, Education, Humanities, Law, Pharmacy and Science.

1.2.3 University of Fort Hare

The University of Fort Hare (UFH) is one of Africa and South Africa's oldest universities, having been founded in 1916 as an institution of higher education for Africans. It survived near closure in 1999; a situation rooted in the inequitable treatment the university was subjected to during the apartheid era, and exacerbated by poor leadership and declining student numbers. UFH has an intricate history that not only parallels, but reflects the contradictions of modern history of South Africa. Today however, it has defied all odds and is striving towards being a vibrant intellectual centre, already a major contributor to economic, political and social development at local, provincial and national levels (University of Fort Hare, 2009).

The university has three campuses the main campus being at Alice which is a small rural town; the other two campuses are located in East London and Bisho

respectively. In the 2011 academic year, the university had 10400 registered students of which 1880 were postgraduate students. It has six faculties' namely Education; Law; Management and Commerce; Science and Agriculture and Social Sciences and Humanities and offers 189 degrees and diplomas within departments in the different faculties.

1.2.4 South African National Library and Information Consortium

The South African National Library and Information Consortium (SANLiC), is an academic libraries consortium whose mission is to facilitate the affordable access to scholarly electronic information in support of the learning, teaching and research activities of its members, through collective negotiations with publishers, while also promoting the use of high quality, open access electronic information resources (SANLiC, 2011). The need for collaborative efforts in the purchase of e-resources, as represented by SANLiC as an organisation represents the magnitude of investment required to make these resources available to users at member institutions.

SANLiC's membership currently consists of 34 member institutions. Apart from negotiating information resource deals on behalf of its members, it also acts as an advisory board, a communications link as well as offers opportunities for the exchange of ideas and training through hosting periodic workshops. It also has a standing board of directors that meets periodically and makes decisions on behalf of its members.

1.3 Statement of the problem

Universities in South Africa are making substantial investments in the provision of Internet-based information resources for their academic community needs. Both individually as well as through the South African National Library and Information Consortium (SANLiC), South African university libraries, spend millions of Rands every year towards subscriptions to online digital libraries, which include subject databases, scholarly e-journals, and e-books, among many other electronic information sources. These are made available to member institutions which include the Nelson Mandela Metropolitan University (NMMU), Rhodes University (RU) and the University of Fort Hare (UFH) for use by their academic communities, including postgraduate students. The Internet-based information sources are availed to them on the assumption that they may be easily used by them as well as meet their research information needs.

As has been demonstrated above, research carried out elsewhere in the world and in South Africa has revealed that digital libraries can easily remain unnoticed by students or are underutilised in spite of their availability. The researcher suspected that Internet-based information sources were being underutilised by postgraduate students in the Eastern Cape Province of South Africa. Therefore the study sought to answer the question: why do postgraduate students underuse Internet-based information sources? The researcher hypothesised that organisational and individual factors are among the critical external determinants of how postgraduate students will interact with Internet-based information resources, leading to either use or non-use of these resources. The non-use or underutilisation of Internet-based information sources by postgraduate students in this region would defeat the purpose of investing in their provision.

To the best knowledge of this researcher, there is no clear evidence of research that has been carried out amongst universities in the Eastern Cape, to probe into the critical factors affecting the pattern of use of Internet-based information sources by postgraduate students. As substantial financial investments are being reserved for the provision of Internet-based information sources, it is crucial that these universities be aware of the critical factors affecting their use by postgraduate students. Insight gained from this study would be useful for the academic libraries in this region to improve their digital library services, for optimal benefit to their student communities.

1.4 Research aim and objectives

The main aim of this study was to determine the extent to which organisational and individual factors affect the use of Internet-based information sources by postgraduate students and the effect of these on meeting their information needs.

The specific objectives of the study were to:

1. Determine the factors affecting the use of Internet-based information sources by postgraduate students, at three universities in the Eastern Cape, South Africa.
2. Establish the Internet-based information sources available among universities in the Eastern Cape.
3. Identify the patterns of postgraduate students' use of Internet-based information sources.
4. Find out the level of postgraduate student satisfaction with Internet-based information sources available for their information needs.

5. Suggest ways of stimulating the use of Internet-based information sources by postgraduate students at universities in the Eastern Cape, South Africa.

1.5 Research questions

The study attempted to answer the following questions:

1. What are the factors that affect postgraduate students' use of Internet-based information sources?
2. What Internet-based information sources do the selected universities avail for postgraduate students' use?
3. What are the patterns of postgraduate students' use of Internet-based information sources?
4. To what extent are postgraduate students satisfied with the Internet-based information sources available for their information needs?
5. How may use of Internet-based information sources by postgraduate students be stimulated at universities in the Eastern Cape, South Africa?

1.6 Significance of study

In the electronic environment, user studies which are carried out to find out the mode of interaction of the user community with the information system are very important as they play a vital role in planning, designing and introducing new information services and their utilities (Varghese 2008). The findings of this research provide valuable insights into how university and library administrators may help in the making of informed decisions on the development of better digital library services in the Eastern Cape region and the larger South Africa.

The research also sought to fill a knowledge gap in academic use of Internet-based information sources, from a South African perspective. Studies on academic use of

Internet-based information sources have been carried out in some parts of the world and are available for scholarly research on reputable databases such as Emerald. However, the majority of this research is focused on Europe and USA (Hinson 2006). The restrictedness of these studies to developed regions creates a void of useful empirical literature in academic Internet use studies within Africa. This study sought to contribute towards filling that information gap, as it was carried out within the unique academic setting of the Eastern Cape Province of South Africa. The province came into existence under the auspices of the new democratic government of South Africa in 1994, and incorporated former Xhosa homelands of the Transkei and Ciskei and part of what was the Cape Province during the apartheid era.

It has also been noted that while graduate students are a segment of the student population that is most highly engaged in the research process, multidisciplinary studies that focus on graduate students as they conduct their research and process of enquiry are lacking in previous studies (George *et al.* 2006). This study seeks to address that gap and provide insight into the factors influencing the Internet information-seeking behaviour of graduate students, as this has implications to help meet their research information needs, in this digital era.

1.7 Scope and limitations

The scope of the study covers the use of Internet-based information sources, provided by university libraries for postgraduate students' use at the selected universities. The use of other types of information sources and services offered by the libraries, were therefore excluded.

The participants in the study were drawn from available, fulltime postgraduate students, across the subject disciplines offered by the three universities under study.

Postgraduate students registered part time were therefore excluded. It was also not possible to gain access to complete lists of postgraduate students, from the three universities; therefore non-random sampling was used to draw participants used in the study.

Because of limitations of budget for travelling and accommodation costs, as well as the time available to conduct the research, the researcher only collected data from the main campuses of the three institutions.

1.8 Definition of terms

Digital library- While there are several definitions of a digital library, the working definition adopted for this study is that a digital library is a collection of collections of electronic knowledge resources, developed and maintained in order to meet the totality of information needs for a given user population (MacCall, Cleveland & Gibson 1999). It is a managed collection of information stored in digital formats and accessible over a network (Arms 2000). Various types of information may be incorporated including converted printed materials, as well as a broad range formats including e-books, journals, sound recordings, pictures and video.

Information-seeking behaviour- The manner in which a user goes about seeking information, in order to fulfil an information need. It is the purposive seeking for information as a consequence of a need to satisfy some goal (Wilson 2000). It includes the decision making process concerning the best information system to enquire from, as well as how they will use the chosen system or systems (Siatiri 1999).

Internet-based information sources- Scholarly information found in electronic format over the web including subject databases, peer-reviewed journals, e-books,

abstracting and indexing databases, online public access catalogues (OPACs), search engines, institutional repositories, newspapers, and archival documents. Interchangeably used with the term electronic information sources (EIS).

User studies- User studies are studies about people, their behaviour and contexts. They cover a wide range of topic and foci including foci on the users', the use of a particular information source, system or focus on an organisation (Banwell & Coulson 2004)

1.9 Structure of the dissertation

Chapter One: Introduction. This chapter introduces the background to the study and outlines the problem that was investigated. It outlines the statement of the problem; as well as the research questions and objectives that guided the study. The significance of the study is also highlighted, while the scope and limitations of the study were outlined. It concludes by defining the important terms used in this report.

Chapter Two: Literature Review. This chapter focuses on previously written literature related to Internet-based information seeking behaviour of university students in the world and region. It also outlines the theoretical framework on Internet-based information use by university students.

Chapter Three: Research Methodology. This chapter outlines the choice and reasons for the use of survey methodology used in the study, the research instruments employed, the data collection plan followed, and the data analysis procedures employed using SPSS to obtain results.

Chapter Four: Data Presentation, and Analysis. This chapter presents findings from the study using graphs and tables and analyses the findings

Chapter Five: Interpretation and Discussion of Findings

Chapter five discusses the findings of the study in light of the research objectives, and related literature.

Chapter Six: Conclusions and Recommendations. This chapter provides sub conclusions to the study findings and makes recommendations on how to increase the use of digital libraries in the region, as well as outlines areas where further research can be carried out.

1.10 Chapter summary

This chapter gives a background to the study by demonstrating the worldwide adoption of digital libraries by academic libraries around the world. It provides a background of the three universities in the Eastern Cape, South Africa, selected for the study, as well as a brief description of the South African Library and Information Consortium (SANLiC) to which the universities belong. The chapter identifies the problem that in spite of huge investments directed towards the development of digital libraries, which include Internet-based information sources; these can remain underutilised by intended users, who include postgraduate students. Chapter one outlines the research objectives and questions that guided the study. It highlights the significance of the study towards filling an information gap from a developing world perspective, and concludes by defining the scope of the study, highlighting the challenges and limitations encountered by the researcher. Important terms used in the study are defined. The next chapter is a review of related literature including a description of theories that have been used to explain technology diffusion.

Chapter Two: Literature review

2.1 Introduction

This chapter reviews previous works done in literature related to information-seeking behaviour of users in digital library environments and on related fields of technology acceptance. It describes views on what constitutes user studies and information-seeking behaviour in a digital era. Previous studies on the use of Internet-based information sources by users in academic institutions are discussed. The chapter also gives insight into critical factors that have been identified in literature to affect academic use of digital libraries. An overview of theories that have been successfully used in the information systems research to explain technology adoption is given, while highlighting the technology acceptance model (TAM) as the guiding theoretical framework in this study.

2.2 Definition and purpose of the literature review

A literature review describes literature relevant to a particular field or topic of study (Emerald Publishing Group 2013). It provides a critical analysis of published sources or literature on a particular topic (Queensland University of Technology 2013). An assessment of available literature is done, providing a summary classification, comparison and evaluation of available literature on a particular topic (Queensland University of Technology 2013). The Emerald Publishing Group (2013) further says that “a literature review may be purely descriptive, or it may provide a critical assessment of the literature in a particular field, stating where the weaknesses and gaps are, contrasting the views of particular authors or raising questions”. In this study, previous literature on user studies and digital information seeking were evaluated. The gaps on valuable empirical insights on the use of Internet-based

information sources by postgraduate students from the South African context were identified, thereby giving direction to the particular focus of this study.

Kaniki (cited in Kalusopa 2011:47) says that a literature review can be historical, thematic, theoretical or empirical and recommends that a combination of these be adopted. The current study therefore adopted a combination of the thematic, theoretical and empirical approaches to literature review, to provide a full scope of available literature on digital information-seeking behaviour.

2.3 User studies

Based on the concept of a “user-centred” approach, library use and user satisfaction are good methods to study and diagnose various problems in libraries and help managers with their decision-making (Songhui 2008). In this case the phenomenon being investigated is the use of Internet-based information sources by postgraduate students. Knowing the critical factors affecting the use of these resources would go a long way in helping academic library administrators make informed decisions, leading to the improvement of their digital library service for specific user groups within the region.

2.3.1 Digital information-seeking behaviour

As the web, the digital libraries and information retrieval systems become a major form of information access for many users, it is necessary to learn more about their interactions with information retrieval technologies during the information search process (Varghese 2008). Empirical evidence on user interaction with electronic libraries would enable key decision makers to make informed decisions on where to allocate the much needed resources for the provision of better services. Libraries will be faced with many decisions on how to organise their services and materials in

order to adapt to changes, brought about by the digital library revolution. Only by conducting user studies can librarians understand how the move to electronic resources is affecting the library's users and how the library's service can be modified to have the most positive effects. Thus only by gathering evidence about the library users, their interactions with library services and materials, and the context in which those services and materials are used can library managers make sound decisions (Siatri 1999). Therefore studying the Internet-based information-seeking behaviour of postgraduate students at selected universities in the Eastern Cape province of South Africa is crucial if academic libraries, in this region hope to serve their communities more effectively.

2.3.2 The development and use of digital libraries

There is currently much confusion surrounding the term digital libraries, with some equating the term "digital library" to mean the same as virtual library or electronic library or the Internet, while others refer the term digital library, to mean an entire organisation, including the people, processes undertaken to bring a digital library into existence (Cleveland 1998). However, the working definition that was adopted in the current study is the same as the one adopted in the IFLA/UNESCO manifesto for digital libraries which says that

"a digital library is an online collection of digital objects, of assured quality, that are created, or collected and managed according to internationally accepted principles for collection development and made accessible in a coherent manner, supported by services necessary to allow users to retrieve and exploit the resources" (IFLA 2012).

The emphasis therefore in this study is on the nature of digital library being an organised collection of digital documents or objects for use by users in an academic library environment.

Libraries of all sizes and types are embracing digital collections. Driven by economic pressures, electronic resource discovery systems (ERDS) are increasingly replacing physical collections in libraries. ERDS include library subscribed electronic databases, e-journal portals such as EBSCO and ProQuest, federated search engines, e-books and catalogues (Stelmaszewska, Wong & Sanderson, 2010). New purchases of journals, magazines and abstracting indexes are heavily weighted toward digital, while e-books are becoming a presence in library collections. The academic landscape is therefore being shaped by the prevalence of digital libraries, as sources of research information to fulfil users' needs.

Libraries prefer digital collections for reasons including that journals can be linked to and from indexing and abstracting databases; access to them can be from the user's home, office or dormitory whether or not the library is open; the library can get usage statistics; and digital collections save space and are relatively easy to maintain (Tenopir 2003). According to Hinson (2005), other benefits that can be realised through the use of the Internet in academic institutions include that users can have access to multi-media data through the World Wide Web (WWW). This is further enhanced through facilities such as search engines; meta-search engines and information gateways; while the file transfer protocol and telnet facilities allow users to utilise information at remote locations as well as supports networking among professionals in the same field. Hong *et al.* (2002) further assert that the major advantage of digital libraries include that resources can be stored in digital forms which are easier to keep track of. Digital libraries also enable remote access by users, and give fast and fair access to digital library collections while techniques for searching offer increased flexibility and power to users (Hong *et al.* 2010). There is evidently much potential to be realised from academic libraries embracing electronic

libraries, yet it is crucial to be aware of the extent to which these same libraries are enjoying success in their new found innovations.

While there is much to be gained from integrating Internet-based information sources as tools for research at institutions of higher learning, there is much evidence to suggest that success at fully exploiting these resources is still an elusive goal for many higher education institutions around the world. One major issue is the non-use or underutilisation of these costly resources by the intended users including university students. In a study carried out by Hong *et al.* (2002), it was discovered that despite all the efforts aimed at developing usable digital libraries to provide better and easier access to a vast amount of electronic collections, these digital libraries could easily remain unnoticed by students or were seriously underutilised in spite of their availability. Stelmaszewska *et al.* (2010) in a study on information seeking behaviour in electronic resource discovery systems (ERDS) made the discovery that despite heavy investment in ERDS, users are still not accessing the quality materials available in them, but are instead more than ever preferring search tools such as Google which often do not lead to high quality scholarly materials located in these electronic resources. Within the South African context, in a study by Finlayson (2010), it was revealed that as many as a third of both postgraduate and undergraduate students neither used e-books or e-journals. The study also revealed that e-books have a significantly lower usage among student users, with respondents reporting several challenges hampering their access to e-books. Another South African study by Nkomo (2009) also revealed a low usage of online databases and subject portals by students from both the University of Zululand and the Durban University of Technology. Some of the reasons that lead to underutilisation of these Internet-based information sources among intended users

include: that users are unaware of available relevant sources (Radford & Connaway 2008:9); poor infrastructural accessibility to the networked information sources (Ajiboye & Adeyinka 2007); inadequate information literacy skills among the users (Wong *et al.* 2009) and negative perceptions and attitudes concerning the usefulness or relevance of the sources (Thong *et al.* 2002). It is therefore important to investigate factors that influence the user's intention to use digital libraries, as this has implications on improving their usage among the academic communities.

2.4 Internet-based information user studies

How people use electronic information sources, or their preferences for print or electronic library services have been the focus of many recent research studies (Tenopir 2003:25). The following is an analysis of some major academic digital library user studies conducted in the Western world, as well as a review of selected individual studies from the developing world; including South Africa.

2.4.1 Studies from the Western countries

One of the most comprehensive literature reviews of user studies from the west was done by Tenopir (2003). She identified and analysed more than 200 research publications that focused on electronic library use. These were grouped into two tiers; that is tier one which consisted of eight major studies, commissioned by major United Kingdom (UK) and United States (US) research institutions; and tier two studies that consisted of about 100 individual research publications. Some of the major studies Tenopir (2003) identified include: The SuperJournal Project; studies from the Digital Library Federation, the Council on Library and Information Resources and Outsell (DLF/CLIR/Outsell); The Stanford e-Journal Users Study (e-Just/Hirewire); OhioLink; Tenopir and King studies; Libqual; JSTOR studies. These

together with studies identified by Connaway and Dickey (2010) in a report compiled for the Joint Information Systems Committee (JISC), are discussed; followed by a summary of the major findings from all the studies conducted in the western countries, to conclude this section.

The UK SuperJournal was a project in the Electronic Libraries Program (e-lib), which was established to investigate factors leading to the success of electronic journals (Eason, Richardson & Yu 2000). The study sought to investigate the academics' use of electronic journals including the discovery features they value most (Pullinger 1999). The project developed an application 'SuperJournal' that contained electronic versions of 49 recent journal issues. These were made available to thirteen research institutions and the use of these journals was monitored by the application development team (Eason *et al.* 2000) A variety of research methods were employed to gather data on staff and students' patterns of use of the SuperJournal, from the 13 British universities. These included surveys; transaction log file analysis, interviews and focus groups (Tenopir 2003).

Some major findings from SuperJournal studies included that users vary in their patterns of use of e-journals depending on their subject discipline and status. The project also identified seven categories of e-journal users: enthused; journal focused; topic focused; article focused; bingers; explorers and window shoppers (Eason *et al.* 2000; Tenopir 2003). Because of the prevalence of this diversity in users, the researchers recommended that there is need for stakeholders in e-journal provision to be able to cater for the needs of diverse groups of users (Eason *et al.* 2000). This proves the necessity for this study, as studying postgraduate students' use of Internet-based information sources at universities in the Eastern Cape South Africa, would help library administrators identify the diversity of information needs for this

group of users. This would enable them to better cater for the diverse needs of postgraduate students in the Eastern Cape region of South Africa. It was also discovered from the SuperJournal project, that as a result of exposure to e-journals, users visit the library less because of desktop access; they accomplish tasks more efficiently; felt more up to date and will do what works for them (Tenopir 2003). This demonstrates that electronic information sources are influencing a change in the information-seeking behaviour of academics, with users preferring the convenience brought about by the use of Internet-based information sources (IIS). Academic users also enjoy the usefulness of electronic information sources (EIS), as they help the users to perform their research tasks better.

A recurrent theme in many digital library user studies is that digital library users in academic settings differ in their use of EIS based on their affiliated academic discipline, as well as other demographic characteristics, such as gender. Between the period 2001 and 2002, the United States (US) Digital Library Federation (DLF) and the Council on Library and Information Resources (CLIR), commissioned a study on the use of both print and electronic resources, at selected private and public doctoral research universities and liberal arts colleges. A survey of 3200 graduate and undergraduate students was conducted, using interviews, with questions designed to solicit information about their preferences and use of electronic resources (Tenopir 2003). The results of the DLF studies revealed that the use of e-journals varies according to the academic disciplines, the particular use the e-journals are consulted for (i.e. teaching or research), and the status of the individual. Law students were discovered to be low users of e-journals, while biological sciences students were considered high users of e-journals (Tenopir 2003). The DLF study revealed that respondents differ in their level of comfort with electronic

information, depending on discipline and their study levels. Respondents' in the arts and humanities were revealed not to feel as comfortable with electronic information as did respondents from the social sciences, engineering and business disciplines. Respondents also differed in their use of e-journals based on gender, with more women accessing e-journals for research than did men (Tenopir 2003). While it has been argued that some demographic characteristics such as age and gender have been found not to affect the use of EIS in some studies (Finlayson 2010), in the current study the researcher sought to discover if any significant differences existed in the use of IIS based on demographic characteristics, of the postgraduate students chosen for the study.

The Stanford e-Journal Users Study (e-JUSt), sought to gain insight into the use of electronic journals among graduate students; faculty members and clinicians from universities; hospitals; government and academic research institutions from 99 countries (Tenopir 2003). The study was carried out between 2000 and 2002, and it employed a variety of data collection methods, including user surveys; transaction log analysis and ethnographic study of scholarly e-journal usage. Some key findings from the study include that online journals have become a very common method for article retrieval, suggesting that e-journals help make scholarly activities more efficient (Institute for the Future 2002a). Scholars were also discovered to use e-journals in personalised ways, shaped largely by the scholarly contexts and the disciplines and communities of practice in which they learn or think. This suggests that the organisational context, in which scholars learn, can influence the patterns of use of electronic information sources. The researchers also suggested that a common explanation for these personal practices is convenience, as scholars use whatever is free and easily available at their institutions (Institute for the Future

2002b). Therefore the intended users of a digital library system will likely use it, if the information sources are easily accessible and free.

The e-JUSt study also revealed differences in user behaviour between work fields and work roles. Biologists were discovered to be more likely to read e-journals than other life scientists (Tenopir 2003). The researchers suggested that the reason for such a difference in information-seeking behaviour could be attributed to the fact that particular fields such as biology have distinct rates of innovation and discovery different from those in other fields, which could influence frequency of use of e-journals. The e-JUSt study also found differences in journal use by age of readers, where younger readers reported that they were more likely to be frequent e-journal users than older readers. Older scholars also reported more trouble with e-journal interfaces, suggesting that the older generation are not technologically savvy. The older scholars were also less likely to think e-journal usage increased their scholarly productivity. The researchers attributed such differences to formative practices developed early in the scholar's career, with the possible outcome that younger scholars developed such practices with personal computers and Internet tools, while older scholars had no such exposure (Institute for the Future 2002a). However, with the pervasiveness of Internet-based information sources, some later studies have found age to have no significant effect on the way scholars interact with electronic information sources. With this in mind, in the current study, the researcher sought to discover if the demographic characteristic of age had any effect on the use of Internet-based information sources by postgraduate students, at the three selected universities under study.

The Ohio Library and Information Network (OhioLINK); a consortium of college and university libraries in Ohio, USA, availed the Electronic Journal Centre (EJC) a digital

library of licenced journals, to scholars and researchers at member institutions (Sanville 2001). Transaction log analysis was used to measure usage levels and usage patterns of the EJC across all OhioLINK's member libraries (Sanville 2001). The study analysed the number of articles users downloaded from the EJC by users from the participating institutions. The key findings from this project were that e-journal users were reading from a wide array of journal titles than had been anticipated, and that all member libraries had experienced growth in the annual number of downloads (Tenopir 2003). The researchers also discovered that providing electronic access to journals increased their use exponentially (Tenopir 2003). In the current study, the researcher sought to find out the Internet-based information sources provided for postgraduate student use by the three universities under study, as the findings of previous studies above suggest that providing access to electronic information sources can possibly increase their usage.

Tenopir and King studies included a series of surveys of more than 16000 engineers, scientists, medical professionals and social scientists in both university and non-university settings. Of interest to the researcher, were their studies that focused on how reading patterns of library users have changed over time with the adoption of e-journals. Consistent with other similar user studies, the Tenopir and King studies reveal that user habits are changing, and most students and faculty prefer e-journals when they make access easier, save the reader's time and are known within the specific scholarly discipline (Tenopir 2003). This again shows the importance users place on the aspect of convenience when choosing the information system to use in order to satisfy their information needs.

LibQUAL+, a study by the Association of Research Libraries (ARL) in conjunction with Texas A & M University, surveyed students and teaching staff at various higher

education institutions in the US in 2002. The questions focused on the participants' use of electronic libraries; including their perceptions of their libraries' levels of e-service delivery that they found acceptable. From the LibQUAL+ studies, an important finding was that respondents, particularly graduate students, faculty members and staff, believe that making information easily accessible, either via the library website or through tools that allow people to find information independently was very important to them (Tenopir 2003). This shows the importance researchers place on the aspect of convenience when considering using any system to supply their information needs.

In the last decade, academic users have been found to be increasingly reliant on Internet-based information sources as necessary tools enabling them to accomplish research tasks. The JSTOR retrospective journal collection, began as a project sponsored by the Andrew W. Mellon Foundation at the University of Michigan (Tenopir 2003). It contained digitised versions of older research journals. In 1999 JSTOR, surveyed more than 4000 academic users of the collection in humanities, economics and social sciences, to discover usage patterns and preferences of academics, when using JSTOR's retrospective journal collection. They also used log analysis of both viewed and printed articles to characterise use of its materials (Tenopir 2003). The findings of the JSTOR study revealed that, electronic access increased use of older materials, because it increased convenience. Ensuring convenience of accessibility to Internet-based information sources therefore may positively influence the use of these information resources. The use of JSTOR by subscribing institutions grew each year. Most of the respondents who were faculty members at higher education institutions in the United States were discovered to greatly value electronic journals. They reported that they were comfortable using

electronic resources, believed a variety of electronic resources were important to their research and considered electronic databases invaluable to their research (Tenopir 2003). This suggests that positive perceptions on the usefulness of electronic information sources can augment their use by intended users.

Recent research proves that scholars in higher education institutions increasingly find Internet-based information sources to be an important part of the research process. The Joint Information Systems Committee (JISC) established a user behaviour and evaluation framework, to investigate use of electronic information sources in United Kingdom (UK) higher education institutions. A recent report by Connaway and Dickey (2010) identified 12 key studies conducted since 1999 that have focused on the information seeking behaviours of scholars within specific disciplines; while others sought to identify behaviours of scholars in multiple disciplines. The studies identified, employed a variety of methods, to collect data about participants' perceptions and use of e-journals; e-books; virtual reference services; online catalogues and other Internet-based information sources. Some of the common findings from the JISC studies included that e-journals are increasingly very important to the process of research at all levels and that disciplinary differences do exist in researcher behaviours. Regardless of age or experience, academic discipline or context of the information need, speed and convenience of electronic information sources are important to users. The issue of convenience is therefore of paramount importance when considering use of Internet-based information sources, and university libraries must ensure that users of their electronic information sources are able to access them as conveniently as possible, so as to enhance usage of these information sources. Users were also discovered to be confident in their own ability to use information discovery tools; however it was

revealed that information literacy had not necessarily improved. This may show that being computer literate, does not necessarily make one, information literate, as specific skill sets are required to effectively search for and use Internet-based information sources. Users were also beginning to desire enhanced functionality and content in library systems that assist them in locating and evaluating resources. Therefore traditional finding aids such as the online public access catalogue (OPAC), having limitations in their ability to be interactive nor to aggregate all possible information sources , from the different electronic information sources offered by a particular library, during a search, may therefore not suffice the needs of the digital library user. This may also explain another important finding from studies by Connaway and Dickey (2010) of the centrality of search engines, and in particular Google, to the users' information seeking strategy- Google was found to be used often to locate and access e-journal content (Connaway & Dickey 2010). This suggests that scholars find search engines more user friendly than localised finding aids such as OPACs, however search engines do not always return search results that are scholarly in nature, nor do they lead users to electronic information sources subscribed to by a particular university library. Such a scenario would consequently lead to the underutilisation of library subscribed Internet-based information sources.

A summary of key findings from these major digital library user studies from the western countries include that:

- E-journals are increasingly very important to the process of research at all levels (Connaway & Dickey 2010:4)
- Today's researcher is comfortable with using a wide variety of information sources, including Internet search engines; e-print servers; full text databases and e-journals (Tenopir 2003)

- The status of students affects the use of Internet-based collections, and that graduate students are heavy and cyclical users of e-journals (Tenopir, 2003)
- Subject discipline affects use of Internet-based information sources (Tenopir, 2003:45; Connaway & Dickey 2010)
- The heaviest use of e-resources is in research, followed by preparing for teaching and gaining current awareness (Tenopir 2003:45)
- Search engines, particularly Google, are very central to users' digital information seeking behaviour, as they are often used to locate and access Internet-based information sources (Connaway & Dickey 2010:4)
- Age may affect use of electronic information sources, as there is some evidence that younger users are enthusiastic adopters of electronic resources (Tenopir 2003:45).
- There was little evidence that gender in most cultures makes a difference in the use of electronic resources (Tenopir 2003)
- Convenience remains the single most important factor for digital library use (Tenopir 2003:45; Connaway & Dickey 2010:4)
- Users are generally confident in their own ability to access Internet-based information sources (Connaway & Dickey 2010:4)
- However, information literacy has not necessarily improved among users (Connaway & Dickey 2010:4)
- Library policies have intentional and unintentional effects of user behaviour (Tenopir 2003:46)

2.4.2 Studies from the developing countries

Research shows that studies conducted to investigate the digital information-seeking behaviour of students from a developing country perspective are few. According to

Liu and Luo (2011), most studies on digital library use have been conducted in Western countries, while studies in other cultures have not kept pace with these changes. Studies on academic Internet-based information source use that could be identified from a few developing countries including South Africa are discussed here.

Liu and Luo (2011) conducted a comparative study of the use of digital libraries by both undergraduate and graduate students in China. Four hundred participants from three Chinese universities were invited to participate in the survey. The questions on the questionnaire, sought to elicit information about the participants' perceptions of factors that influence the use and non-use of digital library sources, as well as the participants' patterns of digital library use. Several findings emerged from the study by Liu and Luo (2011), including that: convenience and the speed of information delivery were crucial determining factors leading to student use of the digital library. Again, the issue of convenience is a recurrent theme that can influence the use of Internet-based information source by scholars from a developing country perspective. Respondents also indicated that they enjoyed the unique features such as enabling users to get access to networked information, at a faster speed and with very little effort. Graduate students were discovered to be significantly more frequent users of digital libraries, than their undergraduate counterparts. The status of the user therefore affects their use of digital libraries, with scholars undertaking higher and research intensive degrees more reliant on electronic information sources than their undergraduate counterparts. The attitudes of the students, particularly their perceived ease of use and perceived usefulness of the digital library, were discovered to play a critical role in the adoption of the new technology. This reiterates the crucial role that the individual beliefs of intended users play towards their interactions with a digital library system.

Following the theme that the perceptions of the intended user of a digital library system affects their use of it, Park *et al.* (2009) surveyed 1370 users of The Essential Electronic Agricultural Library (TEEAL). The participants were drawn from 16 institutions from Africa, Asia and Central/Latin America. The questions sought to elicit information about the factors that influence behavioural intention to use TEEAL based on the Technology Acceptance Model (TAM) framework developed by Davis (1989). The findings from the study by Park *et al.* (2009) revealed that perceived ease of use of TEEAL was found to significantly impact the users perceived usefulness of TEEAL. Thus if the users believed that the digital library was difficult to use, they were less likely to believe that it was useful to accomplish their study tasks. Domain knowledge and English literacy were discovered be important attributes for the adoption of the TEEAL system. Therefore for the TEEAL digital library system to be fully utilised by the researchers, both knowledge in the topic areas and competence in English were revealed to be essential prerequisites. It was also quite significant to note that the majority of the respondents (80%) were not native English speakers; therefore this had a negative impact on the use of the system. In the African context, language seems to play a role in the use of Internet-based information sources, as most electronic information sources currently being published are in the English language. This creates a barrier for researchers in non-Anglophone contexts, as most scholars in the region adopt English as their second language, and they may have difficulties in communicating with it (Ondari-Okemwa 2007). Relevance of the contents of the TEEAL system was also discovered to be the most important external variable affecting the researchers' intention to use the system. The results suggest that digital library systems that are highly compatible with the actual user's research needs, accompanied by the customised provision of

academic resources, are most likely to be adopted and used, especially in countries with limited resources for research (Park *et al.* 2009). Accessibility was also discovered to be an important determinant of perceived ease of use.

In some developing countries contexts, gender plays a crucial role in one's ability to access resources. In some countries for example, females have less access to privileges their male counterparts have, with the result that gender affects the accessibility of researchers to Internet-based information sources. Arif and Kanwal (2009), surveyed 315 female students of the female campus of the International Islamic University, Islamabad, Pakistan. Their study sought to investigate the acceptance and importance of digital libraries among female students, as well as discovering the accessibility problems they face. The major findings from the study included that female students had limited access to the digital library, causing them to be unable to meet their information needs from the Internet. Arif and Kanwal (2009), also discovered that the lack of information literacy program, information technology (IT) training workshops, IT literate staff and electricity failure were among the main hindrances to access the digital library by the female students.

The contextual factors surrounding a university in which a scholar learns can negatively affect their use of Internet-based information sources. Manda (2005), used both quantitative and qualitative methods to study the use of electronic information sources by researchers at ten research and academic institutions in Tanzania in 2004. The study sought to discover the rate of acceptance and use of electronic information sources in Tanzanian academic and research institutions. It also examined the institutional and individual contexts within which the adoption of electronic resources is taking place. The findings revealed that access to personal computers (PCs) for students is limited by restricted opening hours and in some

cases computer use changes. Users and potential users were also discovered to be ignorant of the full range of electronic information sources, which was reflective of poor marketing strategies. It was also established that there was a lack of well developed comprehensive training packages for specific user groups, which also affected their ability to use electronic information sources. Most of the universities had poor ICT infrastructure, including limited bandwidth, leading to slow Internet, and therefore affecting accessibility to Internet-based information sources, by students. In order to improve usage of Internet-based information sources, by intended users it is crucial for authorities to create a conducive and enabling context by providing the necessary ICT infrastructure that would make the electronic information sources easily accessible by intended users.

Many university institutions in the African context however struggle with the necessary financial resources that in turn would provide the ICT infrastructure and relevant electronic information sources, enabling users to access them. Agaba (2005) conducted a study on the utilisation of electronic information sources by academic staff of Makerere University in Uganda. The study examined factors which affect their utilisation as well as the problems the researchers faced when interacting with these resources. methods used to research were both qualitative and quantitative in nature, and the data collection instruments utilised included questionnaires, interviews and content analysis. The findings revealed that the factors that affected the use of Internet-based information sources by academics at Makerere University, included: poor ICT infrastructure, as the Internet speed was reported to be slow and inadequate by study participants. There was also poor and limited publicity of available and relevant electronic information sources. Participants also felt that the e-databases available were irrelevant. The overall result was that

electronic information sources were being used by a limited number of participants. As has been proven in other studies, users of a digital library system will likely use them only if it contains information sources relevant to their needs (Thong *et al.* 2002).

Ndinoshiho (2010), investigated the use of electronic information services by students at the University of Namibia. Questionnaires were administered to 163 students and interviews were conducted with 15 students. The study revealed that the majority of the students made the greatest use of the Internet and had positive perceptions towards these resources. However, the OPAC was moderately used, while e-databases were substantially underutilised. This again shows that traditional OPAC's may be considered unfriendly intermediaries to electronic information sources, leading to the underutilisation of subscription e-databases. Few users also thought that e-databases were useful, perceptions that do not augur well for the use of these resources. The main barriers students faced when they used electronic information services included a shortage of computers, unreliable Internet connection and lack of IT skills (Ndinoshiho 2010).

In Nigeria, Okiki and Asiru (2011) investigated factors that influenced the use of electronic information sources by postgraduate students in six universities in the South Western region of Nigeria. Questionnaires were distributed to 2500 participants drawn from the selected universities. The questionnaires sought to discover the participants' frequency of use of electronic information sources, the factors that encourage their use, the challenges the students' faced in accessing these resources, as well as their levels of awareness of available electronic information sources in their institution. The findings revealed that program of study ranked significantly as a factor that encouraged use of electronic information

sources, with Master's program students using electronic information sources more, followed by MPhil and PhD students. This reiterates that the status of a scholar may influence their reliance on electronic information sources. The need to carry out a research was found to influence the use of electronic information sources the most, therefore if students had a paper to write or assignment to complete, they were more likely to use electronic information sources. More males than females were also found to be using electronic information sources, demonstrating that in some studies, gender differences exist in the use of electronic information sources by users. Study participants also expressed a high level of search skills and the majority of these has received formal training, while the level of training also influenced the frequency of electronic information source use (Okiki & Asiru 2011). Thus in order to improve the use of Internet-based information sources, university libraries need to furnish their intended users with requisite information skills that enable them to access these resources easily.

Ozoemelem (2009) conducted a survey on the use of electronic resources by postgraduate students of the Library School in Delta State University, Abraka, Nigeria. Seventy-eight participants were invited to complete a questionnaire, which sought to find out their level of ICT skills, their level of e-resource usage; and the problems and factors that affect the use of electronic resources among postgraduate students at the university. The findings from the study revealed that there was a low level of ICT skillfulness among postgraduate students. However the level of electronic resource usage was high among postgraduate students. This shows that in spite of a lack of ICT skills, Internet-based information sources are important to postgraduate students. Both male and female postgraduate students were discovered to use electronic resources highly. The problems that the students

encountered included: a lack of search skills; high cost of access to electronic information sources; power outages; and inaccessibility of some electronic resources (Ozoemelem, 2009). It is therefore crucial to enhance the information literacy skills of scholars in order to improve their ability to access, evaluate and use electronic information sources.

From a South African perspective, Mgobozi and Ocholla (2002), investigated the use of electronic journals (e-journals) at the Universities of Natal and Zululand. They sought to determine the use of e-journals by the scholarly communities, and the perceived impact that these journals have on the community. A survey research method was conducted to elicit information from respondents who included the academic staff, library staff and postgraduate students. The findings from Mgobozi and Ocholla's (2002) study, indicated that the level of e-journal use was low at the two universities, despite their historical differences in resource support. They also discovered a lack of adequate resources and electronic facilities particularly at the University of Zululand, which hampered use of e-journals by students.

Finlayson (2010), undertook a study on the patterns of use of web-based library e-resources among students at the University of Kwazulu-Natal (UKZN). The objectives of her study were to establish usage among students; identify determinants of usage of e-resources and to make recommendations. The study employed a two-thronged method approach to obtain data. Firstly a review of vendor usage statistics was carried out. Secondly, a stratified random selection of 760 students from the Howard campus of UKZN were surveyed, via an e-mail based questionnaire. The major findings established from the study included that electronic information sources were being used by the students and that this usage fluctuated during the course of the year, with peak period of use being during the university

terms. E-journals and e-databases were being used more than e-books, perhaps this is reflective of the fact e-books are a more recent phenomenon than are e-databases and e-journals. Postgraduate students were discovered to use electronic information sources the most, proving that the more research intensive the degree a user is undertaking, the more likely they are to use Internet-based information sources. Non users of electronic information sources made up a third of the study participants. Age, gender or discipline were not in evidence as determinants of use of electronic information sources. Search engines were revealed to be a popular virtual starting point, for access to Internet-based information sources. This reveals that search engines are popular access points to electronic information sources among researcher, irregardless of whether they are in a western country or in a developing world context. While remote access to electronic information sources was revealed to be an important advantage of electronic information sources among the students.

Nkomo (2009), conducted a comparative study on the web information-seeking behaviour of students and staff at the University of Zululand and the Durban University of Technology. The researcher sought to examine the participants' interaction with web-based information sources, by identifying their web-information needs, as well as how, when and where they sought the Internet-based information. Survey questionnaires were handed out and interviews held with selected staff and students from the two universities. Nkomo (2009) discovered that although facilities for web access were available, they did not seem to sufficiently cater for the massive student populations at the two institutions. A significant number of participants complained about poor Internet connections, indicating that ICT infrastructure, particularly at the University of Zululand was still poor. The participants were also revealed to lack web-searching and evaluating skills, reflecting poor information

literacy. There was also a lack of technical support or assistance for students who faced problems accessing Internet-based information sources, which hampered accessibility to these resources.

2.4.3 Findings peculiar to developing Countries

Some findings that were discovered in digital library use studies conducted in western countries are similar to those in the developing countries. These include that electronic information sources are increasingly being used and are considered as important by researchers in both the western and developing world. The convenience of Internet-based information sources is also seen as an important advantage appreciated by researchers from around the world. However there are some findings that are pertinent to studies from the developing world, which were considered to be relevant to the current study. While accessibility to digital libraries among researchers in the west appears to be without many infrastructural challenges, use of digital libraries in developing countries, is often hampered by poor ICT infrastructure. Difficulty in access has been discovered to be one of the prominent disadvantages for digital library users in developing regions, and it should be noted that the deployment of digital library systems without the consideration of accessibility issues might end up being a one-time venture at the cost of huge capital investment (Park *et al.* 2009).

Most of the studies identified above revealed that students' interaction with Internet-based information sources is affected by slow Internet, due to inadequate bandwidth or inadequate computer terminals for the many students that need to use them (Manda 2005;Ndinoshiho 2010). Use of electronic information sources by researchers in developing countries, appears to be hampered by a lack of IT skills by both researchers and library staff. Consequently researchers do not receive

adequate assistance when they face technical difficulties, when attempting to access Internet-based information sources (Nkomo 2009). Several studies also cited electricity failure or power cuts as some of the problems encountered when researchers try to access Internet-based sources (Arif & Kanwall 2009). Most digital libraries available today are Anglo centric, and require researchers to be proficient in the English language to be able to successfully utilise them, however most researchers in the developing world have English as a second or third language, which may prove to be a challenge when they try to utilise digital libraries, as was discovered by Park *et al.* (2009).

2.5 Factors affecting academic use of digital libraries.

From the above literature review of western and developing world digital library user studies, the researcher was able to identify some organisational and individual variables that have been identified to influence the use of digital libraries among researchers at academic institutions. These are the variables that were considered to be possible influencing factors for the use of Internet-based information sources, among postgraduate students at Nelson Mandela Metropolitan University (NMMU), Rhodes University (RU), and the University of Fort Hare (UFH), in this study.

2.5.1 Individual factors

Individual differences including computer self-efficacy, computer experience, and knowledge of the subject domain, can help users to interact with digital libraries more easily (Thong, *et al.* 2002). It is therefore important for institutions of higher learning to be aware of the level of Information and Communications Technology (ICT) Literacy and information literacy of their users, as well as to know their subject

affiliations as these have implications on the success or use of Internet-based information resources.

2.5.1.1 Computer Literacy

According to the Online Dictionary for Library and Information Science (ODLIS), computer literacy also known as Information and Communications Technology (ICT) literacy, refers to “the skills required to retrieve information efficiently and communicate effectively using computer hardware and software, based on a conceptual understanding of computer technology and how it can be used to accomplish specific tasks...” Similarly the Association of College Libraries (ACRL) state that “information technology skills enable an individual to use computers, software applications, databases and other technologies to achieve a wide variety of academic, work-related and personal goals”. Computer literacy of academia and their ability to quickly access necessary information can assist them in benefitting from huge volumes of digitised information. It may help to improve the quality of their instruction and they may also encourage their students to use these electronic information sources for their assignments and projects. It is expected that a computer literate faculty member may also feel comfortable using electronic information sources (Majid & Abazova 1999).

2.5.1.2 Information literacy

Information literacy while showing significant overlap with information technology skills is a distinct and broader area of competence (Association of College Libraries [ACRL] 2012). Information literacy is a skill in finding the information one needs , including an understanding of how libraries are organised familiarity with the resources they provide and knowledge of commonly used research techniques

(Online Dictionary for Library and Information Science [ODLIS] 2012). The ACRL proceeds to say that an information literate individual is able to:

- Determine the extent of information needed
- Access the needed information effectively and efficiently
- Evaluate information sources critically
- Incorporate selected information into one's knowledge base
- Use information effectively to accomplish a specific purpose
- Understand the economic, legal and social issues surrounding the use of information ethically and legally. (ACRL 2012)

Clyde and Klobas (2001) are of the opinion that in order to equip students to effectively incorporate Internet-based information sources in their studies, information literacy administrators need to be aware of differences and changes in students' expectations of the Internet and their prior skills. This study sought to discover the different characteristics and technological background of postgraduate students and how these affect the use of Internet-based information sources.

Selwyn (2008), carried out an investigation into the differences of academic use of the Internet by undergraduate students and concluded that not all students are as inclined to integrate Internet-based information sources as might be assumed, and he attributed this phenomenon to deficit skills, motivation and know-how on the part of students, faculty and/or the educational institutions themselves. We can therefore assume from his conclusion that in order for postgraduate students in the Eastern Cape to be able to effectively use Internet-based information resources, they must possess adequate levels of computer and information literacy. The researcher therefore sought to discover the self-reported level of ICT and Information literacy skills by postgraduate students at NMMU, RU and UFH, and how this may be affecting their use of Internet-based information sources.

2.5.1.3 User attitudes, demographical characteristics and sociological factors

User attitudes, individual characteristics and other sociological issues have also been revealed to be contributory factors towards ICT use among academics. In research carried out by Cheung and Huang (2005) the findings revealed that university students' engagement with the Internet is influenced by perceptions of usefulness, ease of use and other psychological attitudes towards both technology and learning.

A study on university undergraduate students' information seeking behaviour by Ajiboye and Tella (2007), showed that interactive influence of gender, course of study and level of study on the information seeking behaviour of students. Findings from their study showed that whereas all these three factors significantly influenced the way students search for academic information, however, the level of study of students contributed most to the observed significance. In an earlier study carried out by Bar-Illam *et al.* (2003), age was found to have major influence on the usage and preference of e-journals, whereby the older the faculty member was the less he or she preferred information in electronic format. Another study carried out in Ghana by Hinson (2006), showed an indication of enthusiasm among younger students in embracing the Internet as a useful tool in achieving their information objectives. It was found that younger scholars are willing to invest in a personal computer and eventually access to the Internet because they believe that their use of a personal computer and the Internet would increase their research productivity or output.

The current research also sought to discover if there are significant demographic differences in postgraduate students' use and attitude towards Internet-based information sources, for academic research, at the institutions selected for the study.

The demographic variables considered were age, gender, level of study and academic faculty of study.

2.5.1.4 Academic discipline affiliation

According to Garvey (1979), a scholar's academic discipline affiliation influences their information seeking behaviour when using traditional information sources. Recent studies have subsequently concluded that disciplinary culture is closely associated with the way in which scholars use networked information (Connaway & Dickey 2010:4; Torma & Vakkari 2004; Tenopir 2003). Talja and Maula (2003), reported that by the year 2000, most scholars in the science disciplines were already high level users of databases and full text e-journals, while humanities scholars were still seen as low level users. Bar-Ilan *et al.* (2003) conducted a survey on the use of electronic databases and journals accessed through the web by academic staff of Israeli universities and confirmed the general view that faculty members from the humanities use and prefer electronic services the least, while in most cases academics from the sciences were the heaviest users and advocates of electronic services.

According to Costa and Meadows (2000), differences between use of networked resources among arts and science students can be attributed to the fact that scientists started using computers well before their social science colleagues. They therefore have more experience with technology and are thus comfortable with and are more easily inclined to using Internet resources.

The current study sought to discover if there are differences in the use and attitudes towards use of e-resources amongst postgraduate students from different academic disciplines, at the three universities under study.

2.5.2 Organisational context factors

Davies (1997) argues that organisational factors affect not only the overall success of an electronic library project within a higher education institution, but also and more specifically the final system for its staff and student end-users. However, Thong *et al.* (2002) observed that given the importance of organisational context, there has been little prior research that examined its impact on system acceptance. This study sought to discover the impact of organisational factors, namely relevance, accessibility, computer and information skills training and support as well as marketing and publicity initiatives on the perceptions and use of Internet-based information sources by postgraduate students from selected universities in the Eastern Cape, South Africa.

2.5.2.1 Relevance

According to Thong *et al.* (2002), the goal of a digital library system is to provide relevant documents to users. In findings of their study on the impact of organisational variables on user acceptance of digital libraries, they discovered that relevance demonstrated the strongest effect on perceived usefulness. Herman (2001) suggested that electronic systems and methods for acquiring information are perceived by researchers as a means to an end, to be chosen when it seems that the information need that arises can best be fulfilled in this way. Therefore if an information system does not contain relevant information, it is unlikely that researchers will choose to use it. A study carried out at Makerere University in Uganda by Agaba (2005), revealed that among the challenges to the utilisation of electronic information resources by academic staff was the fact that there were no relevant databases that suited their information needs. Thus in order to improve usage of Internet-based information sources, university libraries must ensure that

their systems contain information that is relevant to the specific needs of students they serve. This study therefore sought to discover postgraduate students' perception of the relevance of the Internet-based information sources provided by their universities, towards meeting their information needs.

2.5.2.2 Accessibility of Internet-based information sources

The general accessibility of the digital library system may affect not only the usage levels, but also people's attitudes towards the system as a whole. In a multidisciplinary study on the information seeking habits of graduate students, George *et al.* (2006) discovered that accessibility is a key factor that affects graduate students' choices of resources and services. They recommended that libraries need to strive to provide more electronic resources that are easily accessed within a user friendly environment. Davies (1997), arrived at the conclusion that sometimes a user's declaration that something is "too difficult to use" can often refer to accessibility, rather than actual usability once accessed. She further asserts that unless a commitment to the widest possible definition of accessibility is built in at both strategic and operational levels, some groups of users may be unintentionally excluded from access altogether. According to Rosenberg (2005), an adequate ICT infrastructure with a sufficient number of networked and Internet-connected workstations is essential if a library is to offer access to e-resources and develop e-services.

In a study carried out by Okello-Obura and Ikoja-Odongo (2010) among postgraduate students at Makerere University in Uganda, they concluded that in order for university students to access resources, the university must strive to have more networked computers. Nkomo (2009) carried out a study on the web-information-seeking behaviour of students and staff at the Durban University of

Technology and the University of Zululand in South Africa. The findings of his study revealed that some of the barriers the students encounter when trying to access web-resources included, few computers, overcrowding of computer labs and restrictive lab opening hours. He also discovered that slow Internet connection due to low bandwidth made it difficult for students to retrieve desired information.

Similar studies conducted in the UK by Breen *et al.* (2001), revealed that students were sometimes discouraged from using ICT when in university due to access limitations and the cost of personal ownership of equipment. Hassania (2006) observed that differences in the “quality of Internet” access were identified as a likely divide among students, most notably in terms of differences between public and private locations of use. In a study on the contributing organisational factors to the use of digital libraries, Xie and Wolfram (2002) pointed out that it becomes essential to set up new channels to attract non-library users who wish to access state digital libraries from home or the work place.

This study sought to discover the quality and level of ICT infrastructure at the three universities, in order to determine how these might be affecting access to Internet-based information sources by postgraduate students.

2.5.2.3 Information literacy training

According to Pullinger (1999) the degree to which university members are able to confidently use online services will affect usage; therefore the problem of training is acute. User education or training refers to programmes specially designed to teach a group of users the skills needed to use electronic journals (McKnight *et al.* 2000). In her study, Rosenberg (2005) suggested that training of users is highly important for a

library as it has practical (getting the resources used) and political (winning support within the university) implications.

While there is a general consensus that there is need to impart information literacy skills to library users, there are a variety of opinions on how such training should be offered. Okello-Obura (2010), suggested that universities should offer information literacy courses and make them compulsory for all students, as this will go a long way in enhancing the knowledge level of the learners regarding use of Internet-based information sources. Davies' (1997) observed that training students' on using electronic sources is often relegated to separate, optional courses, which tend to be poorly attended, so some students may never learn to fully exploit the facilities on offer.

The current research, sought to find out if the universities under study offered Information literacy programmes to postgraduate students. The study also sought to discover the self-reported efficacy in online searching by postgraduate students, at the three selected universities in the Eastern Cape, South Africa. It also sought to discover the postgraduate student's level of awareness of available specialised training in the use of electronic resources, available at their disposal.

2.5.2.4 Technical support

Nkomo (2009) discovered that one of the challenges faced by students when searching for information on the web were unfriendly intermediaries. In his findings, there were calls for more user friendly computer laboratory officials, as this proved to be a significant deterrent to World Wide Web use. Davies' (1997) observation was that library staff tend to be the ones who train and support electronic library users, and consequently the attitudes of those staff toward the system inevitably affect the

attitudes and behaviour of the end-users. Thus if the staff attitude toward the digital library is negative, then the student will not themselves be open to use the system, and vice versa.

Another of Davies' (1997) observation, was that poorly trained staff or those who lack confidence will fail to encourage library users to make use of the electronic sources in case something goes wrong which they cannot fix and if it does this is in itself discouraging to the end-user.

2.5.2.5 Marketing of Internet-based information sources

E-journals are invisible and concealed from visual inspection or cues. For this reason, users need to be made aware of their existence and helped to find them (Pullinger 1999). In his report on the SuperJournal project, Pullinger (1999) identified two broad mechanisms for creating awareness of e-resources, namely promotion and signalling and the mechanisms that were employed in promotion and signalling included.

- Training subject and general librarians (usually within scheduled information technology (IT) training sessions).
- Posters (large and small) displayed in the library and in relevant departments.
- Mugs with logo and Web address on them.
- Link from an e-service's page on the library Website to SuperJournal.
- Articles in the library and university newsletters.
- E-mail sent to staff of relevant departments.
- User guides sent out to prospective users.
- Subject librarians telephoning and/or writing to prospective users.
- Subject librarian visit to relevant department.
- Running training sessions at the library on 'Journals on the Internet'.
- E-journals 'Info fest' held, to draw attention to the new resources available.
- A continuously running PowerPoint presentation in the library, featuring both content and how to use the service (Pullinger 1999:166)

Okello-Obura (2010) recommended that in order for students to utilise e-resources, awareness campaigns should be intensified, using innovative media such as text alerting system. The findings of a study on the scholarly use of information by

graduate students by George *et al.* (2006) reveals that graduate students' information seeking is primarily influenced by academic and library staff. They discovered that professors and advisors perform the most influential role by recommending and supplying information resources. Confirming this trend, a report on an analysis of several research studies on the use and users of electronic library resources by Tenopir (2003), indicated that students are highly responsive to recommendations of specific resources by their lecturers, or librarians. Davies (1997) is also of the opinion that academic and teaching staff are a group which is fundamental to the success of an electronic library and that the system must contain the texts recommended by students' tutors or lecturer's while those lecturers, must encourage students to explore the available electronic information sources.

This study sought to discover the marketing and publicity programmes or initiatives employed by libraries of the three universities, in order to make postgraduate students aware of the various Internet-based information sources available for their use. The study also sought to discover if and how supervisor or lecturer's support or lack thereof led to use or non-use of Internet-based information sources among postgraduate students in the Eastern Cape.

2.6 Patterns of student use of Internet-based information sources

Discovering patterns of use of electronic information sources as representative samples of the whole offer a means to establish some sort of coherent order on the behaviour of users and so improve our understanding (Finlayson, 2010). Library administrators would then be able to ascertain user preferences, purpose of use and characteristics of use of electronic information sources, information which would enable them to implement better electronic services.

Research shows that academic communities are increasingly being populated by students belonging to the “Google Generation” defined as those born after 1993 with little or no recollection of life before the web (Rowlands *et al.* 2008). According to Lippincott (2006) “Students usually prefer the global searching of Google to more sophisticated but more time consuming searching provided by the library, where students must make separate searches of the online catalogue and every database of potential interest, after first identifying which databases might be relevant. In addition, not all searches of library catalogues or databases yield full-text materials, and NetGen students want not just speedy answers, but full gratification of their information requests on the spot.”

Previous research shows that users increasingly prefer using digital resources over their print counterparts (King *et al.* 2003). Users also tend to use these resources, if it is convenient for them in terms of time and location, easy to access, have relevant content and allowing for portability (Bevilacqua 2005). Researchers will also tend to consult Internet-based information sources for scholarly purposes if they have a paper or dissertation to write (Okiki & Asiru 2011).

This study sought to discover if there are significant differences in the use of specific e-resources among postgraduate students. The e-resources considered included; e-Journals and e-Databases, Library Website, Search Engines such as Google and Yahoo, Document Delivery and Current Awareness (DDCA) as well as Discussion Lists and Newsgroups. The perceptions of respondents on the convenience and quality of accessibility to Internet-based information sources at their university were also sought.

2.7 Theoretical framework on technology adoption

According to Chigona and Licker (2008), the four benefits of any theoretical framework include that theory enables researchers to make predictions. Secondly, it helps procedurally, giving researchers the opportunity to follow a systematic order, or to observe and measure only some things and not everything (Chigona & Licker 2008:58). A theory may also help to explain what is happening, and that last benefit is that putting the theory under test helps to improve it (Chigona & Licker 2008:58). Because this research sought to discover factors that affect the use of Internet-based information sources by postgraduate students in the Eastern Cape, South Africa, it was necessary to consider an appropriate theory to help guide the study, particularly in identifying variables that affect the use of technological innovations.

There are several theories that have been posited to try and explain the adoption and usage of technological innovations by intended users in information systems (IS) research. The most commonly used theories in IS research include the Theory of Reasoned Action (TRA) (Fishbein & Ajzen 1975), the Technology Acceptance Model (TAM) (Davis 1989), and the Diffusion of Innovations (DOI) theory (Rogers 1995). An evaluation of these theories reveals that similar constructs can be observed in these models, particularly the constructs of usability and functionality, albeit under different names (Kanat 2009:6). However, this study considers the variables used in the technology acceptance model (TAM) as it has been widely and successfully used in a variety of contexts to explain determinants of user behaviour and their intention to use a new system or technological resource. The following section gives a brief description of the DOI and TRA, followed by a description of the TAM, and how it was considered in this research, as well as a review of literature where TAM was used as a base theory.

2.7.1 Diffusion of innovations (DOI)

Diffusion of innovations (DOI) is a theory that seeks to explain how, why and at what rate new ideas spread through cultures operating at the individual and firm level (Oliviera and Martins 2011). Roger (1995) defines diffusion as “a process in which an innovation is communicated through certain channels over time among members of a social system”. The process of diffusion is purported to take place over time, with antecedent conditions, characteristics of the adoption and consequences (Chigona and Licker 2008). According to Roger (1995), there are four main elements that influence the spread of a new idea, which are: the innovation, communication channels, time and the social system. The likelihood that an innovation will be adopted is dependent on five attributes considered in DOI, which are: relative advantage, compatibility, complexity, observability and trialability (Roger 1995). DOI proposes that innovations that are perceived by individuals as having greater relative advantage, compatibility, trialability, observability and less complexity will be adopted more rapidly than other innovations (Roger 1995). Moore and Benbasat (1991) modified the DOI theory to make it more relevant to the IS domain and expanded it to include eight independent variables which are: voluntariness, relative advantage, compatibility, image, ease of use, result demonstrability, visibility, and trialability.

While it has been successfully used in many information systems studies, much evidence for DOI gathered by Rogers (1995) comes from agricultural methods and medical practice. It was not initially conceived as a model for technology adoption, but as a model for innovation in general (Kanat 2009). Thus for the purpose of this study, the TAM was considered a more appropriate theoretical framework to consider as it is known to be the only commonly accepted theory in the IS domain (Kanat 2009).

Diffusion of Innovations (DOI)



Figure 1: Diffusion of Innovations (DOI), (Adapted from Kanat 2009:8)

2.7.2 Theory of reasoned action (TRA)

Also derived from social psychology setting, the theory of reasoned action (TRA) was originally developed in 1967 in an attempt to provide consistency in studies related to human behaviour and attitudes (Fishbein and Ajzen 1975). TRA defines relationships between beliefs, attitudes, norms, intentions and behaviour and posits that an individual's behaviour, such as their use or non-use of Internet-based information sources, is determined by their intention to perform the behaviour, as well as the perceived social influence of people who are important to the particular person (Tao 2008).

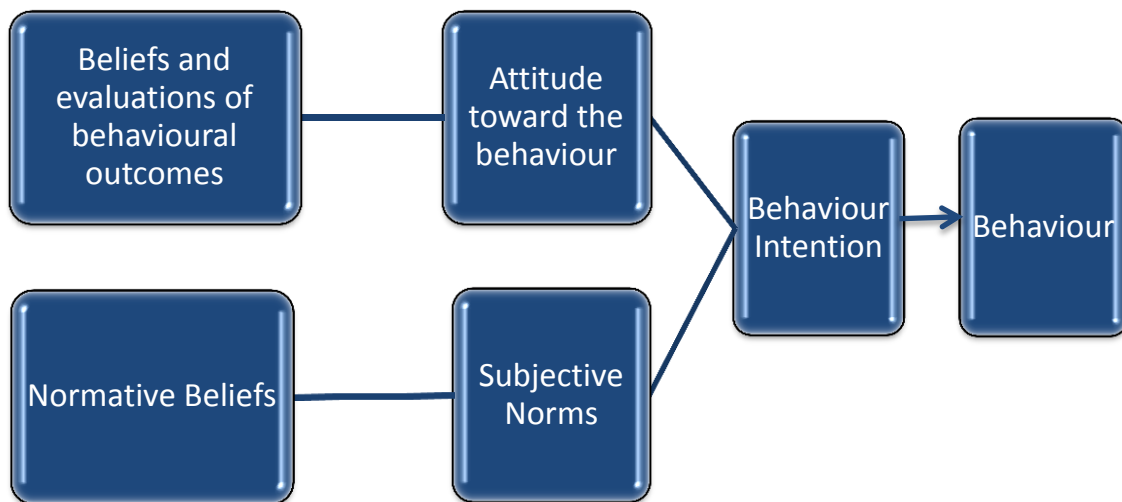


Figure 2: Theory of Reasoned Action (Adapted from Sirgusa and Dixon 2009:970)

Thus a person's decision to adopt a new idea or innovation is said to be influenced by their attitude towards the new idea or innovation as well as the individual's perceptions of what people who are important to the individual think about the adoption (Chigona and Licker 2008). According to Tao (2008), the purpose of TRA is to predict and understand an individual's behaviour by considering the effect of personal feelings (attitude) and the perceived social pressure (subjective norm). The TRA has been empirically tested successfully in a wide variety of studies, including being applied to studies related to voting in elections, to the consumption of alcohol (Silva and Dias 2007; Tao 2008). Results point to the conclusion that the TRA is applicable in understanding the determinants of human behaviour in situations which people may exert their choice (Tao 2008). It is therefore considered useful in information systems research (Silva and Diaz 2007).

2.7.3 Technology acceptance model (TAM)

The TAM was developed by Davis (1989), from the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975). TAM theorises that people tend to use or not use a

technological application based on two basic beliefs, perceived usefulness (PU) and perceived ease of use (PEOU). Therefore TAM asserts that people will tend to use a technological innovation firstly to the extent they believe it will help them perform their jobs better. This first variable is referred to as perceived usefulness (PU).

Secondly it theorises that usage of new technology will also be influenced by the users' perceived ease of use (PEOU), which is described as the extent to which a user believes that using a particular system will be free from effort (Davis 1989). Thus even if people believe that a given application is useful, they may also at the same time believe that the system is hard to use and that performance benefits of usage are outweighed by the effort required to use the technological innovation.

TAM further postulates that both these characteristics, PU and PEOU are directly influenced by external characteristics such as the individual's system familiarity or experience, top management support, and user involvement (Davis 1993). Other external variables that may be considered to influence an individual's perceptions about technology include an individual's prior exposure to technology, the environment in which the individual operates as well as the organisational culture in which they are accustomed.

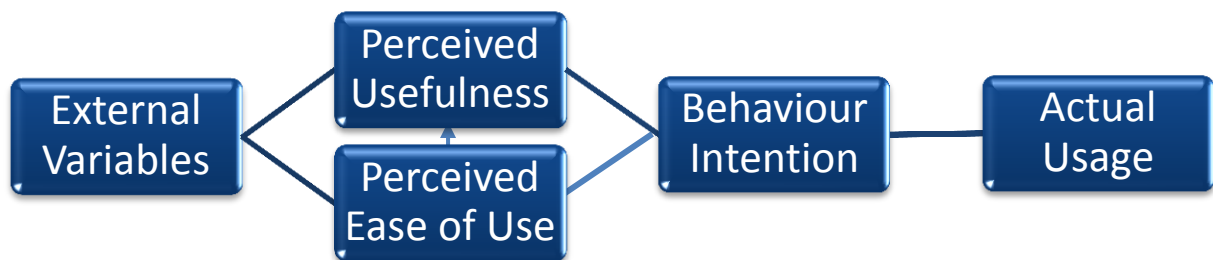


Figure 3: Technology Acceptance Model (TAM), (Adapted from Davis 1989:476)

In applying this theory to this study, the researcher sought to investigate and discover the organisational and individual factors that influence postgraduate students' beliefs about Internet-based information sources, which would in turn lead to their use or non-use of Internet-based information sources. The organisational variables that were considered included: organisational support, institution's accessibility to the Internet and electronic resources, information literacy programmes, relevance of available e-resources, technical support, supervisor support and marketing and publicity programmes. The individual characteristics considered included the postgraduate's ICT Literacy, Information literacy, level of study, age, academic discipline, perceptions of usefulness and ease of use of Internet-based information sources.

This theory was chosen by the researcher as it has been widely accepted and used among researchers in the information systems field to conduct similar studies, in the more developed countries (Greenfield *et al.* 2009). The study therefore adds to

empirical literature on technology use and acceptance in the education sector from a South African perspective.

2.7.4 Application of TAM in information systems research

Although many models have been proposed to explain and predict the use of an information system (IS), the TAM has been the only one which has captured the most attention of the IS community (Chuttur, 2009). There has been a plethora of studies conducted using the TAM as a theoretical base (Thong *et al.* 2002; Hong *et al.* 2002; Lederer *et al.* 2000)). Among the advantages of the TAM model are that it is considered to be an effective and simple model and can provide effective explanation of factors that affect IS adoption (Jeong 2011). It is capable of explaining user behaviour across a broad range of end user technologies and it is both parsimonious and theoretically justified (Jeong 2011). The researcher therefore deemed it an appropriate model to consider in this study, as this study sought to discover factors that affect user behaviour when interacting with Internet-based information sources, among postgraduate students at selected universities in the Eastern Cape, South Africa. The TAM also assists in the identification of external variables that have significant effects on potential users' intentions to use IT (Jeong 2011). Previous research in on the TAM identified three such categories of variables known to significantly affect the use of digital libraries by students and these were individual characteristics, organisational context and interface characteristics (Thong *et al.*) The TAM therefore assisted the researcher to identify individual and organisational variables known to affect the use of Internet-based information sources among postgraduate students at three universities in the Eastern Cape, South Africa.

The TAM has also been subjected to many alterations and reviews (Davis *et al.* 1989; Venkatesh & Davis 1996; Chuttur 2009). There have also been some criticisms directed at the TAM. Some of the weaknesses of TAM identified are the use of self-reported data to measure system use instead of actual use data (Chuttur 2009). Self-reported data has been considered to be a subjective measure and thus unreliable in measuring the actual use of a system. However the general consensus within the IS community is however that the TAM has proved to be a useful theoretical model in helping to understand user behaviour in IS implementation, having been tested in many empirical researches, with the tools used within the model having proved to be of quality and having yielded statistically reliable results (Legris, Ingham & Colletette 2003).

Lederer *et al.* (2000), investigated TAM for work related tasks with the World Wide Web (WWW) as the application. The results of their research supported the TAM as a model to predict use of the WWW. The other purpose of their research was focused on identifying antecedents to web ease of use and usefulness. They used an e-mail survey instrument that had sections asking i) the extent to which a website met with ease of use characteristics, ii) web specific antecedents, iii) the extent to which web site meets usefulness characteristics, iv)and general demographic information including age, work experience, browser, speed of connection and website location. Lederer *et al.* (2000), affirmed that TAM helps researchers to understand the relationships between ease of use and usefulness and the acceptance of web technology by users. Their study confirmed that use of websites depends on how useful the website is to the researcher and how easy it is to use and navigate through the website.

Bopape (2010) used the survey method to investigate the utilisation of IT to support information and knowledge management by lawyers in Polokwane City, in South Africa. The TAM guided his study as he investigated the lawyers attitudes; that is their perceived usefulness and ease of use of IT in their work. Bopape also considered external variables influencing these attitudes, which were organisational support and individual characteristics including background, age, computer training and experience. The results of the study revealed that lawyers in Polokwane are poor users of IT because of various factors, including that the lawyers have a generally rural background, where they had no IT exposure, their educational experience was also during the pre-IT era which consequently meant that they did not acquire IT skills necessary to be able to use IT applications in their work. The organisational factors identified as deterrent to the lawyers' use of IT included that the firms are small with limited financial resources necessary to be able to invest in IT and IT related employees. Consequently the lawyers generally have no wide exposure to IT in their work environment.

Colvin *et al.* (2005) used the TAM to develop a basic theoretical model that would explain why patrol officers embraced or rejected new computer technology. The findings of their study generally supported TAM's hypothesis that patrol officer acceptance would be facilitated by increasing its ease of use and usefulness. Their findings also suggested that a strategy for even greater acceptance would be achieved by considering other variables such as timeliness and the quality of information provided by the new technology. Their recommendation was that future research should address the relationship between personality variables, biographical factors, management practices and the TAM factors to suggest additional strategies for enhancing technology acceptance.

Al-Gahtani (1998) used the TAM as a base model to produce a model answering the basic questions of the research: why do users accept or reject information systems and how user acceptance is affected by system characteristics, perceived usefulness and perceived ease of use and attitude toward acceptance behaviour. The results demonstrated the advantage of the TAM applied to IT. The findings suggested that system features, perceived usefulness and ease of use are the most influential variables in IT acceptance respectively. He suggested that system features and functionality must be emphasised to potential users. While ease of use must not be overlooked as a moderate determinant of IT acceptance, but efforts to be undertaken to improve ease of use such as training which would enhance the self-efficacy of a system's users.

Amongst the critiques of TAM are Legris *et al.* (2003), who suggested that a limitation of TAM is in considering IS to be an independent issue in organisational dynamics and yet research in the field of innovation and change management suggests that technological implementation is related to organisational dynamics, which will have a strong impact on outcomes. Their conclusion was that it may be difficult to increase the predictive power of TAM if it is not integrated into a broader model that includes organisational and social factors. Taking this conclusion into consideration, the current research took organisational, social and individual factors into consideration when investigating the use of Internet-based information sources by postgraduate students.

Chuttur (2009), traced the origins and developments of the TAM in IS research over the years and while acknowledging the crucial role it has played in helping to explain and predicting IS use, he concluded that research on TAM may have reached saturation level, such that future research should exploit the strengths of the TAM

while discarding its weaknesses. Chuttur (2009) highlighted that several studies on TAM make use of students as participants in a controlled environment and therefore results obtained from these studies cannot be generalised to the real world. However, the researcher considered that the advantages of using TAM as a base model in the current study far outweigh its disadvantages. Because the investigation is also being conducted amongst postgraduate students in South Africa nullifies the weight of the criticism as TAM has proved to be a very useful tool for studying the use of IS by students elsewhere in the world.

Greenfield and Rohde (2009) conducted a study on whether people who are likely to pursue careers within the not-for-profit sector, have different attitudes to technology and whether such differences affect the measures used within technology acceptance models. A survey of business and social science undergraduate students revealed differences in attitudes towards technology between the two groups. The results indicated that social studies students, perceived technology to be less useful and not easy to use. Greenfield and Rohde (2009) recommended that as organisations are implementing technology they need to recognise that users are not a homogenous group. An organisation may need to tailor the implementation of technology to the differing attitudes of its workers, while groupings within the organisations may need to be considered differently for example accounting, marketing and sales, versus social roles when it comes to the use of models for acceptance of technology. Thus in this study, groupings within postgraduate students at the three universities in the Eastern Cape were considered, in line with their academic discipline affiliation, gender and background in order to find out how these affect their perceptions and use of Internet-based information sources.

(Abbasi *et al.* 2011), carried out a study aimed at extending the TAM to suit in a developing country context by attempting to identify the relationship between social norms, management support and moderating factors voluntariness and experience. A cross-sectional survey was undertaken to collect data from 504 Pakistan academics. Their findings suggested that expecting acceptance behaviour from individuals on the basis of only TAM constructs is not enough for introducing new IT technologies. The study revealed that individual perceptions are formed or changed through attitudinal and social beliefs along with management support and usage experience. In the current study, TAM's variables of perceived usefulness and ease of use of Internet-based information sources by postgraduate are considered in light of the individual characteristics of the students as well as the organisational context within which they learn, in order to get a more comprehensive picture on the determinants of use of these resources by students in the Eastern Cape region of South Africa.

2.8 Chapter summary

From this review, we are able to see the importance of studying the information-seeking behaviour of student users in this digital age. It is pivotal to help university and library administrators make informed decisions concerning digital library services for optimal benefit to their student users. It is also clear from reviewed literature that there is a dearth of empirical literature on e-resource user studies particularly in Africa and the rest of the developing world; hence the importance of this current study, as it is set in the unique setting of South Africa. Also evident from this review is the vital contribution the Technology Acceptance Model has made towards explaining the use or non-use of innovative technology by the intended users of a particular system. The reviewed literature also helped to identify the key factors that

have been repeatedly revealed to affect academic use of Internet-based information sources as well as the impact of e-resources on meeting student academic information needs. The following chapter outlines the research methodology employed to conduct the study. Included is the choice of research approach, the scope of the survey, the organisation of the survey, including the data collection instruments employed are highlighted. A description of the data analysis techniques used is also given.

Chapter Three: Research methodology

3.1 Introduction

This chapter outlines the survey methodology, as the research methodology that was chosen to conduct the study and describes the methodological approach taken for the study. A description of the sample and sampling procedures followed is given. The chapter also provides a detailed explanation of the research instruments used and their design. Provided are the data collection procedures followed to obtain data from selected participants. The chapter also discusses the data analysis procedures undertaken to produce results. Limitations encountered through the data collection stages are also discussed.

3.2 Survey research methodology

This study employed the survey research methodology. The survey methodology is a type of research strategy that aims at gathering standard information in respect of the same variables for everyone in the sample (Aldridge & Levine 2001). Consistent with this view De Vaus (1991) says that survey research is one method of collecting, organising and analysing data which is characterised by the collection of information about the same variables or characteristics from at least two or more cases and end up with a data matrix. The researcher used this method because according to Covey (2002), surveys are an effective way to gather information about respondents' previous or current behaviours, attitudes, beliefs and feelings. They are also considered to be an effective method to identify problem areas and if they are repeated over time, they are able to identify trends (Covey 2002). This study sought to gather information pertaining to postgraduate students' behaviours, attitudes and beliefs in an effort to explain the current status of their usage or lack thereof of

Internet-based information sources. Therefore the survey research strategy was deemed appropriate for this cause. The survey methodology was also considered because it has the important advantage of enabling the use of both quantitative and qualitative methods of data collection (Aldridge & Levine 2001). This mixed method approach enabled the researcher to corroborate data obtained through three different instruments, giving a more wholistic understanding towards the use of Internet-based information sources by postgraduate students in the Eastern Cape, South Africa.

Surveys employ a variety of methods to gather information such as questionnaires, face to face interviews and observation (Aldridge & Levine 2001). This study utilised self-administered questionnaires as the main instruments to collect data. The study however also employed face-to-face semi-structured interviews, as well as documentary analysis as data collection tools. The researcher compared information gathered through face-to-face semi-structured interviews and documentary analysis with data obtained from the self-administered questionnaires, a strategy called triangulation.

3.2.1 Advantages of surveys

The advantages of using a survey methodology as a research design include that:

- They allow the simultaneous collection of mutually supporting quantitative and qualitative data (Aldridge & Levine 2001). Thus a questionnaire for example can have both open-ended and closed-ended questions, and the data they elicit can open up important insights into respondents' motivation and perceptions. The researcher was able to collect both quantitative and qualitative data which provided mutually supporting evidence on the use of

Internet-based information sources by postgraduate students at three universities in the Eastern Cape, South Africa.

- Surveys are capable of obtaining comparable information from large samples of a population, over a short period of time (Aldridge & Levine 2001; Glasow 2005). Using group administration of questionnaires, for example, a researcher can collect data from many respondents in a short space of time (Aldridge & Levine 2001). In this study, self-administered questionnaires were administered to 200 postgraduate students' at three selected universities in the Eastern Cape, and the data collected over a relatively short three week period. The entire study spanned over a short nine month period, it was therefore helpful to conduct the study using the survey method, because the researcher was able to collect huge volumes of information in a relatively short period of time while the survey data took less time to analyse.
- The primary purpose of survey data is to make planned comparisons between groups (Aldridge & Levine 2001). Surveys are therefore well suited to gathering demographic data that describe the composition of a sample (McIntyre 1999). In this study, it was necessary to find out if demographical characteristics of postgraduate students influenced their use of Internet-based information sources. Thus the survey research methodology was considered appropriate for making such comparisons.
- Surveys require minimal investment to develop and administer. Self-administered questionnaires and postal surveys are considered cheap and easy to do (Maree 2007). This was an important advantage for the current researcher, as the study was conducted with very limited budget.

- A survey is quantifiable and one is able to generalise findings to an entire population if the population is sampled appropriately (The Health Communications Unit 1999). The aim of this study was to ascertain the factors that affect the use of Internet-based information sources among postgraduate students at selected universities in the Eastern Cape. Some degree of generalisation was necessary, making the survey methodology an appropriate method for this study.

3.2.2 Disadvantages of surveys

As with all research methodologies, survey research strategy has some disadvantages, including that:

- Surveys are a prime of extensive research which can be used to establish the general outlines of the researchable problem (Aldridge & Levine 2001). Thus when using closed ended questionnaires for example, it is more difficult to collect a comprehensive understanding of respondents' perspective when compared to in-depth interviews or focus groups. However, because the research design required the gathering of information from a fairly large group of postgraduate students, from three universities, dispersed geographically across the Eastern Cape region, an extensive research strategy was deemed most appropriate, for the study.
- Surveys can be expensive. Costs associated with conducting a survey, include travelling costs; accommodation expenses in the cases of surveys spanning a vast geographical area. Conducting telephone survey is also considered expensive (Maree 2007). This study was conducted in one relatively accessible region, where the researcher resides and is also a

student at one of the institutions chosen for the study. The costs associated with travel and accommodation, were therefore relatively affordable. The data instruments used in this study, particularly the self-administered questionnaire, was also affordable to administer.

- They also require some statistical knowledge, sampling and other specialised skills to process and interpret results (The Health Communications Unit 1999). The researcher took courses in SPSS training to augment her quantitative analysis skills. She also sought for help with statistical aspects of the survey research design, from students in the Statistics department at the University of Fort Hare

3.3 Methodological approach

This survey adopted a mixed method approach, a strategy that combines both quantitative and qualitative research methods. By taking a mixed method approach, the researcher may use closed ended questionnaires to collect quantitative data as well as conduct individual interviews. Mixed method approaches can be helpful in gaining in-depth understanding of some trends and patterns and it allows for contextual interpretation of results obtained from a study (Maree 2007). A mixed method approach is also useful in studying diverse perspectives or when a researcher is trying to understand the relationship between variables in a study (Maree 2007). Collecting and analysing both quantitative and qualitative data within a study, provides a more elaborate approach to the research problem and produces its deeper understanding of the phenomenon under study (Maree 2007). The main aim of this study was to discover the factors that influence postgraduate students' use of Internet-based information sources at three universities in the Eastern Cape, South Africa. It sought to accomplish this, by eliciting self-reported information of the

postgraduate students' perceptions, behaviours and attitudes towards use of Internet-based information sources. Quantitative data collection technique was most appropriate to gather self-reported data from a sample of postgraduate students chosen for the study. However, to gain a more comprehensive understanding of organisational factors that may influence the use of Internet-based information sources by postgraduate students' at the selected universities, it was necessary to include qualitative data. This was gathered through semi-structured interviews conducted with selected librarians at the three universities, as well as data obtained through document analysis.

According to Maree (2007), there are four basic mixed methods designs that are frequently used by researchers. These include explanatory mixed methods; exploratory mixed methods; triangulation mixed methods and embedded mixed methods. This study utilised the triangulation mixed method which is explained below.

3.3.1 Triangulation

According to Bell (2010), triangulation is the use of multi-methods in order to cross-check findings. This study utilised both quantitative and qualitative methods in order to give a wholistic view on the use of Internet-based information sources by postgraduate students in the Eastern Cape, South Africa. The key to triangulation is to see the same thing from different perspectives and be able to confirm or challenge the findings of one method with those of another (Law, Harper & Marcus 2003). Law *et al.*(2003) further say that accounts collected from different perspectives may not match tidily at all, as there may be a mismatch and even conflict between them. A mismatch in perspectives does not necessarily mean that the data collection process is flawed as this could be as a result of people having different accounts of similar

phenomena (Law *et al.* 2003). As highlighted above, this study employed three data collecting instruments that enabled the researcher to gather information from different perspectives on issues pertaining to the use of Internet-based information sources by postgraduate students, at the selected universities under study. These were self-administered questionnaires for the postgraduate students, face-to-face semi-structured interviews with selected university librarians responsible for electronic resource services and documentary analysis of official university records from websites of the universities under study.

3.3.2 Quantitative approach

A quantitative research approach emphasises measurement and allows the relationships between facts to be quantified and analysed (Finlayson 2010). Blanche, Durrheim and Painter (2006) are of the opinion that good quality quantitative data and statistics allow researchers to make comparisons of different situations. Consistent with their observation, this study was carried out at three very different institutions; therefore it is possible to make comparisons of the use of Internet-based information sources by postgraduate students at the different universities, from the quantitative data obtained. Quantitative data has two recognised primary strengths according to Blanche *et al.* (2006), which are firstly that the findings are generalisable and the data are objective. The aim of this study was to be able to ascertain the factors that generally affect the use of Internet-based information sources by postgraduate students at universities in the Eastern Cape and thus an unbiased, objective gathering of facts was necessary to achieve this.

3.3.3 Qualitative approach

Qualitative research is a process of understanding where a researcher develops a complex, holistic picture, analyses words, reports detailed views of informants, and

conducts the study in a natural setting (Creswell 2007, cited in Maree 2007). According to Maree (2007) the key characteristics of qualitative research include that:

- The researcher collects words and images about the central phenomenon being studied.
- The data are collected from people immersed in the setting of everyday life in which the study is framed
- The researcher serves as an instrument of data collection
- Intensive data collection techniques are used. These include individual and focus group interviews; observation; documents such as private and public records about the phenomenon being studied; artefacts and audio-visual materials such as pictures or audio recordings of people, places or events

As has been mentioned above, this research collected qualitative data through semi-structured interviews held with selected university librarians at the three universities under study. Relevant public documents published on the official websites of the three selected universities were also analysed. Information obtained from these qualitative techniques was compared with that which was obtained from questionnaires administered to the sample of postgraduate students selected for this study. The analysis of all data enabled the researcher to gain a holistic insight to the use of Internet-based information sources by postgraduate students in the Eastern Cape, South Africa.

3.4 Study population

In survey research, the term population refers to the category of people about whom a researcher intends to write in his or her report (Davies 2007). Therefore all the

members of a group under study are called a population (De Vaus 1991). In the current research, the population under study consisted of all registered postgraduate students at the University of Fort Hare (UFH), Rhodes University (RU) and the Nelson Mandela Metropolitan University (NMMU) in the 2011 academic year. All three universities are located in the Eastern Cape province of South Africa. The total number of postgraduate students at the three universities under study was 6945, consisting of 1880 postgraduate students from the University of Fort Hare; 1612 postgraduate students from Rhodes and 3453 postgraduate students from Nelson Mandela Metropolitan University. The population also included the three university libraries: The University of Fort Hare Library; Nelson Mandela Metropolitan University Library and the Rhodes University Library. These were included because there was need to obtain data from an organisational perspective on the use of Internet-based information sources by postgraduate students.

According to Maree (2007), it is impossible to include the entire population under study, especially where the entire population being studied is large. In the case of surveying postgraduate students in the current research, 6945 was too large a number to study, therefore sampling was necessary. Sampling helps the researcher to study a subset of the population and according to Leedy (2010), the researcher can use the results obtained from the sample to make generalisations about the entire population. The secret is to select a sample which will be representative, or has the same characteristics, as the overall population (Moore, 1983).

All three university libraries were however included in the study to provide corroborative organisational data.

3.5 Sampling

According to Maree (2007), the goal of a survey is to use the sample to learn about the population. De Vaus (1991), describes sampling as the strategy for collecting information from only some people in a target population in such a way that their response and characteristics reflect those of the group from which they are drawn. Aldridge and Levine (2001) define sampling as the process of choosing in a systematic fashion a subset of cases from which data will be collected, from the pool of all those potentially relevant to the research being conducted. Sampling is an essential aspect of surveying in order to make the task of surveying less costly and more manageable (Moore 1983). The sampling process consists of several stages. These are:

- Defining the population of concern
- Specifying a sampling frame from which possible cases can be drawn
- Specifying a sampling method for selecting cases from the frame
- Determining the sample size
- Implementing the sampling plan
- Sampling and data collecting
- Reviewing the sampling process (Chaturvedi 2009)

Aspects of this process and how it was carried out in the current study are described and explained below.

3.5.1 Sampling frame

The sampling frame is the list from which potential respondents are drawn, or a set of items or events that are possible to measure (Chaturvedi 2009). According to (Neuman 2006:225, cited in Nkomo 2009), a sample frame is a list of cases in a

population or the best approximation of a given population. The following table represents the sample frame from which the sample used in the study, was drawn.

Table 1: Sampling Frame of Postgraduate Students¹

Faculty	NMMU Postgraduates	RU Postgraduates	UFH Postgraduates	Total Population
Education	542	266	346	1154
Law	311	12	72	395
Management & Commerce	948	294	610	1852
Sciences	1142	573	438	2153
Social Sciences & Humanities	510	467	414	1391
Total Population	3453	1612	1880	6945

3.5.2 Sampling methods

There are two major types of sampling methods used in survey research that is probability and non-probability sampling. These are discussed below.

3.5.2.1 Probability sampling

In probability sampling, the researcher can specify in advance that each segment of the population will be represented in the sample (Leedy & Ormond 2010). This is

¹ Five faculties were identified, as being similarly available across the three universities. Therefore where there were distinct faculties, at each university, for example the faculty of Pharmacy at Rhodes University, these were added to the Sciences faculty for sampling purposes. Health Sciences and the Built Environment and Information Technology populations at NMMU were also included within the Sciences, for sampling purposes.

because probability sampling makes use of established statistical procedures enabling the researcher to estimate the extent to which his or her findings for the sample differ from the population from which it was drawn. The methods that fall under probability sampling methods include simple random sampling, systematic sampling, stratified random sampling and cluster sampling. In survey research, probability samples are preferred as they are most likely to produce representative samples (De Vaus, 1991). However Bell (2010) contends that all researchers are dependent on the goodwill and availability of respondents, and it will probably be difficult for an individual researcher to achieve a true random sample. This argument proved true in this study, while the researcher initially intended to use stratified random sampling, she resorted to use non-random sampling techniques, as it was not possible to gain access to complete lists and contact details of postgraduate students from all three universities. In random sampling, it is important to get complete lists and details concerning the entire population under study. However, postgraduate student lists and contact information were considered classified by authorities approached by the researcher at the institutions under study. What the researcher was able to obtain were the total numbers of postgraduate students and the distribution of these postgraduate students' figures across academic faculties and departments.

3.5.2.2 Non-probability sampling

Non-probability sampling methods do not make use of a random selection of population elements and therefore give the researcher no assurance that the results obtained can be related in terms of probability levels, to the population from which they were drawn (Maree 2007; Davies 2007). However; non-probability samples have their advantages in special situations such as: the researcher not having much

time available, while results are needed urgently; not having much money available or where the population is difficult to find (Maree, 2007). The types of methods that fall under non-probability sampling include: convenience sampling; quota sampling; snowball sampling and purposive sampling.

In the current research, non-probability sampling methods were employed; that is quota sampling and purposive sampling. The main reasons why the researcher adopted non-random sampling methods include that it was impossible to obtain the complete postgraduate student lists from the three universities, necessary when employing probability sampling methods, as the administrators cited privacy policies which prohibit the distribution of such information. The researcher was however given access to statistics relating to postgraduate student numbers in the different faculties and departments, for Rhodes University and University of Fort Hare, while for Nelson Mandela Metropolitan Postgraduate student statistics were obtained from official reports available NMMU's website. Permission was however granted by the administrative authorities at the three institutions to allow the researcher to collect data from available and willing postgraduate students. Thus non-random sampling methods were deemed more appropriate. This research employed quota sampling and purposive sampling, which are explained below.

3.5.2.2.1 Quota sampling

Quota sampling is a non-probability technique aimed at producing representative samples without random selection of cases (De Vaus 1991). The researcher first identifies categories of people that need to be in the sample and the required number in each category (Maree 2007). Once the researcher has identified the categories and corresponding number of respondents required for each category, the choice of respondents is left to the interviewers' discretion, but the researcher will

have set prior constraints on their choice (Sapsford 2007). This type of sampling regulates only the size of sample required for each category within the sample. The end result of the quota sample must match the population in terms of the variables important to the question under study and thus the sample will have achieved some degree of representativeness (Sapsford 2007).

Quota sampling can be employed in two ways; that is through proportional quota sampling or non-proportional quota sampling. Through proportional quota sampling, the researcher will be seeking to represent the major characteristics of a population by sampling a proportional amount of respondents required from each category (Trochim 2006). Thus if for example the chosen characteristic by which to produce a proportional sample of 100 respondents, is gender, and it is already known that 40% of the population are males, while 60% are females, then 40 male respondents and 60 female respondents will be required to be represented in the sample, respectively.

In non-proportional quota sampling the researcher specifies the minimum number of sampled units he or she wants in each category. The researcher is not concerned about having a number that match the proportions in the population, but wants to have enough numbers in the sample, to assure that it will be possible to analyse even the smaller groups within the population (Trochim 2006).

In the current research it was necessary to include postgraduate students sufficiently representing the three different institutions, under study. Thus non-proportional quota sampling was employed to determine the number of postgraduate respondents required from each university. This was done to ensure that the sample would represent at least 50 respondents from Rhodes University as it had the smallest total

number of postgraduate students. The result was that 30% of the sample represented the University of Fort Hare, 25% represented Rhodes University, while 45% represented the Nelson Mandela Metropolitan University.

Table 2: Postgraduate Students' Sample by University

University	Population Size	Percentage of Sample Allocation	Sample Allocation in numbers
Nelson Mandela Metropolitan University	3453	45%	90
Rhodes University	1612	25%	50
University of Fort Hare	1880	30%	60
Total	6945	100%	200

Proportional quota sampling was however employed to ensure that the sample proportionally represented postgraduate students from across the five faculties chosen for the study. The resulting sample allocation was as shown in Table 3 with 16.6% of the sample represented the Education faculty, 5.7% of the sample represented the Law faculty, and 26.7% of the sample represented Management and Commerce faculty, 31% of the sample represented the Science faculty while 20% of the sample represented the Social Sciences and Humanities faculty.

Table 3: Postgraduate Students' Sample by Faculty

Faculty	Population Size	Percentage of Sample Allocation	Sample Allocation in numbers
Education	1154	16.6%	34
Law	395	5.7%	11
Management and Commerce	1852	26.7%	53
Science	2153	31%	62
Social Sciences and Humanities	1391	20%	40
Total	6945	100%	200

3.5.2.2.2 Purposive sampling

In purposive sampling, the researcher chooses a sample based on who they think would be appropriate for the study (Chaturvedi 2009). Cases included in the sample are chosen for a particular purpose which is directly linked to the study or they are chosen and included because they represent diverse perspectives on an issue (Leedy & Ormond 2010). Therefore, when employing purposive sampling, the researcher identifies and targets individuals whom they believe to be typical of the population being studied, and who fall in categories of interest to the researcher (Davies 2007; De Vaus 1991). He or she will be seeking to include and locate respondents with attributes that are of particular interest to their study.

In this research, after establishing the quotas of postgraduate students representing the three universities under study, as well as quotas of postgraduate students representing different academic faculties, purposive sampling was used to include

within the quotas, postgraduate students representing different levels of study, gender and age, as these characteristics were of interest to the study.

Purposive sampling was also used in this study to identify and target key library personnel who would participate in interviews. The library personnel were included in order to provide information, from an organisational perspective on the use of internet-based information sources by postgraduate students at the three selected universities in the Eastern Cape, South Africa.

3.5.3 Sample size

When it comes to sampling, a very important consideration is the size of the sample as it needs to be representative of the population (Maree 2007). Factors that influence sample size include: the type of research; research hypothesis; financial constraints; importance of results; number of variables being studied; methods of data collection; accuracy needed and the size of the population (McMillan & Schumacher 2007). In the current research, the researcher decided on a total of 200 postgraduate students to be the size of the sample. Leedy and Ormond(2010), suggest that when considering the sample size for a population beyond 5000, the population size is almost irrelevant, and the general principle to apply is that the larger the population, the smaller the percentage to be drawn for the sample. The total population under study was fairly large at 6945. Therefore the researcher chose to draw a sample of 200 postgraduate student participants, judging this figure as being the most practical number of individuals the researcher could reach considering she had to self-administer the questionnaires as well as conduct interviews with librarians. Travelling and accommodation costs were also determining factors as the researcher had to collect data from three different sites over a very limited period of time.

The researcher also considered the advice given by McMillan and Schumacher (2007), that when the research involves comparing groups, a minimum of 15 respondents per group must be included in the sample. In the current study some comparisons on how the use of Internet-based information sources by postgraduate students differed according to their academic discipline affiliation, level of study, age and gender, was required. It was therefore necessary to have these categories sufficiently represented in the sample. The sample size of 200 made it possible have the recommended minimum number of cases required to make comparisons on the use of internet-based information sources by postgraduate students across the differing groups they represented.

3.6 Research instruments

The research instruments that were employed in this study included self-administered questionnaires, distributed to 200 postgraduate students chosen to participate in the study. The researcher had also included a sample of three librarians, with whom she would conduct face-to-face interviews. Each of the selected librarians was to represent, e-resource services at the libraries of the University of Fort Hare, Rhodes University and the Nelson Mandela Metropolitan University. The researcher also used documentary analysis as instruments to collect supplementary data relevant for the study.

3.6.1 Self-Completion questionnaires

In this study self-completion questionnaires were administered to postgraduate students using collective administration. The postgraduate students' questionnaire was called E-resource Use Survey. It was designed from a combination of previous

and validated constructs from the TAM variables, as well as from information gathered during the review of related literature.

The self-completion questionnaires were chosen as instruments to collect data because according to Bryman (2004) and Seale (2004) they are cheaper and quicker to administer, as well as are convenient to respondents, while eliminating interviewer effects. The researcher was able to gather data from respondents concentrated in specific areas, which were postgraduate computer laboratories, departmental workspaces and postgraduate residences at the three universities selected for the study.

Self-completion questionnaires also have an advantage on the time it takes to collect data. According to Aldridge and Levine (2001) self-administered questionnaires can be distributed and returned quickly. In this study, the researcher was able to distribute and collect the questionnaires back from willing postgraduate participants in a relatively short period of time. The respondents were informed either to drop their completed forms at a central location convenient to them, or the researcher would collect the completed questionnaire at a designated time and place convenient to the respondents. Through this procedure, the researcher was able to obtain a response rate of 66.5%.

Some of the common disadvantages of self-completion questionnaires include that they are inappropriate to illiterate respondents, or to people who cannot read English. Self-administered questionnaires are also known to have low response rates and after distributing the questionnaire, the researcher may not know or be certain about who actually completes the questionnaire. The disadvantage on low response rate was counteracted by the fact that the self-completion questionnaires

were administered collectively, and therefore either the participant would physically submit the completed questionnaire at a designated location, or the researcher would physically collect from the respondent once they were completed. No postal distribution or collection was necessary. To ensure that the participants were literate, prior to the distribution of a questionnaire, the researcher verified the participants' level of study and academic discipline. This was done to ensure that only participants, who were postgraduate students and therefore deemed to be literate, because of their higher degree status, were the ones who received and completed the questionnaires. Also collective administration of questionnaires is one way of ensuring a very high response rate and one is also able to explain the purpose, relevance and importance of the study and clarify any questions that respondents may have (Kumar 2005).

Other disadvantages of questionnaires as identified by Aldridge & Levine (2001) are that the questionnaire needs to be and look short; it must be limited to simple questions and must have few open questions. The researcher attempted to mitigate the disadvantage of length by designing a three-page questionnaire with three distinct sections. The questions were mostly closed ended and offered respondents response options from which they could choose.

3.6.1.1 Questionnaire design

The questionnaire was made up of three sections, A, B and C. Section A. of the questionnaire sought to elicit information on the use of the Internet and Internet-based resources for academic purposes. Information on other uses of the Internet, other than academic related was also sought.

Section B. had a set of 25 questions measured on a 5 point Likert scale. The Likert scale is one of the most widely used scale in survey research (Maree 2007). Scales are used to measure how respondents feel or think about something and help researchers to measure strength of feeling or attitude (Maree 2007). The most common use of the Likert scale is asking respondents whether they agree or disagree with a statement. At least two categories of agree or disagree are necessary, however more usually four to seven categories are used, to give respondents a wider choice (Maree 2007).

In this study, the five point Likert scale was used to in order for postgraduate student participants to indicate their level of agreement with statements related to variables associated with the use of Internet-based information sources. The five categories included strongly disagree, disagree, neutral, agree and strongly agree. The neutral response option was included to allow respondents who were undecided on a statement to have an option from which to choose.

The Likert scale statements were used to elicit information on postgraduate students' feelings and attitudes concerning their experience with Internet-based information sources, with reference to variables identified in literature known to affect the use of digital libraries or technology. These were either in the individual variables category or organisational variables category as shown in table 4. This would help the researcher to determine the individual and organisational factors influencing the use of Internet-based information sources, by postgraduate students at selected universities in the Eastern Cape

Table 4: Likert Scale Statements

Section B. Likert Scale Statements		
	Variables	Question Number
Individual Factors	ICT Skills	1,2,3
	Information Literacy	4, 12
	Disciplinary Affiliation	5
	Perceived Usefulness	18, 19, 20, 21
	Perceived Ease of Use	22, 23, 24, 25
Organisational Factors	Organisational Support	6
	Accessibility	7,8,9,10,11
	Training and Technical Support	12, 13
	Publicity	14,15
	Supervision	

Section C. of the questionnaire had questions covering the demographic background and had dichotomous questions, and multiple choice questions. The demographic characteristics covered were, gender, level of study, university of respondent, their faculty and department of study.

3.6.2 Face-to-face interviews

According to Maree (2007), an interview is a two-way conversation in which the interviewer asks the participant questions designed to collect data geared towards learning about the participant's ideas, beliefs, views, opinions and behaviours.

According to Davies (2007) six classes of data can be gathered through interviews and these include:

- Facts about the 'here and now'
- What the interviewee knows
- Facts about past events
- Feelings
- Attitudes of opinions
- Beliefs (Davies 2007:106-107)

There are three identifiable types of interviews namely, unstructured or open ended; semi-structured and structured interviews.

“Open-ended interviews often take the form of a conversation with the intention that the researcher explores with the participant her or his views, ideas, beliefs and attitudes about certain events or phenomena” (Maree 2007: 87). These types of interviews are often used in qualitative research and according to Maree (2007) can be spread over a period of time and consist of a series of interviews. On the other hand, semi-structured interviews are commonly used in research to corroborate data emerging from other sources, and usually requires the participant to answer a set of predetermined questions (Maree 2007: 87). In a structured interview, the researcher asks a standard set of questions and nothing more (Leedy & Ormond, 2010). Questions in a structured interview are according to Maree (2007) detailed and developed in advance.

In survey research, interviews are fairly structured (Leedy & Ormond, 2010). In the current study, the researcher chose the semi-structured interview technique, since the data obtained from the interviews was to be used to corroborate data emerging

from the E-Resource Use Survey regarding organisational factors influencing use of Internet-based information use by postgraduate students, at the three selected universities, in the Eastern Cape, South Africa.

Interviews have several recognised advantages which include that; with interviews it is possible for the researcher to ask more probing questions, unlike would be the case in self-administered questionnaires. The researcher is also able to explain complex questions and clarify anything the participant misunderstands as the interviewer will be present. The researcher also has control over who responds to questions and the sequence of questions, and also by establishing good rapport the researcher can ensure that questions are taken seriously (Aldridge & Levine 2001). According to (Leedy & Ormond 2010) face-to-face interviews also yield the highest response rate in survey research.

The disadvantages of face-to-face interviews include that they tend to be expensive. They cost money and time, including travelling and accommodation costs. Interviews also require a substantial amount of time to conduct. According to Aldridge and Levine (2001), interviewing can also be taxing for the interviewer, especially when the interviews are not wholly structured.

In order to gather data from an organisational perspective concerning the use of Internet-based information sources by postgraduate students, the researcher developed a 21 semi-structured interview schedule with the initial plan of conducting face-to-face interviews with three librarians, each representing the libraries of the three institutions chosen for the study. The researcher held a face-to face interview with one librarian at the University of Fort Hare. The senior librarian from Nelson Mandela Metropolitan University, who had been identified by the researcher to

participate in the interview, opted to have three of his staff members responsible for different aspects electronic resource service to be interviewed in his place. Therefore the researcher held a group Interview with three librarians at the Nelson Mandela Metropolitan University, but to ensure uniformity, used the same Interview schedule, as for the one used at the University of Fort Hare and Rhodes University. The librarian approached to participate in the interview from Rhodes University opted to respond to the questions on the interview schedule in written format, as she was unable to avail herself for a face-to-face interview at a time suitable for both parties. Responses to the interview schedule on E-resource Use were however obtained from all three universities.

3.6.3 Document analysis

Documents can be used to provide relevant data useful to corroborate evidence from other sources. When one uses documents as a data gathering technique, they focus on types of written communication that may shed light on the phenomenon being investigated (Maree 2007). Document analysis can be used to supplement information obtained by other methods, as for instance when the reliability of evidence gathered from interviews or questionnaires is checked (Bell, 2010). According to Bell (2010) document research can involve the analysis of photographs, films, CD-ROMS, videos, slides and other non-written sources and records kept in electronic form.

Documents can be categorised into primary and secondary sources. Primary sources of data or original source documents are those which are usually unpublished, and which the researcher has gathered from the participants or organisations directly (Maree 2007). Secondary sources of data refer to any materials that are based on previously published works (Maree 2007). Examples of

document data sources include: company reports, published or unpublished documents, newspapers, journals, letters and correspondence of educational institutions including e-mail, college websites and other Internet material (Bell 2010; Maree 2007). The researcher visited the three university websites focusing on the library services pages. Of interest to the researcher was information linked to the provision of electronic services at libraries of the three institutions selected for the study. The data obtained from the three university library services website pages was compared with some of the data supplied by in interviewed librarians and questionnaire respondents.

3.7 Pilot study

All data gathering instruments should be piloted to test how long it takes recipients to complete them, to check that all questions and instructions are clear and to enable the researcher to remove any items which do not yield usable data (Bell 2010). According to Bell (2010), the main purpose of a pilot exercise is to get the bugs out of the instrument, so that respondents in the main study will experience no difficulties in completing it. It also enables one to carry out a preliminary analysis to see whether the wording and format of questions will present any difficulties when the main data are analysed. A pilot study was conducted to pre-test the questionnaire that was used in this study. The designed questionnaire was distributed to 15 potential respondents from the University of Fort Hare representing the varying demographics, including faculties, gender and levels of study. The pilot test was conducted at the University of Fort Hare because it was where the researcher could easily access postgraduate students to participate in the test at short notice, and without incurring travelling and accommodation costs. From the pilot test, it was discovered that respondents were not very familiar with the term "Internet-based

information sources” used in the initial questionnaire, but were more familiar with the use of the word e-resources. The name of the questionnaire was therefore changed to e-Resource Use Survey, which was readily understood by most respondents. Some questions were removed from the original questionnaire, as they appeared repetitive to the respondents. After redrafting the initial questionnaire, the final draft of the questionnaire was then distributed to the population sample in the study.

3.8 Ethical considerations

Research ethics are principles that are used to guide researchers in decision making about what is acceptable practice in any research project (Sheffield Hallam University n.d.). It is necessary to uphold research ethics as research participants have moral and legal rights, which researchers should not violate (Sheffield Hallam University n.d.). Ethical principles or code of conduct in social research, therefore serve to protect research participants from harm, by ensuring that there are agreed standards of acceptable behaviour which protect participants’ moral and legal rights. (Finlayson 2010; Sheffield Hallam University n.d.).

According to Leedy *et al.* (2010), most ethical issues fall into one of four categories: protection from harm; informed consent; right to privacy and honesty with professional colleagues. In order to be able to conduct this study, it was necessary for the researcher to be able to obtain official approval from the three participating university institutions, in compliance with ethics guidelines set out by the research ethics committees at each university. Application letters requesting the permission to conduct the survey were submitted to each of the three universities selected for the study, and approval was given in the form of ethics clearance certificates from the Nelson Mandela Metropolitan University, and the University of Fort Hare. While

permission to conduct the study at Rhodes University, was obtained in the form of an e-mail confirmation from the universities' registrar.

Consent to participate in the research was also sought and obtained from all respondents, chosen for the survey. Each questionnaire began with explaining the details of the research, and assuring the participants of confidentiality, while also giving the participants the opportunity to agree or disagree to participate in the research. In order to proceed with the survey, each willing respondent was asked to read and sign a declaration of consent, indicating that they agreed to participate in the study.

3.9 Data analysis

Raw data taken from questionnaires, interview schedules and checklists need to be recorded, analysed and interpreted (Bell 2010). This calls for the process of data analysis where data are coded, entered into some statistical package and analysed. According to Bell (2010), the researcher will be constantly looking for similarities and differences, for groupings, patterns and items of particular significance. The next section describes the steps that were taken during the data analysis stage of the study.

3.9.1 Data coding

Data coding is according to Davies (2007) the building of relevant coding systems that will facilitate speedy data inputting. Coding assists the researcher in reducing a large number of replies into a few categories containing only the critical information required for analysis.

The data from the E-resource Use Survey was coded in preparation for entry into the Statistical Package for the Social Sciences (SPSS) version 19.

3.9.2 Data entry

Coded data were then entered into SPSS version 19. According to Davies (2007), SPSS has become the standard analytical tool for most survey researchers. The researcher then used SPSS (19) to conduct basic statistical functions which produced frequencies as well as cross tabulations, useful for descriptive analysis.

3.9.3 Reliability and validity

The validity of a measurement instrument is the extent to which the instrument measures what it is supposed to measure (Leedy & Ormond 2010). In order to test the validity of the research instruments used in this study, the researcher employed the content validity method, which according to Muijs (2004), refers to whether or not the content of the manifest variables, such as questions of a questionnaire is right to measure the latent concept such as attitude, that we are trying to measure. In the particular study the questionnaire which was designed to measure attitudes of postgraduate students towards the use of Internet-based information sources, was designed in reference to literature related to measuring attitudes, and patterns of use of the electronic resources or technology by students. According to Muijs (2004), conducting an extensive search of the literature on the concept one wants to measure helps to achieve content validity. Another way to ensure the content validity of an instrument, the researcher usually presents a provisional version to experts in the field for their comments before finalising the instrument (Maree, 2007). In the current research, during the design stage of the instrument, the researcher sought the guidance and critiquing of professionals within the Information Science field. A group of four experts were asked to systematically review the questionnaires' contents, to see check if all items on the instruments were measuring what they were

supposed to measure. Revisions were made until the final product was deemed satisfactory.

According to Leedy *et al.* (2010), a researcher can enhance the reliability of a measurement instrument by ensuring that the instrument be administered in a consistent fashion, as there should be standardisation in the use of the instruments from one situation or person to the next. In the current research the same questionnaire “E-resource Use Survey”, was administered in similar fashion to postgraduate students at the three institutions chosen for the study. Questionnaires were handed out to willing postgraduate students, who filled them out and the researcher collected the completed questionnaire, from designated points.

3.10 Limitations from data collection

There were a number of limitations that the researcher encountered before and during data collection. The process of obtaining permission to collect data particularly from the University of Fort Hare (UFH) and the Nelson Mandela Metropolitan University (NMMU) proved to be cumbersome and lengthy. It took the researcher six months to get the ethical clearance certificates from the two universities. The researcher however eventually managed to obtain clearance from all three institutions and was then able to collect data albeit very late into the academic year.

As the data were collected towards the end of the academic years’ at all three universities, it was not very easy to locate postgraduate students to accommodate the various demographic characteristics, as the students had begun vacating for the holidays or were in the middle of writing exams. At NMMU for example, quite a substantial number of postgraduate students from faculties other than those within

Science and Agriculture, had left for the holidays when data was collected. Consequently respondents from these faculties at this university were under represented. At Rhodes University (RU), there were more respondents from the honours groups than there were in the Master's and PhD categories, as these were the most easily accessible postgraduate students that the researcher was able to locate during the period she conducted the study.

Funding also proved to be a limiting factor, as the researcher had to rely on personal savings to fund the whole project. Accommodation, living and travelling costs limited the time the researcher could spend collecting the data at each university. She was also not able to employ research assistants to be able to collect data from more postgraduate students.

3.11 Chapter summary

This chapter provided a detailed explanation of the research methodology chosen and procedures undertaken to conduct the study. It outlined the survey research methodology that was used in the study, highlighting the motivation for choice of method. It gives a description of the research sites, as well as the population from which a sample of participants were drawn. The data collection instruments that were employed are also described, as was the pilot study undertaken to test and improve the research instruments. Ethical procedures that were undertaken to gain entry to the participating institutions are also highlighted. The chapter then ends by outlining the challenges the researcher encountered concerning and during the process of data collection. The next chapter is a presentation and analysis of the findings from data gathered from the study.

Chapter Four: Data analysis and presentation

4.0 Introduction

The preceding chapter details the procedures used to collect and analyse the data that were collected from the field. The purpose of this chapter is to present findings of the study from the E-Resource use survey and interview results. These are presented in two sections. The first section is a presentation of findings from the E-Resource Survey and the second section presents findings from the Interviews held with librarians across the three universities.

4.1 Presentation of data from E-Resource Use Survey

This section presents data obtained from the questionnaires distributed to and returned by the sample of postgraduate students from the three universities under study.

4.1.1 Response rate

A total of 200 questionnaires were handed out to a sample of postgraduate students at the Nelson Mandela Metropolitan University (NMMU), the University of Fort Hare (UFH) and Rhodes University (RU), using the proportions determined by the sampling used. This resulted in 90 questionnaires being distributed to postgraduate students from NMMU, 60 questionnaires being distributed to postgraduate students at UFH and 50 questionnaires being distributed to postgraduate students at RU. Of the 90 questionnaires distributed to postgraduate students at NMMU, 47 were returned, and of these 42 were complete and usable for data analysis. All 60 questionnaires distributed to postgraduate students at UFH were returned, and complete. They were therefore included for data analysis. Of the 50 questionnaires handed out to students at Rhodes University, 34 questionnaires were returned and

of these 31 were complete and therefore included for data analysis. In total, 133 questionnaires were completed from the three universities and therefore included in the data analysis. Overall, the response rate was 66.5%. The researcher considered this a reasonable response given that over 50% of the respondents returned fully filled up questionnaires.

4.1.2 Demographic characteristics

Demographic features such as age, gender or level of study allow researchers to create a profile of a study's respondents. In this study, it was necessary to establish whether or not individual characteristics of postgraduate students influence the use of Internet-based information sources. This section presents a profile of the sample population in terms of the demographic characteristics of gender, age, academic faculty, level of study and university affiliation.

4.1.2.1 Gender profile of sample

The responses to the e-Resource survey were made up of 68 men (51%) and 65 women (49%). This shows that there were slightly more male than female postgraduate students among the respondents.

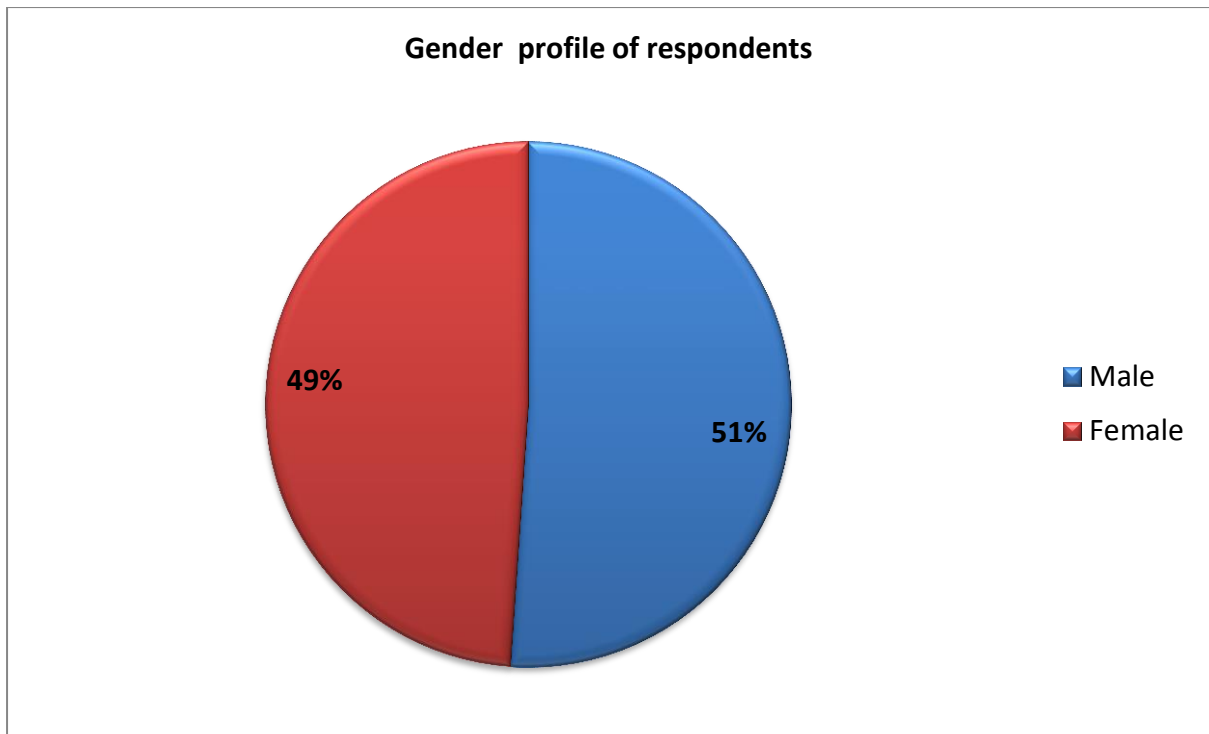


Figure 4: Gender profile of respondents

4.1.2.2 Age profile of respondents

The majority of respondents 92 (69.2%) were in the 21-30 age bracket. This is followed by 24 respondents (18%) who were in the 31-40 age bracket. 14 (10.5%) of the respondents were between 41-50 years, and the least age representation of 3 respondents (2.3%) were aged 51 years or older. This distribution of age is typical of an institution of higher learning where the bulk of students enrol as school leavers to undertake their first degree and then proceed to postgraduate studies while mature students are usually the minority group of students because they come later in their life to undertake postgraduate studies.

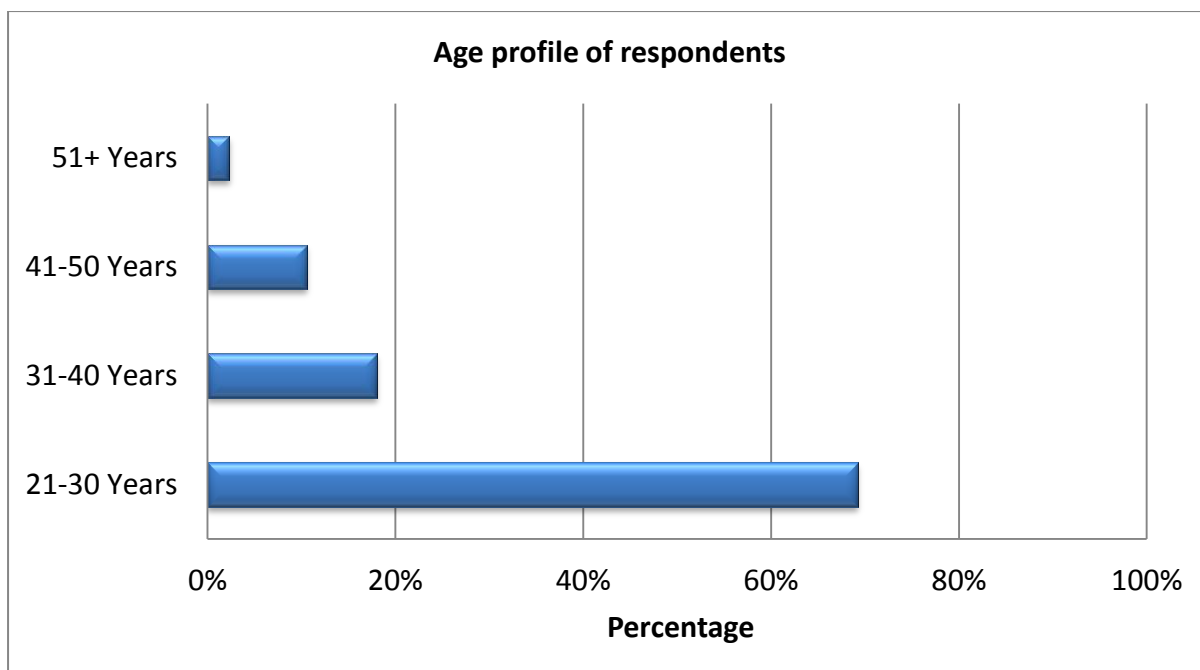


Figure 5: Age profile of respondents

4.1.2.3 Respondents' level of study

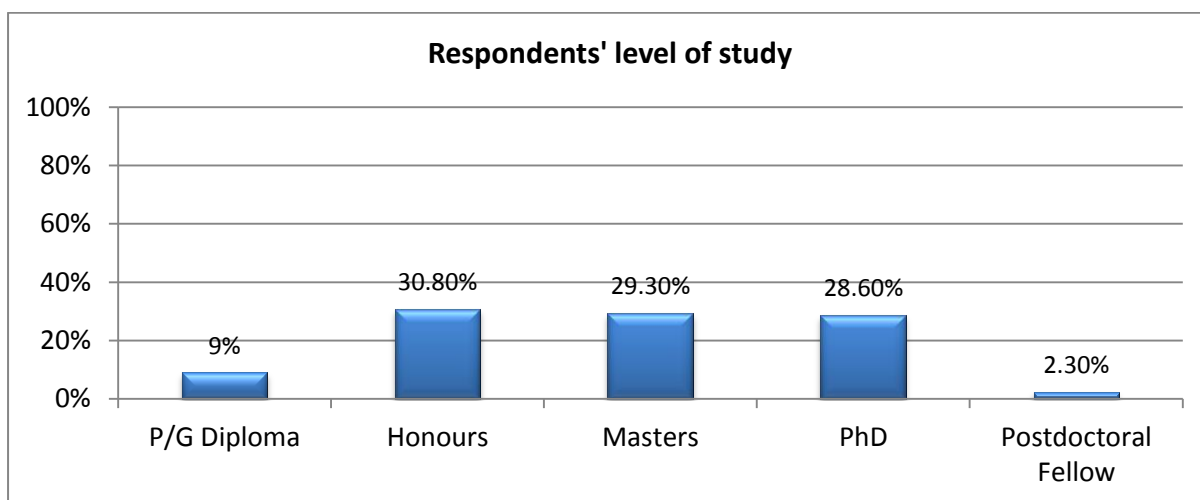


Figure 6: Respondents' level of study

The distribution of respondents' by their level of study included 41(30.8%) Honours students, closely followed by 39 Masters Students who constituted approximately 29.3% of the respondents. A total of 38 (28.6%) respondents were studying towards their PhD. 12 (9%) respondents were studying towards a postgraduate diploma, while only three (2.3%) respondents were postdoctoral fellows

4.1.2.4 Respondents' by university

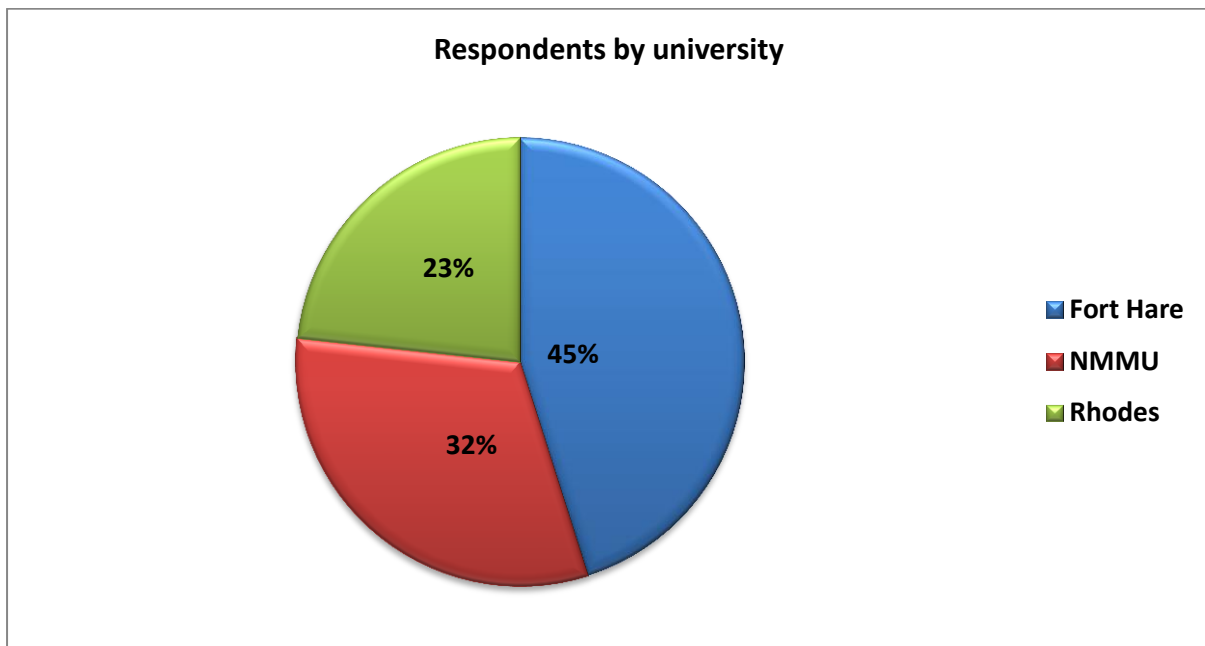


Figure 7: Respondents by University

The most respondents 60 (45.1%) were from the University of Fort Hare. This was followed by 42 (31.6%) respondents were from the Nelson Mandela Metropolitan University, while 31(23.3%) respondents were from Rhodes University. There was a higher response rate from the University of Fort Hare because the academic faculties and departments and hotels from which postgraduate students were targeted are located in one central campus, and therefore it was fairly easy to trace back completed questions for collection, from respondents. Another factor that affected a lower response rate from the sample allocation at the Nelson Mandela Metropolitan University (NMMU) may have been that the time the researcher collected data, as some postgraduate students at the NMMU were busy preparing their exams and therefore were unable to return their completed questionnaires in time.

4.1.2.5 Respondents by academic faculty

A total of 61 (42.9%) respondents were from the faculties of science. Thirty-six (27.1%) respondents were students from the Humanities and Social Sciences. The third largest group of respondents represented by 25 (18.8%) students were from the faculties of Management and Commerce. Six (4.5%) of the respondents were from the faculties of Education, and five (3.8%) of the respondents were from the faculties of Law. This shows that the majority of responses were from students affiliated to science related academic disciplines. The sample allocation for the faculties of Science was considerably higher than for the other faculties, as the population of postgraduate students studying towards science-related qualifications was considerably higher than were the populations for the other faculties.

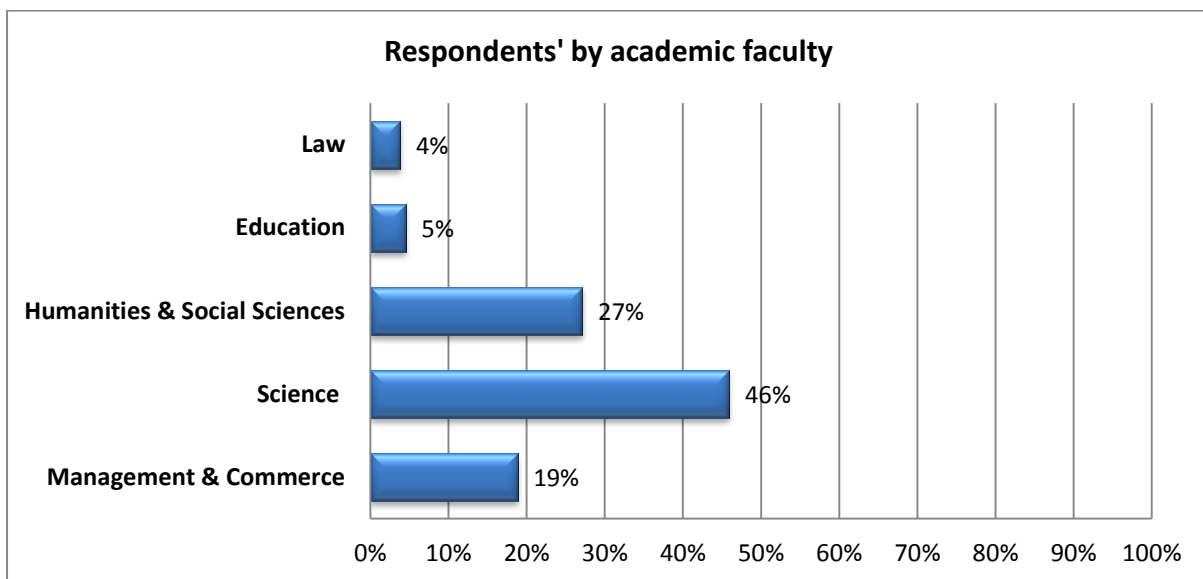


Figure 8: Respondents by faculty

4.1.3 Internet use patterns

The questions under this section sought to elicit respondents' views on their use of the Internet for academic purposes. Their views on their use of specific e-resources, such as the Online Public Access Catalogues (OPACs); e-Databases and e-

Journals; library websites and search engines were also sought. The respondents were also invited to indicate other activities that they engage in when using the Internet.

4.1.3.1 Internet experience

The respondents were asked to indicate how long they had been using the Internet. Sixty-two (46.6%) of the respondents indicated that they had been using the Internet for a period between 6-10 years. While 26 (19.5%) of the respondents had been using the Internet for over 10 years. 42 (31.6%) of the respondents have been using the Internet for a period between 1-5 years, while two (1.5%) of the respondents indicated that they have been using the Internet for less than a year. The majority of the respondents indicated that they had been using the Internet for 6 years or more, which may indicate that the majority of respondents are fairly experienced in their use of the Internet to search information resources for academic research.

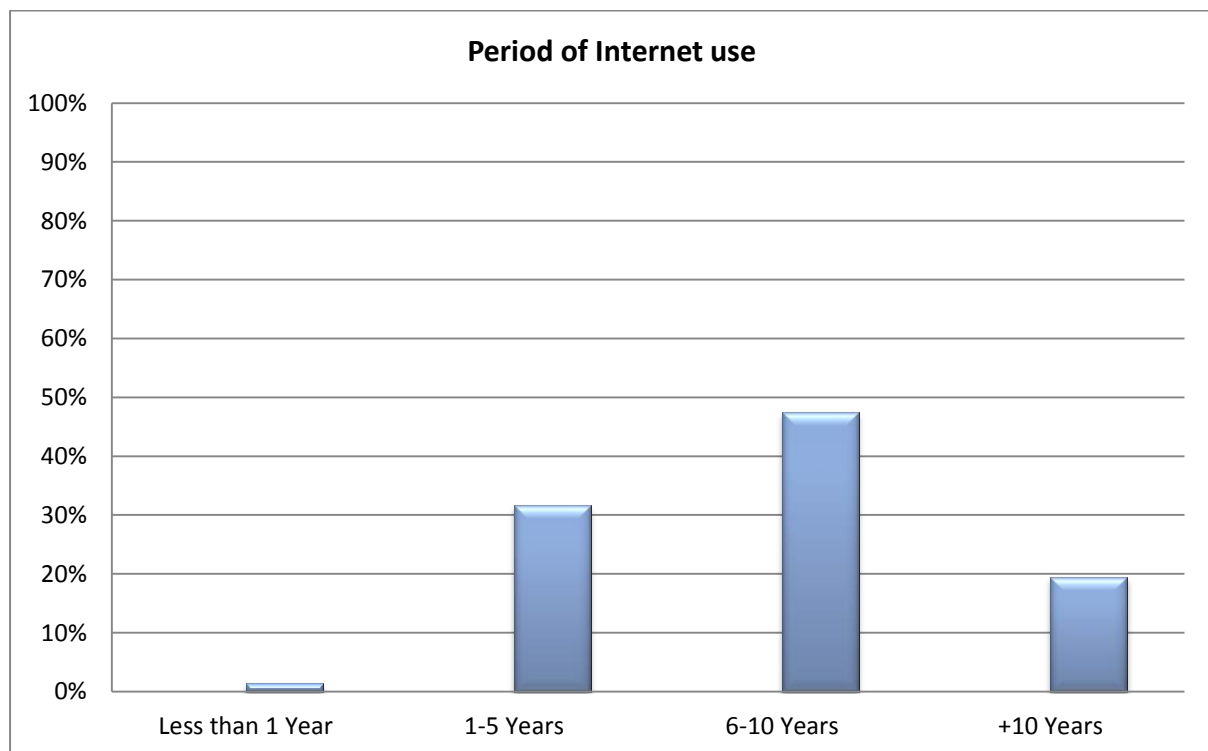


Figure 9: Period of Internet Use

4.1.3.2 Use of the Internet for academic purposes

Respondents were asked to indicate if they used the Internet for academic purposes and all the 133 (100%) respondents, indicated that they used the Internet for academic purposes.

4.1.3.3 Use of specific e-resources

The respondents were then asked to indicate whether or not they used specific e-resources for academic purposes and if they did, they were also to indicate frequency of use. They were asked to indicate this from a scale of never use to use every day. This was re-coded by the researcher to a three item scale which included “never use”, “non-frequent use” and “use frequently”. Therefore the responses in the “never Use” category remained in the “never use” category, while responses in the “use once a month” and “use three or four time each month”, and “use once a week” were all re-coded to become the “non-frequent use” category and the responses in the, “use two or three times a week” and “use every day” were re-coded to the “use frequently” category.

4.1.3.4 Use of online public access catalogues (OPACs)

As shown in figure 10 below, 68 (51%) respondents were in the non-frequent use of Online Public Access Catalogues (OPACs) category. This was followed by 48 (36%) respondents who were in the frequent use of OPACs category. There were also 17 (13%) respondents who indicated that they never use the OPAC. These results could indicate that the OPAC is an unpopular source of gaining access to e-resources among the respondents.

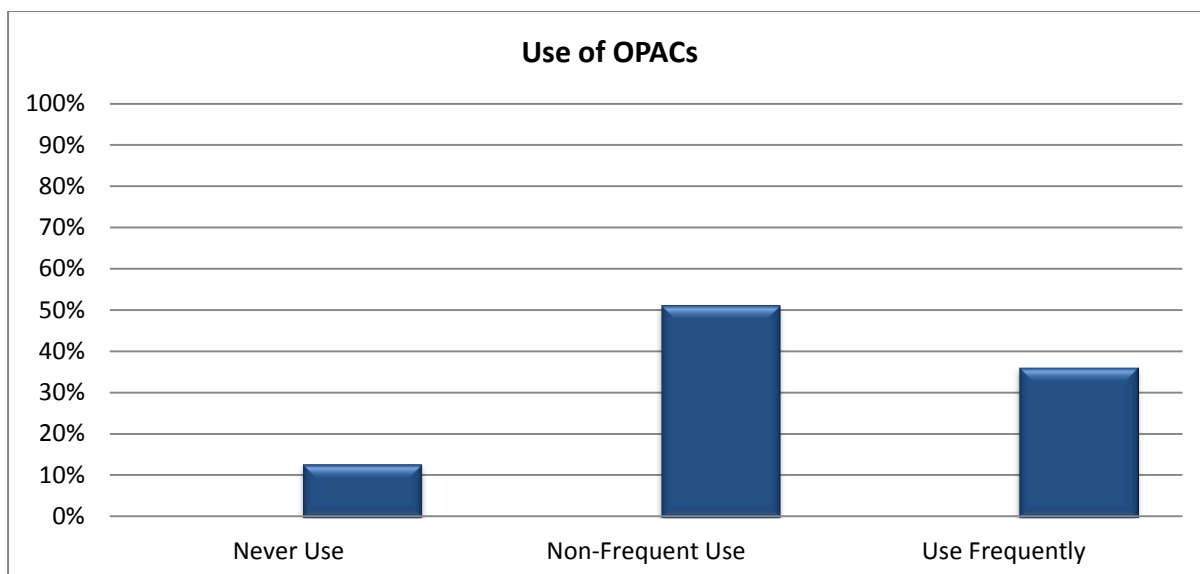


Figure 10: Use of online public access catalogue

4.1.3.5 E-Journal and e-database use

Seventy-five (56%) respondents, representing the majority indicated that they use e-journals and e-databases frequently to conduct academic research. There were however 48 (36.1%) respondents who fell in the non-frequent use of e-journals and e-databases category, while 10 (7.5%) respondents indicated that they never use them.

These findings seem to indicate that e-journals and e-databases are a moderately popular source of academic information among the respondents as just over half the respondents indicated frequent use.

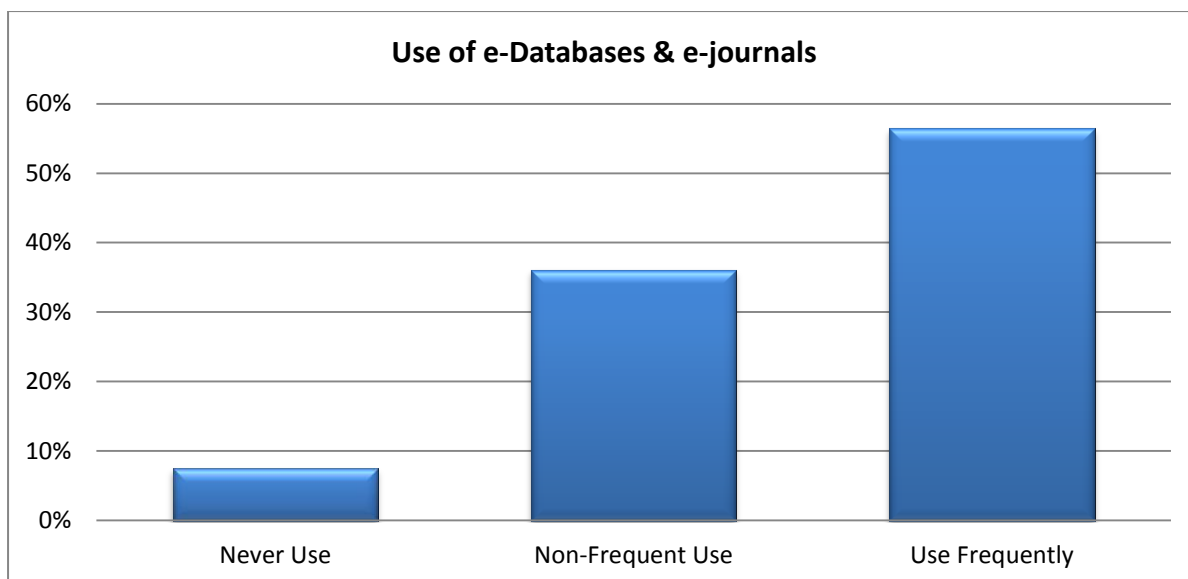


Figure 11: Use of e-Databases and e-Journals

4.1.3.6 Use of e-journals and e-databases by age

An analysis to find out if there were any differences in the use of e-databases and e-journals by different age brackets was conducted. The findings revealed that within the 21-30 age bracket, 45 (45.7%) of respondents indicated that they use e-databases and e-journals frequently. Forty (43.5%) respondents within this category reported infrequent use of the e-resources, while 10 (10.9%) of the respondents in this category indicated that they never used e-databases and e-journals. They were also notably the only respondents who reported that they never used e-databases and e-journals across the age ranges.

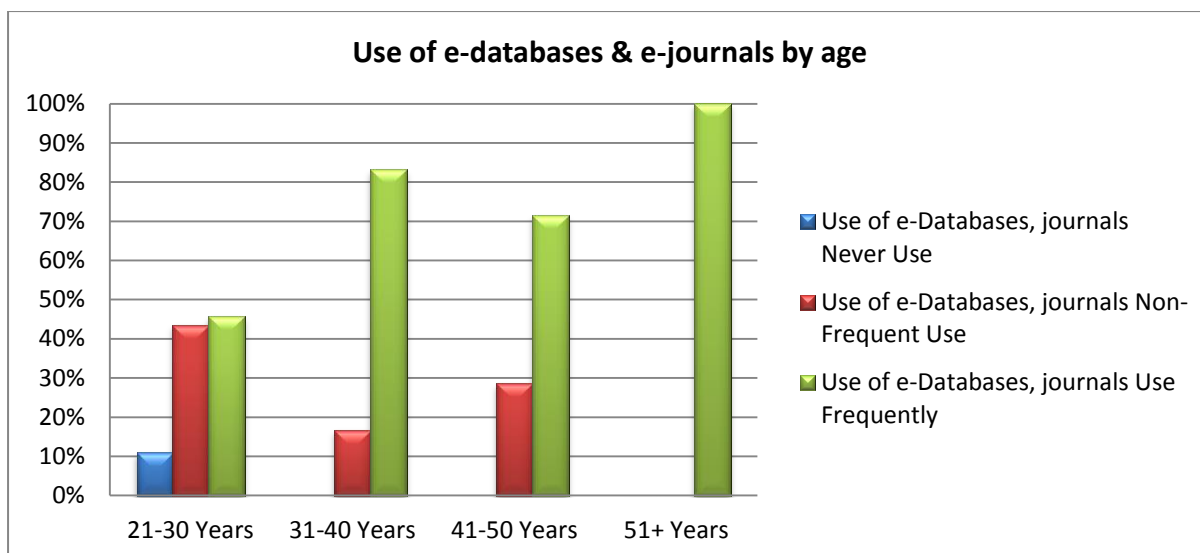


Figure 12: Use of e-databases & e-journals by age

Twenty (83.9%) of the respondents within the 31-40 years age bracket indicated that they frequently used e-databases for academic research. The other four (16.7%) respondents in this category reported that they infrequently used e-databases and e-journals.

Within the 41-50 years age bracket, 10 (71.4%) respondents indicated that they frequently used e-databases and e-journals. The other four (28.6%) respondents indicated an infrequent use of these e-resources.

All three (100%) respondents, 51 years and older, reported frequent use of e-journals and e-databases.

The findings above reveal that, proportionately, there are significantly more respondents amongst the more mature students: 51+ years (100%); 31-40 years (83.3%) and 41-50 years (71.4%) who frequently use e-journals and e-databases, compared to the respondents within the younger age category 21-30 (45.7%). This may be indicative of the fact that the more mature respondents are undertaking higher degrees and therefore undertaking more research intensive courses, which

would make them rely more heavily on e-journals and e-databases to fulfil their research information needs.

4.1.3.7 Use of e-Journals and e-Databases by Gender

There were 41 (60.3%) male respondents who indicated a frequent use of e-databases and e-journals for academic research. Twenty-three (33.8%) male respondents reported infrequent use of e-databases and e-journals, while four (5.9%) respondents in this category reported that they never use e-databases and e-journals.

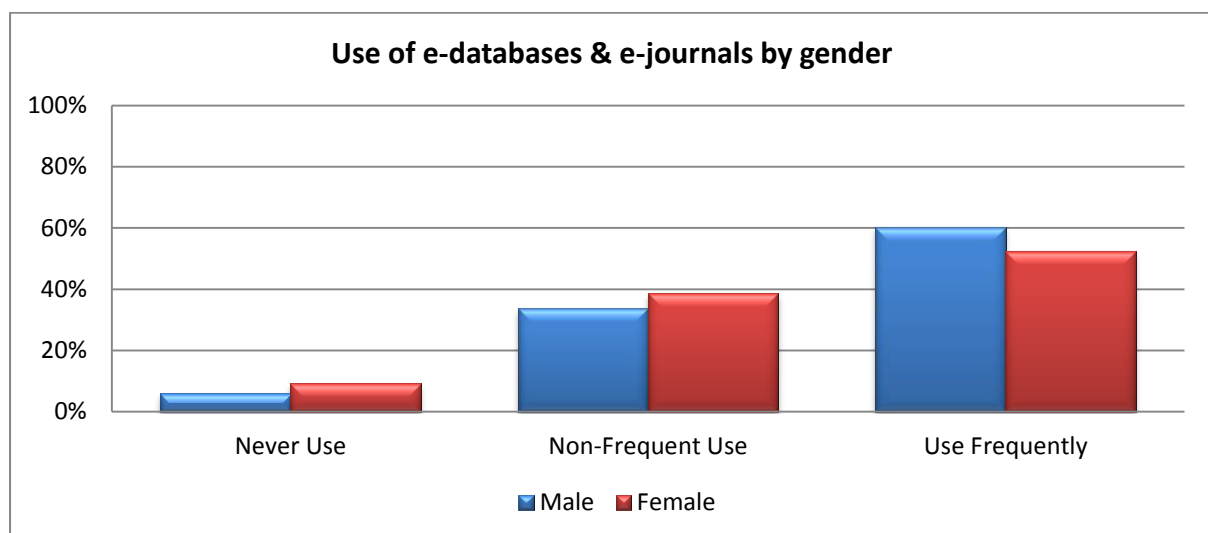


Figure 13: Use of e-databases & e-journals by gender

In the female category, 34 (52.3%) respondents indicated that they use e-databases and e-journals frequently, while 25 (38.5%) respondents in this category reported an infrequent use of the same resources. There were six (9.2%) female respondents who reported that they never use e-databases and e-journals.

There appeared to be marginally more male respondents (60.3%) who reported frequent use of e-databases and e-journals than there were female respondents

(52.3%). This indicates that gender does not significantly affect the use of e-databases and e-journals among the respondents.

4.1.3.8 Use of e-databases and e-journals by level of study

An analysis of the use of e-databases and e-journals by level of study revealed that three (25%) of the postgraduate diploma level respondents used e-databases and e-journals frequently. Eight (66.7%) respondents in this category indicated an infrequent use of e-databases and e-journals. One respondent representing (8.3%) respondents in this category indicated that he or she never used e-databases and e-journals for their academic research.

At the honours level, 11 (26.8%) respondents reported that they frequently used e-databases and e-journals for academic research. Twenty-two (53.7%) respondents at the honours level indicated that they infrequently used e-databases and e-journals, while 8 (19.5%) respondents at this level of study indicated that they never use e-databases and e-journals.

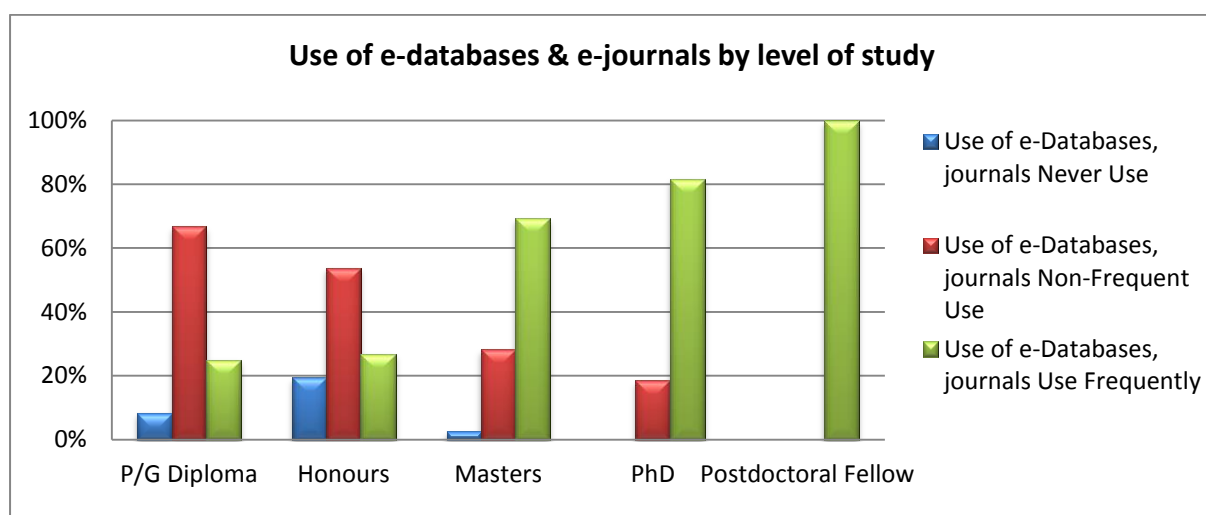


Figure 14: Use of e-databases & e-journals by level of study

At the master's level, 27 (69.2%) respondents reported frequent use of e-databases and e-journals. Eleven (28.2%) respondents in this category reported infrequent use

of the same resources, while one (2.6%) master's level respondent indicated he or she never used e-databases and e-journals.

At the PhD level, 31 (81.6%) of the respondents indicated that they used e-databases and e-journals frequently, while seven (18.4%) respondents reported non-frequent use of the resources.

All three (100%) post-doctoral level respondents indicated that they use e-databases and e-journals frequently.

There was a significant difference between the use of e-databases and e-journals among the respondents, with proportionately more respondents from the higher degrees that is; masters, PhD and post-doctoral, reporting frequent use of e-databases and e-journals for academic research than there were respondents who reported the same in the lower degrees category. There was also a proportionately progressive difference in frequent use, with the percentage of frequent use of e-databases and e-journals increasing proportionately the higher the level of study of the respondents. This may indicate that the higher the degree level of the respondents, the more they rely on e-databases and e-journals to fulfil their information needs. This may be because the higher degrees are more research intensive, requiring the respondents to conduct a significant research project, which requires intense literature reviews, therefore rendering e-databases and e-journals a useful reservoir for relevant information, fulfilling the information needs of respondents in their higher degrees category.

4.1.3.9 Use of Search Engines

Respondents were asked to indicate if they used general search engines such as Google and Yahoo for academic purposes, and the frequency of that use.

Figure 15 below indicates that the majority 124 (93.2%) respondents use search engines frequently for academic research. There were only nine (6.8%) respondents who indicated that they infrequently make use of search engines in their academic research. These findings reveal that search engines are a preferred source or access point for academic information resources among the respondents.

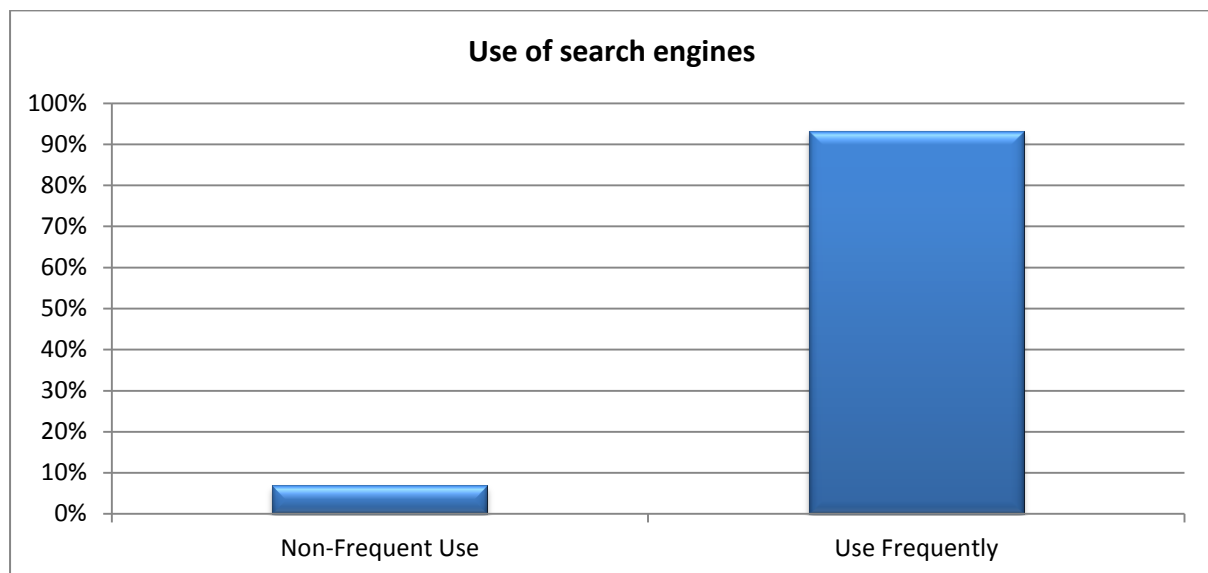


Figure 15: Use of search engines

4.1.3.10 Use of Search Engines by Age

An analysis of the use of search engines for academic research purposes among respondents by age category revealed that 86 (93.5%) respondents in the 21-30 age bracket use search engines frequently. Six (6.5%) respondents in this category reported an infrequent use of search engines.

Of the respondents between the ages of 31-40 years, 22 (91.7%) reported that they frequently used search engines for academic research and only 2 (8.3%)

respondents within this category indicated an infrequent use of search engines for research purposes.

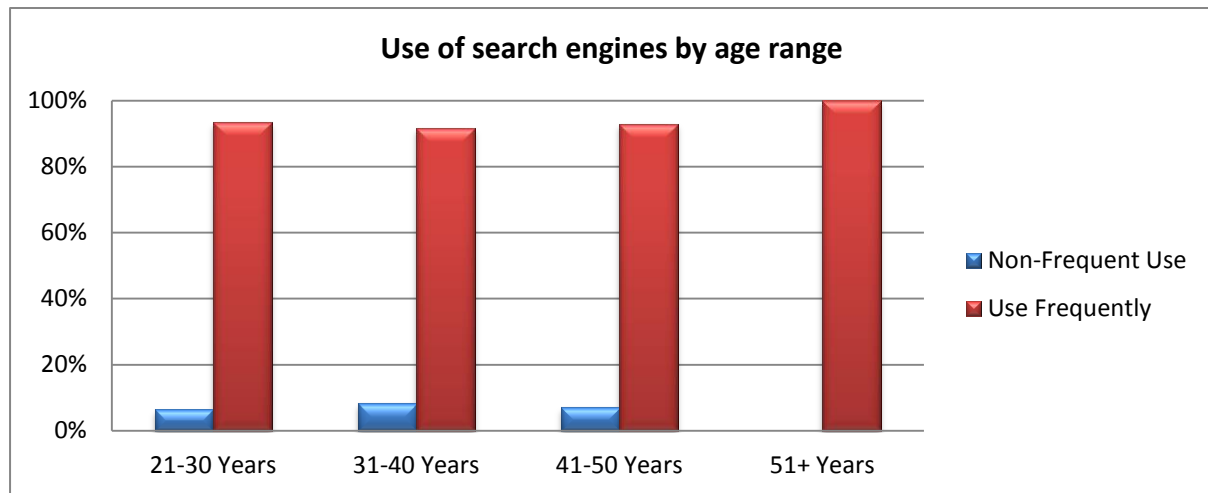


Figure 16: Use of search engines by age range

Within the 41-50 years age category, 13 (92.9%) respondents revealed that they frequently used general search engines in search for academic information. There was one (7.1%) respondent in this category who reported that he or she infrequently used search engines for academic research purposes.

All three respondents in the 51+ age category reported a frequent use of search engines for academic research purposes.

The findings reveal an overwhelmingly positive receptiveness to the use of search engines for academic research purposes by respondents across the different age categories. There were proportionately more respondents across the different age categories who indicated a frequent use of search engines for academic research, compared to those who infrequently use them. Search engines therefore seem to be a popular and preferred access point to academic resources on the Internet among respondents, whether young or old.

4.1.3.11 Use of search engines by gender

An analysis of the respondents' use of search engines for academic research purposes by gender revealed that 63 (92.6%) male respondents reported frequent use of search engines, while only five (7.4%) male respondents indicated an infrequent use of the same resources for academic research work.

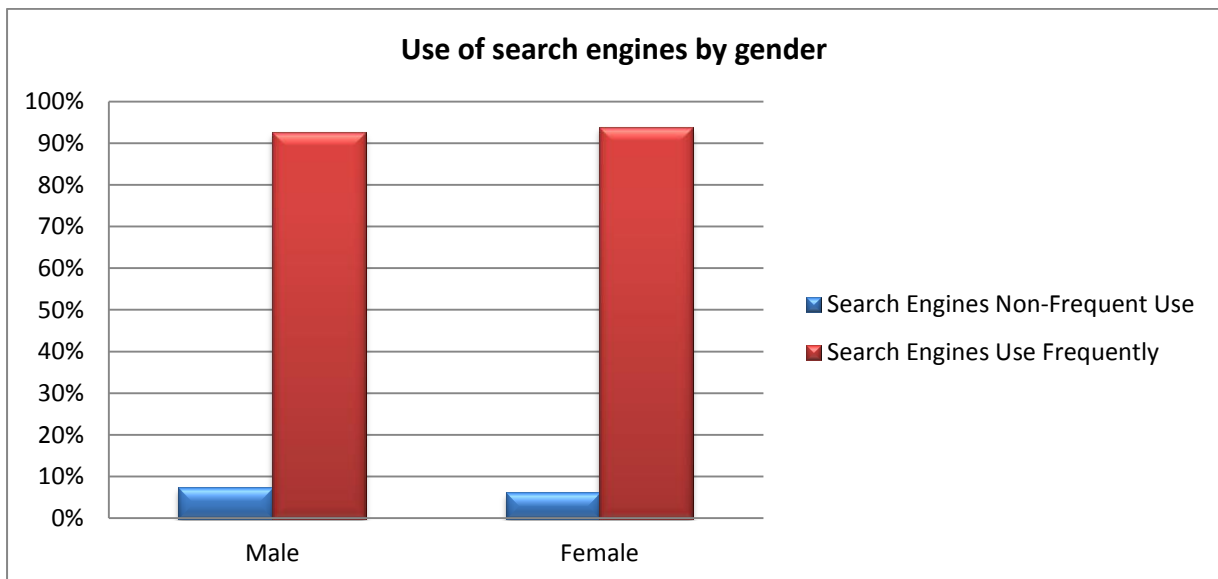


Figure 17: Use of search engines by gender

Of the female respondents, 61 (93.8%) indicated that they used search engines frequently for their academic research needs, while (6.2%) female respondents indicated an infrequent academic use of these resources.

The findings reveal a very marginal difference in the use of search engines by either male or female respondents. This indicates that gender has no significant impact in the respondents' choice to use search engines for academic research.

4.1.3.12 Use of search engines by level of study

Eleven (91.7%) respondents who are undertaking postgraduate diploma level studies indicated that they frequently use search engines to access scholarly

information from the Internet. Only one (8.3%) respondent in this group reported an infrequent use of search engines.

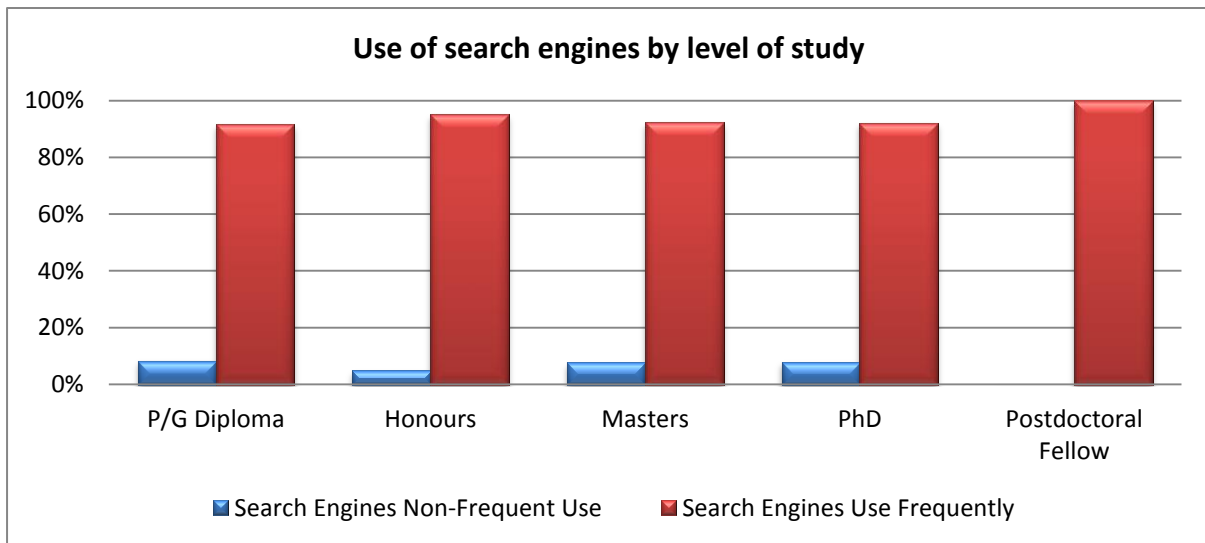


Figure 18: Use of search engines by level of study

Of the respondents studying towards their honours degree, 39 (95.1%) reported a frequent use of search engines for academic research, while two (4.9%) respondents in this category reported an infrequent use of search engines for scholarly research purposes.

At the Master's degree level, 36 (92.3%) of the respondents reported that they frequently use search engines in their academic research activities. Three (7.7%) respondents in this category however reported an infrequent use of the same resources for scholarly research purposes.

There were 35 (92.1%) respondents at the PhD level, who indicated that they frequently use search engines for their academic research needs. Three (7.9%) respondents in this group use search engines for the same purpose infrequently.

All three (100%) postdoctoral respondents use search engines frequently use search engines for their academic information needs.

The findings reveal a frequent use of search engines for academic research purposes proportionately across respondents at the different level of studies. This may indicate that search engines are a preferred access point to e-resources, regardless of the level of study of the respondents.

4.1.3.13 Use of the library websites

The gateway for postgraduate students to easily access scholarly e-databases and e-journals subscribed to by their university is usually via the university's library website. The respondents were asked to indicate whether or not they used their library's website, as well as their frequency of use of them.

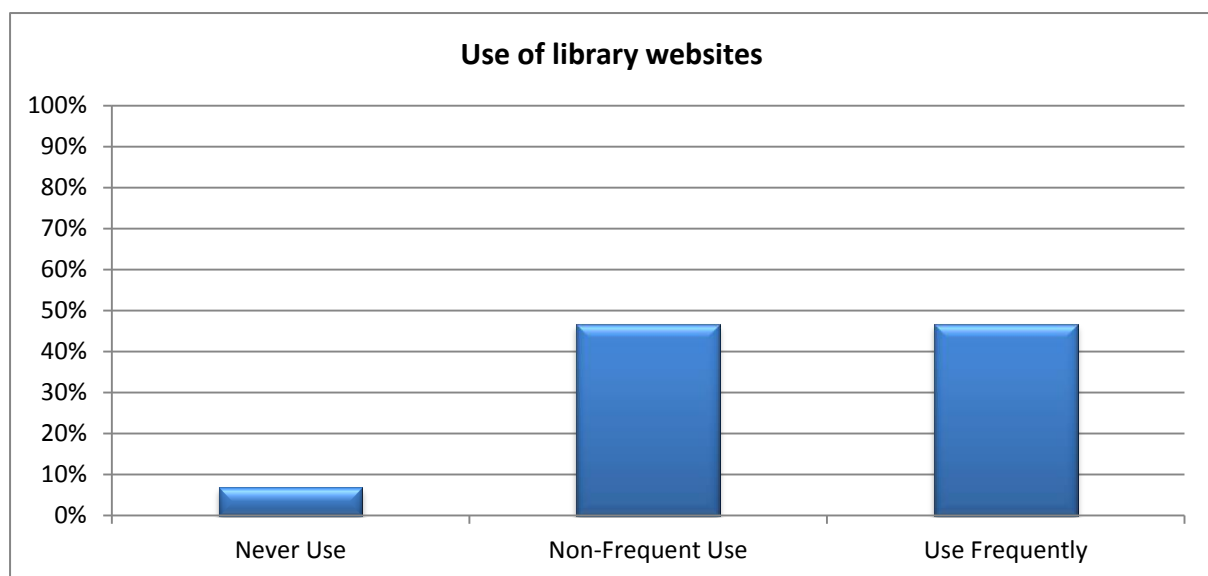


Figure 19: Use of library websites

In response to the question on whether the respondents used their library website to conduct academic research, 62 (46.6%) respondents indicated that they frequently use the library's website to access academic information. An equal number of 62 (46.6%) respondents were in the category indicating infrequent use of the library's website for academic research. There were nine (6.8%) respondents across the three universities who indicated that they never use the library website for academic

research purposes. The findings reveal that respondents moderately rely on library websites to access academic information sources.

4.1.3.14 The use of document delivery and current awareness services

Document delivery services are services offered by some scholarly e-database and e-journal vendors to deliver the latest relevant documents to the researcher's desktops via e-mail. While current awareness services are used by scholarly e-databases and e-journal vendors to keep academic researchers informed of the availability of the latest relevant journal articles or electronic information sources.

Figure 21 below shows that 62 (46.6%) of the respondents indicated that they never use document delivery and current awareness services for academic research purposes. There were however 45 (33.3%) of the respondents who use these services infrequently, while 26 (19.5%) of the respondents indicated that they frequently used document delivery and current awareness services for academic purposes.

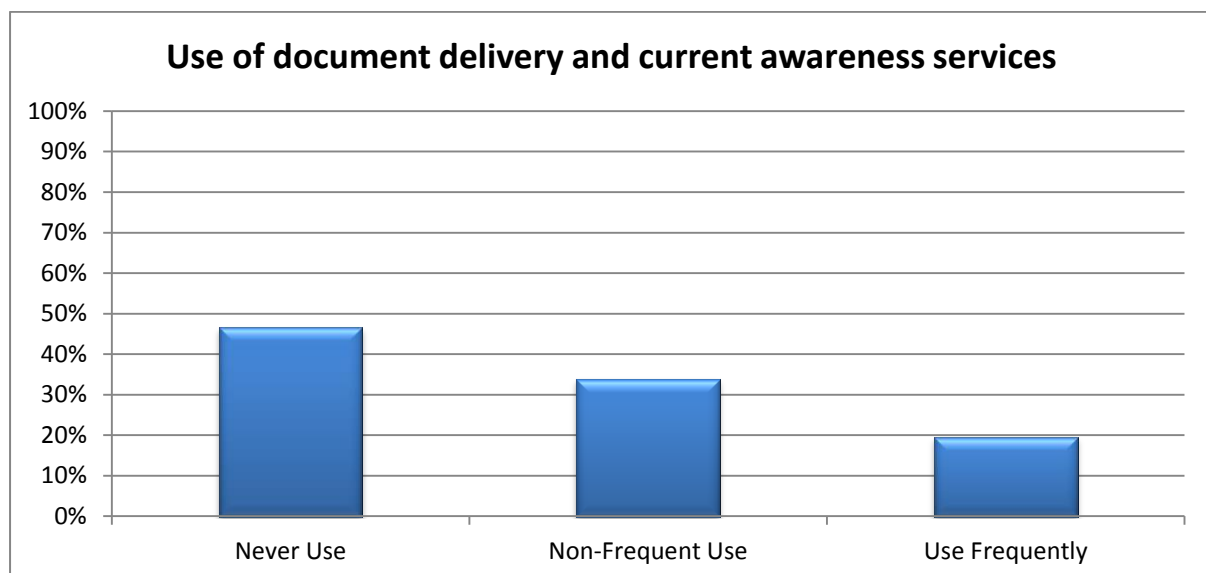


Figure 20: Use of document delivery and current awareness services

The findings indicate that document delivery and current awareness services are an unpopular source of obtaining academic information among respondents at the universities included in the study. The majority (46.6%) of the respondents to this question were in the never use document delivery and current awareness services category. This was followed by (33.3%) respondents in the infrequent use category. Only (19.5%) of the respondents indicated that they used these services frequently. This may indicate that the majority of respondents across the three universities are unaware of the existence of such services for their benefit. Of those who are aware of the existence of document delivery and current awareness services, the majority of the respondents, (33.3%) use it infrequently, which may indicate that this is not the preferred method of accessing Internet-based information sources for academic research purposes.

4.1.3.15 The use of discussion lists and newsgroups

Discussion and newsgroups are online based interactive forums that can be beneficial towards meeting the information needs of postgraduate students. Discussion lists are electronic forums for interaction among a closed group of like-minded people (Gould 1998, cited in Hundie 2002). When messages are sent to the discussion list, it is redistributed to all subscribed members of the group via e-mail (Hundie 2002). Newsgroups are similar to discussion lists in that they are news forums where people of similar interests can converge and exchange ideas. However newsgroups are different to discussion lists in that no e-mails are distributed to subscribers, and the subscriber to a newsgroup has to visit the newsgroup website to read the latest messages. Both discussion lists and newsgroups provide a great opportunity for postgraduate students in various

academic disciplines to have immediate access to people within their fields of study thereby engaging in mutually beneficial interactions.

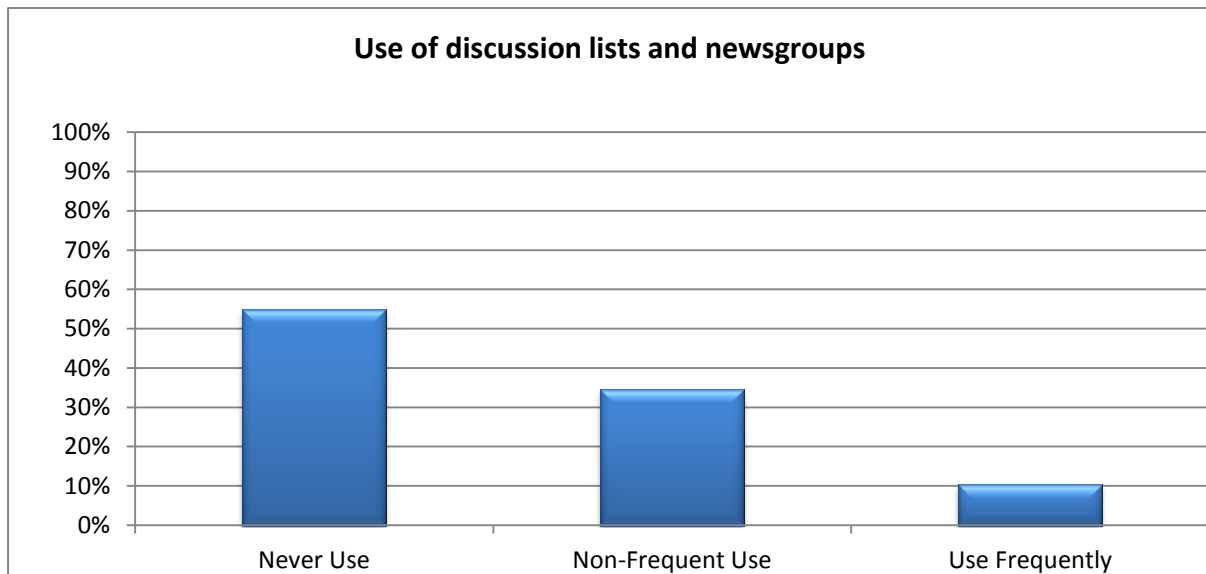


Figure 21: Use of discussion lists and newsgroups

The respondents were asked to indicate whether or not they used discussion lists and newsgroups, as well as to indicate the frequency of use of these tools. 73 (54.9%) respondents indicated that they never used discussion lists and newsgroups as sources of academic information. A further 46 (34.6%) respondents were in the category of respondents who indicated non-frequent use of discussions lists and newsgroups, while only 14 (10.5%) respondents indicated that they frequently used discussion lists and newsgroups as sources of academic information for research.

These findings indicate the unpopularity of discussion lists and newsgroups among the respondents as sources of academic information. This may be because they are unaware that these services do exist, and are at their disposal.

4.1.3.16 Other purposes of Internet use

Recent studies reveal that among academics, there is a growing reliance on the Internet, for purposes other than for teaching, learning and research (Nkomo 2009).

The Internet can be used for personal communication and social networking through the use of e-mail and social networking tools. It can also be a source of entertainment as Internet users can access websites that provide music, videos and interactive games. People can access the Internet for job seeking purposes as well as to conduct commercial transactions, such as buying and selling banking among many others. In order to find out the nature and frequency of interaction with the Internet by postgraduate students for non-academic purposes, the respondents were asked to indicate the other purposes for which they accessed the Internet.

64 (48.1%) of the respondents said that they use the Internet for the purposes of e-mail, job-seeking, entertainment and social networking as well as for commercial activities. 37 (27.8%) of the respondents indicated that they used the Internet for e-mail, entertainment and social networking and job seeking only. 13 (9.8%) used the Internet for e-mail, entertainment and social networking, five (5.3%) of the respondents use the Internet for e-mail and job seeking, three (2.3%) respondents use the Internet for entertainment and social Networking only. While a further three (2.3%) use the Internet for e-mail only. There was only one respondent who indicate that they used the Internet for job-seeking only. The findings indicate that the predominant use of the Internet, other than for academic purposes is for e-mailing. The majority of the respondents also indicated that they use the Internet for several other purposes, including e-mailing, entertainment, social networking, commercial activities and job seeking. This indicates that the Internet is a popular medium for social networking, business transacting and personal communication among the respondents.

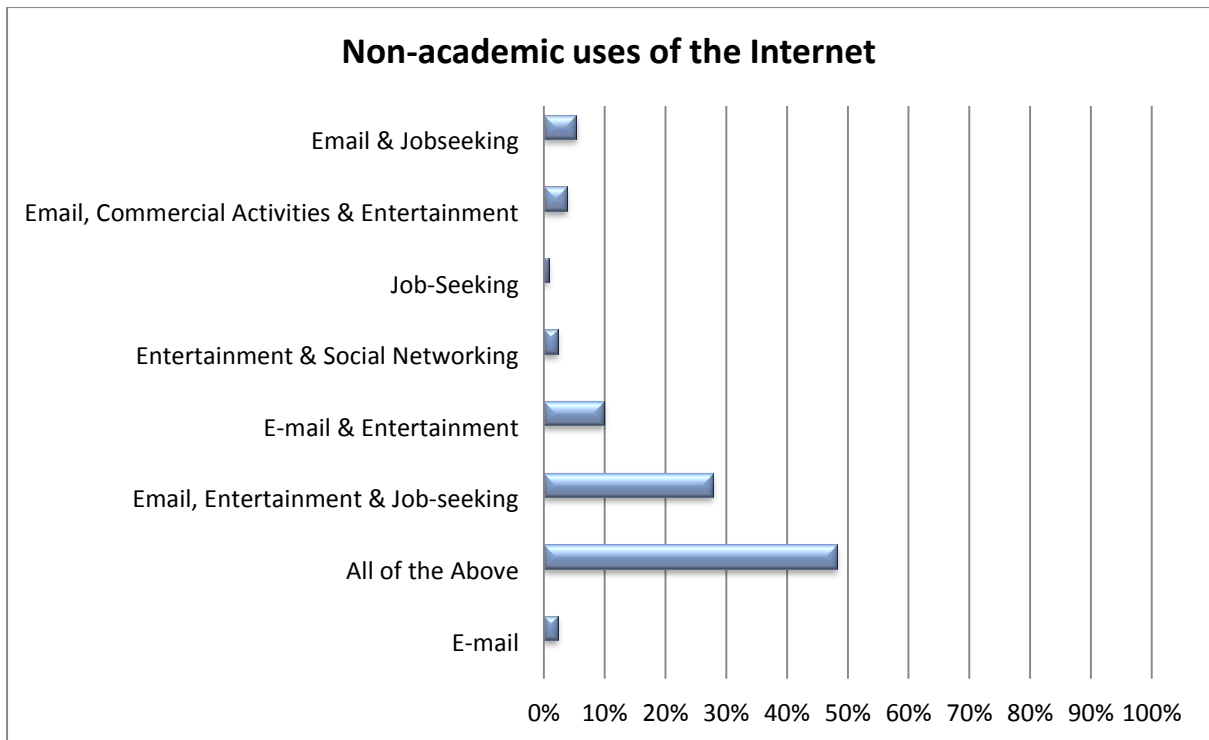


Figure 22: Non-academic use of the Internet

4.1.4 Individual factors affecting Internet-based information resource use

The findings under this section represent respondent’s views on questions relating to individual factors affecting Internet-based information use. The respondents were asked to indicate the degree to which they disagreed or agreed to statements related to their computer self-efficacy, information literacy, academic discipline affiliation and individual perceptions on the usefulness and ease of use of Internet-based information sources. These together with the demographic factors of age, level of study and gender would enable the researcher to determine individual characteristics that affect postgraduate students’ use of Internet-based information sources.

4.1.4.1 Computer self-efficacy

Computer self-efficacy refers to the self-reported level of computer use know-how by respondents. Knowing the level of computer self-efficacy among the respondents would help determine their level of confidence in using technology, including the

Internet. Respondents were asked to agree or disagree on a five point Likert scale to a statement that they know how to use computers for doing their work. 97 (72.9%) of the respondents strongly agreed while 27 (20.3%) of the respondents agreed that they knew how to use computers to do their work. Four (3%) of the respondents selected the neutral response option. One (0.8%) of the respondents strongly disagreed and a further one (0.8%) disagreed with this statement. These findings reveal that the majority of the respondents believe that they know how to use computers, which would also mean that they possess adequate computer literacy skills that enable them to use the Internet in search for electronic information sources useful for their academic work.

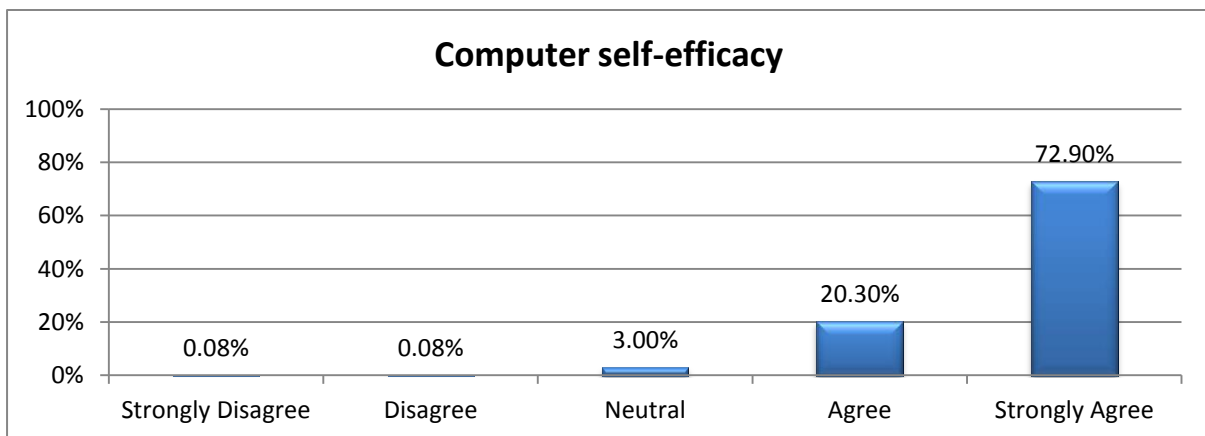


Figure 23: Computer self-efficacy

Table 5: Computer self-efficacy by gender

Computer self-efficacy by gender				
	Male Frequency	Male Percentage	Female Frequency	Female Percentage
Strongly Disagree	1	100%	0	0%
Disagree	0	0%	1	100%
Neutral	3	75%	1	25%
Agree	17	63%	10	37%
Strongly Agree	47	49%	50	52%

Table 5 shows that, of the respondents' who strongly agreed that they knew how to use computers, 50 (51.5%) were female, while 47 (48.5%) were males. While 17 (63%) of those respondents who chose the agree option were males and 10 (37%) were females. Of the four respondents who selected the neutral option to this question, three (75%) were males while one (25%) was female. There was only one (100%) male respondent who strongly disagreed that they knew how to use computers while only one (100%) female respondent disagreed that they knew how to use computers. These findings reveal that there is not much difference on the ability of either male or female respondents to use computers.

4.1.4.2 Information literacy

Information literacy is a broader area of competence that enables one to be able to find and fulfil one's information needs, including understanding how libraries are organised (ACRL 2012; ODLIS 2012). For any researcher to be able to search for relevant Internet-based information sources, a user must possess more than just computer literacy but to also possess the skills encompassed in information literacy. The information literacy skills include: an ability to identify the information need; to locate and access the relevant information in an efficient manner; to evaluate the discovered information sources and to appropriately use that information to fulfil the information need. In this study, the researcher sought to discover the respondents' self-reported level of information literacy with specific reference to Internet-based information sources. This helped to determine the level of confidence with which postgraduate students in the selected universities, have in their information literacy skills when searching through Internet-based information sources, to fulfil their information needs.

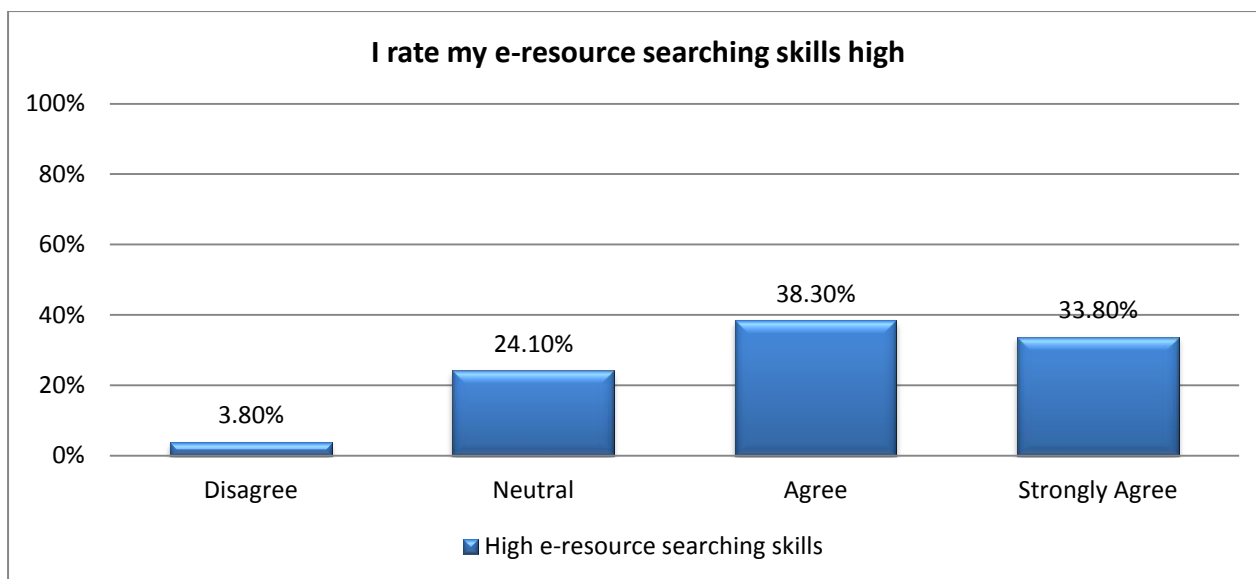


Figure 24: Information literacy skills

The respondents were asked to rate themselves on a Likert scale if they felt their e-resource searching were high. This question sought to elicit information about the self-reported information literacy levels of the respondents, when interacting with electronic information sources. Figure 24 shows that, 51(38.3%) of the respondents who were the majority, agreed that they would rate their e-resource searching skills high. This was closely followed by 45 (33.8%) of the respondents who strongly agreed to this statement. There were 32 (24.1%) respondents who selected the neutral option while five (3.8%) of the respondents disagreed that they would rate their e-resource searching skills high. The majority of the respondents agreed that they had high e-resource searching skills, which would indicate that the respondents are reasonably able to manoeuvre their way on the Internet and are therefore able to easily retrieve e-resources for use in the studies.

4.1.4.3 Academic disciplinary culture of e-resources use

In literature there is much evidence to suggest that there are some academic disciplines that have a propensity towards embracing technology earlier than

happens in other academic disciplines. It has been discovered that scholars or researchers in for example the sciences academic disciplines, were early adopters of Internet-based information sources, when compared to researchers from other academic disciplines (Talja & Maula 2003). The basic proposition of such claims is that scholars in some academic disciplines advocate for and are generally heavy users of Internet-based information sources.

A statement was included, that sought to elicit respondents' views on whether the culture within their discipline of study or line of profession leaned strongly towards e-resource use. 70 (52.6%) of the respondents, representing the majority strongly agreed that professionals and colleagues within their field strongly encouraged the use of e-resources to conduct research. A further 42 (31.6%) of the respondents selected the neutral option. While three representing (2.3%) of the respondents disagreed and one (0.8%) respondent strongly disagreed that professionals and colleagues in their academic discipline strongly encouraged the use of e-resources for research purposes. This indicates that the majority of respondents felt that the culture in their academic discipline encouraged the use of e-resources for academic research purposes.

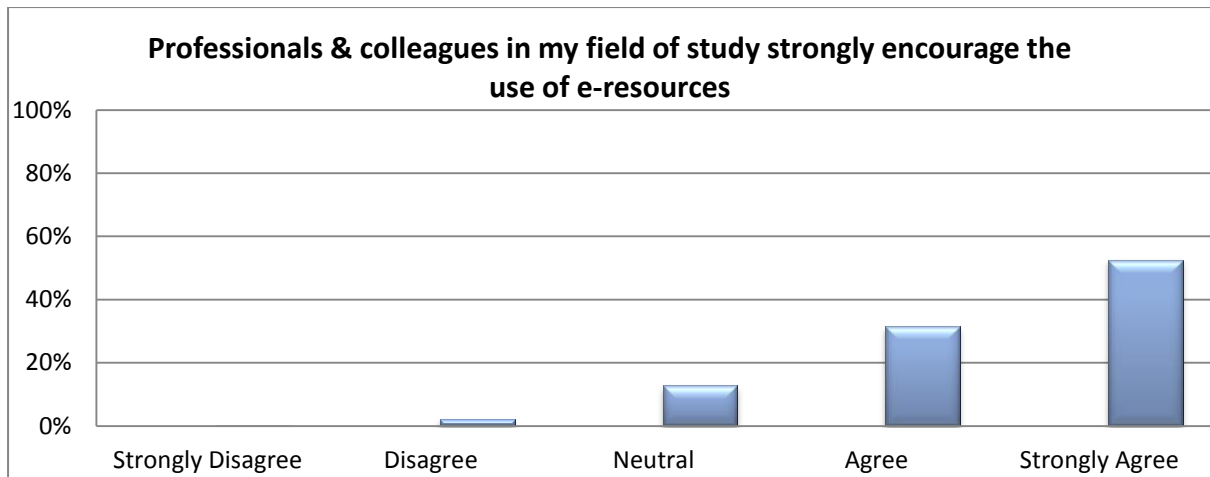


Figure 25: Academic disciplinary culture of e-resource use

4.1.4.4 Academic disciplinary culture of e-resources by faculty

Further analysis was made through cross tabulation to find out the pattern of responses to the question regarding academic discipline culture towards the use of e-resource use within each faculty represented in the sample.

Within the Management and Commerce faculty, 12 (48%) of the respondents in this category strongly agreed that professionals and colleagues within their field of study strongly encourage the use of e-resources for research purposes. A further eight (32%) respondents agreed with this notion. Four (16%) of the respondents selected the neutral option, while one (4%) of the respondents within the Management and Commerce faculty strongly disagreed that professionals and colleagues in their field of study strongly encourage the use of e-resources for research purposes.

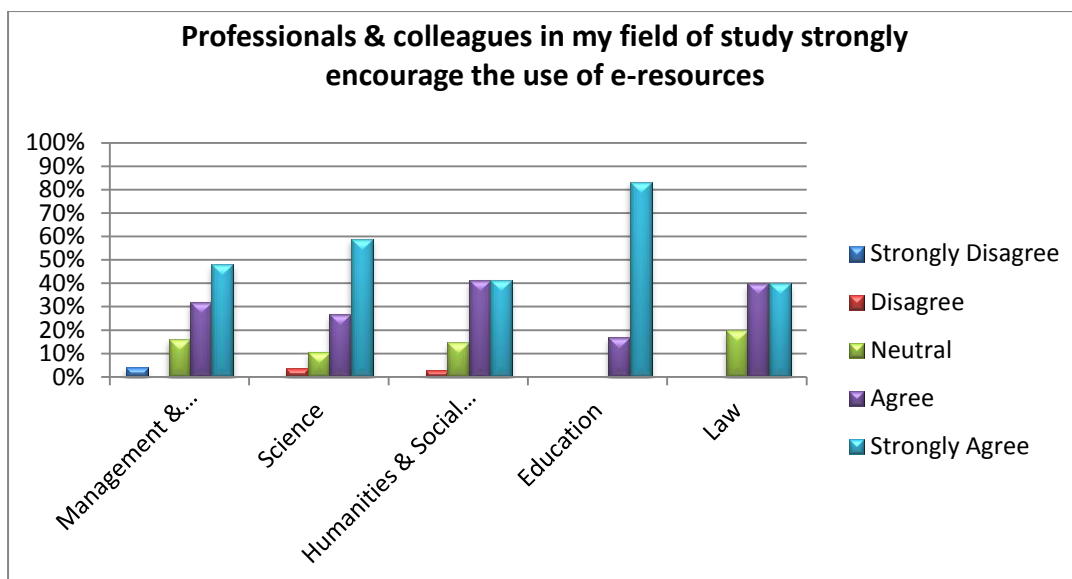


Figure 26: Academic discipline culture of e-resource use by faculty

Within the Science faculty, 33 (58.9%) of the respondents strongly agreed that professionals and colleagues in their field of study strongly encourage the use of e-resources to conduct research. 15 (26.8%) more respondents agreed to this notion. While six (10.7%) of the respondents within the Science faculty selected the neutral option. Only two (3.6%) of the respondents from the Science faculty disagreed with the statement that professionals and colleagues in their field of study strongly encourage the use of e-resources for research purposes.

Within the Humanities and Social Science faculty, 14 (41%) of the respondents strongly agreed that professionals and colleagues within their field of study strongly encourage the use of e-resources for research purposes. A further 14 (41%) respondents, agreed that professionals and colleagues within their field of study strongly encourage the use of e-resources for research purposes. 5 (14.7%) of the respondents selected the neutral option, suggesting they were not sure how to respond and only one (2.9%) respondent disagreed to the statement that

professionals and colleagues within their field of study strongly encouraged the use of e-resources for study or research purposes.

From within the Education faculty, five (83.3%) respondents strongly agreed, while one (16.7%) respondent agreed that professionals and colleagues within their discipline strongly encourage the use of e-resources for research purposes. This suggests that among the respondents within the education faculty there is a belief that the use of e-resources is strongly encouraged among colleagues and professionals in their academic field.

From the Law faculty, two (40%) study participants strongly agreed, while two (40%) more respondents agreed with the statement that professionals and colleagues within their field strongly encourage the use of e-resources to conduct research. One (20%) respondent from the faculty selected the neutral option to respond to this question.

The findings reveal that there were proportionately more respondents from within the five faculties represented who strongly agreed that professionals and colleagues in their department strongly encourage the use of e-resources. This could indicate that the use of Internet-based information sources are increasingly becoming part of the research culture across disciplines.

4.1.4.5 Perceptions and attitudes and use of e-resources

Perceptions and attitudes of intended users towards a technological innovation have been discovered to potentially determine whether or not they will use it (Hong *et al.* 2002; Cheung & Huang 2005; Chigona & Licker 2008). A group of statements were included in the questionnaire to elicit information from respondents on their perceived usefulness and perceived ease of use of e-resources.

The statements included to measure the perceived usefulness of electronic information sources by respondents, sought to discover how respondents felt about the effect their use of electronic information sources had on their ability to complete their tasks efficiently and effectively. The statements also sought to elicit the respondent's perceptions on the effect of the use of Internet-based information sources on the quality of their work.

The other set of statements sought to elicit respondents' perceived ease of use of Internet-based information sources. These questions sought to measure the respondents' level of confidence in their ability to manoeuvre through the Internet-based information sources in order to fulfil their academic information needs. This was another way to verify the respondents' perceived level of information literacy.

4.1.4.6 The effect of e-resource use on study tasks

In response to the first statement that sought to measure the perceptions of respondents towards the use of electronic information sources and their effect on completing study tasks, 71(53.4%) of the respondents; strongly agreed that using e-resources enabled them to accomplish their research tasks quickly. A further 44 (33.1%) respondents agreed to the same statement. While 15 (11.3%) of the respondents selected the neutral option. Two (1.5%) of the respondents disagreed to the statement that using e-resources enabled them to accomplish their study tasks quickly option and only one (0.8%) respondent strongly disagreed. These results indicate that the majority of the respondents believe that the use of e-resources improves their academic efficiency, and are therefore useful for their studies.

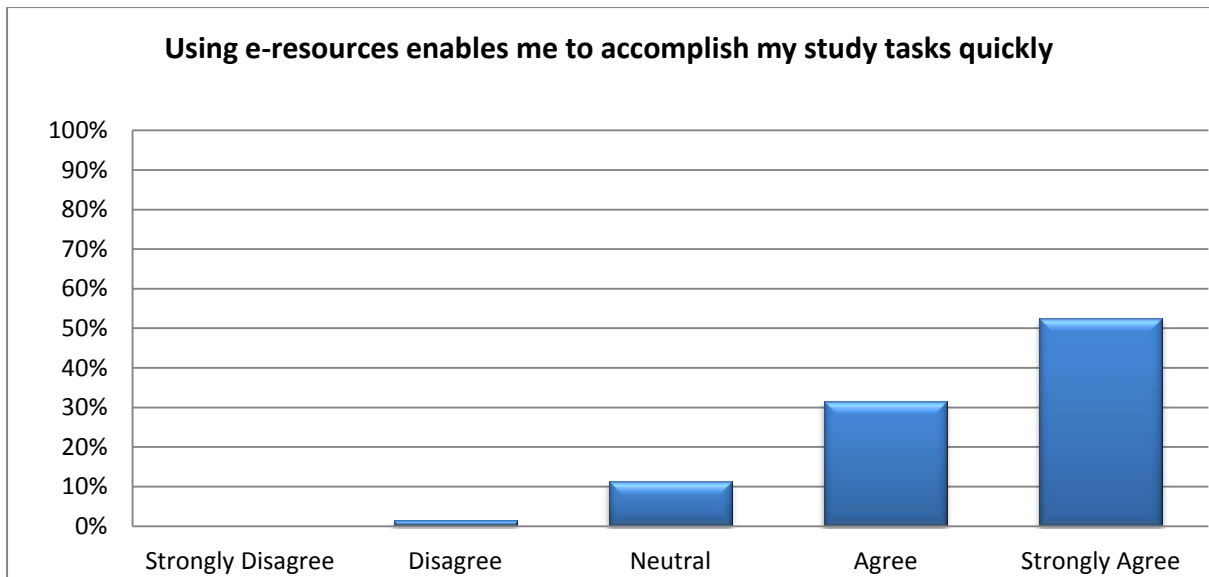


Figure 27: The effect of e-resource use on study tasks

4.1.4.7 The effect of e-resource use on quality of work

The respondents were asked to indicate on a Likert scale whether or not they believed that using e-Resources improves the quality of their academic work. Figure 28 reveals that 66 (49.6%) respondents representing the majority strongly agreed that using e-resources improved on the quality of their research work. This was closely followed by 51 (38.3%) respondents who agreed that the use of e-resources improves the quality of their work. However, 16 (10.5%) respondents selected the neutral option to respond to this statement, which may indicate their uncertain on how best to respond to the statement. The findings indicate that the majority of respondents believe that their use of e-resources in their studies improves the quality of their academic work, thereby increasing their effectiveness, through gaining access to relevant Internet-based information sources. This suggests that e-resources are considered quite important by respondents as they improve the quality of their academic work.

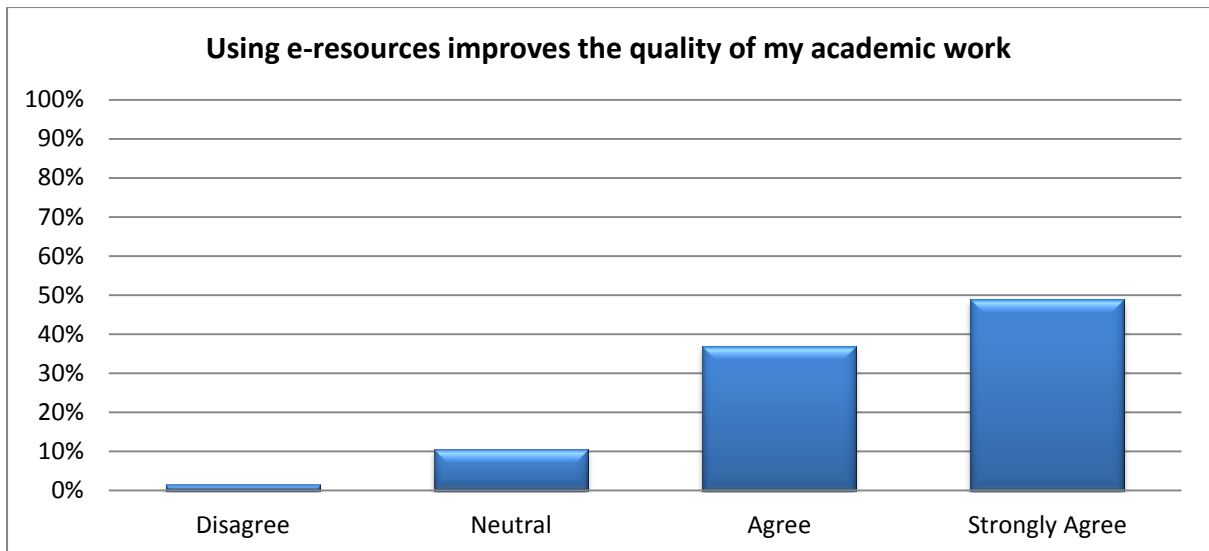


Figure 28: The effect of e-resource use on quality of work

4.1.4.8 The level of understanding on how to use e-resources

This question sought to elicit information on whether or not the respondents clearly understood how to use e-resources in support of their studies. 48 (36.1%) of the respondents strongly agreed, while 62 (46.6%) respondents agreed that the use of e-resources in support of their research work was clear and understandable to them. 19 (14.3%) of the respondents selected the neutral option while four (3%) respondents disagreed with the statement that the use of e-resources in support of their research work was clear and understandable to them. These results indicate that the majority of respondents as shown by the (36.1%) respondents who agreed and (46.6%) who strongly agreed to the statement, believe they have the know-how to search for and retrieve relevant Internet-based information sources useful for their research needs.

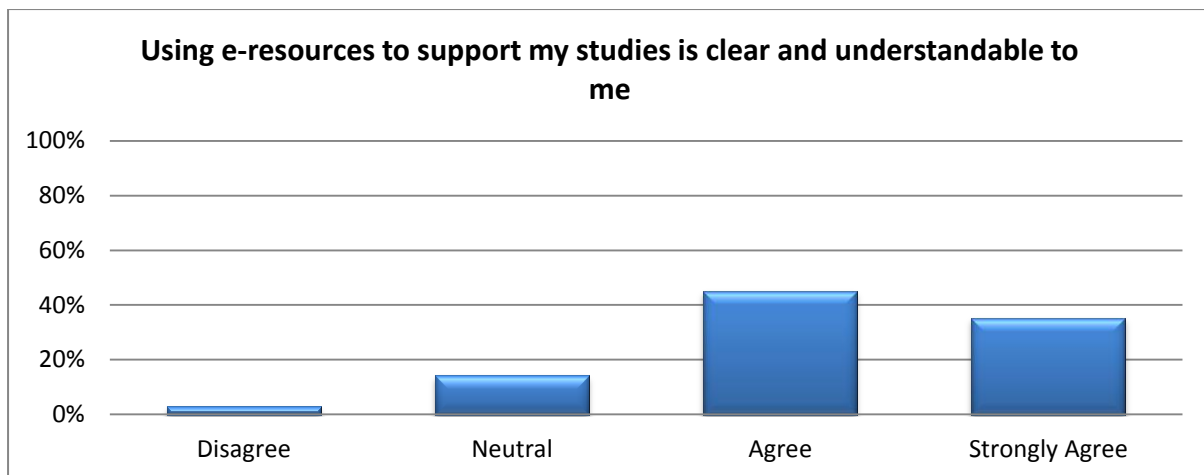


Figure 29: The level of understanding on how to use e-resources

4.1.4.9 The level of ease of access to relevant e-resources

The second statement under the section on perceived ease of use of e-resources sought to find out respondents' beliefs on how easy it is for them to access relevant information when using e-resources. Figure 30 below shows that 50 (37.6%) of the respondents strongly agreed while a similar number 50 (37.6%) of the respondents agreed that it was easy for them to access relevant e-resources on the Internet. 28 (21.1%) of the respondents chose the neutral option, while 5 (3.8%) of the respondents disagreed that it was easy for them to access relevant e-resources from the Internet. These results indicate that the majority of the respondents have relevant information literacy skills, which makes it easy for them to access e-resources.

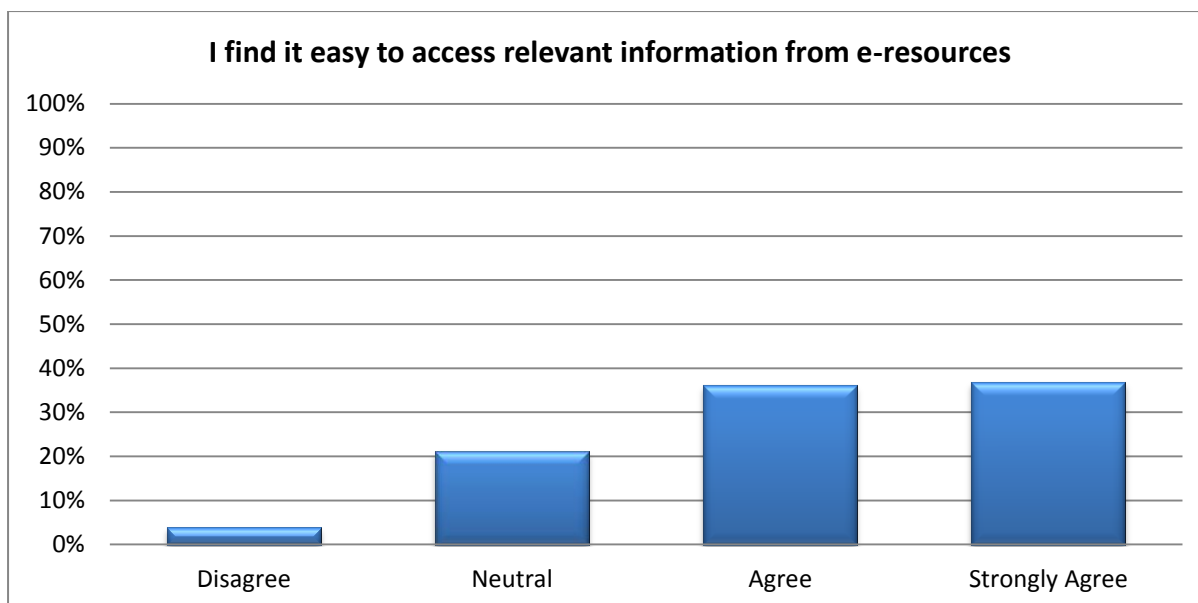


Figure 30: The level of ease of access to relevant e-resources

4.1.4.10 Learning how to use e-resources

Respondents were asked to the extent to which they agreed to a statement “I find it easy to learn how to use e-resources”. 59 (44.4%) of the respondents agreed, while 42 (31.6%) respondents strongly agreed that they found it easy to learn how to use e-resources. 25 (18.8%) of the respondents selected the neutral option. Six (4.5%) of the respondents disagreed, while one (0.8%) respondent strongly disagreed that they found it easy to learn how to access e-resources. These findings suggest that for the majority of respondents, learning how to use e-resources is not complicated, indicating that the majority of respondents possess requisite information literacy and ICT literacy skills that help them to manoeuvre easily through new Internet-based information sources. The findings also suggest that information literacy programs available at the universities are achieving considerable success in training postgraduate students to utilise electronic information sources.

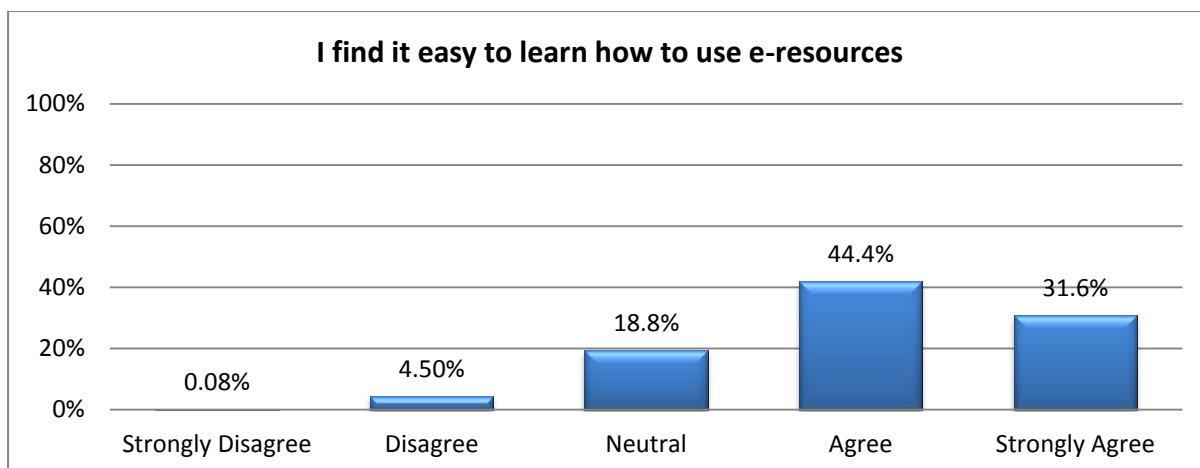


Figure 31: Learning how to use e-resources

4.1.5 Organisational factors affecting e-resource use

This section presents the findings of the study participants' views to statements related to organisational variables that affect the use of Internet-based information sources among postgraduate students. The respondents were asked to state on a Likert scale, the extent to which they agreed that a specific organisational variable had an effect on their use of Internet-based information sources. The variables examined included: organisational and departmental support; supervisors' support; the availability of relevant e-resources; the accessibility to Internet-based information sources at convenient times; the accessibility to Internet-based information sources at convenient locations; the quality of Internet connectivity offered by the universities; the provision of computer terminals; the availability of information literacy training; the availability of technical support and the level of publicity of Internet-based information sources engaged by the university library's for the benefit of postgraduate students.

4.1.5.1 Organisational and departmental support

The respondents were asked to indicate the extent to which they believed that their university and department strongly encouraged the use of e-resources for research

purposes. 93 (69.9%) of the respondents strongly agreed that their institution strongly encouraged the use of e-resources for research purposes. This was followed by 27 (20.3%) respondents who agreed with this notion. 11 (8.3%) of the respondents selected the neutral option and only 2 (1.5%) respondents disagreed that their university or department strongly encouraged the use of e-resources for research. The majority represented by 93 (69.9%) of the respondents are of the opinion that their university and academic departments encourage the use of e-resources. This may indicate that Internet-based information sources have been embraced as a viable medium of academic information by the three institutions under study.

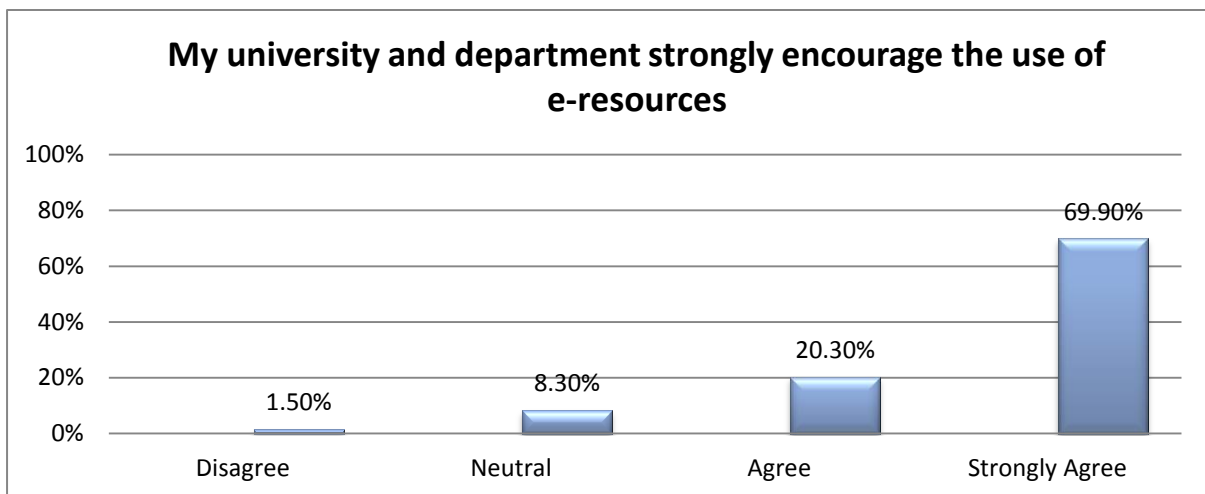


Figure 32: Organisational and departmental support

4.1.5.2 Organisational and departmental support by university

A cross tabulation analysis of these results was conducted to be able to see if there were any significant differences in the respondents' views by university on the extent to which they believed their university and academic departments encouraged the use of Internet-based information sources. Of those respondents who responded to this question from RU, 26 (92.9%) of the respondents strongly agreed that they felt their institution strongly encouraged them to use e-resources. One (3.6%)

participant agreed while another one (3.6%) respondent selected the neutral option. None of the respondents from RU disagreed that their university and departments strongly encouraged their use of e-resources.

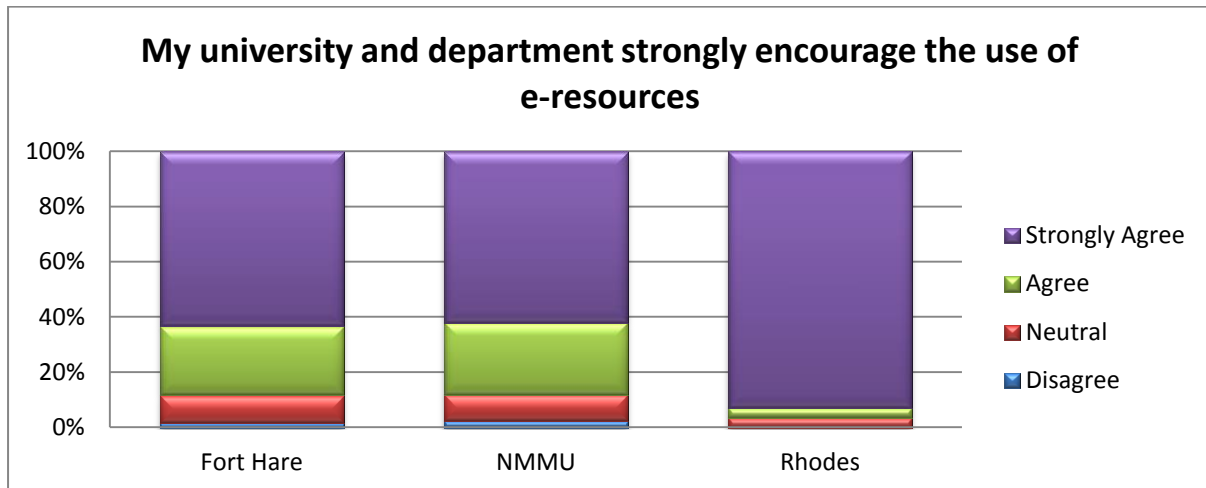


Figure 33: Organisational and departmental support by university

Of the respondents from the University of Fort Hare (UFH) who responded to this question, 38 (63.3%) strongly agreed that their university and department strongly encouraged the use of e-resources for research purposes. A further 15(25%) agreed to this statement, while six (10%) selected the neutral option. Only one (1.5%) respondent from UFH disagreed that their university and department strongly encouraged the use of e-resources for their research.

The respondents from Nelson Mandela Metropolitan University (NMMU), who responded to the question on whether or not they felt their university or department strongly encouraged their use of e-resources for research, included 26 (61.9%) who indicated that they strongly agreed to this statement. This represented the majority of the respondents to this question from NMMU. A further 11 (40.7%) respondents agreed to this statement. There were four (9.5%) respondents from NMMU who selected the neutral option, while one (2.4%) respondent disagreed with the

statement that their university and department strongly encouraged the use of e-resources.

The findings indicate that, while proportionately the majority of the respondents from each of the three universities, as represented by 26(92%.9%) from RU; 38(63.3%) from UFH and 26 (61.9%) respondents strongly agreed that their university and department strongly encouraged the use of e-resources, there were proportionately more respondents from RU (93%) who strongly agreed with that notion than at the other two universities. This suggests that there may be a very positive university culture towards e-resource use at RU, than at NMMU or UFH.

4.1.5.3 Availability of relevant e-resources

Some researchers have argued that intended users of a digital library system may be inclined towards using it, if the system provides relevant Internet-based information sources (Thong *et al.* 2002; Tenopir 2003). The availability of relevant Internet-based information sources such as subscription e-databases and e-journals may therefore encourage the use of these resources by postgraduate students. A statement was included in the e-Resource Survey questionnaire to ascertain the extent to which the study participants believed that their respective university provided relevant e-resources.

Of the respondents who responded to this statement from RU, 23 (82.1%) indicated that they strongly agreed that their university avails e-resources that are relevant to their research needs. Four (14.3%) respondents from RU agreed to the statement while one (3.6%) respondent from RU, selected the neutral option in response to this statement.

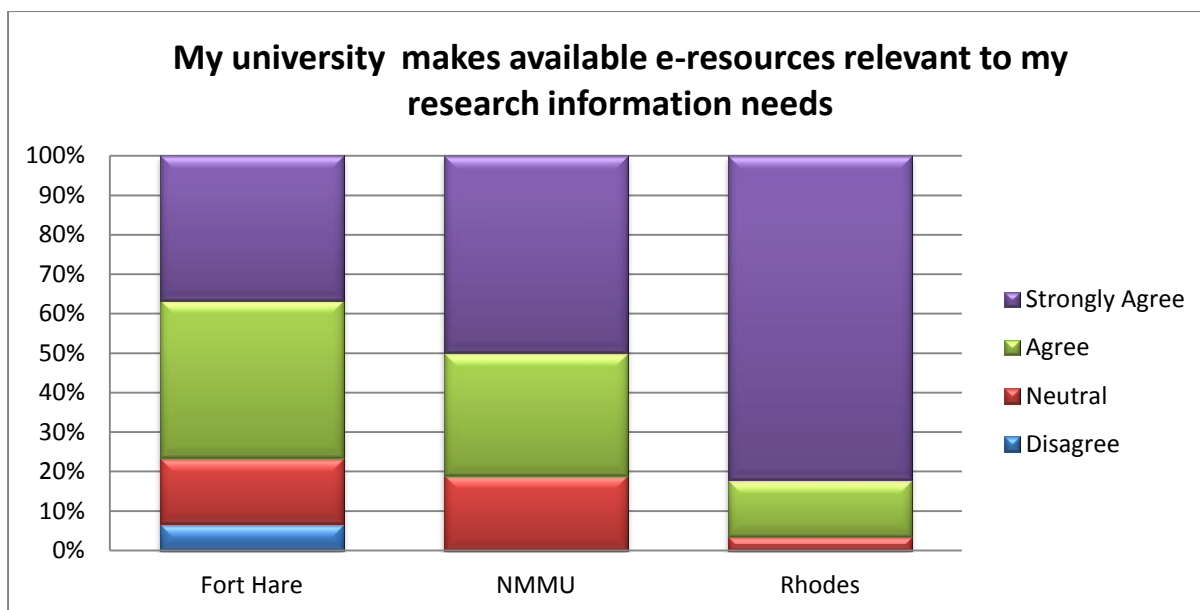


Figure 34: Availability of relevant e-resources

Of the respondents who responded to the that their university provided relevant e-resources from UFH, 24 (40%) representing the majority from this group agreed, while 22 (36.7%) respondents strongly agreed that their university availed e-resources relevant to their research information needs. 10 (16.7%) of the respondents from UFH selected the neutral option, while four (6.7%) disagreed that UFH avails e-resources relevant to their research or study needs.

Study participants from NMMU who responded to the Likert scale statement that their university availed e-resources relevant to their research included, 21 (50%) respondents who strongly agreed, while 13 (31%) agreed that their university provided e-resources relevant to their information needs. There were however eight (19%) respondents from NMMU who selected the neutral option to respond to this question.

These findings indicate there are that the greater proportion of study participants from RU, strongly believe that their university avails relevant e-resources for their information needs compared to the proportion of respondents from NMMU and UFH

who believe that their university avails relevant e-resources to meet their information needs. This may indicate that the digital library at RU provides relevant Internet-based information sources of a depth and breadth relevant to the study participants' information needs. This may also be corroborated by the results of the Interviews with university librarians, which revealed that RU library subscribes to a significantly greater number of e-databases, 233 in total, than do either NMMU which subscribes 67 e-databases or UFH, which subscribes to 71 e-databases. Therefore RU arguably offers a wider selection of e-resources from which their patrons can choose.

4.1.5.4 Access to Internet-based information sources at convenient time and location

Previous studies in the digital library use literature reveal that users consider the issue of convenience important when deciding upon which information system to use in order to satisfy their needs (Tenopir 2003; Connaway & Dickey 2010). Thus, it is suggested that users will be favourably disposed towards digital library use if they are able to access it at a time and location convenient to them.

The study participants were asked to indicate the extent to which they agreed that their university enabled access to e-resources at a time convenient to them. 24 (85.7%) of the respondents from RU strongly agreed that their institution has ensured that they have access to the Internet and e-resources when they need to use them. A further four (14.3%) agreed. All the respondents from RU therefore were generally satisfied that their university avails the Internet and e-resource access at times convenient to them.

Of the study participants affiliated to NMMU, 29 (69%) strongly agreed while seven (16.7%) respondents from NMMU agree that their institution had ensured that they

have access to the Internet and e-resources when they need to use them. There were four (9.5%) of the respondents from NMMU selected the neutral option. Only two representing (4.8%) of the respondents from NMMU disagreed that their institution availed access to the net and e-resources whenever they need needed to use them.

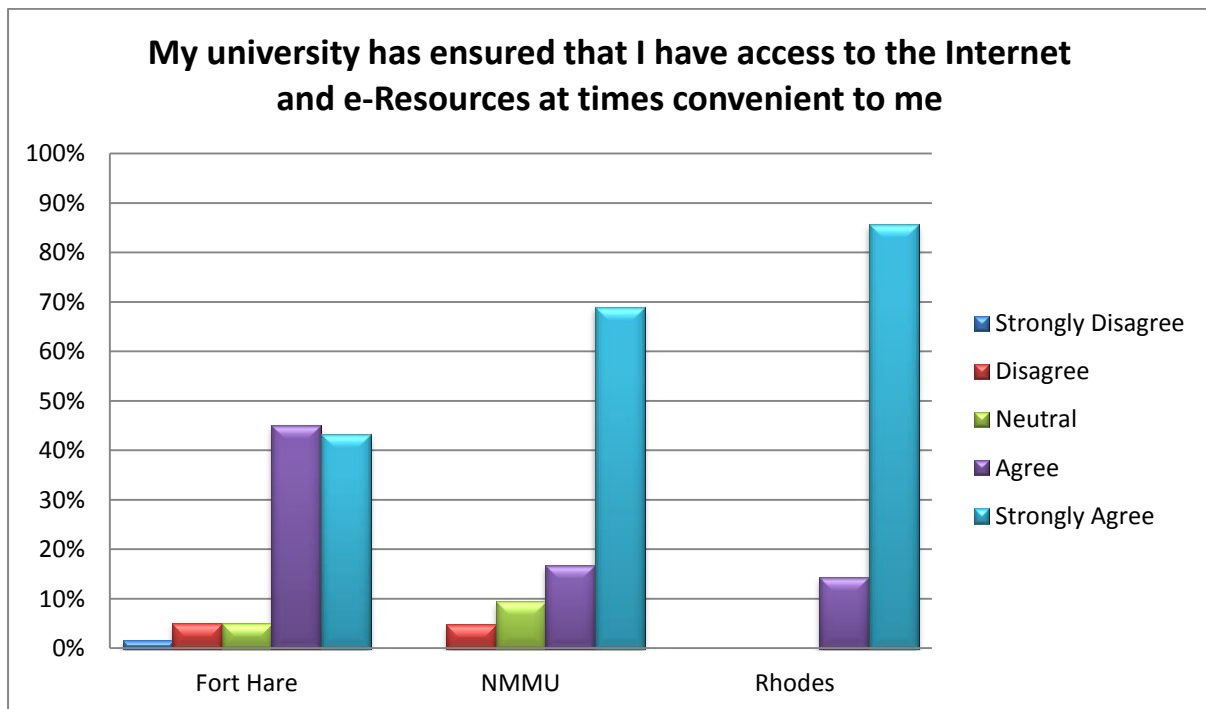


Figure 35: Accessibility to e-resources at convenient times

Of the study participants from UFH who responded to the statement that their university had enabled access to e-resources at a time convenient to their needs, 26 (43.3%) strongly agreed, while 27 (45%) agreed that their university had ensured that they have access to the Internet and e-resources when they need to use them. 3 (5%) respondents from UFH selected the neutral option. There was however one (1.7%) respondent from UFH who strongly disagreed that their university avails access to the Internet and e-resources at a time convenient to the study participant.

The findings suggest that proportionately over half the respondents from all three universities are satisfied with their universities' provision of Internet-based information sources, as over half the respondents at each university either agreed or strongly agreed that their university availed the Internet and e-resources at a time convenient for the participants.

4.1.5.5 Availability of the Internet and e-Resources at convenient locations

The advent of digital libraries has added a new dimension to a researcher's ability to access library resources, without necessarily being confined to the physical library. Researchers now find it important that they are able to access Internet-based information sources at a location convenient to their needs. Thus to cater for postgraduate student needs, some institutions provide infrastructure that enables postgraduate students to access electronic information sources from their halls of residence, offices, or even allow off campus access to Internet-based information.

The figure 36 below shows that from RU, 25 (89.3%) respondents strongly agreed that their university enabled them to access the Internet and e-resources at a location convenient to them. A further three (10.7%) agreed with this notion. An overwhelming majority of respondents from RU believe that their university avails the Internet at convenient locations.

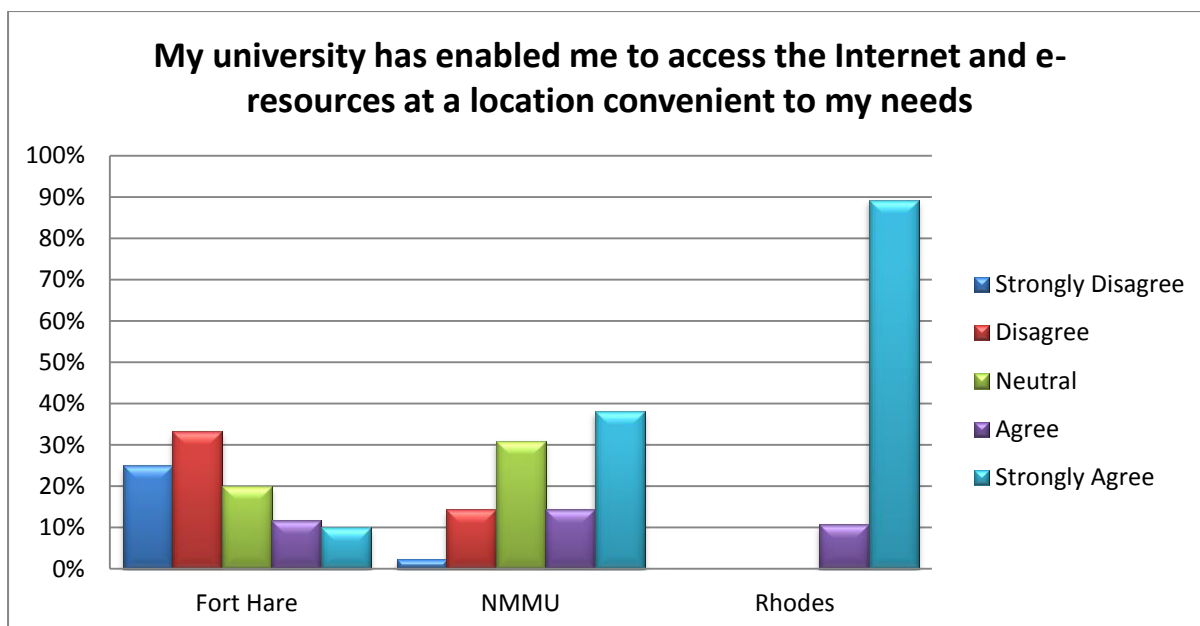


Figure 36: E-resource access from a convenient location

Of the study participants from NMMU, 16 (38%) were strongly agreed that their university enabled them to access the Internet and e-resources at any place they preferred to do their research from, a further six (14.3%) respondents agreed to this statement. There were however 13 (31%) study participants who selected the neutral option to this question, suggesting that they were undecided on how best to respond. While six (14.3%) respondents disagreed and another one (2.4%) participant strongly disagreed that their institution availed the Internet and e-resources at any place they preferred to do their research from.

From UFH, there were 20 (33.3%) respondents who disagreed, while 15 (25%) respondents strongly disagreed that their university had enabled them to access the Internet and e-resources at any place they preferred to do their research from. 12 (20%) of the respondents from UFH selected the neutral option. 7 (11.7%) respondents agreed, while 6 (10%) respondents from UFH strongly agreed that UFH enabled them to access the Internet and e-resources at any place they preferred to do their research from.

These findings indicate that the majority of the students who responded to this question from RU and NMMU are generally in agreement that their universities give them access to the Internet and e-resources at locations of their preference. This may be because these two universities offer Internet connectivity to their students on campus as well as in the university residences.

The majority represented by 20 (33.3%) respondents from UFH disagreed and 15 (25%) more respondents, strongly disagreed that their university enabled access to the Internet and e-resources at a location of their preference. This suggests that the majority of respondents from UFH were dissatisfied with the accessibility of the Internet and e-resources. This may be because at the time of writing, the university did not offer Internet connectivity in the residences, where respondents may prefer to conduct their research from.

4.1.5.6 Computer terminals access points by university

Of the study participants affiliated to RU, 27 (96.4%) strongly agreed, while one (3.6%) respondent agreed that their university provided sufficient computer terminals for postgraduate students to access e-resources.

From NMMU, there were 19 (45.2%) respondents who strongly agreed; while a further 12 (28.6%) respondents agreed that their university provides sufficient computer terminals for postgraduate students to access e-resources. There were however seven (16.7%) respondents from NMMU who selected the neutral option. Three (7.1%) respondents disagreed and a further one (2.4%) respondent strongly disagreed that sufficient computer terminals were provided for postgraduate students to access e-resources at NMMU.

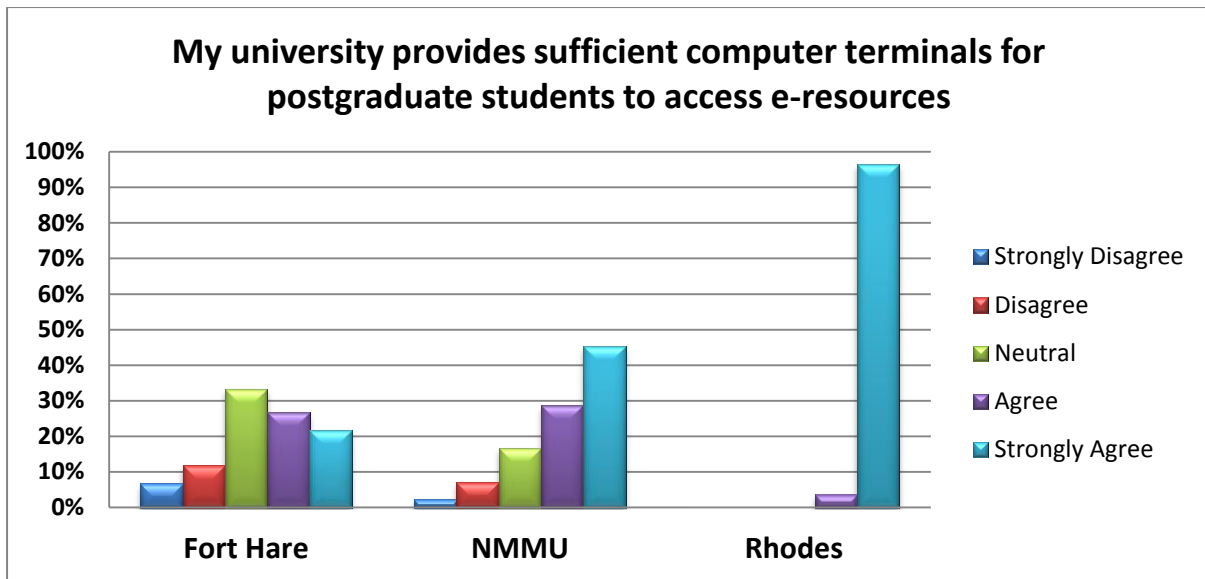


Figure 37: Provision of computer terminals

Of the respondents from UFH who responded to the statement eliciting the extent to which they believed that their university provided sufficient computer terminals for postgraduate to access e-resources, the majority 20 (33.3%) respondents selected the neutral option, perhaps indicating they were not sure about the sufficiency of the available computer terminals for postgraduate student use. However, 16 (26.7%) respondents from UFH agreed, while a further 13 (21.7%) respondents strongly agreed that the university provided access to sufficient computer terminals for postgraduate students to access e-resources. There were seven (11.7%) study participants from UFH who disagreed with this statement, while a further four (6.7%) respondents strongly disagreed with this statement.

The majority of the respondents' from RU and NMMU universities were of the view that there were sufficient terminals for postgraduate students to access and use e-resources. There was however a significantly larger proportion (96.4%) of respondents from RU who strongly agreed to this notion than there were at NMMU (45.2%). This may indicate that adequate infrastructure that enables respondents to

access e-resources is in place at RU and NMMU, though possibly at varying degrees.

A significant number of respondents from UFH (33.3%) selected the neutral option to this statement. This may indicate that they do not know how best to respond, or that they were not aware of the status of the computer terminals, nor their ability to sufficiently meet the needs of postgraduate students.

4.1.5.7 Availability of information literacy training for graduate students

In order to find out the extent to which the study participants believed that they had access to information literacy programs to equip them with skills to enable them to access Internet-based information sources, the respondents were asked to indicate on Likert scale the extent to which they agreed to a statement that specialised instruction on how to use e-resources was available to them.

Of the study participants from Rhodes 15 (53.6%) agreed, and a further 11 (39.3%) respondents from RU strongly agreed that specialised instruction on how to use e-resources is available to them at RU. There were however 2 (7.1%) respondents from RU who selected the neutral option for this question.

From NMMU there were 20 (47.6%) respondents who strongly agreed; while a further 10 (23.8%) respondents agreed that specialised instruction on how to use e-resources was available to them at NMMU. However seven (16.7%) respondents from NMMU selected the neutral option. There also five (11.9%) respondents who disagreed that specialised instruction on how to use e-resources was available to them at NMMU.

Of the study participants affiliated with UFH, 28 (46.7%) agreed, while 13 (21.7%) more respondents strongly agreed that specialised instruction on how to use e-resources was available to them at UFH. There were 12 (20%) respondents from UFH who selected the neutral option to this question. While those who disagreed that specialised instruction on how to use e-resources at UFH were 7 (11.7%).

The majority of respondents' at all three institutions were of the opinion that specialised instruction on how to use e-resources was available to them at their university. This may indicate that the information literacy programs are visible enough for the respondents to be aware of their availability.

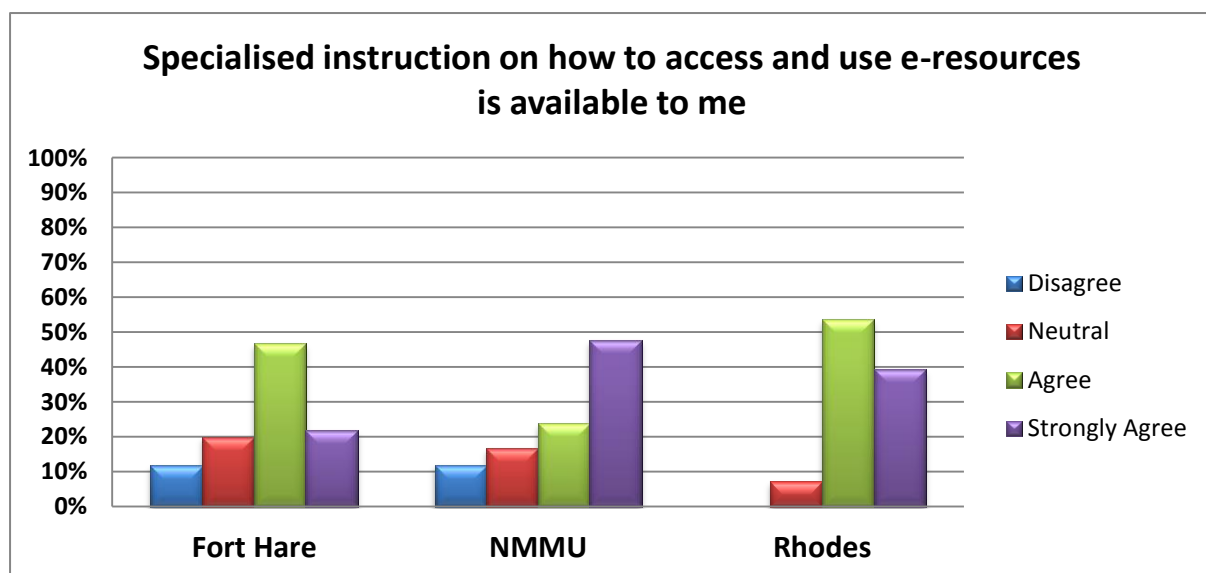


Figure 38: Availability of information literacy training

4.1.5.8 Availability of technical support

The nature of digital libraries is that technical difficulties may arise for the user which will require specialised technical assistance. Therefore to encourage the use of electronic information sources, one of the important factors an organisation can facilitate, is the provision of effective technical assistance (Nkomo 2009). In order to find out the extent to which the participants believed that technical assistance was

available whenever they encountered e-resource retrieval difficulties at their respective universities.

From RU, 16 (57.1%) of the respondents strongly agreed and a further 11 (39.3%) respondents agreed that assistance is always available to help them solve e-resource retrieval difficulties. One (3.6%) respondent from RU selected the neutral option to this question.

Of the study participants from NMMU, there were 13 (31%) respondents who strongly agreed and 10 (23.8%) respondents who agreed that assistance is always available to help them solve e-resource retrieval difficulties. There were 14 (33.3%) respondents from NMMU who opted for the neutral option to respond to the question. Three (7.1%) respondents strongly disagreed and a further two (4.8%) respondents from NMMU disagreed that assistance is always available to help them solve e-resource retrieval difficulties at NMMU.

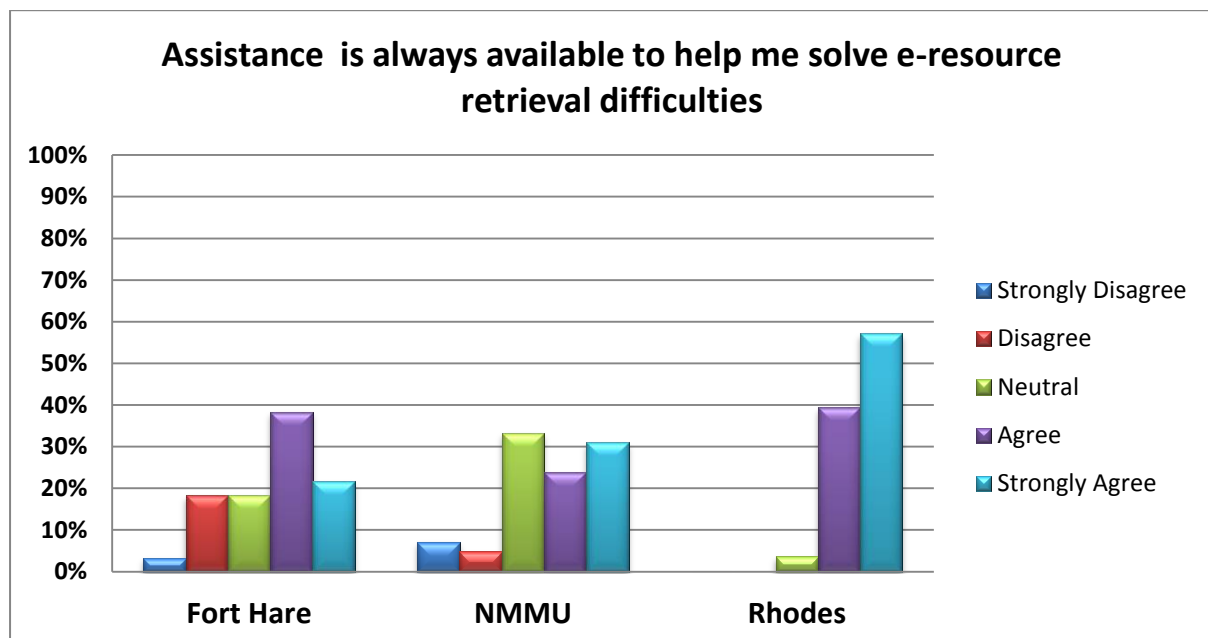


Figure 39: Availability of technical assistance

From UFH there were 23 (38%) respondents who agreed, and a further 13 (21.7%) respondents from UFH who strongly agreed that assistance is always available to help them solve e-resource retrieval difficulties at their university. There were however 11 (18.3%) respondents who disagreed and a further two (3.3%) respondents from UFH who strongly disagreed with this statement. Another 11 (18.3%) respondents selected the neutral option to this question.

The results indicate that a greater proportion of the respondents across the three agreed that sufficient technical assistance was available to them when they needed it. This may also indicate that the three universities have sufficiently, trained staff to respond to any technically related problems.

4.1.5.9 Marketing and publicity efforts

One of the barriers to use of electronic information sources in literature is the failure of university libraries to successfully publicise or market the availability of these information resources to the intended users (Agaba 2005). The study sought to discover the availability of and effect of marketing and publicity efforts towards keeping postgraduate students up-to-date with available e-resources.

Postgraduate students' level of e-resource awareness

The study participants were invited to indicate on Likert scale the extent to which they agreed that they were always aware of available and relevant e-resources. Of the study participants from UFH, 30 (50%) respondents agreed, while a further 9 (15%) respondents strongly agreed that they were aware of available e-resources relevant for their research information needs. There were however eight (13.3%) respondents from UFH who disagreed while one (1.7%) respondent strongly disagreed that they were always aware of available e-resources relevant to their

research needs. There were also 12 (20%) respondents from UFH who selected the neutral option to respond to this question.

From NMMU, there were 16 (38.1%) respondents who agreed, while 14 (33.3%) respondents from NMMU strongly agreed that they were aware of available e-resources relevant to their research needs. A total of four (9.5%) respondents from NMMU disagreed and another one (2.4%) respondent from NMMU strongly disagreed with this statement. Seven (16.7%) respondents from NMMU selected the neutral option to this statement.

From RU there were 10 (35.7%) respondents who strongly agreed, while nine (32.1%) more respondents from RU agreed that they were always aware of available e-resources that are relevant for their research needs. There was however one (3.6%) respondent from RU who disagreed that they were always aware of available e-resources for their research needs, and eight (28.6%) respondents from RU who selected the neutral option to this question.

These findings indicate that a significant percentage of respondents as represented by 35.7% participants from RU, 33.3% participants from NMMU and 15% participants from UFH who strongly agreed, and a further 32.1% respondents from RU, 38.1% respondents from NMMU and 50% respondents from UFH are aware of available e-resources relevant for their research needs. This suggests that the e-resource publicity efforts engaged in by the three university libraries, are achieving some success at keeping study participants informed about available e-resources.

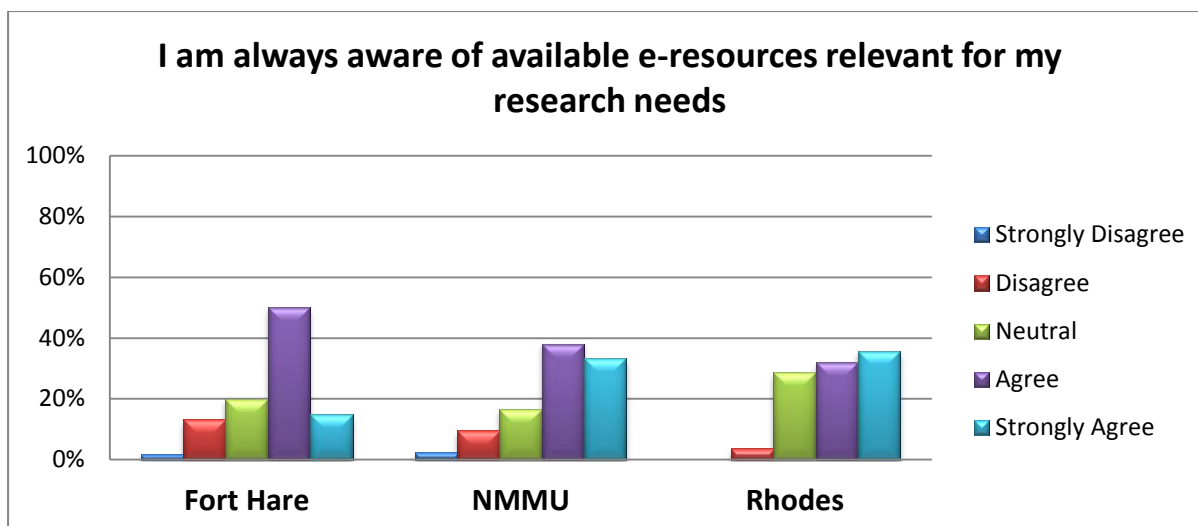


Figure 40: Postgraduate students' level of awareness of available e-resources

4.1.5.10 Supervisor recommendations of specific e-resources

Previous studies have revealed that academic supervisors, such as professors or lecturers can have significant influence towards students' use of digital libraries, through specifically directing students to specific electronic information sources (George *et al.* 2006; Tenopir 2003). In order to find out the extent academic supervisors influence the use of e-resources by postgraduate students, the study participants were asked to indicate on a Likert scale the extent to which they agreed or disagreed that their supervisor recommends e-resources for them to use in their research.

From RU, there were 18 (64.3%) study participants, who strongly agreed, and a further four (14.3%) participants from the same university who agreed, that their supervisors recommended specific e-resources for them to use for their studies. There were however six (21.4%) respondents from RU who opted for the neutral option as a response to this question.

From NMMU, there were 22 (52.4%) respondents, representing over half the respondents in this group, strongly agreed, while a further 10 (23.8%) respondents

agreed that their supervisor recommends specific e-resources for them to use in their studies. There were however two (4.8%) respondents from NMMU who disagreed with this statement. While eight (19%) study participants from NMMU selected the neutral option.

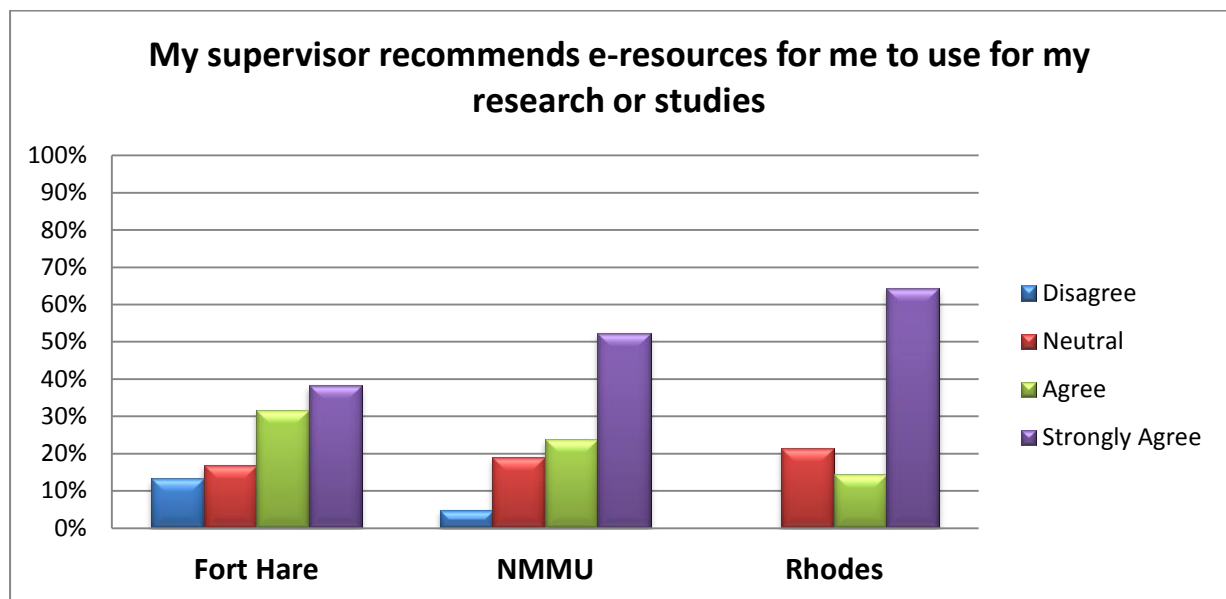


Figure 41: Supervisor recommendations for specific e-resource use

Of the respondents from UFH who responded to the question on whether or not they agreed that their supervisor recommends specific e-resources for them to use for their research or studies, 23 (38.3%) strongly agreed while 19 (31.7%) agreed to this statement. There were however 10 (16.7%) respondents who selected the neutral option. While eight (13.3%) respondents disagreed that their supervisors recommended specific e-resources for them to use in their research or studies.

Across the three universities, proportionately the majority of respondents either strongly agreed, with (64.3%) from RU, (52.4%) from NMMU and (38.3%) from UFH; or agreed, with (14.3%) from RU, (23.8%) from NMMU and (31.7%) from UFH; that their supervisors recommend specific e-resources for their use in their studies. This

suggests that supervisors do play a significant role in the respondents' use of e-resources, through directing them to specific Internet-based information sources relevant to the participants' study needs.

4.2 Interview results

In order to corroborate information regarding the organisational factors that affect the use of Internet-based information sources by postgraduate students at the three universities under study, the researcher prepared an interview schedule and was able to conduct semi-structured face-to-face interviews with selected university librarians responsible for electronic resources services from Nelson Mandela Metropolitan University (NMMU) and the University of Fort Hare (UFH), while the librarian responsible for electronic resource management at Rhodes University (RU) opted to give answers to questions on the interview schedule via email. This section is a summary of the findings from results of data obtained from the Interview schedules.

4.2.1 Profile of Interviewees

The designation of interview participants, who responded to questions on the interview schedule for each university, included the electronic resources librarian from UFH. From RU, the respondent was the head librarian: user services and research support services. The interview participants from NMMU included the senior manager, information services and training, the systems librarian, and the senior librarian.

4.2.2 Numbers of postgraduate students served by university libraries

The interview schedule had a question seeking to elicit the number of postgraduate students served by each of the university libraries. NMMU's response was that they

serve 1786 postgraduate students, these were postgraduate students registered as library users and not necessarily the entire group of postgraduate students. This is because the library requires that all registered students, to register separately as library users, and so while this university has 3453 postgraduate students, and only 1786 were registered library users.

The electronic resources librarian at the University of Fort Hare (UFH) said that they serve approximately 500 postgraduate students. While the electronic resources manager from Rhodes University (RU) library indicated that they serve approximately 1850 postgraduate students.

4.2.3 Accessibility to the Internet and e-resources

All the three university libraries reported that they are able to facilitate access to electronic information sources by postgraduate library users at several locations within the universities. Thus postgraduate students at NMMU, UFH and RU are able to access e-resources from the library or at computer laboratories.

At RU and NMMU, registered postgraduate students can access the university network which gives them access to the Internet-based information sources from their halls of residence, while at UFH registered postgraduate students do not yet have access to the Internet and consequently Internet-based information sources within their residence, as this is a project was still to be embarked on at the time the study was conducted.

At all three universities reported that postgraduate students registered with the libraries were able to access e-journals and e-databases subscribed to by each university, from outside each university's network. The students would however need special access passwords issued by the university library, to be able to do this.

4.2.3.1 Quality of Internet connection

The interviewees were asked to indicate the type of internet connection to which registered library users have access to. All three university libraries reported that they use broadband, and are all connected to the Internet using their universities' campus wide network. The size of the bandwidth for the broadband internet connection however differed with each university.

The interviewees were also asked to describe the quality of Internet connection from a supplied list of response options which included "excellent-fast and reliable", "good", "adequate and acceptable speed", "poor" and "very poor".

The librarians from both UFH and NMMU described their Internet speed as being adequate and acceptable, while the RU librarian described their Internet connectivity to be excellent, fast and reliable. These findings suggest that there may be room for improvement with regards the quality of Internet connection at both NMMU and UFH.

4.2.4 Financial resources allocated to e-resources

The respondents were asked to indicate the percentage of their libraries budgets that was dedicated to the purchase or subscriptions of e-resources. RU reported that it dedicates 50% of their libraries' financial resources towards the purchase or subscriptions to e-resources. This budget however excludes salaries of library's staff. NMMU library indicated that they dedicate 36% of the library's budget towards the purchase or subscription of e-resources while UFH library indicated that they dedicate 25% of the libraries' budget towards the purchase or subscription of e-resources.

These findings indicate that the university libraries are spending substantial amounts of financial resources on provisioning of e-resources to their users. RU uses at least

half (50%) their financial resources, NMMU uses over a third (36%) of their financial resources and UFH uses at least a quarter (25%) of their financial resources towards the provision of e-resources.

4.2.5 Human resources: e-Resources management

There was a set of questions that were included in the Interview schedule designed to help the researcher ascertain the level of human resource allocation towards providing an efficient electronic library service at each of the libraries.

4.2.5.1 Separate e-resource management unit

The interviewees at each of the universities under study were asked to indicate whether or not their libraries have separate units for e-resources management. RU and UFH reported that they have separate units dedicated to e-resources management. While at NMMU the provision of e-resources to users is through the combined effort of librarians within the library structure.

4.2.5.2 E-Resource use and support training for staff

The researcher sought to find out if the three university libraries offered their staff training to enable them to adequately support users in the use of e-resources. All three libraries reported that they offer various kinds of e-resources management training to their staff members enabling staff members to offer support and training to postgraduate students whenever the need arose.

At NMMU, they reported that they offer in-house training in e-resource retrieval to their staff, and the Senior Systems Librarian is responsible for doing this training. The NMMU staff members have also participated in e-resource management training workshops that are offered by the South East Academic Libraries Consortium

(SEALS), the regional academic libraries consortium to which all three libraries belong.

At UFH, it was reported that the library staff members responsible for e-resource services have also received e-resource management training through the SEALS library consortium. They have also received training in how to use specific e-databases from some of the vendors or suppliers of the e-databases subscribed to by UFH.

From RU, it was reported that the RU library provides in-house training workshops in e-resource management and support for their staff members. They also encourage their staff members to participate in e-resource management training workshops offered by SEALS.

4.2.5.3 Ability to offer technical support

The researcher also sought to find the level of technical support, the university libraries were able to offer, to assist in resolving any e-resource retrieval difficulties postgraduate students faced. Interviewees were given four response options from which to respond to a question asking the level of technical support they were able to offer postgraduate students upon request. The possible options were “all the time”, “most of the time”, “sometimes-we do not have adequate staff” and “never”.

RU and UFH reported that they are able to offer technical support to postgraduate students most of the time. NMMU however, indicated that they can only offer technical support sometimes, for reasons that they do not have enough support staff. These findings suggest that there are advantages in setting up a separate electronic resources management unit within the library as this unit would be responsible

among other duties, to recruit and train staff who would be available and ready to offer technical support to their patrons.

4.2.6 E-resource marketing and publicity efforts

In literature, it has been argued that some users may fail to use Internet-based information sources due to a lack of awareness of their availability (Radford & Connaway 2008:9; Connaway & Dickey 2010). Nkomo (2009) suggested that in order to encourage use of web-based information resources by intended users, libraries must employ effective marketing strategies. The researcher included questions in the interview schedule, designed to elicit information on the nature and results of the marketing and publicity efforts being employed by the three university libraries to keep postgraduate students aware of available e-resources.

Some of the publicity strategies employed by all three universities include the use of posters; pamphlets; e-mail alerts; training sessions. NMMU however also have a Facebook page and an electronic notice board, as additional tools that they use to inform their patrons including postgraduate student users of available e-resources. UFH also host information-clinics, which are workshops, aimed at helping postgraduate students to be aware of the e-resources available for their research needs. UFH also indicated that they also disseminate a newsletter which also includes information about available e-resources

The respondents were asked to indicate how they would rate the level of postgraduate student awareness of available e-resources, at each university. All three universities indicated that they consider that their postgraduate users are reasonably aware of the e-resources available for their use, suggesting that each of

the libraries consider their publicity strategies to be achieving moderate success on their efforts to reach out to postgraduate students.

4.2.6.1 Training workshops for postgraduate students

The provision of information literacy training programs by libraries can equip patrons with requisite information skills that can enable them to effectively access and use Internet-based information sources. The respondents were asked to indicate how many information literacy training programs their libraries had held. All three universities indicated that they have held more than 6 information literacy training sessions for postgraduates and through these programs RU trained 800 postgraduate students, while NMMU trained 731 postgraduate students and UFH trained 400 postgraduate students.

4.2.7 Postgraduate e-resource user satisfaction

The interviewees were asked to indicate the level of postgraduate student satisfaction with the e-resources offered by their university library, from options ranging from very satisfied to very dissatisfied. All three universities chose the satisfied option.

4.2.8 E-resource service achievements

The respondents were asked to describe areas in which they felt their library had succeeded in their e-resource service programs. NMMU indicated that implementing Research Pro a federated search application that streamlines access to multiple data services was an excellent innovation. E-resource users are therefore able to search across databases from a single access point. They have also incorporated Google Scholar on their library webpage, enabling users who prefer Google Scholar to use this route. They also host specific database pages on the library website. NMMU

also offer information literacy training online. Postgraduate students are therefore able to receive information literacy training by taking the online course

UFH reported that they have met with success in offering a wide coverage of e-journals and e-databases.

RU also reported that their great success was being to offer a wide variety of e-journals; databases as well as e-books, from which their postgraduate student users can choose.

4.2.9 E-resource services challenges

The interviewees were asked to describe the most critical challenges that their library faced in their provision of e-resources. All three libraries indicated that a major challenge they face in their efforts towards providing e-resource service were inadequate financial resources. UFH reported that in order to significantly improve the breadth and quality of Internet-based information sources, their library budget would need to be doubled, while RU library indicated that their budget is limited.

In addition to limited finances being a hindrance towards offering e-resource services at optimal level, NMMU indicated that they face challenges of staffing, as they are currently understaffed in the library. They therefore cannot offer adequate support staff towards e-resource use by users. The other challenge that limits NMMU's library's e-resource service is limited equipment.

UFH Library also added that they faced challenges with the Internet connectivity, as the Internet speed is slow. They also felt that the usage of e-resources by specific product is also low. They also felt that postgraduate students lack the commitment to

come for their training programs, as evidenced by low turn outs to various e-resource training workshops organised by the library.

4.2.10 E-resource service improvement plans

In order to find out if the university libraries had any immediate future plans to improve e-resource service provision, the respondents were asked to indicate three areas within the library's e-resource service which they hope to address within the following three year period. UFH indicated that they want to expand coverage of e-resources for specific subject areas, including Physics, Nursing Sciences and Agriculture Databases, as these were currently underrepresented.

RU reported that they would like to expand their e-books collection. They also intend to cancel subscriptions to most print journals in favour of online alternatives. They also intend to digitise their key collections that are still in physical format.

NMMU would like to add Internet-based information sources that have video content, including those that are linked to YouTube. As part of their digitising program, they would like to develop their e-thesis and e-dissertation database, enabling postgraduate students to electronically publish completed dissertations and thesis. They also hope to incorporate mobile technology into their e-resource service program, thereby enabling their users to be able to access e-resources using their mobile phones.

4.2.11 The future of digital libraries at the universities

In order to discover the long term future plans of e-resource service provision at libraries of the three universities under study, the interviewees were asked to describe what they think is the future of e-resource services within their library. NMMU have adopted an e-strategy and are looking towards a hybrid library system.

They also feel that in the future, the library will have more e-resources than print, as they intend to increasingly channel financial resources towards subscriptions and purchases of e-resources.

UFH are considering incorporating the use of mobile technology in their e-resource services. They hope to enable their users to access their e-resources via cell phones, and other mobile receivers.

RU hopes to be able to provide their library patrons with one e-resource discovery platform. This would be a single point of entry through which patrons can access all e-resources subscribed to, purchased by or offered by the university including their institutional repository, thus enabling their students to perform integrated searching.

4.2.12 Recommendations towards improving e-resource use

The interviewees were invited to make recommendations and suggestions towards the improvement of e-resource utilisation by postgraduate students. The respondent from RU library said that better outreach and marketing of e-resource services to academic departments would help improve utilisation. This was also echoed by the UFH electronic resources librarian, who also indicated that better marketing strategies would help improve utilisation. She also felt that the postgraduate students themselves need to show more commitment towards using the e-resources.

The respondents from NMMU library suggested the implementation of a research commons in academic libraries would help to improve utilisation of e-resources. A research commons is a research area designated for postgraduate students within the library, giving them access to e-resources and to facilities such as photocopiers, printers and computer terminals. They also felt that the provision of laptops to all

postgraduate students would also help improve utilisation of e-resources by postgraduate students.

4.3 Chapter summary

This chapter presented the findings of results from the e-resource survey distributed to the sample of postgraduate students across the three universities and interviews with university librarians, using descriptive statistics and charts, and diagrams. The findings reveal a general acceptance of and very positive perceptions towards use of Internet-based information sources by respondents across the three universities studied. Individual characteristics that have a significant effect on e-resource use include level of study and age of respondent, while disciplinary differences were marginal. At institutional level, organisational support towards use of e-resources appeared high across the three institutions, although at differing capacities depending on the university. There were differences in the use of specific e-resources for academic research, with search engines dominating use among the respondents, and moderate use of subject databases, e-journals, library websites and OPACs. While respondents possess ICT literacy skills, their information literacy skills may need improvement. Respondents across the three institutions were satisfied with the e-resources available and their relevance to meet their needs. The next chapter is a discussion of the findings in relation to the research questions of the study.

Chapter Five: Interpretation and discussion of findings

5.1 Introduction

This chapter discusses findings of the study presented in the preceding chapter, in relation to the first four objectives of the study, while the last objective will be discussed in the concluding chapter, as part of the recommendations given. The main aim of this study was to investigate the factors that affect the use of Internet-based information sources by postgraduate students at three universities in the Eastern Cape province of South Africa, and the impact of these on meeting their information needs. The objectives of this study were to:

1. Determine the factors affecting the use of Internet-based information source.
2. Establish the Internet-based information sources available among the universities in the Eastern Cape.
3. Identify the patterns of postgraduate students' use of Internet-based information sources.
4. Find out the level of postgraduate student satisfaction with Internet-based information sources available for their information needs.
5. Suggest ways of stimulating the use of Internet-based information sources by postgraduate students at universities in the Eastern Cape, South Africa.

5.2 Factors affecting postgraduate students' use of Internet-based information sources

The extent to which university student populations will use the innovation digital libraries has in literature been discovered to be influenced by the individual characteristics of the intended user, as well as the organisational environment in which the intended user operates (Hong *et al.* 2002; Connaway & Dickey 2010). In

order to find out the factors that affect the use of Internet-based information sources by postgraduate students at Rhodes University (RU), Nelson Mandela Metropolitan University (NMMU) and the University of Fort Hare (UFH) in the Eastern Cape province of South Africa, some individual and organisational variables were identified, and the extent of their influence investigated in the current study.

5.2.1 Individual factors

In this study, the variables identified as being individual factors that could possibly influence the use of Internet-based information sources by postgraduate students included: the level of the students' ICT literacy skills; information literacy skills; demographic characteristics such as gender, age and level study as well as the postgraduate students' academic discipline affiliation. Psychological perceptions of postgraduate students towards the ease of use and usefulness of Internet-based information sources were also considered among variables that may affect the use of Internet-based information sources among postgraduate students in the Eastern Cape, South Africa.

5.2.1.1 ICT literacy

According to (Okello-Obura 2010), it is only when someone knows how to use a computer that they can learn how to access e-resources. The findings revealed that a considerable majority of the respondents, 72.9%, across the three universities believe that they know how to use computers (cf 4.1.4.1). This would suggest that the majority of the respondents possess the Information and Communications Technology (ICT) literacy skills necessary to be able to learn information literacy skills that would enable them to search for Internet-based information sources efficiently and effectively. From the findings, all respondents indicated that they use the Internet for research, and this may also be attributed to the high computer

literacy skills possessed by the respondents (cf 4.1.3.2). This is consistent with Foertsch's (1995) observation that those scholars who have most enthusiastically embraced the new medium- electronic resources, tend to be those with minimal technological obstacles to overcome.

5.2.1.2 Information literacy

Information literacy refers to a skills set required of a scholar to be able to identify and fulfil an information need, through the use of the most appropriate information system, efficiently and effectively. A significant percentage of the respondents felt that they had high e-resource searching skills, as 38.3% agreed and 33.8% strongly agreed with the statement "I rate my e-resource searching skills high". This may indicate that the respondents are reasonably able to manoeuvre their way through the Internet and are therefore able to retrieve relevant e-resources for use in their studies.

As shown in Figure 38 (cf 4.1.5.7) , the majority of the respondents, proportionately across the three universities under study either agreed, or strongly agreed with the statement that specialised instruction on how to use e-resources was available to them at their universities. This suggests that the information literacy programmes offered by the universities are visible enough for the respondents to be aware of their availability. It may also indicate that these respondents have gone through the formal literacy courses available at their institutions, which would make the majority of these respondents sufficiently competent to search for e-resources for academic purposes.

The interview results also revealed that all three university libraries offered information literacy programs for their postgraduate students (cf 4.2.6.1). Each of the three university libraries had offered more than six information literacy training

sessions, specifically for postgraduate students throughout the 2011 academic year. Postgraduate students at NMMU and UFH are also able to access an online information literacy course (cf 4.2.8). Judging from the confidence demonstrated by a significant number of respondents (38.3%) who agreed and (33.8%) who strongly agreed that their e-resource searching skills were high (cf 4.1.4.2), it may indicate that the information literacy programmes offered by each of the three universities are having a significant impact on the respondents' confidence levels to search for and utilise e-resources.

There may however be need for improvement in the effectiveness of the information literacy programs among lower level postgraduate students, as the findings revealed infrequent use of e-databases and e-journals by 66.7% of the postgraduate diploma students and 53.7% of the honours level respondents (cf. 4.1.3.8). The findings also indicated that the majority of respondents 51% infrequently use the OPAC with 13% respondents who never use the OPAC (cf 4.1.3.4). There were 46.6% of the respondents who indicated that they infrequently used their university library website, and 6.8% respondents indicated they never used the library websites (cf 4.1.3.13). The conclusion was that it may be that the OPAC and library websites are not very popular access points to scholarly information, which may mean that the respondents' information literacy skills are lacking with regard to the OPAC use as well as accessing e-resources via the library website.

The vast majority of respondents (93.2%) indicated that they use ordinary search engines such as Google and Yahoo to access scholarly e-resources (cf 4.1.3.11). A preference to use search engines to access scholarly e-resources may be indicative of a deficit in information literacy skills among the respondents. While users may achieve some success in searching for e-resources for academic purposes through

search engines, this is not the most effective way, as search engines give feedback to queries with myriads of irrelevant results that are also not necessarily scholarly in nature. A more efficient way to get to scholarly e-resources would be for postgraduate users to access e-databases and e-journals that are subscribed to by their respective universities and these are normally accessed via the library OPACs or websites.

5.2.1.3 Academic discipline affiliation

In literature it has been discovered that the use of electronic resources among postgraduate students can be influenced by the academic discipline to which they are affiliated (Tenopir 2003; Connaway & Dickey 2010). In the current study, the larger proportion, (70%), of respondents across the faculties of Management and Commerce, Science, Humanities and Social Sciences, Law and Education were strongly of the opinion that colleagues and other professionals in their area of study encouraged the use of e-resources to conduct research (cf 4.1.4.4). There were however differences as to the degree of this belief among respondents within each faculty, with 80% of the respondents in the Education faculty strongly agreeing, that colleagues and professionals in their field of study encouraged the use of e-resources to conduct research. This was followed by 58.9% from the Science faculty; 48% from the Management and Commerce faculty; 41.2% from the Humanities and Social Sciences and 40% from the Law faculty. These findings suggest that there is a growing general acceptance of the use of e-resources from respondents across disciplines. This would support Costa and Meadows' (2000) argument that recent studies suggest differences in use of networked resources had decreased as all disciplines adapted to the use of digital information and communication. However, respondents from Education, Science and Management and Commerce faculties

may be more favourably disposed to use Internet-based information sources, than those from the Humanities and Social Sciences and Law faculties. This would be consistent with studies carried out by Torma and Vakkari (2004), whose findings indicated that respondents from the natural sciences , economists, medicine and engineering reported daily use in more cases than academics from the social sciences. Some researchers argue that researchers in the science academic disciplines were early adopters of e-resources when compared to their counterparts in the humanities, and by 2000, scholars in sciences were high users of e-databases and e-journals, than were their colleagues in humanities (Talja & Maula 2003). Thus, while the gap on the use of Internet-based information sources among respondents from different academic disciplines appears to be narrowing, the respondents within the sciences category seem to still be ahead, reflective of the advantage they had, having started using electronic information sources ahead of other disciplines.

5.2.1.4 Perceptions on the usefulness and ease of use of e-resources

From the technology acceptance model (TAM) by Davis (1989) there are two basic beliefs that are believed to influence a user's decision to use an information system. These are the user's "perceived ease of use" and "perceived usefulness". Thus a hypothesis was posed to say that users were more likely to use an information system, if they believe that the system is easy to use, and if they believe that using the system would be useful in fulfilling the intended objectives of the user. The study sought to investigate the beliefs of participants surrounding their use of Internet-based information sources.

From the results, a significant percentage of the respondents scored high on positive perceptions on the usefulness and ease of use of e-resources. This is reflected by 53.4% respondents who strongly agreed, while 33.1% agreed that e-resources

enabled them to accomplish their study tasks quickly (cf 4.1.4.6). There were also 49.6% of the respondents who strongly agreed, while 38.3% more respondents agreed that using e-resources improved the quality of their work (cf 4.1.4.7). The majority of the respondents were therefore of the opinion that e-resources are useful to their academic work, improving their academic efficiency and effectiveness, while also improving the quality of their work. With such positivity towards the usefulness of e-resources among the respondents' it is highly likely that the respondents are favourably disposed to use e-resources for their academic work. As the findings indicated all (100%) respondents use e-resources, albeit differently, this may be because of the held positive perceptions on e-resource usefulness, by respondents.

The significant percentage of the respondents found e-resources fairly easy to use. There were 38.6% of the respondents, who strongly agreed, while 37.6% more of the respondents agreed that they found it easy to access relevant information from e-resources (cf 4.1.4.9). There were also 44.4% respondents who agreed, while 31.6% respondents strongly agreed that they found it easy to learn how to use e-resources (cf 4.1.4.10). Since the majority of the respondents find it easy to learn how to access, and can access e-resources easily, it suggests that the study participants possess adequate information literacy skills which positively influence their receptivity towards use e-resources in their academic work.

5.2.1.5 Demographic characteristics: age, gender and level of study

The study sought to find out if there were any significant differences in the use of Internet-based information sources by study participants in respect of their demographic characteristics of age, gender and level of study.

5.2.1.5.1 Age

There were significant differences in the respondents' use of e-databases and e-journals by age. There were proportionately more respondents among the more mature students; that is 100% of those 51+ years or older; 83.3% of study participants between 31-40 years; and 71.4% study participants between 41-50 years who indicated that they frequently use e-journals and e-databases, when compared to 45.7% respondents in the younger 21-30 years age group category who reported frequent use of e-journals and e-databases (cf 4.1.3.6). Although some studies have not found any significant differences in the use of electronic information sources by age, (Finlayson 2010), the findings in the current study are unlike findings in the studies done by Tenopir (2003), who discovered that there is evidence that younger users are more enthusiastic of electronic resources than older users; and that younger users rely heavily on electronic resources than do older users. The results from the current study may be indicative of the fact that the more mature respondents are undertaking higher degree studies which are more research intensive, consequently making respondents in this category rely more heavily on e-journals and e-databases to fulfil their information needs.

5.2.1.5.2 Gender

There were marginally more male respondents 60.3% who indicated a frequent use of e-journals and e-databases, when compared to 52.3% female respondents who indicated the same (cf 4.1.3.7). This could be indicative of the fact that gender does not significantly affect the use of e-databases and e-journals by respondents. This finding is congruent to findings by Tenopir (2003), whose research revealed there is little evidence that gender makes a difference in the use of electronic resources, in most cultures.

5.2.1.5.3 Level of Study

The findings of the current study revealed a significant difference between the use of e-databases and e-journals among the respondents studying towards higher degrees than those at the lower postgraduate degree levels. There were proportionately more respondents from the higher degrees; with 69.2% masters' level respondents, 81.6% PhD level respondents and all post-doctoral students, reporting frequent use of e-databases and e-journals for academic research than there were respondents who reported the same with in the lower degrees category; postgraduate diploma (25%) and honours (26.8%) (cf 4.1.3.8). There was also a proportionately progressive difference in frequent use, with the percentage of frequent use of e-databases and e-journals increasing proportionately the higher the level of study of the respondents. This may indicate that the higher the study level of the respondents, the more they rely on e-databases and e-journals to fulfil their information needs. A possible reason for this trend may be that advanced level degrees such as Master's, and PhD are more research intensive, requiring the respondents to conduct significant research projects, which require intense literature reviews, therefore rendering e-databases and e-journals a useful reservoir for relevant information, fulfilling the information needs of respondents in their higher degrees category. These findings are similar to those reached by Ajiboye and Tella (2007), who reported that the level of study of students contributed most to observed significance on students' information seeking behaviour. Ajiboye and Tella (2007), postulated that the higher the students go on the academic ladder, the more academic information they required to tackle the various challenges they encounter. And also that at a higher stage, students tend to be given opportunities to organise their own learning, and more specifically, thesis and dissertation projects require

students at higher levels of study to surf the Internet more frequently. These findings also echo those of Brown and Czerniewicz (2008), who in a study on the trends in student use of ICT's in higher education in South Africa, found that there were differences in the way students interacted with ICT's for learning, by level of study. They concluded that differences in use by level of study may be attributed to the observation that postgraduate students have a strong research focus and engage in research related ICT mediated activities such as online database searching than do undergraduate students.

5.2.2 Organisational factors

In the literature, organisational characteristics have been identified as possible determinants of use of digital libraries by intended users (Thong *et al.* 2002). The current study sought to investigate if the organisational variables had any influence in the use of Internet-based information sources by postgraduate students at the selected universities under study. The organisational variables included university, departmental and supervisor support; relevance of available e-resources; convenience in access; the quality and adequacy of ICT infrastructure; availability of user support; and marketing and publicity of e-resources.

5.2.2.1 Organisational and departmental support

The philosophies and policies that govern an institution can influence the practices of the people affiliated to the organisation. Enyon (2005) argues that institutional and faculty resourcing can potentially enhance or inhibit the use of electronic information sources among users. Thus a university may encourage the use of Internet-based information sources by postgraduate students through policies that create an environment in which the use of electronic information sources is encouraged.

5.2.2.1.1 University and departmental level support

The majority of the respondents (69.9%) from all of the universities believed that their universities strongly encourage the use of e-resources for academic work (cf 4.1.5.1). There were however a significantly greater proportion of respondents who believed this at RU with 92.9%, than there were respondents from UFH with 63.3% and NMMU 61.9% (cf 4.1.5.2). This may indicate a stronger organisational support towards use of e-resources at RU, than at UFH and NMMU. This would also be supported by results from the interview results, which indicated that RU library dedicates 50% of its financial resources towards the purchase or subscriptions to e-resources, a percentage significantly higher than at NMMU library who dedicate 36% of their financial budget and UFH who dedicate 25% of their financial budget towards purchase and subscription of e-resources. The result is that the RU libraries seem to offer a wider selection of e-resources, than do UFH and NMMU, (see appendices A, B and C which are lists of e-resources offered by each of the three universities).

5.2.2.1.2 Supervisor support

The findings indicated that the majority of respondents at each of the universities, with 64.3% from RU, 52.4% from NMMU and 38.3% from UFH strongly agreeing and 14.3% from RU, 23.8% from NMMU and 31.7% from UFH, agreeing that their supervisors recommend specific e-resources to use in their studies (cf 4.1.5.10). The findings would therefore seem to indicate that supervisors' at all the three institutions positively influence the use of e-resources among respondents, although at varying degrees.

5.2.2.1.3 Library policies

Findings from the interviews with the librarians at the three university libraries indicated that their libraries are leaning towards augmenting their e-resources rather

than print resources (cf 4.2.10, cf 4.2.11). According to Tenopir (2003), library policies that favour electronic journals over print are having an effect on user behaviour as users are increasingly positive about electronic collections. This also corresponds to the positive receptiveness to the use of the Internet for academic purposes by respondents across the universities, as they all indicated they use the Internet for academic research.

5.2.2.1.4 Financing e-resources

From the interview results, it was revealed that RU Library dedicates 50% of its libraries budget towards purchase of e-resources, while NMMU and UFH respectively dedicate 36% and 25% of their libraries budgets towards purchase of e-resources (cf 4.2.4). RU Library therefore makes a significantly substantial investment towards purchase of the e-resources, enabling it to offer a wider selection of the resources.

All three institutions however cited financial resources amongst the most critical challenges their libraries face towards their provision of e-resources. This indicates that the three university libraries hope to do much more in improving their e-resource provision which would in turn improve usage of the resources by their users. Overall, the findings reveal a willingness amongst the libraries to dedicate significant portions of their financial resources towards e-resource services.

5.2.2.1.5 Human resource support

The findings revealed that RU and UFH libraries have separate units within the libraries', with trained staff dedicated to e-resources management, while e-resources management at NMMU library is through the combined efforts of librarians at the university (cf 4.2.5.1). All three libraries indicated that they offer e-resource use

training to their staff members, through in-house training, as well as training offered through the South East Academic Libraries Consortium (SEALS) (cf 4.2.5.2). In response to a question on whether or not the university libraries were able to offer technical support to postgraduate students when attempting to use e-resources, UFH and RU indicated that they were able to do this most of the time; while NMMU indicated they were able to do this some of the times, due to shortage of staff (cf 4.2.5.3). The findings reveal that the three universities have trained staff in the use of e-resources, who would be sufficiently able to offer reliable technical support and training in e-resource use for their patrons, including postgraduate student users. The fact that UFH and RU are able to offer technical support most of the time, may be indicative of the advantages of having dedicated e-resource management unit, as through it appropriate technical support staff allocations can be made. It may therefore be helpful for NMMU to consider implementing a separate e-resource management unit, in order to help increase technical support staff, who can be available to assist patrons with their e-resource queries.

5.2.2.2 Relevance of e-resources provided by universities

The ability of a digital library system to offer its users information sources relevant to their needs, influences both the perceptions of the intended user and affects whether or not intended users will use the digital library (Thong *et al.* 2002; Agaba 2005). In the current study, the findings revealed that while the majority of respondents across the three universities agreed that their universities offered them relevant e-resources, there were a significant proportionate percentage of respondents from RU with 82.1% who strongly agreed that their university offered them relevant e-resources. This was unlike the respondents from NMMU with 50% of the respondents, while 40% of the respondents from UFH just agreed to the statement

that their universities offered them relevant e-resources. The pattern of the results may be because RU Library invests more finances into the purchase and subscription of e-resources and are therefore may be able to offer a wider selection of e-resources. The wide selection of e-resources from RU would in turn be able to satisfy the needs of a greater proportion of their postgraduate students, than do those e-resources available from NMMU and UFH.

5.2.2.3 Convenience of access to e-resources

According to Connaway and Dickey (2010), the issue of convenience is one of the most important reasons why potential users will use a digital library. If the supporting ICT infrastructure is in place, digital libraries bring with them the advantages that postgraduate users can be able to access Internet-based information sources from any location, such as their homes, laboratories and campus residences and at any time.

5.2.2.3.1 Time

It was revealed that the majority of respondents' at all three universities believe that their universities provide access to the Internet and e-resources whenever they need to use them. However there were proportionately more respondents from RU with 85.7% study participants who strongly agreed to this notion than there were from NMMU with 69% respondents and UFH with 43.3% respondents. This may be indicative that RU has a superior ICT infrastructure that supports Internet access at variety of locations, where students can be found at any one time. Documentary evidence, from the RU university website indicates that students are able to access the Internet at a variety of locations, including their residences. NMMU also offer access to the Internet for postgraduate students in their residences, while for UFH, this is still a project to be implemented. The result is that at UFH, most students can

only have access to the Internet and e-resources, during the day, while on campus, and only a limited number of students can use the computer laboratory and library, which are closed at 12 am, and open again at 9 am. Postgraduate students at UFH therefore do not have access to the university network for the full 24 hour period.

5.2.2.3.2 Location

The findings also revealed that the majority represented by 89.3% of the respondents from RU, strongly agreed while a further 10.7% respondents from RU agreed that their university enabled them to access the Internet and e-resources at a location convenient to their needs (cf 4.1.5.5). From NMMU, 38% of the respondents strongly agreed, while 14.3% respondents agreed that their university enabled them to access the Internet and e-resources at convenient locations (cf 4.1.5.5). This may again be indicative to the better ICT infrastructure at RU and NMMU, as these two universities offer Internet access on campus as well as in the students' residences. A significant proportion of respondents (33.3%) from UFH, disagreed, while a further 25% of the study participants from UFH strongly disagreed that their university offered them access to the Internet and e-resources at a location convenient to their needs(cf 4.1.5.5). As has been mentioned earlier, this may be because the ICT Infrastructure at UFH is still to be improved to enable postgraduate students to access the Internet and e-resources in their hostels.

5.2.2.4 Supporting ICT infrastructure

In studies on digital library use conducted in many developing countries, the use of electronic information sources has been discovered to be hampered by poor ICT infrastructure. A number of such studies indicate that students' interaction with electronic information sources is affected by slow internet connection or inadequate computer terminals for many students who need to use them (Manda 2005;

Ndinoshiho 2010). This study sought to find out the level and quality of ICT infrastructure support available to accommodate the use of Internet-based information sources by postgraduate students at the three universities under study.

5.2.2.4.1 Internet connectivity

The level of Internet connectivity affects the speed at which electronic information sources can be downloaded by a user. The librarian at RU described the Internet connectivity at RU to be excellent, fast and reliable, while the librarians from NMMU and UFH described their universities' Internet connectivity as adequate and acceptable (cf 4.2.3.1). These findings suggest that the Internet connectivity at RU is of a substantially higher quality, while that of NMMU and UFH maybe of sufficient quality.

5.2.2.4.2 Availability of computer terminals

The majority 96.4% of the e-resource survey study participants from RU and a significant percentage of respondents from NMMU 45.2% strongly agreed that their universities provide sufficient computers for postgraduate students' use (cf 4.1.5.6). From UFH, a 33.3% of the respondents selected the neutral option to this statement (cf 4.1.5.6). This may indicate that respondents at UFH were not aware of the status of the computer terminals, nor their ability to sufficiently meet the computer needs of postgraduate students. The findings however seem to reiterate that there is better supporting ICT infrastructure for the use of e-resources by postgraduate students at RU and NMMU, than there are at UFH.

5.2.2.5 Training and support

Training in information literacy skills and support with technical difficulties, are important services that university libraries can offer to be able to encourage the use

of Internet-based information sources, by their postgraduate user constituents. The current study sought to discover the availability of information literacy training and technical support at the universities under study, towards encouraging the use of Internet-based information sources by postgraduate students.

5.2.2.5.1 Information literacy training

To be able to effectively access and use Internet-based information sources, intended users, such as postgraduate students must be equipped with requisite information literacy skills. University libraries can play an important role in augmenting information skills of postgraduate students by offering effective information literacy training programmes. The study sought to find out if the universities under study offered information literacy programmes specific for postgraduate students.

The results from the Interview indicated that the three university libraries offer information literacy training sessions for postgraduate students. All three had offered over six information literacy training sessions averaging one session every two months (cf 4.2.6.1). Through these programmes RU indicated that at the time of conducting the study, it had been able to train 800 postgraduate students, while NMMU had trained 731 postgraduate students and UFH had trained 400 postgraduate students. Compared to the total number of postgraduate students at each university, the RU library appears to have managed to train almost half their postgraduate student population and NMMU and UFH are lagging behind in this regard. It may therefore indicate that the postgraduate populations at NMMU and UFH may not have superior information literacy skills.

5.2.2.5.2 Technical support

Libraries must also be ready to provide technical support to be able to assist with any technically related challenges that users of digital libraries may encounter. The study sought to find out the perceptions of study participants on the availability of technical support at their universities. The significant percentage as represented by 57.1% of respondents from RU while 31% of respondents from NMMU strongly agreed that assistance is always available to help them solve e-resource retrieval difficulties (cf 4.1.5.8). At UFH, 38% of the respondents, agreed to this notion (cf 4.1.5.8). These findings suggest that the respondents across the three universities were generally of the opinion that technical assistance in support of the use of e-resources is sufficient.

From the interviews, the librarians from RU and UFH reported that they were able to offer technical support to postgraduate students most of the time, while at NMMU, the librarian indicated that they are able to offer technical support sometimes, citing human resource shortages (cf 4.2.5.3). This may also indicate that RU and UFH may be able to offer technical support to postgraduate students more easily, than NMMU. A possible reason for such an outcome may be because RU and UFH have a smaller postgraduate constituent than do NMMU, and therefore their library staff would be able to attend to a greater number of postgraduate needs.

5.2.2.6 Marketing and publicity of e-resources

Previous studies in digital library use have revealed that users may fail to use available electronic information sources, because of a lack of awareness of their existence (Radford & Connaway 2008; Connaway & Dickey 2010). In order to ensure that postgraduate students are aware of available Internet-based information sources, university libraries must use innovative marketing strategies to keep their

digital libraries visible to the intended users. The study sought to find out the level of postgraduate students' awareness of e-resources available at their universities, as well to find out the types of e-resource publicity techniques used by the university libraries studied.

5.2.2.6.1 Postgraduate student awareness of e-resources

The findings indicate that a significant percentage of respondents were aware of the e-resources available for their use across the universities. This is represented by 35.7% participants from RU, 33.3% participants from NMMU and 15% participants from UFH who strongly agreed, and 32.1% respondents from RU, 38.1% respondents from NMMU and 50% respondents from UFH who agreed that they were always aware of available e-resources relevant to their research needs (cf 4.1.5.9). This suggests that across the universities there is a considerably high level of awareness of the availability of relevant e-resources for the respondents research needs and indicates that the e-resource publicity efforts being engaged in by these universities are achieving considerable success at informing postgraduate students of the available e-resources.

The results were also confirmed by the interview results, where librarians interviewed at the three university libraries' seemed to believe that postgraduate students are reasonably aware of the e-resources available for their use.

5.2.2.6.2 Types of marketing and publicity

All the three university libraries employ similar publicity efforts as they all display posters within the library; publish and distribute pamphlets on e-resources; send e-mail alerts and conduct e-resource training sessions for their postgraduate users (cf

4.2.6). All the three university libraries host a website, which gives access to available e-resources (cf 4.2.6)

NMMU library however indicated that they also make use of Facebook, (which is a social networking website) to disseminate information on their e-resource services and they also have an electronic notice board (cf 4.2.6). With the significant percentage of respondents, 48.1%, indicating they use the Internet for many other activities including e-mailing, job-seeking, commercial activities, entertainment and social networking (cf 4.1.3.16), it may be useful for the university libraries to engage newer social networking tools such as Facebook, Twitter or Google+ to disseminate information on e-resources, as they are likely to meet their target audience through use of these.

5.3 Internet-based information sources available among the universities in the Eastern Cape.

In order to find out the information sources availed for postgraduate student use by the three universities studied, the three university libraries were asked to supply a list of e-resources that they offer for their postgraduate students. The lists supplied are shown on Appendix A, for the University of Fort Hare, Appendix B, for Nelson Mandela Metropolitan University, and Appendix C, for Rhodes University. Rhodes list of subscription databases numbered 233. The UFH subscriptions list had 71 electronic databases, while the NMMU electronic database subscriptions list numbered 64. It was notable that the number of subscription electronic databases offered by Rhodes was significantly higher than the number of electronic databases subscribed to by the University of Fort Hare and the Nelson Mandela Metropolitan University. This would indicate that Rhodes University is able to offer a significantly

wider selection of subscribed to Internet-based information sources for use by their patrons than do the Nelson Mandela Metropolitan University and the University of Fort Hare.

The most commonly used e-databases at all three Universities were ScienceDirect and EBSCOHost. Perhaps the reason why these two subject databases are popular among academic researchers at all three universities is their ability to provide a wide coverage of content in many subject areas. Another frequently used subject database at both NMMU and RU was the SA e-publications database. At RU, Oxford Scholarship was reported as another frequently accessed e-database. JSTOR is another popular database with researchers at NMMU. At UFH, two other databases frequently accessed by researchers are Wiley and Taylor and Francis. The three universities also offer access to freely available peer reviewed e-resources.

5.4 Patterns of postgraduate students' use of Internet-based information Sources

The study sought to investigate the patterns of postgraduate students' use of Internet-based information sources by establishing the frequency of use of specific electronic information sources. The researcher sought to establish postgraduate students' preferences for access to Internet-based information sources for academic purposes by comparing their frequency of use of Internet-based information sources such as, the Online Access Public Catalogue (OPAC), e-databases and e-journals, search engines, document delivery and current awareness services, discussion lists and newsgroups.

5.4.1 Use of the Online Public Access Catalogue (OPAC)

The researcher observed that for the university libraries investigated, the online public access catalogue (OPAC) is the formal access point through which postgraduate students can have to the complete list of e-databases and e-journals, subscribed to by their universities. The findings indicated that the majority of the respondents (51%), across the three universities infrequently used the OPAC to search for information (cf 4.1.3.4). This could mean that the OPAC is an unpopular access point to e-resources among the respondents in this study, possibly because they find the OPAC to be an unfriendly intermediary to Internet-based information sources. Digital library user studies of student communities conducted elsewhere by Connaway *et.al.* (2006), revealed that participants stated that library OPACs are difficult to use and that this belief was held by all types of participants. A review of several user studies by Connaway and Dickey (2010) drew conclusions that catalogues probably would better serve users with better delivery, more links and more online content and that the library catalogue should look more like search engines, i.e., Google, Yahoo , since most people are more familiar with this type of search, display and interface.

5.4.2 Use of e-databases and e-journals

The researcher particularly wanted to find out the patterns of study participants use of e-databases and e-journals, as these take a significant amount of university library budgets, as they seek to fulfil the information needs of the academic communities they serve. The findings revealed that a moderate percentage (56%) of respondents indicated that they frequently use e-journals and e-databases for academic research (cf 4.1.3.5). These finding supports that of Connaway and Dickey (2010) , who

reported that e-journals are increasingly becoming very important to the process of research at all levels.

5.4.3 Use of search engines

A search engine is a web-based software programme that enables users to locate information on the Internet. Search engines are less complicated to use because users can enter their queries in their natural language, and can expect a myriad of results, from which to choose. The most popular search engines are Google and Yahoo. However, search engines, may not be the best access points for scholarly resources, as they return results of many documents that may not be necessarily scholarly in nature. There was an overwhelmingly positive response with 93.2% of the respondents indicating that they frequently use search engines for academic research (cf 4.1.3.9). These findings suggest that search engines are a preferred source or access point for Internet-based information sources among the respondents. Search engines seem to be a preferred entry route for internet research among students as other studies by Rowley *et al.* (n.d.), indicated that search engines and known sites are the first resort for most academic queries. They attribute this tendency to the observation that search engines are the first screen that usually appears on the first screen as users enter the web, and, further, offer what students perceive as a one stop shop, which is more desirable to the user. The central findings on a review of several digital library user studies by Connaway and Dickey (2010) included that evidence provided by the results of the studies supports the centrality of Google and other search engines and that Google is often used to locate and access e-journal content.

5.4.4 Use of libraries' websites

There was an equal percentage of respondents 46.6% who frequently use and of those who infrequently use their university library websites (cf 4.1.3.13). Library websites seem not to be the preferred access point to information resources by users as revealed in other user studies. De Rosa (2011) in a study conducted on the perceptions of a variety of users on libraries and information resources reported that no one started their library search on a library website, and that only 33% of users visited the library website. De Rosa (2011) however also discovered that of those who indicated they used the library website, the majority found success in their information search. This indicates that despite being generally underutilised, library websites usually lead users to information relevant to their needs; and therefore ways to enhance their visibility among users need to be sought.

5.4.5 Use of document delivery and current awareness services

A document delivery service enables subscribers to receive new electronic information sources, such as a newly published e-journal in their e-mail inbox, while a current awareness service is an alerting service that sends e-mail alerts of freshly published Internet-based information sources. Postgraduate students can benefit from such services, by having the latest copy of e-journals on subjects of their interest, delivered straight into their e-mail inbox, or being alerted whenever new issues are in print. From the current study, 46.6% of the respondents indicated that they never used document delivery and current awareness services (cf 4.1.3.14). It therefore could mean that respondents across the three universities are unaware of the existence of such services for their academic benefit. If they are aware, then it would indicate that current awareness services are an unpopular way for gathering scholarly information by respondents. These findings are similar to findings by Agaba

(2005) who in a study on the assessment of the utilisation of Makerere University electronic information resources by academic staff, discovered that most of the respondents had not heard about document delivery services. In another study on researchers' use and information seeking behaviour Nicholas *et al.* (2010) concluded that alert services were by no means a routine way into the literature as only one survey respondent had reported using an alert service and only a few instances of use were discovered among interviewees.

5.4.6 Use of discussion lists and newsgroups.

Discussion lists and newsgroups are Internet-based forums at which people with similar interests, can meet and exchange ideas. In an academic setting, they can be used by researchers, as a source of information on latest developments in research of a particular subject, as well as a platform to exchange ideas, by researchers in fields of mutual interest. From the current study, the majority as represented by 54.9% of the respondents indicated that they never used discussion lists and newsgroups as sources of academic information (cf 4.1.3.15). There were also 34.6% of the respondents who reported an infrequent use of these services. The findings indicate that discussion lists and newsgroups are not popular as sources of academic information among the respondents. This may be because they may be unaware that these services do exist for their benefit. In a similar study by Nicholas *et al.* (2010), professional e-mail lists and list servs were mentioned by a minority of respondents, again indicating their unpopularity as sources of academic literature among researchers in academic settings.

5.5 The level of postgraduate students' satisfaction with Internet-based information sources available for their information needs

The researcher sought to discover the levels to which postgraduate students were satisfied with the Internet-based information sources available for their information needs. In response to a question that sought to elicit the study participants' beliefs about the relevance of the Internet-based information sources offered by their universities, a significant percentage of respondents were positive about the relevance of e-resources. This was represented by 82.1% of the study participants from RU, 36.7% respondents from UFH and 50% of the study participants from NMMU who strongly agreed that their universities made available e-resources relevant to their information needs (cf 4.1.5.3). There were also 14.3% respondents from RU, 40% of the respondents from UFH and 31% of the respondents from NMMU who agreed that their universities made available e-resources relevant to their information needs (cf 4.1.5.3). It was concluded that the respondents were generally satisfied with the Internet-based information sources offered by their institutions. This finding is similar to findings in a study of gendered access and uses of information and communications technologies in South Africa by Czerniewicz and Brown (2006), which revealed that overall, students were satisfied with the adequacy of available online content.

The results of the interviews held with the librarians from NMMU, UFH and RU revealed that they all believed their postgraduate students were satisfied with the Internet-based information sources available for their research needs (cf 4.2.7). Because the librarians interviewed did not choose the very satisfied option, it may indicate that all libraries aspire to improve the level of satisfaction with e-resources

by postgraduate students, by improving the quality and breadth of Internet-based information sources, from those they currently offer.

5.6 Chapter Summary

This chapter discussed the findings of the survey on the use of Internet-based information sources by postgraduate students at the three universities under study. The findings revealed positive perceptions towards e-resources by respondents and strong beliefs that e-resources are useful and easy to use among the study participants. Search engines were the most significantly used access point to Internet-based information sources. Subject e-databases and e-journals were moderately used, while study participants studying towards higher degrees, used them more e-databases and e-journals more frequently than those studying towards honours or postgraduate diplomas. The OPACs and library websites were used infrequently, among the study participants, and it was concluded that they were not the preferred mode of access to Internet-based information sources among the study participants. Discussion lists, current awareness and document delivery services were also largely unused e-resource services among the postgraduate respondents. Respondents were discovered to possess high ICT literacy skills, but may need to improve on Information literacy skills. Academic discipline differences in the use of e-resources, while they still marginally exist, seem to be declining. Age and level of study of respondents were discovered to greatly affect use of e-resources, with older respondents and those enrolled for higher degrees using e-databases and e-journals more frequently. All the three universities encourage the use of e-resources by postgraduate students. The universities' libraries are leaning towards improving their e-resource service provision, with significant financial budget allocations being set aside towards purchase or subscriptions of e-resources, as well as human resource

allocations towards e-resource services. However there are significant differences in the ability of universities to provide e-resource services, with Rhodes University library having a significantly higher budget dedicated to e-resources, wider selection of subscribed to subject databases; superior ICT infrastructure and Internet connectivity, while the University of Fort Hare needing to significantly improve infrastructure to help students to access e-resources at locations convenient to them. Respondents however seem generally satisfied with available e-resources, across all three institutions. The next chapter provides conclusions reached on the factors that affect the use of Internet-based information sources by postgraduate students at the selected universities in the Eastern Cape, South Africa. The conclusions are based on the findings of the study. The next chapter also makes recommendations towards the improvement of the use of Internet-based information sources and gives suggestions for areas of future research.

Chapter Six: Conclusion, recommendations, and areas of future study

6.1 Introduction

In the previous chapter, a summary of the major findings in respect with the first four objectives of the study were given, which were: to determine the factors affecting the use of Internet-based information source; to establish the Internet-based information sources available among the universities in the Eastern Cape; to identify the patterns of postgraduate students' use of Internet-based information sources; and to find out the levels of postgraduate student satisfaction with Internet-based information sources available for their information needs. In this chapter, conclusions are made regarding factors that characterise the use of Internet-based information sources by postgraduate students at the three selected universities in the Eastern Cape, South Africa. The chapter also provides recommendations on the improvement of e-resource use by postgraduate students in light of the findings in the current study, thus fulfilling the last objective of the study, which was to suggest ways of stimulating the use of Internet-based information sources by postgraduate students at selected universities in the Eastern Cape, South Africa.

6.2 Conclusions

The main aim of this study was to discover the factors that affect the use of Internet-based information sources by postgraduate students at the three selected universities in the Eastern Cape province of South Africa. To guide the process of achieving this objective, the study sought to answer stated research questions and the conclusions reached are given as follows.

6.2.1 What factors affect postgraduate students' use of Internet-based information sources?

The use of Internet-based information sources by postgraduate students is characterised by both individual and organisational factors.

- The use of Internet-based information sources is increasingly becoming important for postgraduate students at the three selected universities in the Eastern Cape, South Africa, as all the respondents indicated that they use the Internet for academic research purposes (cf 4.1.3.2). Internet-based information sources offer distinct advantages in that they can be accessed from any location and time of convenience.
- Respondents have positive perceptions on the use of Internet-based information sources for academic purposes. Most of the study participants believed in the usefulness of Internet-based information sources, with 53.4% of the respondents who strongly agreed and 33.1% respondents who agreed that their use of e-resources enabled them to accomplish their study tasks quickly (c.f.4.1.4.6). A significant percentage of study participants also believed that their use of e-resources improved the quality of their work, with 49.6% of the respondents strongly agreeing and 38.3% more respondents agreeing to the notion that their use of e-resources improves the quality of their work (cf. 4.1.4.7). It was concluded that study participants are favourably disposed towards the use of Internet-based information sources as they believe in their usefulness for academic purposes.
- Most respondents were confident in their ICT literacy skills, with 38.3% of the respondents agreeing, and 33.8% strongly agreeing that they rated their e-resource searching skills high (cf.4.1.4.2). However their moderate use of

subscription e-databases and e-journals as evidenced by 56% of the respondents who frequently used e-databases and e-journals (cf. 4.1.3.5) or infrequent use of the OPACs with 51% respondents who reported infrequent use of the OPAC may indicate a lack of sophisticated information literacy skills necessary to manoeuvre through subscription and high end e-resources, provided by their institutions.

- Age affects the use of Internet-based information sources. There were significant differences in the study participants use of e-databases and e-journals by age, with more study participants in the more mature age groups of 31-40 years (83.9%); 41-50 years (71.4%) and 50years and older (100%) who indicated that they frequently used e-journals and e-databases compared to 45.7% of the respondents in the 21-30 years age category (cf 4.1.3.6). However it should be noted that the respondents in the 50 years plus category were not very many, as there were only 3 study participants (cf 4.1.2.2). It was however, concluded that most respondents in the mature age category were pursuing higher research degrees, at either Master's or PhD level. Therefore the research intensive nature of master's and PhD degrees, consequently makes study participants 31 years and older reliant on e-databases and e-journals to fulfil their information needs.
- Level of study influences the use of Internet-based information sources, with study participants pursuing higher degrees using Internet-based information sources more frequently than those in lower level degrees. There were 81.6% of the study participants at PhD level and 69.2% of the study participants at the Masters level who indicated that they frequently used e-databases and e-journals, and these were significantly higher percentages than the 26.8%

respondents at honours level and 25% respondents at postgraduate diploma level who frequently used e-databases and e-journals (cf.4.1.3.8). This trend was attributed to the fact that Master's and PhD programmes are more research intensive, compared to honours and postgraduate diploma programmes. Consequently respondents within the Master's and PhD category heavily depended on e-databases and e-journals to fulfil their information needs than do their colleagues pursuing either honours degrees or postgraduate diplomas. These findings are similar to those of Ajiboye and Tella (2007), who observed that level of study posed the most influence in the information seeking behaviour of participants. This led Ajiboye and Tella (2007) to make the conclusion that the higher the students go on the academic ladder, the more academic information they required to tackle the various challenges they encounter, thereby influencing their reliance on the Internet as a source of information.

- Gender does not significantly affect the use of Internet-based information sources among postgraduate students. Only 60.3% of the male respondents indicated that they frequently used e-databases and e-journals compared to 52.3% female respondents who reported the same (cf. 4.1.3.7). This was consistent with an observation by Tenopir (2003) that gender does not seem to affect the use of electronic information sources in most cultures.
- While differences still exist in the culture of using Internet-based information sources by academic disciplines, postgraduate students in all subject disciplines are increasingly moving towards reliance on Internet-based information sources to fulfil their information needs (cf. 4.1.4.3).

- Universities in the Eastern Cape encourage the use of Internet-based information sources. Majority of the respondents (69.9%) believed that their universities encourage and support the use of e-resources (cf.4.1.5.1).
- University libraries in the Eastern Cape are increasingly leaning more towards providing Internet-based information sources, than print resources, with Nelson Mandela Metropolitan University (NMMU) and Rhodes University (RU) having plans to cancel subscriptions to print journals in favour of their electronic counterparts in the near future (cf. 4.2.10; cf.4.2.11).
- Significant financial investments are channelled towards the provision of Internet-based information sources by the university libraries. The RU library dedicates 50% of its libraries' budget towards subscriptions to e-databases and e-journals; NMMU dedicates 36% of its library budget, while the University of Fort Hare (UFH) dedicates 25% of its library budget towards subscriptions and purchases of e-databases and e-journals (cf. 4.2.4).
- Significant efforts are being made by the libraries of the three universities, towards supporting the use of Internet-based information sources by postgraduate students. RU and UFH have a dedicated team of staff members dedicated towards support of e-resources services, while at NMMU, the e-resource services tasks are shared amongst the different library staff members (cf.4.2.5.1.1).
- The three universities generally offer relevant Internet-based information sources, with significant percentages of respondents agreeing that their universities avail relevant e-resources (cf. 4.1.5.3). The RU library may however have greater capacity to offer more electronic information resources, having 233 subscriptions to e-databases and e-journals compared to the 67 e-

databases and e-journals subscribed to by NMMU and UFH's 71 e-database and e-journal subscriptions (cf.4.1.5.3).

- Location of access to Internet-based information sources by postgraduate students at UFH was inconvenient. There were 33.3% of the respondents from UFH who disagreed and 25% more respondents from UFH who strongly disagreed that their university enabled them to access the Internet and e-resources at locations convenient to their needs (cf. 4.1.5.5). While RU and NMMU offered their postgraduate students access to Internet-based information sources in their residences, study participants from UFH were restricted to accessing Internet-based information sources from their computers laboratories and university library which does not open for a 24 hour period (cf. 4.2.3).
- The techniques used by university libraries in the Eastern Cape to market Internet-based information sources are achieving considerable success as a significant percentage of respondents were aware of available e-resources. There were 35.7% of the respondents from RU, 33.3% from NMMU and 15% of the respondents from UFH who strongly agreed , while 32.1% respondents from RU, 38.1% respondents from NMMU and 50% of the respondents from UFH agreed that they were always aware of available e-resources relevant from their research needs (cf. 4.1.5.9).

6.2.2 What Internet-based information sources do the selected universities avail for postgraduate students' use?

All three universities avail both subscription databases and open access or free peer-reviewed e-resources to their university communities. Rhodes University was discovered to offer a significantly wider selection of e-resources than do the Nelson

Mandela Metropolitan University and the University of Fort Hare (See appendices A, B and C). Despite these differences, the majority of respondents felt that their university offered them relevant e-resources for their information needs (cf. 4.1.5.3).

6.2.3 What are the patterns of postgraduate students' use of Internet-based information sources?

- Subscription e-databases and e-journals are used moderately with 56% of the respondents indicating that they frequently use e-journals and e-databases for academic purposes.
- The OPAC and library websites are unpopular access points to Internet-based information sources among postgraduate students. There were as many as 51% of the respondents who infrequently used the OPAC and 46.6% of the respondents who infrequently used their library websites to access Internet-based information sources (cf.4.1.3.4). In other similar studies, OPACs have been found to be difficult to navigate in search of Internet-based information sources (which studies?).
- Search engines are the preferred point of access to Internet-based information sources, irrespective of the study participants' level of study, age or gender, with 93.2% of the respondents indicating that they frequently used search engines to access information resources for academic purposes (cf. 4.1.3.10). While search engines such as Google and Yahoo offer user-friendly interfaces, and enable users to conduct search queries in their natural language and expect numerous results, these do not always lead to e-resources subscribed to by the universities.
- Alerting services and Internet forums are unpopular sources of academic information. Up to 46.6% of the respondents reported that they never used

document delivery and current awareness services, and 54.9% of the respondents never used discussion lists and newsgroups (cf. 4.1.3.14; cf. 4.1.3.15). It was concluded that study participants were unaware of the availability of such services and their potential in being sources of academic information.

6.2.4 Are postgraduate students satisfied with the Internet-based information sources available for their information needs?

- It was concluded that the study participants were generally satisfied with the Internet-based information sources offered by their universities. This was evidenced by a significant number of the respondents (82.1%) from RU, 36.7% participants from UFH and 50% participants from NMMU strongly agreeing, while 14.3% of the respondents from RU, 40% of the respondents from UFH and 31% of the respondents from NMMU agreed that their universities made available relevant e-resources for their information needs (cf.4.1.5.3).

6.3 Recommendations

From the findings in the current study, the following recommendations are made to improve the use of Internet-based information sources by postgraduate students in the Eastern Cape Province of South Africa.

- If libraries in the Eastern Cape province of South Africa region wish to improve the visibility and usage of subscription databases, e-journals, e-books and open access resources organised by the libraries, it is recommended that they incorporate the use of federated searching and searchable journals management software on their university library websites. This would provide

seamless access to subscription databases and e-journals, via the library homepage, with a look and feel of general search engines such as Google and Yahoo. Examples of federated search software that can be used as finding aids on the libraries homepages instead of the unpopular OPAC include Ex Libris Primo, Summon and Encore, among other solutions offered by library software vendors.

- It is recommended that libraries at RU, UFH and NMMU consider opening up their electronic resources to be searchable via popular search engines such as Google, as these have proved to be popular gateways to Internet-based information sources among postgraduate students. Connaway and Dickey (2010) recommend that “library systems need to look and function more like search engines such as Google and Yahoo and Web services such as Amazon.com, since these are familiar to users who are familiar and confident in using them.
- Information literacy training programmes at the three universities may be tailor-made to cater for the needs of students at varying levels and disciplines of study. In a study by Connaway and Dickey (2010), observed that the library serves many constituencies with different needs and behaviours; therefore one size does not fit all. They recommended that libraries must provide services and materials in multiple modes and formats, to be able to cater for the variety of user needs. The libraries of the three universities can therefore provide tailor-made training programmes for postgraduate students at varying levels of study as well as in different academic disciplines. Training programmes may also include interactive online-based information literacy

training modules that are subject specific and suit a specific level of study of the student user.

- It is recommended that libraries of RU, NMMU and UFH provide e-reference services, such as instant messaging so that if students have any query on accessing e-resources, ready help and support can be obtained electronically, without having to physically visit the library.
- It is recommended that UFH upgrades the ICT infrastructure so as to improve convenience of access to e-resources by postgraduate students. This can be done by prioritising and widening access points to include network in residence hostels. Off campus access can also be improved through enabling accessibility of e-resources through mobile technology.
- It is recommended that the libraries of RU, NMMU, and UFH need to brand and market themselves, in order to improve their visibility and create an awareness of the strategic role they play in the provision of e-resources. Connaway and Dickey (2010) recommend that the “library must advertise its brand, its value and its resources better within the community”. Improving e-resources awareness strategies can include use of social networking tools which are now being used by a substantial number of postgraduate students.
- It is recommended that the library policies of the three universities be revised to ensure the provision of e-resources relevant for different academic levels of study as well as subject areas available at each university. The policies should also seek to make e-resources more accessible to postgraduate users by providing appropriate infrastructural and user support. It is also recommended that increased financial and human resources should also be

allocated to the continuous improvement of e-service delivery at the universities.

6.4 Suggestions for future research

According to Hofstee (2006) in research, one answer usually leads to several other questions that help researchers forge ahead. From the current study, several issues emerged which could be grounds for useful future research.

- The current study investigated the use of Internet-based information sources by postgraduate students at three universities in the Eastern Cape, South Africa. It is however suggested that other similar studies on the use of Internet-based information sources be conducted, but must however include academic staff and undergraduate students, as this would give a more holistic picture of e-resource use at academic institutions within the region.
- In the current study, library websites and OPACs were found to be unpopular access points to Internet-based information sources. It is suggested that a study on how to improve the technical effectiveness of library websites and open access public catalogues (OPACs), would help university libraries to find ways of improving usage of subscription resources, hidden behind these interfaces.
- The libraries of the institutions under study indicated they had plans of incorporating mobile technology in their e-resource services. According to Czerniewicz (2012), current trends in educational technology include an increase in the use of mobile technology. As mobile communication is the technology of the future, it is suggested that studies on how mobile technology can be effectively incorporated to improve e-resource service

provision be undertaken as these would be useful in helping universities to incorporate mobile technology effectively in the provision of e-resource services.

- It was apparent that the three universities under study had varying capacities in their abilities to provide a variety of subscription electronic information sources. The Open Access (OA) initiative is an emerging movement geared towards the provision of open access peer reviewed resources to researchers, which would be beneficial for institutions that are of modest financial means. Studies on how OA resources can be incorporated in the academic landscape of the region would provide valuable insights into successfully incorporating these resources to benefit researchers.

6.5 Final conclusion

A major conclusion emanating from this study is that the higher education landscape in the Eastern Cape Province, as in other parts of South Africa and the world, is being shaped by an increasing reliance on electronic resources to fulfil the information needs of academic researchers. Consequently, postgraduate students in the Eastern Cape, South Africa have embraced Internet-based information sources and are increasingly relying on them to fulfil their research information needs. However this study revealed differing patterns in the use of e-resources by postgraduate students at the three universities. It also emerged that, the degree at which students use Internet-based information, depends on a number of factors.

The perceptions of students included in this study towards use of Internet-based information sources were very positive, as the majority of the respondents indicated that e-resources were useful to their studies and were easy to use (cf.4.1.4.6). All

respondents also indicated that they use the Internet for their academic work (cf.4.1.3.2). All this indicates the importance e-resources generally are in the lives of postgraduate students in the Eastern Cape, South Africa.

There were however, differences in the patterns of use of the various Internet-based information sources identified in the study. Age and level of study were found to significantly affect frequency of usage, with the more mature students utilising specialised e-databases and e-journals more than the younger students (cf.4.1.3.6; cf.4.1.3.8). It was observed that the older students were mostly undertaking higher research degrees. The students enrolled for the higher degrees such as Masters and PhD also indicated a higher frequency in use of e-databases and e-journals than did their graduate counterparts studying for an honours degree or postgraduate diploma. The researcher concludes that higher level postgraduate degrees are more research intensive and hence students enrolled for them will likely depend more on specialised e-resources to fulfil their information needs, than do the lower degree students.

There was an overwhelming use of search engines across the spectrum of respondents (cf.4.1.3.9). From comparisons with other studies which also revealed this trend among researchers (Stelmaszewska, *et al.*, 2010), it was concluded that postgraduate students prefer to use search engines as access points to e-resources, because they find them fairly easy and quick to use, unlike library OPACs which lack seamless integration with subscription e-resources . This may also reveal that postgraduate students in the Eastern Cape province of South Africa region lack requisite information literacy skills to successfully navigate successfully through e-resources subscribed to by their libraries.

It is concluded that a supportive institutional environment enhances the use and acceptance of e-resources by users. It was discovered that all three institutions are currently making significant financial commitments towards e-resource services and they intend to invest more on e-resources in the future (cf. 4.2.4). The libraries of the three institutions seem to heavily lean towards offering more e-resources than print, with plans underway to cancel print information resources in favour of e-resources in the near future (cf. 4.2.10). Apparently, more human resources are being allocated towards providing e-resource services (cf.4.2.5.1). With such commitment from the top level management towards providing and improving e-resource services, it is highly likely that students in this region will increasingly depend on e-resources to fulfil their information needs.

All the three institutions, although at differing capacity levels, have put up ICT infrastructure necessary for students to conveniently access Internet-based information sources (cf.4.1.5.4). However, study participants from UFH were largely of the opinion that they did not access e-resources at locations convenient for them (cf.4.1.5.5). This indicates that of the three institutions, UFH is the most in need of improving its ICT infrastructure to make it possible for students to access e-resources at locations of their convenience.

Although academic disciplinary differences in the use of e-resources were apparent (cf.4.1.4.4), the researcher was drawn to the conclusion that all subject disciplines are moving towards the reliance on Internet-based information sources in pursuance of academic information, and that any differences that may exist, are increasingly becoming blurred. A variety of publicity efforts were being employed by the three universities in a bid to increase postgraduate students' awareness of the available and relevant e-resources to meet their information needs (cf. 4.2.6). However, the

moderate use of subscription databases, and the rare use of services such as document delivery, current awareness, newsgroups and discussion lists, indicates that current publicity efforts may need to be improved.

In light of the findings, the researcher gave recommendations that may improve the use of Internet-based information sources among postgraduate students at universities in the Eastern Cape, South Africa. It was recommended that libraries of the three universities incorporate federated e-resource searching software, such as Ex Libris Primo, on their library websites. This would provide seamless access to subscription databases, through a more user friendly interface, which are easier for patrons to use. It was also recommended that the three university libraries provide tailor-made information literacy training for the needs of students at varying levels and disciplines of study. It was also recommended that the three university libraries provide e-reference services, giving postgraduate students ready help and support online. Another recommendation given was that upgrading the ICT infrastructure at UFH would improve convenience of access to e-resources by postgraduate students. It was also recommended that libraries of the three universities studies brand and market themselves so as to create an awareness of the strategic role they play in the provision of e-resources.

The researcher also gave suggestions for areas of possible future research. These include that a replication of the current study can be made to however include academic staff and undergraduate students. This would give a more holistic picture of e-resource use at academic institutions within the Eastern Cape region of South Africa. It was also suggested that a study on how to improve the technical effectiveness of the library websites and OPAC would help the three university

libraries studied to find ways of improving usage of subscription resources hidden behind these interfaces.

6.6 Chapter summary

In this chapter, the conclusions reached on the research questions that guided the study on the use of Internet-based information sources by postgraduate students at selected universities in the Eastern Cape province of South Africa, are outlined. Recommendations on how libraries at the universities studied may improve the use of Internet-based information sources by postgraduate students are also given based on the findings of the study. The chapter also highlights suggestions for areas of possible future research.

References

Abbasi, M. S., Chandio, F. H., Soomro, A. F., Shah, F. 2011. Social influence, voluntariness, experience and the Internet acceptance: an extension of technology acceptance model within a south-Asian country context. *Journal of Enterprise Information Management*, 24(1): 30-52.

Association of College Libraries. 2012. *Introduction to Information Literacy*. Available from: <<http://www.ala.org/acrl/issues/infolit/overview/intro>> [Accessed: 16 May 2012].

Agaba, D. 2006. Assessment of the utilization of Makerere University electronic information resources by academic staff, Unpublished work, *University of Pretoria*. [n.p.]. Available from: <<http://repository.up.ac.za/bitstream/handle/2263/6426/agaba.pdf?sequence=1>> [Accessed: 2 April 2011].

Ajzen, I. 1985. *From intentions to actions: a theory of planned behaviour*. Berlin: Springer.

Ajiboye, J. O. & Tella, A. 2007. University undergraduate students' information seeking behaviour:-implications for quality of Higher Education in Africa. *The Turkish Online Journal of Educational Technology*, 6(1) : 40-52.

Al-Aufi, A. 2006. Transforming information societies:report on survey investigating the use of the networked information for research and scholarly communication at SQU, Oman. *Intercultural Communication Studies*, 15(2): 135-149.

Aldridge, A. & Levine, K. 2001. *Surveying the social world:principles and practice in survey research*. Buckingham/Philadelphia: Open University Press.

Al-Gahtani, S. S. 1998. System characteristics, user perceptions and attitudes in the prediction of information technology acceptance: a structural equation model. In [online]. *Proceedings of the Diffusion Interest Group in Information Technology Conference, 12 December 1998, Helsinki, Finland*. Available from: <http://www.usc.edu/schools/business/atisp/Information_Systems/DIGIT/MEET1998.htm> [Accessed: 21 March 2011].

Arif, M. & Kanwal, S. 2009. Acceptance of digital library among female students and effects of limited access of digital library on their performance in research work: a case of International Islamic University. *The International Information & Library Review*, 41(3): 122-128.

Arms, W.Y. 2000. *Digital libraries*. Cambridge, Mass: MIT Press. Available from: <<http://www.cs.cornell.edu/wya/diglib/MS1999/index.html>> [Accessed: 30 October 2011].

Banwell, L. & Coulson, G. 2004. Users and user study methodology: the JUBILEE project. *Information Research*, 9(2): 167. Available from: <<http://InformationR.net/ir/9-2/paper167.html>> [Accessed: 16 July 2012].

Bar-Ilan, J., Peritz, B.C. & Wolman, Y. 2003. A survey on the use of electronic databases and electronic journals accessed through the web by the academic staff of Israeli universities. *The Journal of Academic Librarianship*, 29(6): 346-361.

Bell, J. 2010. *Doing your research project: a guide for first time researchers in education, health and social science*. Berkshire:Open University Press.

Bevilacqua, F. 2005. Implications of scholarly electronic journals for users: a literature review. *University of Parma*. Available from:<<http://dspace-unipr.cilea.it/bitstream/1889/450/1/BP100.pdf>> [Accessed: 16 August 2011].

Blanche, M.T., Durrheim, K. & Painter, D. 2006. *Research in practice: applied methods for the social sciences*. Cape Town: University of Cape Town Press.

Bopape, S. 2010. Utilisation of information technology to support information and knowledge management by lawyers in Polokwane City. *SA Journal of Library and Information Science*, 76(2): 129-140.

Borgman, C.L., Smart L.J., Finley, J.R., Champeny, L., Gilliland, A.J. & Leazer, G.H. 2005. Comparing faculty information seeking in teaching and research: implications for the design of digital libraries. *Journal of the American Society for Information Science & Technology*, 56(6): 636-656.

Breen, R., Lindsay, R., Jenkins, A. & Smith, P. 2001. The role of Information and Communication Technologies in a University learning environment. *Studies in Higher Education*, 26(1): 95-114.

Brown, C. & Czerniewicz L. 2008. Trends in student use of ICTs in higher education. In *South Africa 10th Annual Conference of WWW Applications*. Conference proceedings, 3-6 September, 2008. Cape Town: University of Cape Town, 1-15.

Bryman, A. 2004. *Social research methods (2nd ed.)*. Oxford: Oxford University Press.

Chaturvedi, K. 2009. Sampling Methods. n.p. Available from <<http://www.pitt.edu/~super7/43011-44001/43911.ppt>> [Accessed: 16 June 2011].

Cheung & Huang. 2005. Proposing a framework to assess Internet usage in University education:an empirical investigation from a student's perspective. *British Journal of Educational Technology*, 36(2): 237-253.

Chigona, W. & Licker, P. (2008). Using diffusion of innovations framework to explain communal computing facilities adoption among the urban poor. *The MIT Press*, 4(3): 57-73.

Chuttur, M. 2009. Overview of the technology acceptance model: origins, developments and future directions. *Sprouts:Working Papers on Information Systems*, 9(37): 9-37. Available from < <http://sprouts.aisnet.org/9-37> > [Accessed: 9 May 2011]

Cleveland, G. (1998). Digital libraries: definitions, issues and challenges. *UDT Occasional Papers*, 8: 1-8. Available from www.ifla.queenslibrary.org/ir/5/op/udtop8/udtopt8/udt-op8.pdf > [Accessed: 12 May 2012].

Clyde, L.A. & Klobas, J.E. 2001. The first Internet course:implications of increased prior participant experience. *Internet Research: Electronic Networking Applications and Policy*, 11(3): 235-245.

Colvin, Caran A & Goh, Angeline. 2005. Validation of the technology acceptance model for police. *Journal of Criminal Justice*, 33(1) : 89-95. Available from: Science Direct < www.sciencedirect.com > [Accessed: 23 August 2011].

Connaway, L. S. & Dickey T. J. 2010. *The digital information seeker: report on findings from selected OCLC, RIN, and JISC user behaviour projects.*

England,Wales: Higher Education Funding Council for England (HEFCE). Available

from:<

<http://www.jisc.ac.uk/media/documents/publications/reports/2010/digitalinformationsekerreport.pdf> > [Accessed: 21 January 2012].

Connaway, L.S., Chandra, P. & Dickey, T.J. 2006. *Sense-making the information confluence: The whys and hows of college and university user satisfying of information needs. Phase III:Focus Group Interview Study. Report on National Leadership Grant LG-02-03-0062-03, to the institute of Museum and Library.* Washington DC, Columbus, Ohio: School of Communication, The Ohio State University. Available from: <

http://imlsproject.comm.ohiostate.edu/imls_reports/PHASE_III/PH_III_report_list.html > [Accessed: 21 January 2012].

Costa, S. & Meadows, J. 2000. The impact of computer usage on scholarly communication among social scientists. *Journal of information Science*, 26(4) : 255-262. Available from: Sage < <http://jis.sagepub.com/content/26/4/255> > [Accessed: 23 June 2011].

Cotton, S.R. & Jelenewicz, S.M. 2006. A disappearing digital divide among college students?: peeling away the layers of the digital divide. *Social Science Computer Review*, 24(4): 497–506. Available from: Sage < <http://ssc.sagepub.com/content/24/4/497> > [Accessed: 17 March 2011].

Covey, D. T. 2002. *Usage and usability assessment: library practices and concerns.* Washington D.C.: Digital Library Federation.

Czerniewicz, L. & Brown C. 2006. Gendered access to, and uses of information and communication technologies (ICTs) in South Africa: higher education experiences in

the Western Cape. In Pearson E. & Bohman,P. *Proceedings of the EdMedia 2006:World Conference in Educational Multimedia, Hypermedia and Telecommunications. 26-30 June 2006, Orlando, Florida*. Florida: Association of Computing in Education, 31-38.

Davies, C. 1997. Organizational influences on the university electronic library. *Information Processing and Management*, 33(3): 377-392. Available from: Science Direct < www.sciencedirect.com > [Accessed: 3 March 2011].

Davies, M. B. 2007. *Doing a succesful research project*. Hampshire: Palgrave Macmillan.

Davis, F.D., Bagozzi, R.P. & Warshaw, P.R. 1989. User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35 (8) , 982–1003. Available from: JSTOR < <http://www.jstor.org/stable/2632151> > [Accessed: 26 February 2011].

Davis, F.D.1989. Perceived usefulness, perceived ease of use, and user acceptance. *MIS Quarterly*, 13(3): 319-340. Available from: JSTOR < <http://www.jstor.org/stable/249008> > [Accessed: 26 February 2011].

Davis, F.D.1993. User acceptance of information technology: system characteristics, user perceptions and behavioural impacts. *International Journal of Man-Machine Studies*, 38(3), 475-487. Available from Science Direct < www.sciencedirect.com > [Accessed: 26 February 2011].

De Rosa, C. 2011. *Perceptions of libraries and information resources: a report to the OCLC membership*. Dublin, Ohio: OCLC Online Computer Library Centre. Available

from: < http://www.oclc.org/reports/2010perceptions/2010perceptions_all.pdf>

[Accessed: 25 May 2012].

De Vaus, D. 1991. *Surveys in social research*. London: Allen & Unwin.

Eason, K., Richardson, S. & Yu, L. 2000. *Patterns of use of electronic journals*.

Journal of Documentation, 56(5): 477-504. Available from: Emerald <

www.emeraldinsight.com > [Accessed: 24 March 2011].

Emerald Publishing Group. 2013. How to... write a literature review. *Emerald*

Publishing Group. Available from: Emerald <

<http://www.emeraldinsight.com/authors/guides/write/literature.htm>> [Accessed: 1

April 2013].

Eynon, R. 2005. The use of the Internet in Higher Education: academics'

experiences of using ICT's for teaching and learning. *ASLIB Proceedings* 57 (2):

168-80. Available from: Emerald < www.emeraldinsight.com > [Accessed: 27 March

2011].

Finlayson, A. J. 2010. *Patterns of use of web-based library e-resources among students on the Howard College Campus of the University of KwaZulu-Natal*.

Available from: < <http://hdl.handle.net/10413/2680> > [Accessed: 16 August 2011].

Fishbein & Ajzen. 1975. *Belief, attitude, intentions, and behavior: an introduction to theory and research*. Boston: Addison-Wesley.

Foertsch, J. 1995. The impact of electronic networks on scholarly communication:

avenues for research. *Discourse Processes*, 19(2): 301-328.

Garvey, W. 1979. *Communication: The essence of Science*. Oxford: Pergamon.

George, C. A., Bright, A., Hurlbert, T., Linke, E.C., St Clair, G. and Stein, J. 2006. Scholarly use of information: graduate students' information seeking behaviour. *Information Research*, 11(4) n.p. Available from: < <http://informationr.net/ir/11-4/paper272.html> > [Accessed: 12 April 2011].

Glasow, P.A. 2005. Fundamentals of survey research methodology. Virginia, USA: Mitre.

Greenfield, G. & Rohde, F. 2009. Technology acceptance: not all organisations or workers may be the same. *International Journal of Accounting Information Systems*, 10(4): 263-272. Available from: ScienceDirect < www.sciencedirect.com > [Accessed: 29 March 2011].

Hammond, C. 1994. Nontraditional students and the library: options, preference and behaviours. *College and Research Libraries*, 55(4): 323-341.

Hassania. 2006. Locating digital divides at home, work, and everywhere else. *Poetics*, 34(4-5): 250-272. Available from: ScienceDirect < www.sciencedirect.com > [Accessed: 24 July 2011].

Herman, E. 2001. Endusers in academia: meeting the information needs of university researchers in an electronic age: Part 2 Innovative information-accessing opportunities and the researcher: user acceptance of IT-based information resources in academia. *ASLIB Proceedings*, 53(10): 431-457. Available from: Emerald < <http://dx.doi.org/10.1108/EUM0000000007072> > [Accessed: 26 June 2011].

Hinson, R. 2005. Internet adoption among Ghana's SME non traditional exporters: expectations, realities and barriers to use. *Africa Insight*, 35 (1) : 20-27. Available

from: Sabinet < <http://hdl.handle.net/10520/EJC17418> > [Accessed: 21 August 2011].

Hinson, R. 2006. The internet for academics: towards a holistic adoption model. *Online Information Review* 30(5): 542-554. Available from: Emerald <http://dx.doi.org/10.1108/14684520610706415> [Accessed: 21 August 2011].

Hofstee, E. 2006. *Constructing a good dissertation: a practical guide to finishing a Master's, MBA or PhD on schedule*. Sandton, SA: EPE.

Hong, W., Thong, J.Y.L., Wong, W. & Tam, K. 2002. Determinants of user acceptance of digital libraries: an empirical examination of individual differences and system characteristics. *Journal of Management Information Systems*, 18(3): 97-124.

Hundie, K. 2002. Academic and scholarly discussion lists. *Campus-Wide Information Systems*, 18(4): 156-159. Available from: Emerald < <http://dx.doi.org/10.1108/10650740210438856> > [Accessed: 22 May 2011].

Institute for the Future. 2002. E-journal user study: report of first survey. California, USA: Institute for the Future. Available from: < <http://ejust.stanford.edu/findings/survey1.pdf> > [Accessed: 12 August 2011].

Institute for the Future. 2002. Final synthesis report of the e-Journal user study. California, USA: Institute for the Future, SR786. Available from: < <http://ejust.stanford.edu/SR-786.ejustfinal.pdf> > [Accessed: 12 August 2011].

International Federation of Library Associations and Institutions. (2012). Manifesto for digital libraries. The Hague: International Federation of Library and Institutions.

Available from: <[www.ifla.org/publications/iflaunesco-manifesto-for -digital-libraries](http://www.ifla.org/publications/iflaunesco-manifesto-for-digital-libraries) >
[Accessed: 15 July 2012].

Jeong, H. 2011. An investigation of user perceptions and behavioural intentions towards the e-library. *Library Collections, Acquisitions, and Technical Services*, 35: 45-60. Available from: ScienceDirect < <http://dx.doi.org/10.1016/j.lcats.2011.03.018> > [Accessed: 13 April 2012].

Kalusopa, T. 2011. Developing an e-records readiness framework for labour organisations in Botswana. Unpublished Doctoral thesis, University of South Africa, Johannesburg, South Africa. Available from: <
<http://uir.unisa.ac.za/handle/10500/5690>> [Accessed: 1 April 2013]

Kanat, I.E. 2009. E-government adoption model based on theory of planned behaviour: empirical investigation. Unpublished Master's thesis, Middle East Technical University, Ankara, Turkey. Available from: <
http://www.ii.metu.edu.tr/sites/default/files/i_emrah_kanat_msc_thesis.pdf >
[Accessed: 20 April 2012].

Kim, Y. 2010. Gender role and the use of the university website resources: a social cognitive theory perspective. *Journal of Information Science*, Vol. 36(5): 603-617. Available from: Sage < <http://jis.sagepub.com/content/36/5/603> > [Accessed: 13 August 2011].

King, D. W., Tenopir, C., Montgomery, C. H., Aerni, S.E. 2003. Patterns of journal use by faculty at three diverse universities. *D-Lib Magazine Vol 9(10)* . Available from: < <http://www.dlib.org/dlib/october03/king/10king.html> > [Accessed: 23 August 2011].

Kumar, R. 2005. *Research Methodology*. London: Sage Publications.

Law, S., Harper C. & Marcus R. 2003. *Research for development*. London: Sage Publications.

Lederer, A.L., Maupin, D.J., Sena, M.P. & Zhuang, Y. 2000. The technology acceptance model and the world wide web. *Decision Support Systems* 29 : 269-282. Available from: ScienceDirect < <http://www.sciencedirect.com> > [Accessed: 15 April 2011].

Leedy, P.D. & Ormond, J.E. 2010. *Practical research:planning and design*. New Jersey: Pearson Education.

Legris, P., Ingham, J. & Collette, P. 2003. Why do people use information technology? A critical review of the technology acceptance model. *Information & Management*, 40(3): 191-204. Available from: <<http://www.sciencedirect.com> > [Accessed: 16 April 2011].

Lippincott, J. 2005. Net Generation students and libraries. *Educause Review*. 7: 56-66. Available from: < <http://net.educause.edu/ir/library/pdf/erm0523.pdf> > [Accessed: 15 March 2012].

Liu, Z. & Luo, L. 2011. A comparative study of digital library use: factors, perceived influences, and satisfaction. *The Journal of Academic Librarianship*, 37(3): 230-236. Available from: ScienceDirect < <http://www.sciencedirect.com> > [Accessed: 17 June 2012].

MacCall, S.L., Cleveland, A.D. & Gibson, I.E. 1999. Outline and preliminary evaluation of Classical Digital Library Model. *ASIS'99: Proceedings of the 62nd Annual Meeting*. 33-46. Available from:

http://www.bama.ua.edu/smaccall/papers/assist_proc/1999/cdlm.pdf [Accessed: 23 August 2011].

Majid, S. & Abazova, A.F. 1999. Computer literacy and use of electronic information sources by academics: A case study of International Islamic University Malaysia. *Asian Libraries* 8(4): 100-111. Available from: Emerald < <http://dx.doi.org/10.1108/10176749910275867> > [Accessed: 23 June 2011].

Marcum, D. (2003). Requirements for the future digital library. *The Journal of Academic Librarianship*, 29(5): 276-279. Available from: ScienceDirect < <http://www.sciencedirect.com> > [Accessed: 12 June 2011].

Maree, K. 2007. *First steps in research*. Pretoria: Van Schaik.

Manda, P.A. 2005. Electronic resource usage in academic and research institutions in Tanzania. *Information Development*, 21(4): 269-282. Available from: Sage < <http://idv.sagepub.com> > [Accessed: 25 May 2011].

McIntyre, L.J. 1999. *The practical sceptic: core concepts in sociology*. Mountain View, CA: Mayfield Publishing.

McKnight, C., Yu, L., Harker, S. & Phillips, K. 2000. Librarians in the delivery of electronic journals: roles revisited. *Journal of Librarianship and Information Science* 32(3): 117-134. Available from: Sage < <http://lis.sagepub.com/content/32/3/117> > [Accessed: 13 May 2011].

McMillan, J.H. & Schumacher, S. 2007. *Research in education: a conceptual introduction*. New York: Longman.

Mgobozi, M.N. & Ocholla, D.N. 2002. The use of electronic journals for the dissemination of scholarly information by the University of Natal and the University of Zululand. *South African Journal of Libraries and Information Science*, 68(2): 81-93.

Moore, G.C. & Benbasat, I. 1991. Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2: 192-222. Available from: < <http://isr.journal.informs.org/content/2/3/192.full.pdf> > [Accessed: 9 May 2011].

Moore, N. 1983. *How to do research*. London: Library Association Publishing.

Muijs, D. 2004. *Doing quantitative research in education with SPSS*. London: Sage Publications.

Ndinoshiho, J.M. 2010. The use of electronic information services by undergraduate nursing students at the University of Namibia's Northern Campus: a descriptive study. *Information Development*, 26(1): 57-65. Available from: < <http://idv.sagepub.com> > [Accessed: 23 September 2012].

Nelson Mandela Metropolitan University (NMMU). 2009. Annual report to the minister of higher education 2009. Port Elizabeth, South Africa: Nelson Mandela Metropolitan University. Available from: < www.nmmu.ac.za >. [Accessed: 2 February 2011].

Nelson Mandela Metropolitan University. 2012. History. *Nelson Mandela Metropolitan University*. Available from: <www.nmmu.ac.za/About-NMMU/Management---Identity/History> [Accessed: 10 October 2012].

Nicholas, D., Williams, P., Rowlands, I. & Jamali, H. R. 2010. Researchers' e-journal use and information seeking behaviour. *Journal Of Information Science*. 36(4) : 494-

516. Available from: Sage < <http://jis.sagepub.com/content/36/4/494> > [Accessed: September 2011].

Nkomo, N. 2009. *A comparative analysis of the web information seeking behaviour of students and staff at the University of Zululand and the Durban University of Technology*. Unpublished master's dissertation, University of Zululand, KwaDlangezwa, South Africa. Available from: < <http://www.lis.uzulu.ac.za/etds/nnkomo/nnkomo.pdf> > [Accessed: 5 March 2011].

Nycyk, M. 2010. Hindrances as learning tools when seeking information: sensemaking methodology and system improvement. *Library and Information Science Research Electronic Journal*, 20(2) : 1-8. Available from: < <http://espace.library.uq.edu.au/view/UQ:217402> > [Accessed: 18 May 2011].

Online Dictionary for Library and Information Science (ODLIS). (n.d.). Online dictionary for library and information science. Available from: < http://www.abc-clio.com/ODLIS/odlis_i.aspx#iil > [Accessed: 16 May 2012].

Okello-Obura, C. 2010. Assessment of the problems LIS postgraduate students face in accessing e-resources in Makerere university, Uganda. *Collection Building* , 29(3): 98-105. Available from: Emerald < <http://dx.doi.org/10.1108/01604951011060385> > [Accessed: 14 June 2011].

Okello-Obura, C. & Ikoja-Odongo J.R. 2010. Electronic information seeking among LIS postgraduate students at Makerere University, Uganda. *Library Philosophy and Practice* . Available from: < <http://digitalcommons.unl.edu/libphilprac/499> > [Accessed: 14 June 2011].

Okiki, O.C. & Asiru, S.M. 2011. Use of electronic information sources by postgraduate students in Nigeria:influencing factors. *Library Philosophy and Practice*, 499. Available at : < <http://digitalcommons.unl.edu/libphilprac/500> > [Accessed: 14 June 2011].

Oliviera, T. & Martins, M.F. 2011. Literature review of information technology adoption models at firm level. *The Electronic Journal of Information Systems Evaluation*, 14(1): 110-121. Available from: < <http://www.ejise.com/issue/download.html?idArticle=705> > [Accessed: 4 June 2012].

Ondari-Okemwa, E.O. 2007. Scholarly publishing in sub-Saharan Africa in the twenty-first century: challenges and opportunities. *First Monday*, 12(10): 1-12. Available from: < <http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1966/1842>> [Accessed: 28 November 2012].

Ozoemelem, O.A. 2009. Use of electronic resources by postgraduate students of the department of Library and Information Science of Delta State University, Abraka, Nigeria. *Library Philosophy and Practice*, 1-23. Available from: <<http://www.webpages.uidaho.edu/~mbolin/obuh-alex.pdf> > [Accessed: 30 May 2011].

Park, N., Roman, R., Lee, S. & Chung, J.E. 2009. User acceptance of a digital library system in developing countries: an application of the technology acceptance model. *International Journal of Information Management*, 29: 196-209. Available from: ScienceDirect < <http://www.sciencedirect.com> > [Accessed: 18 May 2011].

Pullinger, D. 1999. Academics and the new information environment: the impact of local factors on use of electronic journals. *Journal of Information Science*, 25(2): 164-172. Available from: Sage < <http://jis.sagepub.com/content/25/2/164> > [Accessed: 14 April 2011].

Queensland University of Technology. 2013. Writing a literature review. *Queensland University of Technology*. Available from: < <http://www.citewrite.qut.edu.au/write/litreview.jsp> > [Accessed: 1 April, 2013].

Ramlogan R. & Tedd L.A. 2006. Use and non use of electronic information sources by undergraduates at the University of the West Indies. *Online Information Review*, 30(1): 24-42. Available from: Emerald < <http://dx.doi.org/10.1108/14684520610650282> > [Accessed: 9 May 2011].

Rhodes University. 2011. Introducing Rhodes. *Rhodes University*. Available from : < <http://www.ru.ac.za/rhodes/introducingrhodes/historyofrhodes> > [Accessed: 16 February, 2011]

Rogers, E.M. 1995. Diffusion of innovations. 4th ed. New York: Free Press.

Rosenberg, D. 2005. *Towards the digital library: findings of an investigation to establish the current status of university libraries in Africa*. Oxford: International Network for Availability of Scientific Publications (INASP). Available from: < <http://www.inasp.info/uploaded/documents/digital-libr-final-format-web.pdf> >. Accessed: 6 February 2011].

Rowlands, I., Nicholas, D., Williams, P., Huntington, P., Fieldhouse, M., Gunter, B., Withey, R., Jamali, H.R., Dobrowski, T. & Tenopir, C. (2008). *The Google generation: the information behaviour of the researcher of the future*. Aslib

Proceedings, 60(4): 296-310. Available from: Emerald <

<http://dx.doi.org/10.1108/00012530810887953> > [Accessed: 23 June 2012].

Rowley, J., Banwell, L., Childs, S., Gannon-Leary, P., Urquhart C & Armstrong, C.

(n.d.). *Encouraging and facilitating the use of EIS*. Available from: <

https://www.researchgate.net/publication/36719670_Encouraging_and_Facilitating_the_use_of_EIS > [Accessed: 26 April 2012].

SANLiC. 2011. About Us. *South African National Library and information Consortium*.

Available from: < http://www.sanlic.org.za/component/docman/doc_download/1034-history-of-sanlic?Itemid= > [Accessed: 23 May 2011].

Sanville, T.J. 2001. A method out of the madness: OhioLINK's collaborative

response to the serials crisis. *The Serials Librarian*, 40(1-2): 129-155. Available from:

Taylor and Francis < http://www.tandfonline.com/doi/abs/10.1300/J123v40n01_12 >

Seale, C. 2004. *Researching society and culture*. London: Sage Publications.

Selwyn, N. 2008. An investigation of differences in undergraduates' academic use of

the Internet. *Active Learning in Higher Education*, 9(1): 23-47. Available from: Sage <

<http://alh.sagepub.com/content/9/1/11> > [Accessed: 3 March 2011].

Sheeja, N.K. 2010. Undergraduate students' perceptions of digital library: a case

study. *The International Information and Library Review*, 42(3): 149-153. Available

from: ScienceDirect < <http://www.sciencedirect.com> > [Accessed: 25 August 2011].

Sheffield Hallam University. n.d. Companion for undergraduate dissertations.

Sheffield Hallam University. [n.p.]. Available from:

<http://www.socscidiss.bham.ac.uk/s8.html> > [Accessed: 6 October 2012]

Siatri, R. 1999. The evolution of user studies. *Libri*, 49(3): 132-141. Available from: < <http://www.librijournal.org/pdf/1999-3pp132-141.pdf> > [Accessed: 12 March 2011].

Silva, P.M. & Dias, G.A. 2007. Theories about technology acceptance: why users accept or reject the information technology. *Brazilian Journal of Information Science*, 1(2): 69-86. Available from: <<http://www.bjis.unesp.br/>> [Accessed: 13 September 2012].

Siragusa, L. & Dixon, K.C. 2009. Theory of planned behaviour: Higher education students: attitudes towards ICT-based learning interactions. In *Same places, different spaces*. Proceedings of ascilite 2009. Auckland, 969-980. Available from: < <http://www.ascilite.org.au/conferences/auckland09/procs/siragusa.pdf>> Accessed: [12 September 2012].

Songhui, Z. 2008. The influence of traditional reading habits on the construction of digital libraries in developing countries. *The Electronic Library*, 26(4): 520-529. Available from: Emerald < <http://dx.doi.org/10.1108/02640470810893765> > [Accessed: 4 March 2011].

South East Academic Libraries System (SEALS). 2012. *South East Academic Libraries System*. Available from: < www.seals.ac.za > [Accessed: 13 February 2011].

Stelmaszewska, H., Wong B.L.W. & Sanderson, P. M. 2010. Methods for analysing information seeking behaviour in electronic resource discovery systems. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 27 September-1 October 2010, San Francisco ,USA*. Santa Monica, CA:Human Factors

Ergonomics Society,54,807-811. Available from: <
<http://espace.library.uq.edu.au/view/UQ:220188> > [Accessed: 23 June 2011].

Tahir, M; Mahmood, K & Shafique, F. 2010. Use of electronic information resources and facilities by humanities scholars. *The Electronic Library*, 28(1): 122-136.
Available from: Emerald < <http://dx.doi.org/10.1108/02640471011023423> >
[Accessed: 23 March 2011].

Talja, S. & Maula, H. 2003. Reasons for use and non use of electronic journals and databases: a domain analytic study in four scholarly disciplines. *Journal of Documentation*, 59(6):673-91. Available from: Emerald <
<http://dx.doi.org/10.1108/00220410310506312> > [Accessed: 25 March 2011].

Tao, D. 2008. Using theory of reasoned action (TRA) in understanding selection and use of information resources: an information resource selection and use model.
Unpublished doctoral dissertation, University of Columbia-Missouri, Columbia, USA.
Available from: <
<https://mospace.umsystem.edu/xmlui/bitstream/handle/10355/6736/research.pdf?sequence=3> > [Accessed: 29 March 2011].

Tenopir, C. 2003. *Use and users of electronic library resources: an overview and analysis of recent research studies*. Washington, DC: Council on Library and Information Resources. Available from: <
www.clir.org/pubs/reports/pub120/pub120.pdf > [Accessed: 23 February 2011].

Tenopir, C., Hitchcock, B. & Pillow, A. 2003. *Use and users of electronic library resources:an overview and analysis of recent research studies*. Washington, D.C.:

Council on Library and Information Resources. Available from: < www.clir.org/pubs/reports/pub120/pub120.pdf > [Accessed: 23 February 2011].

The Health Communications Unit. 1999. *Conducting survey research*. Toronto: University of Toronto. Available from: < http://www.thcu.ca/infoandresources/resource_display.cfm?translateto=English&resourceID=788&emailID=1586 > [Accessed: 23 August 2011].

Thong, J.Y.L. , Hong, W. & Tam, K. 2002. Understanding user acceptance of digital libraries: what are the roles of interface characteristics, organisational context and individual differences? *International Journal of Human-Computer Studies*, 57(3): 215-242. Available from: < <http://www.idealibrary.com.on> > [Accessed 23 March 2011].

Torma, S. & Vakkari, B. 2004. Discipline availability of electronic resources and the use of Finnish National Electronic Library-FinELib. *Information Research*, 10(1). Available from: < <http://informationr.net/ir/10-1/paper204.html> > [Accessed 21 March 2011].

Trochim, W.M.K. 2006. Research methods knowledge base. *Webcenter for Social Research Methods*. Available from: < <http://www.socialresearchmethods.net/kb/samplenon.php> > [Accessed 4 October 2012].

University of Fort Hare. 2009. Strategic Plan 2009-2016: towards our centenary. *University of Fort Hare*. Available from: < http://www.ufh.ac.za/files/Strategic%20Plan%202009_Final_Nov%202009.pdf > [Accessed: 16 February 2011].

Varghese, R.R. 2008. User studies in the electronic environment:review and brief analysis. *The International Information & Library Review*, 40(2); 83-93. Available from: ScienceDirect < <http://www.sciencedirect.com> > [Accessed: 12 February 2011].

Venkatesh, V. & Davis, F.D. 1996. A model of the antecedents of perceived ease of use: development and test. *Decision Science*, 27(3): 451-481. Available from: < <http://onlinelibrary.wiley.com/doi/10.1111/j.1540-5915.1996.tb00860.x> > [Accessed 23 July 2011].

Venkatesh, V., Morris, M.G., Davis, G.B. & Davis, F.D. 2003. User acceptance of information technology: toward a unified view. *MIS Quarterly*, 27(3): 425-478. Available from: < <http://www.jstor.org/stable/30036540> > [Accessed: 28 June 2011].

Whitmere, E. 2002. Disciplinary differences and the undergraduates' information-seeking behaviour. *Journal Of The American Society For Information Science And Technology*, 53(8): 631-638. Available from: < <http://onlinelibrary.wiley.com> > [Accessed: 7 March 2011].

Wilson, T. 2006. 60 years of the best in information research on user studies and information needs. *Journal of Documentation* 62(6) : 658-670. Available from: < <http://www.asiaa.sinica.edu.tw/~ccchiang/GILIS/LIS/p658-Wilson.pdf> > [Accessed: 2 March 2011].

Wilson, T. 2000. Human Information Behaviour. *Informing Science*, 3(2). Available from: < <http://informationr.net/tdw/publ/papers/2000HIB.pdf> > [Accessed: 2 March 2011].

Xie, H.I. & Wolfram, D. 2002. State digital library inability:contributing organisational factors. *Journal of the American Society for Information Science and Technology*,

53(13): 1085-1097. Available from: < <http://onlinelibrary.wiley.com> >[Accessed: 5 May 2011].

Zimmerman, D. & Paschal, D.B. 2009. An exploratory usability evaluation of Colorado State University Libraries' digital collections and the Western Waters digital library websites. *Journal of Academic Librarianship* 35(3): 227-240. Available from: ScienceDirect < <http://www.sciencedirect.com> > [Accessed: 8 July 2011].

Appendix A: University of Fort Hare subscription e-databases and e-journals

1.	Academic Search Complete
2.	AccessScience
3.	Aluka Digital Library
4.	American Chemical Society Journals (1996-present)
5.	American Theological Library Association CDRI
6.	ArchUP
7.	Business Source Complete
8.	CABI
9.	Cement and Concrete
10.	Chadwyck-Healey Literature Collections
11.	Cloverdex
12.	Communication & Mass Media Complete
13.	Cornell University
14.	CRC AGRICULTUREnetBASE
15.	Current and Completed Research
16.	Current Contents Agriculture, Biology & Environmental Sciences
17.	Current Contents Clinical Medicine
18.	Current Contents Life Sciences
19.	Current Contents Physical, Chemical & Earth Sciences
20.	Current Contents Social and Behavioral Sciences
21.	Daily Law Reports
22.	Directory of Open Access Journals
23.	Econlit
24.	Elsevier ScienceDirect eBooks
25.	Emerald
26.	ERIC
27.	Fiction
28.	Forestry
29.	GeoScienceWorld
30.	Global books in print
31.	Government Gazettes;"Sabinet"
32.	GreenFILE
33.	Health Source - Consumer Edition
34.	Health Source: Nursing/Academic Edition
35.	HeinOnline Legal Periodicals
36.	HighWire Free Access Journals
37.	Highwire Journals Free for Developing Nations
38.	Index to South African Periodicals
39.	ISI Web of Knowledge
40.	JSTOR

41.	Kovsidex
42.	Lexis-Nexis: Academic Universe Full Text
43.	MarketLine
44.	MasterFILE Premier
45.	MEDLINE Ebsco
46.	Newspaper Source
47.	Oxford English Dictionary
48.	Oxford Reference Online
49.	Oxford University Press Journals Online
50.	Parliamentary Bills
51.	Project Muse
52.	ProQuest Agriculture Journals
53.	Quantec Easydata
54.	Regional Business News
55.	Royal Society of Chemistry Open Access Journals
56.	SA ePublications Full Collection
57.	SA Media
58.	Safari Books Online
59.	SAGE Journals Online
60.	SAGE Publications - SAGE Premier Package 2011
61.	Science
62.	ScienceDirect Freedom Collection
63.	SocINDEX
64.	SPORTDiscus
65.	SpringerLink
66.	Taylor & Francis Scientific
67.	Taylor and Francis Social Science and Humanities Library
68.	Thieme Teaching Assistant
69.	Union Catalogue for Thesis and Dissertations (UCTD)
70.	Wiley Online Library
71.	World Bank E-Library

**Appendix B: Nelson Mandela Metropolitan University subscription e-databases
and e-journals**

1.	A to Z
2.	Academic One File
3.	Academic Search Premier
4.	Access Engineering
5.	Access Science
6.	Avery Index to Architectural Periodicals
7.	Business and Management Practices
8.	Business Source Premier
9.	CINAHL
10.	Communications and Mass Media Complete
11.	Emerald
12.	ERIC
13.	Greenfile
14.	Health and Wellness Resource Centre
15.	Health Source- Consumer Edition
16.	Health Source: Nursing/Academic Edition
17.	Humanities International Index
18.	IOP
19.	International Pharmaceutical Abstracts
20.	ISI
21.	JSTOR
22.	Library, Information Science and Technology Abstracts
23.	Literature Resource Centre
24.	Magnet
25.	MasterFILE Premier
26.	Mathscinet
27.	MEDLINE
28.	Music Index
29.	Newspaper Source
30.	NEXUS
31.	OCLC First Search
32.	PsycINFO
33.	Regional Business News
34.	REQUEST
35.	RILM Abstracts of Music Literature
36.	SAGE
37.	SA E-Publications
38.	Science Direct
39.	SPORTDiscus with Full Text
40.	Teacher Reference Centre
41.	Sabinet Online
42.	Book Data
43.	Cement and Concrete
44.	Centre for Rural and Legal Studies

45.	Cloverdex
46.	Current and Completed Research
47.	Daily Law Reports
48.	Fiction Database
49.	Forestry
50.	Government Gazettes
51.	ISAP
52.	Kovsidex
53.	Mintek
54.	Navtech
55.	NDLTD
56.	Netlaw
57.	Parliamentary Bills
58.	Provincial Gazettes
59.	Provincial Legislation
60.	SA Catalogue
61.	SA Media
62.	SANB
63.	SA Statutes
64.	SAGEOLIT
65.	Subsidie
66.	UCTD Theses and Dissertations
67.	Other UCTD Ntec

Appendix C: Rhodes University subscription e-databases and e-journals

Rhodes e-Resources 2011	
1.	Academic Search Premier
2.	AccessPharmacy
3.	AccessScience
4.	Accountancy Magazine
5.	ACM Digital Library
6.	Advancing the Science of Limnology and Oceanography
7.	African Journal Archive
8.	African Journals OnLine
9.	African Writers Series
10.	Africa-Wide Information
11.	Agricultural and Biological Sciences
12.	AIP Journals
13.	Aluka digital library
14.	American Association for the Advancement of Science (AAAS)
15.	American Chemical Society Journals
16.	American Chemical Society Legacy Archives
17.	American Chemical Society Web Editions
18.	American Fisheries Society
19.	American Marketing Association
20.	American Society for Pharmacology and Experimental Therapeutics
21.	American Statistical Association
22.	Annual Reviews
23.	AnthroSource
24.	ArchUP
25.	Ariadne
26.	ArticleFirst
27.	arXiv.org
28.	Atypon Link Journals
29.	BBC College of Journalism
30.	Begell House Publications
31.	Biochemistry, Genetics and Molecular Biology Collection
32.	BioMed Central
33.	BioOne
34.	BMJ Publishing Group
35.	Botanical Society of America
36.	British Pharmacopoeia
37.	Business Monitor
38.	Business Monitor International
39.	Business Source Premier
40.	Business, Management & Accounting
41.	Caliber
42.	Cambridge Books Online
43.	Cambridge journals online
44.	Cambridge journals online - Open Access

45.	CAMIO
46.	CellPress Online
47.	Cement and Concrete
48.	CERN Document Server
49.	Choice reviews online
50.	Citeseer Scientific Literature Digital Library and Search Engine
51.	CLOCKSS
52.	Cloverdex
53.	Communication & Mass Media Complete
54.	Credo Reference
55.	CRLS
56.	Current and Completed Research
57.	Daily Law Reports
58.	Datastream Analyzer
59.	Dawson eBooks
60.	De Gruyter Reference Global journals
61.	Directory of Open Access Journals
62.	Directory of Open Access Journals
63.	Duke University Press
64.	Duke University Press
65.	Earth & Planetary Sciences
66.	EBSCOhost : search multiple databases
67.	Ecological Society of America
68.	Economics, Econometrics and Finance
69.	Emerald Insight Fulltext Plus Journals
70.	Emerald Management Plus
71.	Environmental Sciences
72.	ERIC
73.	ERIC
74.	Fiction
75.	Filmakers Library Online
76.	Fish, Fisheries & Aquatic Biodiversity Worldwide
77.	Forestry
78.	Future Science
79.	Gale's Literary Index
80.	Global books in print
81.	Google Scholar
82.	Government Gazettes;"Sabinet"
83.	GPOMonthly Catalog
84.	GreenFILE
85.	Harvard Educational Review
86.	Harvey Whitney Books Co.
87.	Health source: Consumer Edition
88.	Health Source: Nursing/Academic Edition
89.	HEDBIB International Bibliographic Database on Higher Education
90.	HeinOnline-Retrospective Legal Periodicals
91.	HighWire Free Access Journals
92.	Highwire Journals Free for Developing Nations

93.	HighWire Press
94.	Index to South African Periodicals
95.	Informa Healthcare Journals
96.	Ingenta Connect
97.	Ingenta Connect Open Access Content
98.	Inorganic Chemistry BackFile
99.	Institute of Physics Journals
100.	Institute of Physics Open Access Journals
101.	International Pharmaceutical Abstracts
102.	Inter-Research
103.	ISI Web of Science
104.	JAMA & Archives Journals
105.	JSTOR
106.	Juta Law
107.	Jutastat
108.	Kovsidex
109.	LexisNexis
110.	Library, Information Science & Technology Abstracts with Full Text
111.	Liebert Online Journals
112.	Literature Resource Center
113.	Maney Publishing
114.	Martindale: The Complete Drug Reference
115.	MasterFILE Premier
116.	MathSciNet
117.	Mcgregor BFA: Analyser
118.	MEDLINE
119.	MEDLINE (Sabinet)
120.	Metapress - Metapress (All)
121.	Micromedex
122.	Mineralogical Association of Canada
123.	Mintek
124.	MIT Press Journals
125.	MLA Directory of Periodicals
126.	MyiLibrary
127.	National Academies Press
128.	Nature Open Access Content
129.	Nature Publishing Group (NPG)
130.	Navtech
131.	Naxos Music Library
132.	Netlaw: SA legislation
133.	New left review
134.	New York Times Online Free Content
135.	Newspaper Source
136.	NRC RESEARCH PRESS
137.	OAIster
138.	OCLC FirstSearch
139.	OpenJournals
140.	Oxford Dictionaries Online

141.	Oxford Dictionary of National Biography
142.	Oxford English Dictionary
143.	Oxford Journals Current Subscriptions
144.	Oxford Journals Humanities Archive
145.	Oxford Journals Law Archive
146.	Oxford Journals Medicine Archive
147.	Oxford Journals Science Archive
148.	Oxford Journals Social Science Archive
149.	Oxford Music Online
150.	Oxford Reference Online
151.	Oxford Scholarship Online - Biology
152.	Oxford Scholarship Online - Business and Management E-Books
153.	Oxford Scholarship Online - Classics
154.	Oxford Scholarship Online - Economics & Finance
155.	Oxford Scholarship Online - History
156.	Oxford Scholarship Online - Law
157.	Oxford Scholarship Online - Linguistics
158.	Oxford Scholarship Online - Literature
159.	Oxford Scholarship Online - Mathematics
160.	Oxford Scholarship Online - Music
161.	Oxford Scholarship Online - Philosophy
162.	Oxford Scholarship Online - Physics
163.	Oxford Scholarship Online - Political Science
164.	Oxford Scholarship Online - Psychology
165.	Oxford Scholarship Online - Religion
166.	Oxford University Press Journals Online
167.	PapersFirst
168.	Parliamentary Bills
169.	Philosopher's Index
170.	Philosophy Documentation Centre
171.	Physical Analytical Chemistry
172.	PlanUP
173.	Proceedings
174.	Project Euclid
175.	Project Muse
176.	Provincial Gazettes
177.	PsycARTICLES
178.	Psychology
179.	PsycINFO
180.	PubMed
181.	RefWorks
182.	Regional business news
183.	Rhodes eResearch Repository
184.	RILM Abstracts of Music Literature
185.	Royal Society of Chemistry Archive (1841-2004)
186.	Royal Society of Chemistry Journals
187.	SA ePublications Full Collection
188.	SA ePublications Open Access

189.	SA ePublications Restricted Access
190.	SA Media
191.	SA Statutes
192.	Sabinet Databases
193.	Sabinet Legal Products
194.	SACat
195.	SAGE Journals Online - SAGE Premier Package 2011
196.	SAGEOLIT
197.	SciELO
198.	Science
199.	ScienceDirect
200.	ScienceDirect Freedom Collection
201.	ScienceDirect Reference Works
202.	Scientific American
203.	SciFinder Scholar
204.	Scopus
205.	Searchable Ornithological Research Archive
206.	SIAM Journals Online
207.	Social Sciences
208.	SocINDEX with Full Text
209.	Soil Science Society of America
210.	Springer eBook Collection
211.	Springer LINK archive and current content
212.	SpringerLink
213.	SpringerLink Open Access
214.	Subsidie
215.	SwetsWise
216.	Taylor & Francis Scientific
217.	Taylor and Francis Online Journals
218.	Taylor and Francis Social Science and Humanities Library
219.	Teachers College, Columbia University
220.	The Economist Online
221.	The SAO/NASA Astrophysics Data System
222.	Thieme eJournals
223.	Union Catalogue for Thesis and Dissertations (UCTD)
224.	University of Chicago Journals
225.	University of Illinois Press Open Access Journals
226.	Waters & Oceans Worldwide
227.	WESTLAW database directory [electronic resource].
228.	Wiley Online Library Full Collection
229.	World Newspaper Archive: Africa 1800 - 1922
230.	World Scientific Journals
231.	WorldAlmanac
232.	WorldCat
233.	WorldCatDissertations

Appendix D: Ethics clearance from the University of Fort Hare

OFFICE OF THE DEPUTY VICE-CHANCELLOR:
ACADEMIC AFFAIRS AND RESEARCH
Private Bag X1314, Alice 5700
Tel: 04060 22403
Fax: 0866282944
tsnyders@ufh.ac.za



UFH/UREC, 6 - REC-270710-028

Application for clearance from the University of Fort Hare's Ethics Committee

Project title: *The use of Internet-based information sources by postgraduate students: A survey of three selected universities in the Eastern Cape, South Africa*

Chief Researcher: Sarlomie Mbasera

Supervisor/Co-supervisor: Prof E. Ondari-Okemwa

Date of application: 7 September 2011

Having consulted the Dean of Research, I hereby grant permission to conduct the research.

A handwritten signature in black ink, appearing to read 'J R Midgley', is located below the text of the ethics approval.

Professor J R Midgley
Deputy Vice-Chancellor
Chairperson of the interim Ethics Committee

1 November 2011

Appendix E: Ethics clearance from Nelson Mandela Metropolitan University

Chairperson of the Research Ethics Committee (Human)
NMMU

Tel . +27 (0)41 504-2538 Fax. +27 (0)41 504-2778

Ref: [H11-ADM-EXT-003/Approval]

Contact person: Mrs U Spies

24 November 2011

Prof EM Ondari-Okemwa
c/o Library & Information Science Department
University of Fort Hare
P/bag x1314
Alice
South Africa

Dear Prof Ondari-Okemwa

THE USE OF INTERNET-BASED INFORMATION SOURCES BY POSTGRADUATE STUDENTS: A SURVEY OF THREE SELECTED UNIVERSITIES IN THE EASTERN CAPE, SOUTH AFRICA

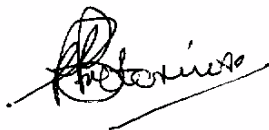
Your above-entitled application for ethics approval served at the Research Ethics Committee (Human).

We take pleasure in informing you that the application was approved by the Committee.

The ethics clearance reference number is **H11-ADM-EXT-003**, and is valid for three years. Please inform the REC-H, via your faculty representative, if any changes (particularly in the methodology) occur during this time. An annual affirmation to the effect that the protocols in use are still those for which approval was granted, will be required from you. You will be reminded timeously of this responsibility, and will receive the necessary documentation well in advance of any deadline.

We wish you well with the project. Please inform your co-investigators of the outcome, and convey our best wishes.

Yours sincerely



Dr B Pretorius
Chairperson: Research Ethics Committee (Human)

cc: Department of Research Capacity Development

Appendix F: Research clearance from Rhodes University

Subject	RE: Request for permission to conduct research
From	Stephen Fourie
To	Mbasera, Sarlomie Farisai
Sent	Monday, May 23, 2011 11:14 AM

Dear Ms Mbasera

Permission is granted for you to do your research at Rhodes as requested except for the lists you have asked for. We do not provide personal information to third parties for obvious reasons. As part of your research proposal you will have to suggest another way of identifying the 200 postgrad students you wish to contact.

Regards
Steve Fourie

-----Original Message-----

From: Mbasera, Sarlomie Farisai [<mailto:201106762@ufh.ac.za>]
Sent: 16 May 2011 09:19 AM
To: registrar@ru.ac.za
Cc: Ondari-Okemwa, Ezra
Subject: Request for permission to conduct research

Dear Sir,

My name is Sarlomie Mbasera, I am a Masters student in the Department of Library and Information Science at the University of Fort Hare and I am currently undertaking research for my Dissertation on "The use of Internet-based Information sources by postgraduate students: a survey of three universities in the Eastern Cape, South Africa". I want to include Rhodes University as part of my research and I am kindly asking for permission to conduct research at your University.

My data collection plan includes the sampling of 200 postgraduate students from the 3 universities chosen for this study. The 200 participants will be given a self-administered questionnaire that I am intending to email out to the selected participants. I am therefore kindly asking to be given asking for permission to gain access to:

. Your list of all currently registered post-graduate students, listed by faculty and then department

. May you please also give me access to their university email addresses, as I intend to send the questionnaire by e-mail.

I also hope to interview two librarians at your university, or whoever is responsible for the provision of Digital Library Services to students at your university. I will commit to treat all information supplied to me with confidentiality and will use it solely for academic purposes.

I have attached with this email, a formal letter from my Department. Should you require any further information from me, please do not hesitate to contact myself on email: 201106762

@ufh.ac.za<<mailto:201106762@ufh.ac.za>> or

mobile: 0825115952. You may also contact my supervisor Prof. Ondari-Okemwa on email: eondari@ufh.ac.za<<mailto:eondari@ufh.ac.za>>. I look forward to hearing from you soon.

Yours sincerely
Sarlomie Mbasera

Appendix G: E-resource Use Survey questionnaire



University of Fort Hare
Together in Excellence

E-Resource Use Survey and Declaration of Consent

Dear Colleague

Re: e-Resource Use Survey and Declaration of Consent

My name is Sarlomie Mbasera, a Master's student at the University of Fort Hare undertaking a research on ***“The use of Internet-based information sources by postgraduate students: a survey of three selected universities in the Eastern Cape, South Africa”***.

I hereby invite you to participate in this study by answering the questions in the attached questionnaire. I am interested in finding out more about postgraduate student views and patterns of use of e-resources and your valuable contribution would help institutions of higher learning in this region to make informed decisions on e-resource services that will better serve their users.

Please understand that you are not being forced to take part in this study and the choice whether to participate or not, is yours alone. However, I would really appreciate it if you do share your thoughts with me. If you choose not take part in answering these questions, you will not be affected in any way. I promise to observe confidentiality in a professional manner.

I will not be recording your name anywhere on the questionnaire and no one will be able to link you to the answers you give. Only I will have access to the unlinked information. The information will remain confidential and there will be no “come-backs” from the answers you give.

If possible, I would like to come back to this university once I have completed my study to inform you and your community of what the results are and discuss our findings and proposals around the research and what this means for people in this university.

May you please kindly fill in the declaration of consent below? Many thanks in anticipation of your co-operation and valuable contribution.

Yours faithfully

Sarlomie Mbasera

CONSENT

I hereby agree to participate in the current research. I understand that I am participating freely and without being forced in any way to do so. I also understand that I can stop participating at any point should I not want to continue and that this decision will not in any way affect me negatively.

I understand that this is a research project whose purpose is not necessarily to benefit me personally.

I understand that this consent form will not be linked to the questionnaire, and that my answers will remain confidential.

I understand that if at all possible, feedback will be given to my community on the results of the completed research.

.....

Signature of participant

Date:.....

E-Resource Use Survey Postgraduate Students

Section A: Internet Use and Experience

Please check the appropriate boxes:

- 1) Do you use the Internet for academic purposes? Yes No
- 2) If your answer to the above question is yes, how long have you been using the Internet?
 Less than 1year 1-5years 6-10years +10years
- 3) Where do you access the Internet from? **Please select all that apply.**
 Office (PC/Laptop) University Computer Labs
 Home/Residence (PC/Laptop) University Library

Other, please specify: _____

- 4) Which of the following e-resources do you use for your research or other academic purposes? **Please select all that apply.**

e-Resource	Frequency					
	Never Use	Use once a month	Use three or four times each month	Use once a week	Use two or three times in a week	Use everyday
Online Public Access Catalogues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online Databases (Full text journal sources like Science Direct, EBSCO, Emerald)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Search Engines (e.g. Google, Yahoo)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University Library Website	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Document Delivery & Current Awareness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discussion Lists, Newsgroups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 5) For which other purpose do you use Internet facilities? **Please select all that apply.**

- E-mail Commercial activities (e.g. banking, shopping)
- Entertainment & Social networking Job seeking
- Other, Please Specify _____

Section B: The next sets of questions are measured on Likert Scale where:

1=Strongly Disagree, 2=Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree. Please tick your response.

Computer and Internet Skills	Strongly Disagree					Strongly Agree					
1. I generally know how to use a computer for doing my work.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						
2. I have been using computers for over ten years.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						
3. I have been using the Internet for over ten years.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						
4. Overall I would rate my e-resource searching skills high.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						
Subject Disciplinary Culture	Strongly Disagree					Strongly Agree					
5. Professionals and colleagues in my field of study strongly encourage the use of e-resources for research purposes.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						
Organisational Support	Strongly Disagree					Strongly Agree					
6. My university and department strongly encourage the use of e-resources for research purposes.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						
Accessibility of e-Resources	Strongly Disagree					Strongly Agree					
7. My university makes available e-resources relevant to my research information needs.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						
8. My university has ensured that I have access to the Internet and e-resources at times convenient to me	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						
9. My university has enabled me to access the Internet and e-resources, at locations convenient to me.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						
10. I can connect to the Internet easily, while at my University.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						
11. My university provides sufficient terminals for postgraduate students to access e-resources.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						
Information Literacy Skills Training & Support	Strongly Disagree					Strongly Agree					
12. Specialised instruction on how to use e-resources is available to me	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						
13. Assistance is always available to help me solve e-resource retrieval difficulties.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						
Publicity of Internet-based Information Sources	Strongly Disagree					Strongly Agree					
14. My university keeps all postgraduate students up-to-date on the e-resources available for their needs.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						
15. I am always aware of available e-resources relevant for my research or study needs.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						
Supervisor/Lecturer Support	Strongly Disagree					Strongly Agree					
16. My supervisors/lecturers strongly encourage me to use e-resources for my research or studies.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5						

17. My supervisor recommends e-resources for me to use for my research or studies.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Perceived Usefulness	Strongly Disagree			Strongly Agree	
18. Using e-resources enables me to accomplish my research/study tasks quickly.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
19. Using e-resources improves the quality of my academic work and enhances my effectiveness.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
20. Using e-resources makes my research/study tasks easy.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
21. Using e-resources enables me to have control over my research/studies.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Strongly Disagree			Strongly Agree	
22. Usage of e-resources to support my research/studies is clear and understandable to me.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
23. When using e-resources, I find it easy to access information resources that I use to do my research work.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
24. I find it easy to learn how to use e-resources.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
25. Overall, I believe that it is easy to use e-resources to support my studies.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

Section C: Demographic Background

Please check the appropriate boxes

- Gender: Male Female
- Age range: 21-30 31-40 41-50 51+
- Level of Study: Undergraduate P/G Diploma Honours
Masters PhD Other-Please Specify _____
- Your University: Fort Hare NMMU Rhodes
- Campus, please specify: _____
- Faculty: _____
- Department: _____
- For how long have you been in the current programme? _____

Thank you for taking your time to complete this survey

Appendix H: Interview schedule for interviews with university librarians



University of Fort Hare
Together in Excellence

Ethics Research Confidentiality and Consent Form

Dear Sir/Madam

Re: e-Resource Use Interview and Declaration of Consent

My name is Sarlomie Mbasera, a Master's student at the University of Fort Hare undertaking a research on ***"The use of Internet-based information sources by postgraduate students: a survey of three selected universities in the Eastern Cape, South Africa"***.

I hereby invite you to participate in this study by answering the questions during this interview. I am interested in finding out more about organizational factors surrounding the use of e-resources by postgraduate students at your University and your valuable contribution would help institutions of higher learning in this region to make informed decisions on e-resource services that will better serve their users. Please understand that you are not being forced to take part in this study and the choice whether to participate or not is yours alone. However, I would really appreciate it if you do share your thoughts with me. If you choose not to take part in answering these questions, you will not be affected in any way. If you agree to participate, you may stop me at any time and tell me that you don't want to go on with the interview. If you do this there will also be no penalties and you will NOT be prejudiced in ANY way. Confidentiality will be observed professionally.

I will not record your name anywhere on the interview schedule and no one will be able to link you to the answers you give. Only the researchers will have access to the unlinked information. The information will remain confidential and there will be no "come-backs" from the answers you give. The interview will last around 45 minutes. I will be asking you questions and ask that you are as open and honest as possible in answering these questions. Some questions may be of a personal and/or sensitive nature. I will be asking some questions that you may not have thought about before, and which also involve thinking about the past or the future. I know that you cannot be absolutely certain about the answers to these questions but I ask that you try to think about these questions. When it comes to answering questions there are no right or wrong answers. When I ask questions about the future I am not interested in what you think the best thing would be to do, but what you think would actually happen.

If possible, I would like to come back to your university once I have completed my study to inform you and your community of what the results are and discuss our findings and proposals around the research and what this means for people in this area. May you please kindly fill in the declaration of consent below. Many thanks in anticipation of your co-operation and valuable contribution.

Yours faithfully

Sarlomie Mbasera

CONSENT

I hereby agree to participate in research regarding I understand that I am participating freely and without being forced in any way to do so. I also understand that I can stop this interview at any point should I not want to continue and that this decision will not in any way affect me negatively.

I understand that this is a research project whose purpose is not necessarily to benefit me personally.

I have received the telephone number of a person to contact should I need to speak about any issues which may arise in this interview.

I understand that if at all possible, feedback will be given to my community on the results of the completed research.

.....
Signature of participant

Date:.....

I hereby agree to the tape recording of my participation in the study

.....
Signature of participant

Date:.....

Internet-based Information Use

Interview with Librarians

Designation:

University: Fort Hare NMMU Rhodes

Background Information

- 1) Approximately, what is the number of postgraduate students served by your library?

- 2) Does your library have computers specific for postgraduate students to access e-resources, and if so how many workstations are available for this purpose?
 No
 Yes. Please specify the number of workstations _____
- 3) Where do postgraduate students access e-resources offered by your University? (Please let me know all that apply)
 In the library only
 At student computer laboratories
 At their faculty/departmental computer labs
 In their residence/hostels
 Remotely from their homes or work offices
- 4) Internet Connectivity
 - a) How is the library connected to the Internet (e.g. dial up, leased line, VSAT etc.)?
 Dial up Leased Line
 VSAT ADSL
 Mobile Broadband Other (Please Specify)

 - b) What is the bandwidth connectivity for the library?

 - c) How would you describe the speed and status of the Internet connectivity for the library?
 Excellent-fast and reliable
 Good-quick and reliable
 Adequate and acceptable speed
 Poor- slow and unreliable
 Very Poor- Totally unreliable

5) Electronic and Digital Resources

- a) For how long has it been since your library began to offer e-resources to your users?
- Less than 1 year
 - Between 1 Year and 5 Years
 - Between 5 Years and 10 Years
 - Over 10 Years

b) May you please kindly supply a list of the e-journals/databases to which the library offers access. Kindly attach separate list.

c) Please name the five most used electronic databases which your library offers access to.

d) Please name the five least used electronic databases which your library offers access to.

6) Electronic Services

Which electronic services has your library developed for its postgraduate students and other users? Please tick all that apply.

- OPAC
- Library Website
- Remote access to OPAC and other Internet-based information sources
- Combined searching of all electronic resources
- Single search tool for all library resources (physical, in-house, regional, virtual)
- Web-based reference service
- Library e-bulletin
- Online training packages for library users
- Other (please specify)

7) Finances

a) What approximate percentage (%) of your budget is dedicated to improving and maintaining ICT facilities (e.g. network, computers, etc.)?

b) Approximately, how much of your library's budget in percentage (%) is dedicated to the purchase or subscriptions of e-resources?

c) Is Internet access unlimited or limited for postgraduate student use?

d) What measures are in place to ensure the sustainability of e-services?

8) E-resources Staff/Management

a) What is the number of library staff in your library?

Professionals:

Paraprofessionals:

Non-professionals:

b) Name the job titles of library staff who manage e-resources in your library

c) Is there a unit solely responsible for the management of e-resources and services in your library?

Yes

No

I am not aware

d) Have your staff members received any training in the management of e-resources?

Yes

No

e) If the answer to the above is yes, what kind of training have your staff received?

9) Marketing and Publicity of Internet-based Information Sources

a) What methods has your library used to disseminate information about available e-resources to postgraduate students? Please tick as many responses as applicable.

- Posters
 - Pamphlets
 - Library website
 - E-mail alerts
 - Training Sessions
 - Other (Please Specify)
-

b) How would you rate the awareness level of postgraduate students on e-resources offered by your library?

- High
- Reasonably aware
- Low

10) Training and Support

a) How many postgraduate training sessions for postgraduate students have been conducted to promote e-resources this academic year?

- None
- Less than 3
- Between 3 and 6
- More than 6

b) How many postgraduate students have been trained through Internal Library Trainings this academic year?

c) Is your library in a position to offer adequate technical support upon request to postgraduate students, in the use of e-resources?

- All, the time
- Most of the times
- Sometimes- we do not have enough support staff
- Never

11) User Needs

How satisfied do you think postgraduate students are of Internet-based Information sources offered by your university, in terms of meeting their research expectations?

- Very satisfied
- Satisfied
- Neutral/not sure
- Dissatisfied
- Very dissatisfied

12) On average how many requests are made daily by postgraduate users regarding e-resources in a week?

13) Does your library keep statistics in relation to the use of e-resources by postgraduate students?

Yes

No

14) If yes, what kind of statistics does your library keep?

15) To the best of your knowledge, do teaching staff incorporate the use of e-resources in their teaching methodologies? For example do they recommend e-resources to postgraduate students?

16) May you please describe the areas in which the library has been successful in its provision of e-facilities and e-resources:

17) May you please describe the most critical challenges that your library faces in its provision of e-facilities and e-resources:

18) What three areas of e-facilities and e-resource provision do you intend to address in the next three or so years?

19) What do you think is the future of e-resources/digital library at your University?

20) What suggestions or recommendations do you have on the improvement e-resource utilisation by postgraduate students?

21) Please suggest any relevant area of study which may not have been covered by this study?

- a) _____
- b) _____
- c) _____

Appendix I: Map of the Eastern Cape Province, South Africa

