THE ADOPTION AND USE OF PEER REVIEWED ELECTRONIC JOURNALS BY ACADEMICS AT SELECTED ZIMBABWEAN STATE UNIVERSITIES

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Submitted: December 2014

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DECLARATION

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ABSTRACT

The study investigated the adoption and use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities. The investigation grew out of the realisation that despite several efforts that were made by different university libraries in Zimbabwe to enhance access to peer reviewed electronic journals, the use of such journals among academics remained very limited. Specifically, the study determined the level of awareness of peer reviewed electronic journals by academics, established academics' extent of use of the resources, assessed the attitudes and perceptions of academics towards the resources, determined factors that influence the behaviour of academics in Zimbabwean State Universities towards the resources, and investigated the strategies used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics. The study was underpinned by the Unified Theory of Acceptance and Use of Technology (UTAUT) whose constructs of Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions and moderating factors of gender, age, experience, and discipline proved valuable to the tackling of research questions and analysis of data.

The study embraced both the positivist and interpretivist paradigms and adopted the quantitative and qualitative approaches within a survey research design. The population consisted of 794 academics from three state universities in Zimbabwe: National University of Science and Technology (NUST), Bindura University of Science Education (BUSE), and Midlands State University (MSU). The population also included 24 professional librarians from the same universities who were all considered as respondents for the study. The sample size for academics was 363. Data were collected by questionnaires from academics and interviews from professional librarians. The overall response rate was 58.4% for academics with 212 questionnaires being returned out of the 363 that were sent out whereas 22 professional librarians were interviewed out of the targeted 24. Quantitative data were analysed using the Statistical Package for Social Sciences (SPSS) and qualitative data were processed using the Nvivo package.

The study found that while the majority of academics in the three universities were aware of the existence of peer reviewed electronic journals in their institutions they did not have intimate

knowledge and awareness of the resources. The study also established that the majority of academics at Zimbabwean State Universities had adopted electronic journals but their level of use was low as measured by the number of articles consulted per week, frequency of use, and the major source of information for academics. Attitudes and perceptions of academics towards peer reviewed electronic journals were generally on the positive side with many academics regarding the resources as important for their work. However, academics in Zimbabwe were frustrated by many barriers that militated against their use of electronic journals. The study also found that state universities libraries in Zimbabwe depended on a number of strategies to promote use of electronic journals. However, there were weaknesses in the way these strategies were implemented as they were largely not personalised. The study also established the best fitting UTAUT model, isolating Performance Expectancy and Facilitating Conditions constructs as the most crucial determinants of adoption and use of peer reviewed electronic journals in Zimbabwe.

The study recommended establishment of strong and fluid communication channels between university libraries and academic faculties as this would result in effective induction processes that would enhance the awareness of peer reviewed electronic journals by academics. Universities were urged to review the information they were giving to academics to determine its relevancy and adequacy in generating in-depth awareness of electronic journals. Universities were also urged to employ more personalised marketing and promotion strategies to augment the broad based strategies they were using. The use of social media in promotion was also emphasised. Top administrators of universities were encouraged to take a leading role in encouraging use of electronic journals. University libraries were urged to review the model they use to subscribe to peer reviewed electronic journals and embrace one that enables more access to full text electronic journal articles and facilitate participation of academics in selection of resources. Universities were urged to eliminate all forms of barriers that militate against the use of electronic journals by academics and institute continuous training programmes to improve the skills of users. Universities were also encouraged to increase research funding as this had the effect of improving usage of peer reviewed electronic journals.

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DEDICATION

To my beautiful wife Beatrice and our lovely daughter Anotidaishe Palin Machimbidza.

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LIST OF ABBREVIATIONS AND ACRONYMS

AGORA	Access to Global Online Research in Agriculture
AHRD	Academy of Human Resource Development International Conference
AIC	Akaike Information Criterion
AIDA	Attention/Awareness, Interest, Desire and Action
AIP	American Institute of Physics
AJOL	African Journals Online
AKU	Aga Khan University
AMOS	Analysis of Moment Structures
AMU	Aligarh Muslim University
ARDI	Access to Research for Development and Innovation
ARL	Association of Research Libraries
AU	Africa University
BCC	Browne-Cudeck Criterion
BHU	Banaras Hindu University
BIC	Bayesian Information Criterion
BUSE	Bindura University of Science Education
CAIC	Consistent Akaike Information Criterion
CARL	Colorado Alliance of Research Libraries
CBD	Central Business District
CBE	College of Business Education
CD-ROMs	Compact Disk- Read Only Memory
CEDHA	Centre for Educational Development in Health, Arusha
CFI	Comparative Fit Index
CONSER	Cooperative Online Serials

CUT	Chinhoyi University of Technology
CUZ	Catholic University in Zimbabwe
CW	College of Wildlife
DIT	Dar es Salaam Institute of Technology
DOI	Diffusion of Innovation Theory
EIFL	Electronic Information for Libraries
ESAMI	Eastern and Southern African Management Institute
EU	Egerton University
FAO	Food and Agricultural Organisation
GCU	Glasgow Caledonian University
GSU	Gwanda State University
GZU	Great Zimbabwe University
HINARI	Health Inter-Network Access to Research Initiative
HIT	Harare Institute of Technology
HKMU	Herbert Kariuki Memorial University
IA	Institute of Accountancy, Arusha
ICIPE	International Centre of Insect Physiology and Ecology
ICT	Information Communication Technology
IFI	Incremental Fit Index
IFM	Institute of Finance Management
IIT	Information Integration Theory
IMS	Institute of Marine Sciences
INASP	International Network for the Availability of Scientific Publications
IP	Internet Protocol

IS	Information System
IT	Information Technology
JKUAT	Jomo Kenyatta University of Agriculture and Technology
JSTOR	Journal Storage
KABU	Kabarak University
LSU	Lupane State University
MEERU	Monitoring and Evaluation of E-Resources Use
MIT	Massachusetts Institute of Technology
MM	Motivational Model
MPCU	Model of Personal Computer Utilisation
MSU	Midlands State University
MU	Mzumbe University
MUCCOBS	Moshi University College of Co-operative and Business Studies
MUCHS	Muhumbili University College of Health Sciences
NFI	Normed Fit Index
NIMR	National Institute of Medical Research
NRC	National Research Council
NUST	National University of Science and Technology
OARE	Online Access to Research in the Environment
OECD	Organisation for Economic Cooperation and Development
OPACs	Online Public Access Catalogues
OUT	The Open University of Tanzania
PBC	Perceived Behavioural Control
PDF	Portable Document File
PERii	Programme for the Enhancement of Research Information

RIN	Research Information Network
RMSEA	Root Mean Square Error of Approximation
RSS	Really Simple Syndication
SAUT	St Augustine University of Tanzania
SCT	Social Cognitive Theory
SEM	Structural Equation Modelling
SPSS	Statistical Package for Social Sciences
SU	Solusi University
SUA	Sokoine University of Agriculture
SUL	Stanford University Libraries
SUZA	Zanzibar State University
TAM	Technology Acceptance Model
TLI	Tucker Lewis Index
TPB	Theory of Planned Behaviour
TPB/TAM	Combined Theory of Planned Behaviour/Technology Acceptance Model
TRA	Theory of Reasoned Action
TU-IC	Tumaini University- Iringa College
TU-KCMC	Tumaini University- Kilimanjaro Christian Medical College
TU-MC	Tumaini University- Makumira College
UAE	United Arab Emirates
UAEU	United Arab Emirates University
UCLAS	University College of Lands and Architectural Studies
UDSM	University of Dar es Salaam
UK	United Kingdom
UKZN	University of KwaZulu-Natal

UNEP	United Nations Environment Programme
UoN	University of Nairobi
USA	United States of America
USIU	United States International University
UTAUT	Unified Theory of Acceptance and Use of Technology
UTHSC	University of Tennessee Health Science Centre
UWE	University of the West of England
UZ	University of Zimbabwe
VSAT	Very Small Aperture Terminal
WHO	World Health Organisation
WUA	Women's University in Africa
WWW	World Wide Web
ZIMCHE	Zimbabwe Council for Higher Education
ZOU	Zimbabwe Open University
ZU	Zanzibar University
ZULC	Zimbabwe University Libraries Consortium

CHAPTER 1

INTRODUCTION

1.1 Background to the Study

The emergence of peer reviewed electronic journals in academia at the close of the 20th century heralded a new milestone for research and scholarship as the innovation presented academics and students in universities of the worldwith expanded and timely sources of information. The move was initiated by journal publishers who saw in electronic journals an opportunity to lower their costs through reduction or elimination of printing and distribution charges (Tomney and Burton, 1998; Curtis, 2005). In addition, electronic journals allowed publishers to expand their audience by reaching out remotely and timely to researchers in institutions all over the world without the limitation of physical borders and distance (Herman, 2001; Cox and Cox, 2010). University libraries that were affected by the ever increasing costs of print publications quickly welcomed the move as it would shift emphasis from ownership to access. This reduced the costs and broadened the resource base for their clients, chiefly academics and students (Simmonds and Andaleeb, 2001). University libraries expected electronic journals to easily gain traction with the academic community as the resources addressed its long expressed needs of increased choice of information, timeliness, and convenience. However, contrary to expectations, the adoption and use of peer reviewed electronic journals in universities all over the world was disappointingly low, inadequate, and uninspiring (Lenares, 1999; Massey-Burzio, 1999; Tenner and Young, 1999; Tenopir, 2003; Siebenberg, Galbraith and Brandy, 2004). Researchers such as Nelson (2001) and Tenopir (2003) blamed academics for failing to take leadership in the adoption and use of electronic journals in universities.

The situation has since improved drastically in the developed countries of North America, Europe, and some parts of Asia and the Middle East where use of electronic journals surged over the last ten years (Voorbij and Ongering, 2006; Borrego, Anglada, Barrios and Cornellas, 2007). This happened after academics changed their culture and practice and accepted the resources as valid sources of information in academia (Nicholas, Huntington and Jamali, 2007; Cox and Cox, 2010; Kumar and Kumar, 2010; Veeramani and Vinayagamoorthy, 2010; Zhang, Ye and Liu, 2010; Thanuskodi, 2010; Shahmohammadi, 2012). The positive developments in the developed world have not extended to Africa as the adoption and use of peer reviewed electronic journals

remain depressed in institutions on the continent in general and in Zimbabwean universities in particular (INASP, 2006; Utulu, 2006; Shija, 2009; Harle, 2010, Egberongbe, 2011). This issue is worrying as it threatens the investments made yearly by university libraries and providers of electronic journals when they avail these resources to African institutions (Oduwole and Sowole, 2006; Bayugo and Agbeko, 2007). Further, the low use of electronic journals brings to fore questions about the quality of research and scholarship in Africa and academics, as the expected front runners in adopting and using these resources, cannot escape scrutiny.

Academics would ordinarily be expected to take leadership in the adoption and use of electronic journals because of the many benefits these resources offer to their community. The advantages of electronic journals in the academic field as revealed by numerous researchers (Rusch-Feja and Siebeky, 1999; Morse and Clintworth, 2000; Dillon and Hahn, 2002; Monopoli, Nicholas, Georgiou, and Korfitai, 2002; Bar-llan, Peritz and Wolman, 2003; Zainab, Huzaimah and Ang, 2006; Voorbij and Ongering, 2006; and Dilek-Kayaoglu, 2008; Min, 2010; Spiro and Henry, 2010) in studies they conducted in different parts of the world include the following:

- Timeliness;
- Currency;
- The speed and ease with which they can be accessed;
- Powerful searching capabilities;
- Accessibility from office or home without the need to go to the library;
- Facilities for downloading, printing, and copying information;
- Access to large quantities of information;
- Ability to share downloads with members of research groups;
- Access to a wide range of abstracts and full-text documents;
- Ability to provide multiple access to many researchers at the same time;
- Possibility of inclusion of audio and video content;
- Ability to be adapted to technologies for the visually impaired;
- Advanced functional capabilities such as hyperlinks to other relevant articles; and,
- Their manipulability like ability to link, annotate, visualise, and integrate tables.

These benefits of peer reviewed electronic journals should make academics more effective in their research and teaching endeavours thereby enhance their chances of success in their jobs (Tenopir, 2003). Non or low adoption of peer reviewed electronic journals means essentially forfeiting these advantages that have been proved critical in academia by several researchers cited above.

Several studies have been conducted globally by researchers such as Lenares (1999), Tenopir (2003), Hynes and Stretches (2005), Saikia (2007), Sarasvady and Khatri (2007), Isah (2010), Veeramani and Vinayagamoorthy (2010), Thanuskodi (2011), and Tyagi (2011) among others in an attempt to understand the factors that determine adoption and use of peer reviewed electronic journals by academics. The studies have unearthed chiefly four issues that should be addressed if academics are to adopt and use peer reviewed electronic journals: awareness, attitudes and perceptions, barriers to adoption and use, and promotion strategies used by university libraries to encourage use of these resources.

The first factor that any researcher in the domain of adoption and use of peer reviewed electronic journals should consider is that of awareness. This is the gateway for the use of these resources. Bar-llan, Peritz and Wolman (2003) conducted a study in several universities in Israel and discovered that use of electronic journals only began to appreciate after university librarians understood awareness levels of the resources by academics and acted to increase that awareness. Siebenberg, Galbraith and Brandy (2004) reported that academics at Washington State University in the United State of America (USA) increased their adoption and use of electronic journals markedly after efforts were made to enhance their awareness of the resources. Studies held in several other institutions such as University of Hong Kong (Woo, 2005), University of Ghana (Bayugo and Agbeko, 2007), Turkish universities (Dilek-Kayaoglu, 2008), Aligarh Muslim University (AMU) and Banaras Hindu University in India (Khan and Ahmad, 2009), University of Agriculture, Abeokuta, Nigeria (Salaam and Aderibidge, 2010), and Islamic Azad University in Iran (Shahmohammadi, 2012) all pointed to the need to understand users' awareness of electronic journals if there is any hope of increasing use of the resources.

Attitudes and perceptions have also been isolated as important in the adoption and use of peer reviewed electronic journals. Researchers such as Lenares (1999), Massey-Burzio (1999:632), Herman (2001:433), Nelson (2001:209), Shultz and Doranski (2005), Saikia (2007), De Groote (2008), Salaam and Aderibidge (2010), and Tyagi (2012) have all pinpointed negative attitudes and perceptions towards the use of electronic journals by academics. This contributed to the lack of adoption and use of these resources. Researchers from the developed world note that there had to be a period of shaping of positive attitudes and perceptions of electronic journals before academics could fully accept them. Many of the academics in the developed world, researchers note, had previously not considered electronic journals as "real" publications (Lenares, 1999; Shultz and Doranski, 2005; De Groote, 2008). Many academics did not consider electronic journals as authentic academic resources. This view is still held by some academics, especially in the developing world (Ashcroft and Watts, 2005; Salaam and Aderibidge, 2010). As a result, they sabotage the use of these resources. Any study that seeks to understand adoption and use of electronic journals would do well to assess the attitudes and perceptions of the intended users towards these resources (Tenopir, 2003; Harle, 2010).

Researchers have also identified barriers such as lack of skills by users, lack of Information Communication Technology (ICT) infrastructure, slow Internet speeds, lack of computers, password challenges, and electricity challenges. These factors influence the behaviour of academics towards peer reviewed electronic journals (Borah, Kuchida, Lee, Lippincott and Nagaraj, 2004; Ondari-Okemwa, 2004; Secker and Price, 2004; Bevilacqua, 2005; Upadhyay and Chakraborty, 2008; Salaam and Aderibidge, 2010; Shahmohammadi, 2012). The developed countries have addressed some of these barriers however, a number of institutions in the developing world still grapple with these debilitating challenges (Ashcroft and Watts, 2005; Said, 2006; Harle, 2010). Researchers who seek to understand adoption and use of peer reviewed electronic journals, especially in Africa, are encouraged to find out about the factors that influence the behaviour of users towards these resources. This is important in determining acceptability of these resources by targeted users (Egberongbe, 2011).

Studies on adoption and use of peer reviewed electronic journals have also tended to focus on the promotional efforts instituted by university libraries in order to encourage use of these resources.

Researchers such as Pullinger (1999), Ashcroft and McIvor (2001), Lock, Cornell and Colling (2001), Stark (2001), Bevis and Graham (2003), Smith (2003), Kortelainen (2004), Nicholas, Huntington and Watkinson (2005), Thanuskodi (2011), and Vasishta and Navivoti (2011) have all emphasised the need for university libraries to institute effective promotion strategies if their clients are to adopt and use electronic journals. Whereas promotional strategies are deemed to have improved over time in the developed world the situation still needs further investigation in developing world institutions as this has been identified as one possible weak link in the adoption and use of electronic journals in these institutions (Manda, 2008; Harle, 2010).

A number of studies that have investigated the adoption and use of peer reviewed electronic journals by academics have focused on developed countries of North America, Europe, and some parts of Asia and the Middle East. These studies highlighted crucial issues such as awareness, attitudes and perceptions, barriers to adoption and use, and promotion strategies used by university libraries to encourage use of these resources. Only a few countries in Africa (Nigeria, Uganda, Kenya, Tanzania, Malawi, Ethiopia, Ghana, and South Africa) have visible literature that addresses the adoption and use of peer reviewed electronic journals in universities (Dadzie, 2005; Ani and Ahiauzu, 2008; Manda, 2008; Harle 2010; Egberongbe, 2011; INASP, 2012). Many other countries in Africa have not yet conducted notable research in this area. This includes Zimbabwe where there are no published studies although state universities started offering peer reviewed electronic journals in 2003. This is over a decade ago and since then, universities in the country have been grappling with challenges of low usage (INASP, 2006).

The investigation on adoption and use of peer reviewed electronic journals in the Zimbabwean context would provide university librarians, policy makers, and organisations providing these resources with information on the extent of use of these resources by academics and the factors that affect or influence such use. Such a study would isolate academics from the rest of the users in universities. It would also provide information on the extent to which they use these resources since they are expected to take leadership in the adoption and use of the resources. Isolation of usage by academics is crucial. Many organisations that provide peer reviewed electronic journals capture and send usage statistics to universities however, such statistics combine all users and are not specific to academics. A study that focuses on the adoption and use of peer reviewed

electronic journals by academics would also benefit the academics themselves with the benefits spilling over to other users such as students. This is because issues that militate against their use of the resources are likely to be attended to after librarians and policy makers in their respective universities learn of the issues affecting adoption and use of these resources. It is against this backdrop that this study aimed at investigating the adoption and use of peer reviewed electronic journals by academics at Zimbabwean State Universities.

In this study electronic journals are defined as peer reviewed publications offered by reputable publishers or scientific societies and that publish original, scholarly writings that are made available by remote means in electronic form (Tomney and Burton, 1998; Bar-llan, Peritz and Wolman, 2003; CARL, 2003; CONSER, 2004, Curtis, 2005:8). This definition sets apart electronic journals in this study from direct access electronic resources which are issued on a physical carrier, for example, on Compact Disk- Read Only Memory (CD-ROMs). An electronic publication qualifies as a journal when it is offered on a continuing basis and is issued as a succession of discrete parts, usually bearing numbering, with no predetermined conclusion (Curtis, 2005:8). An electronic journal may have a print counterpart where a publisher offers both electronic and print editions for the same publication. However, as Cox and Cox (2010) note, print journals have largely been supplanted by electronic journals and the prevalence of print journals will continue to decrease. Journal publishers now prefer to publish electronically for reasons already given in the first paragraph. Studies should now focus, not on whether journal publishers are switching to the electronic platform, but on the extent to which the intended users have adopted and used these electronic formats. This line of research is important because it unravels the critical factors that determine such adoption and use.

1.2   Background to the Research Problem

The adoption and use of peer reviewed electronic journals by academics has improved the quality of research and scholarship in universities of countries such as China, France, Greece, India, Iran, Israel, Italy, Malaysia, Netherlands, South Africa, Spain, United Arab Emirates, United Kingdom, and United States of America (USA) (Bar-llan, Peritz and Wolman, 2003; Tenopir, 2003; Ibrahim, 2004; Bevilacqua, 2005; Voorbij and Ongering, 2006; Zainab, Huzaimah and Ang, 2006; Borrego, Anglada, Barrios and Cornellas, 2007; Negahban and

Talawar, 2009; Cox and Cox, 2010; Harle, 2010; Kumar and Kumar, 2010; Zhang, Ye and Liu, 2010). While academics in universities of the countries mentioned are leveraging electronic journals to improve their performance, the situation is the opposite in Zimbabwean State Universities (INASP, 2006).

The Zimbabwe University Libraries Consortium (ZULC) reports that academics still depend on print resources which are outdated and in short supply (INASP, 2006; Harle, 2010). The statistics that ZULC harvests from providers of peer reviewed electronic journals still show depressed usage many years after introduction of these resources (INASP, 2006; Harle, 2010). The severe economic challenges that gripped Zimbabwe at the turn of the century impacted negatively on the ability of university libraries in the country to keep pace with building their repertoire of print collections (INASP, 2006). The purchase of books, journals and other print resources virtually stopped amid declining government funding. As a result, university libraries depended more on donations. Many of the donated resources were not suitable for academic purposes (INASP, 2006). Besides, university libraries in Zimbabwe organised themselves into the Zimbabwe University Libraries Consortium (ZULC). The main goal of the organisation is to alleviate shortage of reading resources and increase access to scholarly information in member institutions. In 2003, ZULC managed to negotiate access to over 18000 full text and 7000 abstract peer reviewed electronic journals through the International Network for the Availability of Scientific Publications (INASP)'s Programme for the Enhancement of Research Information (PERii) initiative. This initiative provides expensive academic journals online to institutions in developing countries at a cheaper or affordable price (INASP, 2005). In addition to the PERii initiative, university libraries in Zimbabwe benefitted from other initiatives. For example, Cornell University together with the World Health Organisation (WHO), Food and Agricultural Organisation (FAO), and the United Nations Environment Programme (UNEP) spearheaded the provision of information on environmental sciences, health sciences and agricultural sciences through electronic journal databases. The databases included Online Access to Research in the Environment (OARE), Access to Global Online Research in Agriculture (AGORA), and Health Inter-Network Access to Research Initiative (HINARI) (AGORA, 2008). Another initiative, the Electronic Information for Libraries (EIFL) has also provided electronic journals to university libraries in Zimbabwe.

1.3   Statement of the Problem

Despite several efforts made by ZULC and individual university libraries in Zimbabwe to enhance access to peer reviewed electronic journals, the use of such journals among academics remains minimal (Harle, 2010). In September 2006 INASP hosted a workshop on the Monitoring and Evaluation of E-Resources Use (MEERU) at the University of Zimbabwe Law Library. The workshop expressed concerns at the general underutilisation of peer reviewed electronic journals by virtually all state universities in Zimbabwe (INASP, 2006). Statistics published on the use of electronic journals in Zimbabwean State Universities since that workshop continued to show a depressed outlook (Harle, 2010). Academics were consistently singled out for their failure to provide leadership in the use of peer reviewed electronic journals.

The consequences of non-use or low usage of electronic journals by academics in Zimbabwe are many. Fistly, if academics do not use electronic resources in general and peer reviewed electronic journals in particular, they are unlikely to encourage their students to use them. Course Outlines and reference materials prepared by such academics would not include electronic resources thereby perpetuating a culture of indifference to electronic journals by the academic community (Tenopir, 2003; Khan and Ahmad, 2009); secondly, academics who do not make much use of electronic journals do not give their students tasks that require them to use these resources. This results in a culture of shallow learning in universities (Vasishta and Navivoti, 2011); thirdly, non-use or low use of electronic journals negatively affects the academics' own research activities which ultimately affect the ranking and integrity of universities (Harle, 2010); and, finally, non-use or low use of electronic journals by academics could imply that academics are teaching outdated material. The material provided by electronic journals is usually current and up to date (Cox and Cox, 2010; Harle, 2010; Thanuskodi, 2011).

The underutilisation of peer reviewed electronic journals by academics in Zimbabwe comes against the backdrop of the increasing cost of subscribing to these resources (INASP, 2006; Harle, 2010; Veeramani and Vinagamooythy, 2010; Shahmohammadi, 2012). The arrangement that ZULC has with journal providers where affiliate universities subscribe to selected electronic journals at discounted rates has not insulated institutions from increasing costs. Presentations made by ZULC at a Monitoring and Evaluation of E-Resources Use (MEERU) workshop show

that state university libraries in Zimbabwe were committing between 50% and 65% of their acquisition budgets to the subscription of peer reviewed electronic journals (INASP, 2006). Justifying these costs to university administrators is a difficult task in the face of minimal usage. The libraries run the risk of having their electronic journals subscription budgets cut since usage statistics are not commensurate with the cost incurred in maintaining subscription to these resources. In light of this problem the study investigated the adoption and use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities.

1.4   Purpose of the Study

The purpose of the study was to investigate the adoption and use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities. This purpose was achieved through the following objectives and research questions:

1.4.1   Objectives of the Study

The objectives of the study were to:

1. Determine the level of awareness of peer reviewed electronic journals by academics at selected Zimbabwean State Universities;
2. Establish the extent of use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities;
3. Assess the attitudes and perceptions of academics towards peer reviewed electronic journals;
4. Investigate the factors that influence the behaviour of academics at selected Zimbabwean State Universities towards peer reviewed electronic journals; and,
5. Investigate the strategies used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics.

1.4.2   Research Questions

The research questions of the study were as follows:

1. What is the level of awareness of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?

2. What is the extent of use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?

3. What are the attitudes and perceptions of academics towards peer reviewed electronic journals?

4. What factors influence the behaviour of academics at selected Zimbabwean State Universities towards peer reviewed electronic journals?

5. What strategies are used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics?

1.5   Delimitation of the Study

The study investigated the adoption and use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities. The definition of academics in this study refers to teaching and research staff in universities who have at least a Master's degree. Teaching Assistants and Research Assistants were excluded from this study as in the Zimbabwean context these positions are held by individuals who have not yet attained their Master's degrees. Due to time and financial constraints the study could not incorporate all state universities in Zimbabwe. The study focused on three: National University of Science and Technology (NUST), Bindura University of Science Education (BUSE), and Midlands State University (MSU). The reason these institutions were chosen as representative institutions for state universities is explained in Chapter 4 (section 4.5).

Whereas the study was primarily about academics it also included professional librarians in the mould of Librarians, Sub-Librarians for Reader Services, Faculty Librarians, and Systems Librarians from the three state universities mentioned above. Professional librarians are crucial to the study since they are the providers of peer reviewed electronic journals to academics in their respective institutions. The views of professional librarians are important in the study of the adoption and use of peer reviewed electronic journals by academics. Inclusion of professional librarians in this study provided an understanding of the environment within which academics have to adopt and use electronic journals. The professionals manage the libraries that provide these resources to academics. An understanding of the environment helped the researcher to understand some of the factors that shape the adoption and use of electronic journals by

academics. This is consistent with the facilitating conditions construct of the Unified Theory of Adoption and Use of Technology (UTAUT) which underpin this study. The inclusion of professional librarians in studies focusing on the adoption and use of electronic journals by academics is supported by researchers such as Tenopir (2003) and Tenopir, King, Edwards and Wu (2009). Justification of the inclusion in this study of each of the specific categories of professional librarians mentioned above is given in section 4.5.

Due to the need to maintain a focused study its boundary was restricted and excluded other tertiary educational institutions in Zimbabwe such as privately owned universities, teachers' colleges, and polytechnics. The study also excluded students, both undergraduate and postgraduate. The researcher chose to focus on academics since these are the expected first line of users of electronic journals whose behaviour affects usage by other groups of users including students (Tenopir, 2003). But in recognition of the need to understand adoption and use of peer reviewed electronic journals on a wider scale in Zimbabwe the researcher recommended in section 7.9 that future studies focus on the tertiary educational institutions mentioned above and also on students.

1.6   Rationale and Justification of the Study

Creswell (1994:111) notes that the significance of any research is seen in its ability to add to scholarly research and literature in the field, improve policy, and improve practice. Zhang, Ye and Liu (2010) in justifying why they were conducting a survey of electronic journals use by academics in seven universities of Wuhan, China, pointed to the fact that this type of research has useful theoretical and practical value. While the researcher fully summed up the contributions of this study to theory, policy, and practice in section 7.8 from a post research perspective it is important to justify the study in this introductory chapter so that it is clear why the researcher engaged in the study in the first place.

This study is significant because it is likely to result in more efficient use of scarce resources by academics at universities in Zimbabwe. The university libraries will be aware of the factors affecting adoption and use of peer reviewed electronic journals. This will enable them to provide specific service to users. The study may also help shape positive attitudes towards peer reviewed

electronic journals thereby impacting positively on research culture in Zimbabwean universities while improving the quality of teaching by academics in Zimbabwe. Prior to this study there was no research which covered academics and librarians at several Zimbabwean universities and the adoption and use of electronic journals. This study contributes to scholarly literature on the subject of adoption and use of electronic journals from a Zimbabwean perspective. Besides, given the increasing availability of electronic journals and the level of investment made by different organisations and institutions both international and national in providing electronic journals to the academic field in Zimbabwe there was need to investigate the adoption and use of such resources.

Studies of this nature have been previously undertaken by researchers such as Morse and Clintworth (2000), Bar-llan, Peritz and Wolman (2003), Dillon and Hahn (2003), Tenopir (2003), Borrego, Anglada, Barrios and Cornellas (2007), Madhusudhan (2007), Kumar and Kumar (2008), Manda (2008), Mergesa and Mammo (2008), Sharma (2009), Cox and Cox (2010), Harle (2010), Spiro and Henry (2010), and Zhang, Ye and Liu (2010). However, the researcher believes it was still necessary to study the adoption and use of electronic journals by academics at Zimbabwean State Universities for two reasons. Firstly, many of the studies were done outside Africa. Studies have mostly been held in North America, Europe, Asia and the Middle East. Studies in these continents could not be taken to represent the situation in Zimbabwe because of differences in economic conditions, culture and technology. Secondly, studies of a similar nature that have been done in Africa have been funded by some of the organisations providing these resources. For example, Manda (2008) did a study in Tanzania but it was a project funded by INASP. Other projects in Ethiopia (Mergesa and Mammo, 2008), Malawi, Kenya, Rwanda, and Tanzania (Harle, 2010) were INASP funded. The problem here is electronic journals offered in university libraries in Zimbabwe come from different organisations, not just INASP, although it is also a major provider. Because of differences in provision mechanisms by different organisations users are likely to have different experiences with electronic journals from different suppliers. Therefore, a study on adoption and use that focused only on INASP journals, for example, cannot be taken to represent all providers. This study did not restrict itself to resources of any one particular provider but considered adoption and use of peer reviewed electronic journals in general.

1.7   Theoretical Framework

The study was grounded and underpinned by the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by four scholars: Viswanath Venkatesh, Michael G. Morris, Gordon B. Davis, and Fred D. Davis. The UTAUT aims to explain user intentions to use an Information System (IS) and subsequent usage behaviour. The theory holds that four key constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) are direct determinants of usage intention and behaviour (Venkatesh, Morris, Davis and Davis, 2003). Gender, age, experience, and voluntariness of use are posited to mediate the impact of the four key constructs on usage intention and behaviour (Venkatesh et al., 2003). The theory was developed through a review and consolidation of the constructs of eight models that earlier research had employed to explain IS usage behaviour (theory of reasoned action, technology acceptance model, motivational model, theory of planned behaviour, a combined theory of planned behaviour/technology acceptance model, model of PC utilisation, innovation diffusion theory, and social cognitive theory). Subsequent validation of UTAUT in a longitudinal study found it to account for 70% of the variance in usage intention (Venkatesh et al., 2003).

The researcher considered the UTAUT to be relevant to this study as its four key constructs were critical in addressing the objectives and research questions of the study. The moderating factors of UTAUT, particularly gender, age, experience, and the one added in this study, discipline, were crucial in illuminating the dynamics that determine adoption and use of peer reviewed electronic journals in the Zimbabwean context. The UTAUT was also chosen for its flexibility and comprehensiveness as a hybrid theory that is composed of the best attributes from eight earlier models. UTAUT's high explanatory power is considered more desirable than other technology acceptance and use theories (Venkatesh et al., 2003; Hess, Wigang, Mann and Walter, 2007; Kripanont, 2007; Schaper and Pervan, 2007; Tibenderana and Ogao, 2009). UTAUT contributes to better understanding about the drivers of behaviour of adoption and use of new technologies than other similar theories and models (Wu, Tao and Yang, 2007).

While full justification of the use of UTAUT in this study is given in Chapter 2 (Theoretical Framework) the researcher here maps the research questions of this study to the attributes of the theory as shown in Table 1 below.

Table 1: Mapping the research questions to the attributes of UTAUT

No.	Research Question	Theory Attribute
1	What is the level of awareness of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?	Facilitating Conditions, adoption, usage behaviour, user intentions [Moderating factors – gender, age, experience, and discipline]
2	What is the extent of use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?	Effort Expectancy, Facilitating Conditions, user intentions, usage behaviour [Moderating factors – gender, age, experience, and discipline]
3	What are the attitudes and perceptions of academics towards peer reviewed electronic journals?	Performance Expectancy, Facilitating Conditions, usage behaviour, user intentions [Moderating factors – age and discipline]
4	What factors influence the behaviour of academics at selected Zimbabwean State Universities towards peer reviewed electronic journals?	Social Influence, Facilitating Conditions, user intention, usage behaviour [Moderating factors – age and discipline]
5	What strategies are used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics?	Facilitating Conditions

1.8 Research Methodology

The study was underpinned by both the positivist and interpretivist paradigms and adopted both the quantitative and qualitative approaches. The survey design was adopted for the study and the population consisted of 794 academics from three state universities in Zimbabwe: National University of Science and Technology (NUST), Bindura University of Science Education (BUSE), and Midlands State University (MSU). The population also included 24 professional librarians from the same universities. The sample of the study was 363 for academics whereas all the professional librarians were targeted as they were all deemed to be uniquely positioned to be

of benefit to the study. Data were collected by questionnaires from academics and interviews from professional librarians. To enhance the reliability and validity of the main data collection tool of the study, the questionnaire, the researcher adapted questionnaires that were successfully used to investigate adoption and use of electronic resources in several universities in Africa (Manda, 2008; Mergesa and Mammo, 2008). In terms of data collection from professional librarians the researcher personally conducted interviews so he could ask relevant follow up questions. To prevent cases of misrepresenting interview data all interviews were recorded with permission from the interviewees themselves. In terms of ethics the researcher got permission from the three universities involved. The study also got ethical clearance from the University of KwaZulu-Natal (UKZN). The participants participated on a voluntary basis. The methodological choices made by the researcher in this study and all the information concerning the ethical issues of this study are fully detailed in Chapter 4 (Research Methodology).

1.9   Summary

In this opening chapter the background to the study was presented that included the global and contextualised perspective. The statement of the problem presented the research problem and located it within the Zimbabwean context. The chapter proceeded to outline the purpose of the study, objectives, and research questions. The chapter also delimited the study restricting it to three state universities in Zimbabwe: NUST, BUSE, and MSU. The chapter addressed the rationale and justification of the study. The study adds to scholarly research and literature on adoption and use of peer reviewed electronic journals in the Zimbabwean context thereby, filling a gap that existed in the field. The study would inform policy and practice. The chapter introduced the UTAUT, the theory underpinning this study. This theory will be further explained in Chapter 2. The study is underpinned by both positivist and interpretivist paradigms adopting both quantitative and qualitative approaches within a survey research design.

CHAPTER 2

THEORETICAL FRAMEWORK

2.1   Introduction

The chapter provides a theoretical underpinning for the study. It starts by reiterating the purpose of the study, then the concept theoretical framework and its role in research is introduced. The chapter goes further to briefly outline different theories that are relevant to studying the topic under consideration. The theory that informs this study is isolated and briefly justified. This is followed by a detailed discussion of each of the possible theories for this study, a discussion which ends with a summary of these alternative theories and identification of gaps. The theory that informs this study is considered in detail and an explanation of how it deals with gaps identified in alternative theories is given. The chapter closes with a conceptual framework, where variables that inform this study are isolated.

The study sought to investigate the adoption and use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities. The study was triggered by the realisation that despite several efforts that were being made by ZULC and individual university libraries in Zimbabwe to enhance access to peer reviewed electronic journals, the use of such journals among academics remained limited (INASP, 2006; Harle, 2010). Consistent with the research questions for this study, the chapter pays close attention to theories that address users' level of awareness of peer reviewed electronic journals, level of use, attitudes and perceptions, factors influencing behavior towards electronic journals, and strategies used by libraries to promote peer reviewed electronic journals.

2.2   The Role of Theory in Research

Kerlinger (1979:64) defined a theory as, "a set of interrelated constructs or variables, definitions, and propositions that presents a systematic view of phenomena by specifying relations among variables, with the purpose of explaining natural phenomena." A theory might appear in a research study as an argument, a discussion, or a rationale, and it helps to explain, or predict, phenomena that occur in the world. Labovitz and Hagedorn (1971:17) add to the definition of theory by advancing the idea of a 'theoretical rationale', which they define as "specifying how

and why the variables and relational statements are interrelated." Thomas (1997) notes that theory develops as an explanation to advance knowledge in particular fields. A theory is not a guess or a belief but is based on empirical evidence found through scientific research that was rigorously controlled to avoid bias. Camp (2001) stresses the importance of theory in research by noting that theory provides a "foundation" of research studies.

Torraco (1997) clearly distinguishes between a theory and theoretical framework. He notes that theories are formulated to explain, predict and understand phenomena and, in many cases, to challenge and extend existing knowledge, within the limits of critical bounding assumptions. He specifies the theoretical framework as the "structure" that can hold or support a theory of a research study. The theoretical framework introduces and describes the theory which explains why the research problem under study exists. To this end, Torraco advances that theoretical framework consists of concepts, together with their definitions, and existing theory or theories that are used for a particular study. Camp (2001) agrees with Torraco in the distinction between theory and theoretical framework. He notes that the researcher presents a theoretical framework to place his or her research within the perspective of other studies in the same discipline. The theoretical framework provides support for the study by presenting known relationships among variables, and setting limits or boundaries for the study.

The theoretical framework connects the researcher to existing knowledge of the subject and guides the research by determining what will be measured and what statistical relationships will be looked for (Dyer, Haase-Wither and Washburn, 2003). The researcher is guided by a relevant theory which offers a basis and a focus for the initial design selection, choice of objectives, research questions, hypothesis, research methods, instrument development or adoption, and the organisation, analysis, and interpretation of data (Torraco, 1997; Mirriam, 2001; Camp, 2001; Rojewski, 2002). A theoretical framework permits the researcher to move from simply describing a phenomenon observed to generalising about various aspects of that phenomenon, and to identify limits to those generalisations (NRC, 2002). A theoretical framework specifies which key variables influence a phenomenon of interest. It alerts the researcher to examine how those key variables might differ and under what circumstances (Rojewski, 2002). The theoretical framework delineates the variables of the study, directs operational definitions of the variables

and limits the scope of relevant data. It focuses on specific variables and defines the specific viewpoint or framework that the researcher will take in analysing and interpreting the data to be gathered, understanding concepts and variables according to the given definitions, and building knowledge by validating or challenging theoretical assumptions (Miles and Huberman, 1994; Torraco, 1997; Camp, 2001; Knoblech, 2003). The theoretical framework provides a basis for including and excluding literature. Finally the theoretical framework prevents the study from being flamed by uncontrolled extraneous variables, faulty instruments, haphazard procedures and such other ills (Knobloch, 2003).

Cresswell (2009:55) argues that theories and theoretical frameworks have a place in quantitative, qualitative and mixed methods research. In quantitative studies, one uses theory deductively with the objective of testing or verifying a theory rather than developing it. The researcher advances a theory, collects data to test it, and reflects on its confirmation or disconfirmation by the results. The theory becomes a framework for the entire study, an organising model for the research questions or hypothesis and for the data collection procedure. In mixed methods studies theory may be used deductively, as in quantitative studies, or inductively, as in an emerging qualitative theory or pattern. In mixed methods research a theory emerges as a theoretical lens or perspective to guide the study (Mertens, 2003). To the extent that a theory explains how and why variables are related, it finds place not just in quantitative studies and mixed methods studies, but in qualitative studies as well, where the use of theory is gaining momentum (Cresswell, 2009:69). In highlighting the importance of theoretical frameworks in qualitative studies Rojewski (2002) cites two arguments: the first states that, a theoretical framework deals with preconceived notions, even though the researcher may claim not to know much about the nature of the problem. This is true to many explorative researchers. Secondly, he points out the need to be guided in what one notices and gives attention to in research, a theoretical framework helps one achieve this.

Although the use of theoretical framework is critical to the success of any study, Miles and Huberman (1994) cautions against relying too heavily and uncritically on theory. They also caution against "imposing" theory on the study, shoehorning questions, methods, and data into

preconceived categories and preventing the researcher from seeing events and relationships that do not fit the predefined categories.

2.3   Theories Relevant to the Study of Technology Adoption and Use

The study of the adoption and use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities falls under the ambit of the study of adoption and use of technology. Countless studies within this discipline of study have shown a loyal affinity to the use of theory. Examples of studies in this discipline that have adopted the use of theory include those of Tomney and Burton (1998), Rusch-Feja and Siebeky (1999), Stark (2001), Tenopir (2003), Agaba, Kigongo-Bukenya and Nyumba (2004), Anderson and Schwager (2004), Ibrahim (2004), Connell, Rogers and Diedrichs (2005), Bayugo and Agbeko (2007), Kripanont (2007), Liang (2007), Wu, Tao and Yang (2007), Dilek-Kayaoglu (2008), Al-Qeisi (2009), Tenopir, King, Edwards and Wu (2009), Bassi (2010), Omatayo (2010), Adegbore (2011), Dulle and Minishi-Majanja (2011), Egberongbe (2011), and Massad, Brown and Tuckler (2011). A close examination of studies in the discipline of adoption and use of technology reveals that the most common theories are: Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), Technology Acceptance Model (TAM), Diffusion of Innovation Theory (DOI), and the Unified Theory of Acceptance and Use of Technology (UTAUT).

This study adopts the Unified Theory of Acceptance and Use of Technology (UTAUT) model. Detailed justification of the choice of this theory will be explained towards the end of this chapter; however, it is appropriate here to briefly justify this choice. The researcher considers this theory to be relevant to this study as its four key constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) are relevant to the intentions of this study. It has an advantage in that it is a hybrid theory that has taken the best from other theories. UTAUT is comprehensive and has high explanatory power and is considered more desirable than other technology acceptance and use theories (Venkatesh et al., 2003; Hess, Wigang, Mann and Walter, 2007; Kripanont, 2007; Schaper and Pervan, 2007; Tibenderana and Ogao, 2009). UTAUT contributes to better understanding of the drivers of behaviour of adoption and use of new technologies than other similar theories and models (Wu, Tao and Yang, 2007).

UTAUT has been used successfully in many studies which investigate the adoption and use of information and communication technologies in general, and electronic journals in particular. Examples of such studies include Anderson and Schwager (2004), Louho, Kallioja and Oittinen (2006), Kripamont (2007), Schaper and Pervan (2007), Al-Qeisi (2009), Birth and Irvine (2009), Suhendra, Herman and Sugiharto (2009), Tibendarana and Ogao (2009), Zhou, Lu and Wang (2010), and Dulle and Minishi-Majanja (2011). A number of these studies employed the survey research design which is also used for this study and most also leaned towards the use of both quantitative and qualitative approaches just like this study and were underpinned by interpretive/positivist paradigms.

2.4   A Discussion of Theories Relevant to the Study of Technology Adoption and Use

This section provides an in-depth discussion of the following theories that have been commonly used to study the adoption and use of technology:

- Theory of Reasoned Action (TRA);
- Theory of Planned Behaviour (TPB);
- Technology Acceptance Model (TAM); and,
- Diffusion of Innovation Theory (DOI).

The section closes with a summary of gaps identified in these theories and it opens way to a detailed consideration of the theory of choice in this study, the Unified Theory of Acceptance and Use of Technology (UTAUT).

2.4.1   Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) is a series of linked concepts and hypotheses postulated and developed by social psychologists to understand and predict human behaviour (McKemey and Sakyi-Dawson, 2000; Rehman, McKemey, Garforth, Huggins, Yates, Cook, Tranter, Park and Dorward, 2003). The theory was developed in 1980 from long-standing collaborative research by eminent psychologists Martin Fishbein and Icek Ajzen (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980) as an improvement to the Information Integration Theory (IIT) that had been proposed earlier by Norman Anderson (Trafimow and Finlay, 2002).

The Theory of Reasoned Action addresses the internal or psychological determinants of people's behaviour across a wide range of physical and social situations (Parminter and Wilson, 2003; Botha and Atkins, 2005). TRA is based upon people's behaviour and their attitudes towards that behaviour. The theory holds that people form attitudes by systematically deliberating on any information that they have about the behaviour being considered. In turn attitudes result from an individual's beliefs about the consequences of a particular behaviour and their evaluation of those beliefs. The more an individual expects that a particular behaviour has good consequences for them, the more that individual will have a positive attitude towards the behaviour. Similarly, the more that an individual expects behaviour to have undesirable consequences, the more that they will have a negative attitude towards it. People's attitudes influence their behaviour through the formation of intentions to behave in certain ways (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980). The core assumption of TRA, therefore, is that human beings usually behave in a sensible manner, that is, they take account of available information and implicitly or explicitly consider the implications of their actions. The theory postulates that a person's intentions to perform or not perform a behaviour, is the immediate determinant of that action; barring unforeseen events, people are expected to act in accordance with their intentions (Ajzen, 1988:117; Trafimow and Finlay, 2002; Rehman et al., 2003).

Ajzen and Fishbein (1980) applied two important changes to Anderson's Information Integration Theory in order to come up with TRA. First, TRA adds another element in the process of persuasion, behavioural intention. Rather than attempt to predict attitudes, as does Information Integration Theory, TRA is explicitly concerned with behaviour. However, this theory also recognises that there are situations or factors that limit the influence of attitude on behaviour (Ajzen and Fishbein, 1980; Trafimow and Finlay, 2002). For example, an academic's attitude may lead him or her to want to adopt and use peer reviewed electronic journals. The lack of knowledge on how to negotiate the electronic environment, lack of computers or Internet connection will prevent that attitude from causing the academic to adopt and use peer reviewed electronic journals. Therefore, TRA predicts behavioural intention, a compromise between stopping at attitude predictions and actually predicting behaviour. Because it separates behavioural intention from behaviour, TRA also discusses the factors that limit the influence of attitudes (or behavioural intention) on behaviour. Second, TRA uses two elements: attitudes and

norms (or the expectation of other people), to predict behavioural intent (Ajzen and Fishbein, 1980; Ajzen, 1988). That is, whenever our attitudes lead us to do one thing but the relevant norms suggest we should do something else, both factors influence our behavioural intent. For example, an academic may want to adopt and use peer reviewed electronic journals in his work, but his academic peers may think print journals are more authentic and authoritative.

According to TRA, the immediate antecedent of any behaviour is the intent to perform it. The stronger the intention, the more the person is expected to try and therefore the greater the possibility that the behaviour will actually be performed. The primary concern is with identifying the factors underlying the formation and change of behavioural intent (Fishbein and Manfredo, 1992; Rehman et al., 2003). A person's intention to behave in a certain way is based on the individual's attitude toward the behaviour in question. The perception of the social pressure on them to behave in this way is the "subjective norms". The relative contribution of attitudes and subjective norms varies according to the behavioural context and the individual concerned. Attitudes are determined by the beliefs about the outcomes of performing the behaviour and the evaluation of those expected outcomes. The subjective norm is dependent on beliefs about how others feel the individual should behave and their motivation to comply with those "others" (Rehman et al., 2003).

The basic diagrammatical representation of TRA uses four factors: attitude, subjective norm, intention, and behaviour. Figure 1 below illustrates the Theory of Reasoned Action:
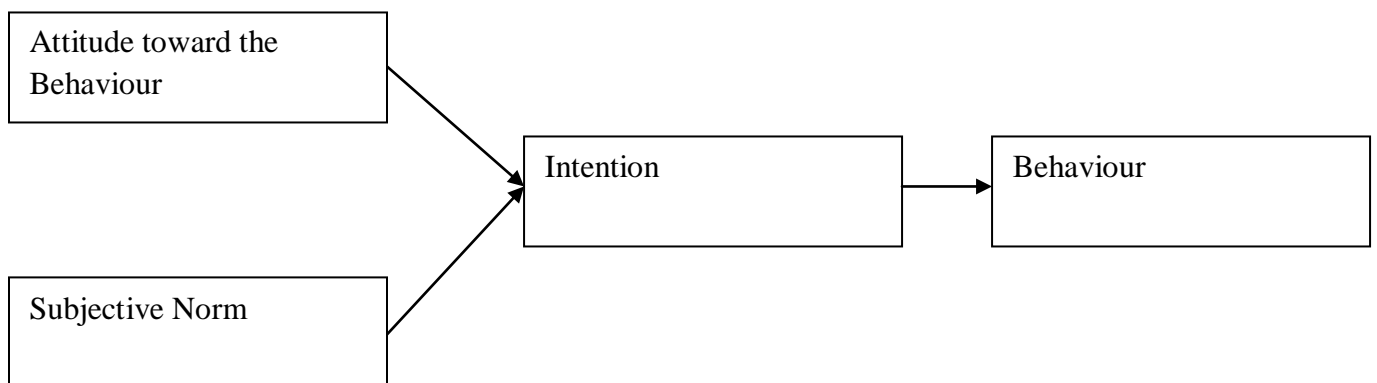
Figure 1: Diagrammatical representation of Theory of Reasoned Action (Ajzen and Fishbein, 1980)

TRA remains an important model for measuring users' behaviour (Brewer, Blake, Rankin and Douglas, 1999; Pak, 2000; Lee, Tsai and Jih, 2006; Song and Kim, 2006; Wooley and Eining, 2006; Wu and Liu, 2007). The researcher, however, did not consider the theory adequate for independent use in this study. Firstly, the theory takes an individualistic approach and fails to consider the role of environmental and structural issues in the adoption and use of technology (Botha and Atkins, 2005). To effectively study the adoption and use of technology in a developing country like Zimbabwe one cannot ignore the environmental and structural issues. These issues inform academics' decision making process insofar as the adoption and use of peer reviewed electronic journals is concerned. Secondly, the linearity of the components of TRA, as shown in the above diagram assumes that behaviour follows intention, which in turn has to happen only after attitude towards behaviour and subjective norms have been considered. Commentators like Hale, Householder and Greece (2003) and Botha and Atkins (2005) point out that individuals may first change their behaviour and then their beliefs and attitudes. The researcher therefore considers the theory restrictive and internally inflexible to achieve his purposes. Thirdly, while TRA is effective in explaining behaviour when volitional control is high, that is, when there is a high degree of perceived success or perceived and actual control over the internal and external factors that may interfere with the execution of the intended action, the theory is not effective where volitional control is low (Ajzen, 1985; Sheppard, 1988; Fishbein and Middlestat, 1989; Montano and Kasprzyk, 2002). The current study deals with circumstances where volitional control is normally low. For example, an academic may want to adopt and use peer reviewed electronic journals but his institution may not have adequate infrastructure to enable him to use the electronic journals as desired. In this case his volitional control is very low since he has other circumstances that are beyond his control which affect his decision to use or not to use the resources.

2.4.2   The Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB) was formulated by Icek Ajzen in 1991 as an extension to the Theory of Reasoned Action which he and Martin Fishbein developed in 1980 (Ajzen, 1991). One of the major limitations of the Theory of Reasoned Action is that it is only effective in predicting behaviour when volitional control is high. TRA is relevant when the subjective probability of success or perceived and actual control over the behavioural goal is at its

maximum level. However, when the probability of failure is salient and actual control in limited, it becomes necessary to go beyond the Theory of Reasoned Action. The Theory of Planned Behaviour is, therefore, an extension of TRA, and attempts to understand behaviour when people cannot exercise full control over the internal and external factors that make it possible to engage in a given behaviour (Ajzen, 1985; Fishbein and Middlestadt, 1989; Ajzen, 1991; Montano and Kasprzyk, 2002).

Ajzen (1991) formulated the TPB by adding a measure of "perceived behavioural control" to the TRA. The extension was based on the idea that behavioural performance is determined by motivation (intention) and ability (behavioural control). The rationale behind the addition of PBC was it would allow the prediction of behaviours that were not under complete volitional control (Tlou, 2009). Thus, while the TRA could adequately predict behaviours that were relatively straightforward, under circumstances where there were constraints on action, the mere formation of an intention was insufficient to predict behaviour. The inclusion of PBC provides information about potential constraints on action as perceived by the actor, and explains why intentions do not always predict behaviour. Perceived Behavioural Control comprises two main facets. Firstly, PBC depends on the degree to which individuals conceptualise themselves as sufficiently knowledgeable, skilful, disciplined, and able to perform some act, called internal control (Kraft, Rise, Sutton and Roysamb, 2005). Secondly, perceived behavioural control depends on the extent to which individuals feel that other factors, such as the cooperation of colleagues, resources, or time constraints, could inhibit or facilitate the behaviour, called external factors. A diagrammatical representation of the Theory of Planned Behaviour follows in Figure 2 below:
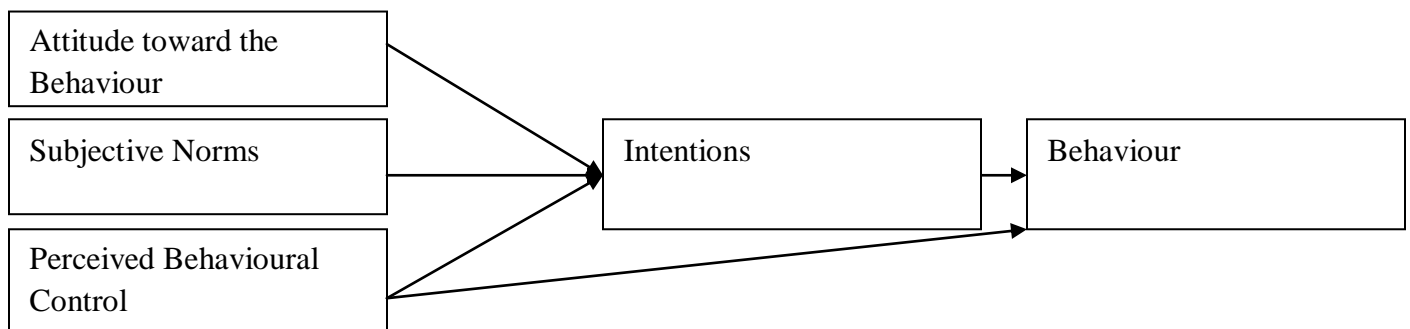
Figure 2: The Theory of Planned Behaviour (Ajzen, 1991:182)

Since its formulation, the Theory of Planned Behaviour has been used extensively. Examples of studies that have used TPB in technology acceptance situations include Tan and Teo (2000), Venkatesh, Morris and Ackerman (2000), Bobbit and Dabholkar (2001), Venkatesh and Brown (2001), Riemenschneider and McKinney (2001), Chau and Hu (2002), Gentry and Calantine (2002), Lim (2003), Limayen and Hirt (2003), Lwin and Williams (2003), Riemenschneider, Harrison and Mykytyn (2003), Celuch, Taylor and Goodwin (2004), George (2004), Grandson and Mykytyn (2004), Hansen, Jensen and Solgaard (2004), Hsu and Chiu (2004), Leonard, Cronan and Kreie (2004), Shih and Fang (2004), Bosnjak, Tuten and Wittman (2005), Brown and Venkatesh (2005), Morris, Venkatesh and Ackerman (2005), and Workman (2005). It is evident that TPB became popular especially at the turn of the century. The use of TPB, however, became less popular following the introduction of another theory, the UTAUT.

Some critics of the theory have pointed out that except for the addition of perceived behavioural control, the theory still retains most of the weaknesses of TRA (Montano and Kaspyzyk, 2002; Barnett and Presley, 2004). Armitage and Conner (2001) point out that intention to perform some act do not always culminate in the envisaged behaviour as touted by TPB. Perceived Behavioural Control is partly, but not absolutely, related to actual behavioural control. This in turn affects the extent to which intentions are associated with the corresponding behaviours. Perceived and actual behavioural control can sometimes diverge, such as when individuals are oblivious to factors that obstruct or facilitate the intended behaviour. While the researcher will not use TPB as his core theory, he will benefit from some of its constructs which are also included in UTAUT, the theory of choice for this research.

2.4.3 Technology Acceptance Model (TAM)

The Technological Acceptance Model (TAM) was proposed by Fred Davis in 1986 in his doctoral thesis at Massachusetts Institute of Technology (MIT) Sloan School of Management (Chittur, 2009; Park, 2009; Miller and Khera, 2010). Davis (1986) proposed that a user's adoption of a technological system is a response that can be explained or predicted by the user's motivation. This in turn, is directly influenced by an external stimulus consisting of the actual system's features and capabilities. In his proposal, Davies isolated the features and capabilities of a system as the major underlying determinant of that system's acceptability by targeted users. A

system should therefore encapsulate qualities that are sought after by its envisaged users. This allows for acceptance and motivation of potential users to use the system. Only after a potential user has been sufficiently motivated to use the system or the technology do they engage in the actual habit of system use. Davies explains this in the following diagram:

System features and capabilities	→	User's motivation to use system	→	Actual system use

Stimulus   Organism   Response
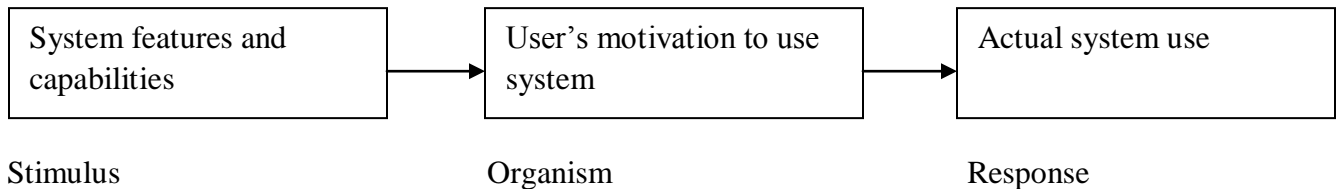
Figure 3: Davis' initial representation of TAM (Davis, 1986:10)

Davies (1986) relied on prior work done by Ajzen and Fishbein (1980) who formulated the Theory of Reasoned Action (TRA) to further refine his model. This resulted in the Technology Acceptance Model shown in Figure 4 below:
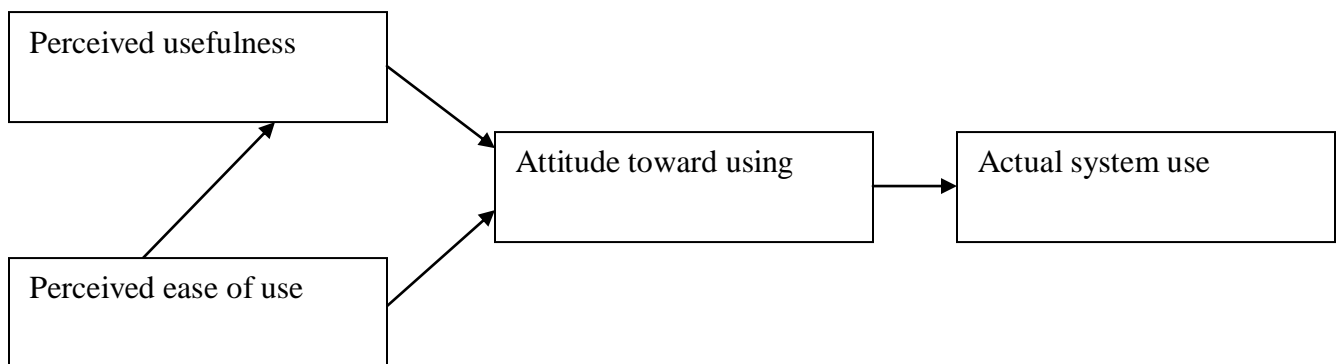
Figure 4: Diagrammatic representation of the Technology Acceptance Model (Davis, 1986)

As shown in the diagram above, Davis (1986) suggested that users' motivation can be explained by three factors: perceived ease of use, perceived usefulness, and attitude toward using the system. He hypothesised that the attitude of a user toward a system was a major determinant of whether the user will actually use or reject the system. The attitude of the user, in turn, was considered to be influenced by two major beliefs: perceived usefulness (the extent to which a potential Information Technology (IT) user believes that the use of that IT system will enhance that users' job performance) and perceived ease of use (the extent to which a potential IT user

perceives or believes that the use of that IT system will be free of effort), with perceived ease of use having a direct influence on perceived usefulness. Finally, both these beliefs were hypothesised to be directly influenced by system design characteristics.

Davis would later refine his model to include other variables and modify the relationships that he initially formulated (Chittur, 2009). Similarly, other researchers would apply, and propose several additions to TAM, such that over time, TAM evolved into a leading model in explaining and predicting system use. Venkatesh and Davis (1996:453) published the following updated model of TAM:
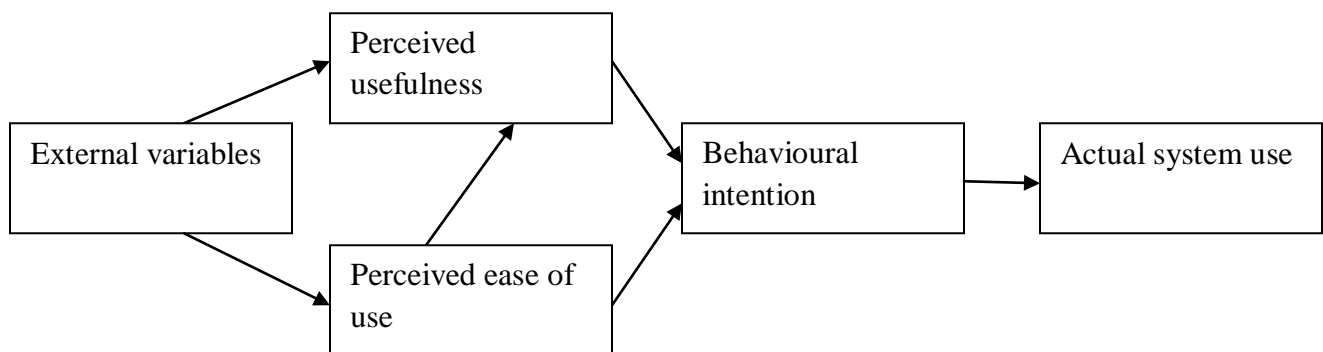
Figure 5: Improved version of the Technology Acceptance Model (Venkatesh and Davis, 1996:453)

Venkatesh and Davis (2000) have since extended the model into TAM2. TAM2 extended the original model to explain perceived usefulness and usage intentions. This includes social influence (subjective norm, voluntariness, and image), cognitive instrumental processes (job relevance, output quality, and result demonstrability) and experience. It is not the intention of this discussion to go deep into TAM2, however, some aspects of TAM2 will be discussed during the discussion on UTAUT that follow later.

The Technology Acceptance Model has been widely used since its formulation and has been hailed as an effective model in explaining and predicting user behaviour of information technology (Legris, Ingham and Collerette, 2003). Technology adoption studies that have used TAM include those of Selim (2003), Grandon, Alshare and Kwan (2005), Lee, Cheung and Chen (2005), Mungania and Reio (2005), Ndubisi (2006), Pituch and Lee (2006), Saade, Nebebe and Tan (2007), and Shahmohammadi (2012).

While TAM has been widely accepted in IT and information systems technology acceptance research, the model has been challenged for different reasons and within different contexts. TAM was developed through studies conducted mainly in North America. Attempts to replicate TAM outside North America did not yield much resultin collective societies like Japan, where it was a failure. It was successful in individualistic societies like Switzerland (Miller and Khera, 2010). TAM has been directly challenged as an inappropriate model for studying technological adoption in developing countries (Anandarajan, Igbaria and Anakwe, 2000). Anandarajan et al. tested the TAM model in technology adoption amongst 88 employees at six Nigerian banks. The study revealed that social pressure was much more important than any other measures, including perceived usefulness (Miller and Khera, 2010). The findings were in tandem with concerns raised earlier by Dillon and Morris (1996). They stated that TAM excluded the possibility of the influence of institutional, social and personal control factors in a potential user's decision to adopt or not adopt a given technology. This led to the questioning of the effectiveness of TAM in societies that are more collectively oriented and less individualistic. TAM assumes that beliefs concerning ease of use and usefulness are always the principal determinants of any technological adoption and use decisions. Research conducted in developing countries which generally value social cohesion and co-operation has refuted this claim. The present study is being conducted within the context of a developing country. Therefore, the researcher felt the model was not adequate on its own.

2.4.4   Diffusion of Innovation (DOI)

The Diffusion of Innovation (DOI) theory was developed by Everrett Rogers in 1962 as a modification and expansion of a theory developed over a century ago by French sociologist, Gabriel Tarde (Guion and Free, 2010). Rogers' 1962 version of DOI was mainly applied to agricultural and medical fields but, in 1995 he further developed the model to encompass use in other fields (Rogers, 1995). The theory has since been used in a variety of disciplines including political science, public health, communication, history, education, and technology (Parisot, 1995; Dooley, 1999; Stuart, 2000; Medlin, 2001). DOI has been used to study the adoption and use of technology by researchers such as Blankenship (1998), Carter (1998), Jacobsen (1998), Suhendra (2001), Zakaria (2001), Isleem (2003), Less (2003), Sahin (2006), Arome and Levine

(2007), Al-Ghaith, Sanzogni and Sandhu (2010), Guion and Free (2010), and Massad, Brown and Tuckler (2011).

Rogers (2003) defined diffusion as, "the process in which an innovation is communicated through certain channels over time among the members of a social system". This definition outlines four factors that are germane to DOI. These are:

- Innovation;
- Communication channels;
- Time; and,
- Social system.

2.4.4.1 Innovation

An innovation is an idea, practice, or project that is perceived as new by an individual or other unit of adoption (Rogers, 2003:12). An innovation may have been invented a long time ago, but if individuals perceive it as new, according to Rogers (2003) it is still an innovation for them. DOI argues that an innovation brings uncertainty to the members who are supposed to adopt the technology. This uncertainty arises from the consequences of adoption or rejection of the technology. The theory then focuses on how proponents of a technology should reduce uncertainty on the part of potential users. This requires technology proponents to adequately inform the target users about the proposed technology, and further explain its advantages and disadvantages so that awareness is raised. DOI stresses that proponents of a technology have to make target users fully 'aware' of the technology so that they make a choice to either adopt or reject the technology from an informed position.

2.4.4.2 Communication Channels

The second element of the Diffusion of Innovations process is the communication channels. Rogers (2003:19) states that diffusion is a social process that involves interpersonal communication relationships. DOI advances that of all the channels that could be used to communicate information about an innovation, interpersonal channels are the most powerful. They have the capacity to create or change strong attitudes held by an individual. This means that proponents of an innovation or technology should devise ways of sharing information about

the desired technology at a more personal level. Impersonal methods should only be used as supportive strategies. The DOI explains the need for librarians to devise interpersonal ways of communicating information about library developments. This includes the introduction of new resources in the library such as electronic journals.

2.4.4.3 Time

Rogers (2003) argues that one of the major strengths of DOI is its regard to the time it takes for different potential users to adopt a technology. Unlike other behavioural theories, DOI recognises that there are categories of adopters of technology, and this categorisation is based on time. DOI recognises five categories of adopters:

- Innovators;
- Early adopters;
- Early majority;
- Late majority; and,
- Laggards.

Innovators are willing to experience new ideas and they are quick to venture into new technology. These innovators take the least time to adopt technology and they are very enthusiastic about adopting and using new technology. After innovators are early adopters. Early adopters work within a social system as gatekeepers of current technology but are much open to new technology. They act as a reference point for other adopters such as early majority, late majority, and laggards. These groups want to get the assurance of early adopters so that they can adopt the technology. This group is crucial because it exerts influence on the behaviour of other groups. Proponents of new technology need to target this group to allow ideas to filter to other groups (Braak, 2001; Rogers, 2003). The early majority are optimistic of new technology but employ caution. They are neither the first nor the last to adopt new technology, they want to see how it works and needs to be assured before they can adopt. The late majority are sceptical of new technology but adopt it under pressure from economic necessity and peers. This group needs a network of peers to persuade it to adopt any innovation. The laggards take the longest time to adopt technology, if at all. In most cases they lack awareness and knowledge of new technology and if they are made aware they are very sceptical. They are traditionalists in their perspective

and will only adopt technology if it has been successfully adopted by others. DOI allows for a better study of behaviour regarding adoption of technology. The theory categorises users and seek to understand them within each category. The users are not viewed as homogenous.

2.4.4.4 Social System

The social system is the last element in the diffusion process. Rogers (2003:23) defined the social system as a set of interrelated units engaged in joint problem solving to accomplish a common goal. Since diffusion of innovations takes place in the social system, it is influenced by the social structure of the social system. It is this aspect that has made DOI relevant in the context of developing countries. These countries have a collective approach to decision making. Unlike other theories that are more suited to individualistic situations, the DOI takes care of social factors.

Rogers (2003) argues that the technology adoption process goes through five stages, that he calls the 'innovation-decision process'. This process involves the following steps:

- Knowledge;
- Persuasion;
- Decision;
- Implementation; and,
- Confirmation.

At the knowledge stage the potential user is made aware of the technology and is equipped with the skills to use the technology. The potential user is also furnished with the knowledge of why it is in his or her best interest to adopt the technology (Spotts, 1999; Seemann, 2003). The second stage, persuasion, is critical for a potential user who is sceptical about the new technology. Sherry (1997:70) notes that most sceptics of technology trust their peers, colleagues and trusted friends to advise them on the decision they need about a new technology. This emphasises the role of the social system in the adoption of technology. The third stage is the decision stage where the individual chooses to accept or reject the technology. The fourth stage is the implementation stage where those who would have made a decision to adopt technology actually use it. At this stage Rogers (2003:180) points out that, the new user is still faced with a lot of

uncertainties and needs constant reassurance and training. At the fifth stage, the confirmation stage, the individual looks for support for his or her decision. At this stage, the decision to adopt a technology can be reversed if the individual is exposed to conflicting messages about the innovation. However, at this stage the individual tends to stay away from these messages and instead seek supportive messages that confirm his or her decision.

Diffusion of Innovation theory recognises five attributes of innovations that affect their adoption and use by potential users. The first attribute, relative advantage, is the degree to which an innovation is perceived as being better than the idea it supersedes (Rogers, 2003). Researchers note for example, that when academics face new demands in their work that cannot be met by the present systems, they will adopt new technology since they will consider it to have relative advantage over the ideas it supersedes (Parisot, 1995; Spotts, 1999; Casmar, 2001; Mckenzie, 2001; Finley, 2003). The second attribute, compatibility, is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters (Rogers, 2003:15). A lack of compatibility of IT with individual needs may negatively affect the individual's IT use (Sherry, 1997; McKenzie, 2001; Sahin, 2006). The third attribute, complexity, is the degree to which an innovation is perceived as relatively difficult to understand and use (Rogers, 2003:15). An excessive complexity of an innovation is an important obstacle to its adoption. A technological innovation might confront academics in a university, for example. It may challenge the individual to change his or her teaching methodology to integrate the technological innovation into instruction. This may include different levels of complexity. If hardware and software are user friendly, then they might be adopted successfully by academics (Martin, 2003). The fourth attribute, trialability, is the degree to which an innovation may be experimented with on a limited basis (Rogers, 2003:16). Some users want to 'try' a new technology before fully committing, if the system allows that, then they are more willing to experiment. The fifth, attribute, observability, is the degree to which the results of an innovation are visible to others (Rogers, 2003:16). Role modelling or peer observation is a key motivational factor in the adoption and diffusion of technology (Parisot, 1997). Similar to relative advantage, compatibility, and trialability, observability is positively correlated with the rate of adoption of an innovation.

In summary, Rogers (2003) argued that innovations offering more relative advantage, compatibility, simplicity, trialability, and observability are adopted faster than other innovations. Rogers, however, cautions that getting a new technology accepted is generally difficult. This calls for conditions to be at their best for users to quickly adopt and use the envisaged technology.

It is evident that DOI is a well thought out model and is applicable in a number of technology adoption situations; however, this model has well documented limitations. Firstly, the theory does not consider the possibility that people will reject an innovation even if they fully understand it (Waterman, 2004). Secondly, the theory does not give sufficient consideration to innovation characteristics and how these change over time (Wolfe, 1994). Thirdly, DOI is a technology driven theory because of its pro-innovation bias (Kole, 2000). Pro-innovation implies that all members of a social system should adopt innovations and adoption should happen quickly. The theory does not take into account the fact that diffusion and adoption may fail because it was a bad idea to begin with. The theory associates the latest technologies with progress thereby ignoring alternatives. While it provides for social factors, the theory is still biased towards studying the individual adopter, not a group of adopters. Due to these limitations, DOI does not meet the requirements of the current study.

2.5   Gaps Identified in the Theories Reviewed Above

The discussion on theories relating to technology acceptance concluded by identifying the gaps, weaknesses and limitations of each theory. The researcher explained why each of these theories could not be used independently is this study. The researcher does not wish to repeat the points already raised. However, there are five fundamental gaps and concerns in the construction and application of the theories discussed above that would make them even more inappropriate for independent use in this study. Firstly, the theories already discussed, namely: Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), Technology Acceptance Model (TAM), Diffusion of Innovation (DOI), and other theories that are normally used to study adoption and use of technology but that were not discussed above such as Social Cognitive Theory (SCT), Motivational Model (MM), Model of Personal Computer Utilisation (MPCU), and Combined Theory of Planned Behaviour/Technology Acceptance Model (TPB/TAM) are all

simplistic and individual-oriented (Botha and Atkins, 2005; Ratten and Ratten, 2007; Al-Quesi, 2009; Miller and Khera, 2010). The present study requires a sophisticated theory like the UTAUT that not only focuses on individual behaviours, but considers individuals and the environment within which they operate.

The second major gap identified with the alternative theories discussed above is that in their construction they mainly used students as participants (Al-Quesi, 2009). Considering the nature of participants in the current study, the student based models present a weakness. The validation of UTAUT went beyond the scope of students to include workers in real work situations. This captures the sentiments of academics in Zimbabwe better than the other models. Thirdly, validation of the theories discussed above was mostly done after acceptance or rejection of use of the proposed technology. The sentiments expressed by participants who helped to validate these theories were retrospective. The validation of the UTAUT was done in real time, making it a better theory for this study (Al-Quesi, 2009). Fourthly, during validation stage, the above theories mostly adopted a cross-sectional approach. This study is cross-sectional in nature but it has to rest on a theory that has been proven over time. The UTAUT model was validated through longitudinal studies so its strength was proved over time and in different situations (Venkatesh, Morris, Davis and Davis, 2003). Finally, a number of studies that resulted in the theories cited and discussed above were conducted in voluntary usage contexts. This makes it difficult to generalise the results to mandatory settings (Al-Quesi, 2009). The UTAUT model has the advantage that it encompasses all contexts and is therefore more flexible.

The identification of gaps and weakness in the earlier models discussed above does not necessarily disqualify these theories as potent theories to study adoption and usage of technology. The theories provided a foundation for the UTAUT, which has been chosen for this study. These theories have been used by researchers such as Venkatesh et al. (2003) to produce a more robust and flexible theory. The following section discusses the UTAUT model in detail. In this discussion cross referencing is made with the research questions, literature review, and research instruments.

2.6   The Unified Theory of Acceptance and Use of Technology (UTAUT)

This study is grounded and underpinned by the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by four leading scholars in the technology acceptance domain: Viswanath Venkatesh, Michael G. Morris, Gordon B. Davis, and Fred, D. Davis (Venkatesh, Morris, Davis and Davis, 2003). These scholars noticed that information technology researchers had to choose from a number of models. The researchers would choose their favoured model and ignore the contribution from alternative ones. There was a need for a synthesis in order to reach a unified view of users' technology acceptance. The UTAUT proponents reviewed and compared the eight dominant models that had been used to explain technology acceptance behaviour. These models are:

- Theory of Reasoned Action (TRA);
- Theory of Planned Behaviour (TPB);
- Technology Acceptance Model (TAM);
- Diffusion of Innovation (DOI);
- Social Cognitive Theory (SCT);
- Motivational Model (MM);
- Model of Personal Computer Utilisation (MPCU); and,
- Combined Theory of Planned Behaviour/Technology Acceptance Model (TPB/TAM).

The scholars empirically compared the eight models in longitudinal field studies. They conducted the study in four different organisations among individuals who were introduced to a new technology in the workplace. The measurement was carried out at the following times: post training, one month after implementation, and three months after implementation. Actual usage behaviour was measured over the six month post training period. The data was divided into two samples for the eight models according to the mandatory and voluntary settings. The authors also studied the effect of some moderating variables that had been reported in previous research to affect the usage decision. These were experience, voluntariness, age, and gender. Results showed that with the exception of the Motivational Model and the Social Cognitive Theory, the predictive validity of the models increased after the moderators were included (Venkatesh et al., 2003; Al-Quesi, 2009). The authors then examined commonalities among models. They found seven constructs to be significant direct determinants of intention or usage on one or more of the

individual models. They hypothesised that four of them played a significant role as direct determinants of user acceptance and usage behaviour. These are:

- Performance expectancy;
- Effort expectancy;
- Social influence; and,
- Facilitating conditions.

The theory was further validated and was found to account for 70% of the variance in usage intention, a percentage far higher than any of the individual theories alone (Venkatesh et al., 2003; Al-Quesi, 2009). A diagrammatical representation of the constructs of UTAUT follows in Figure 6 below:
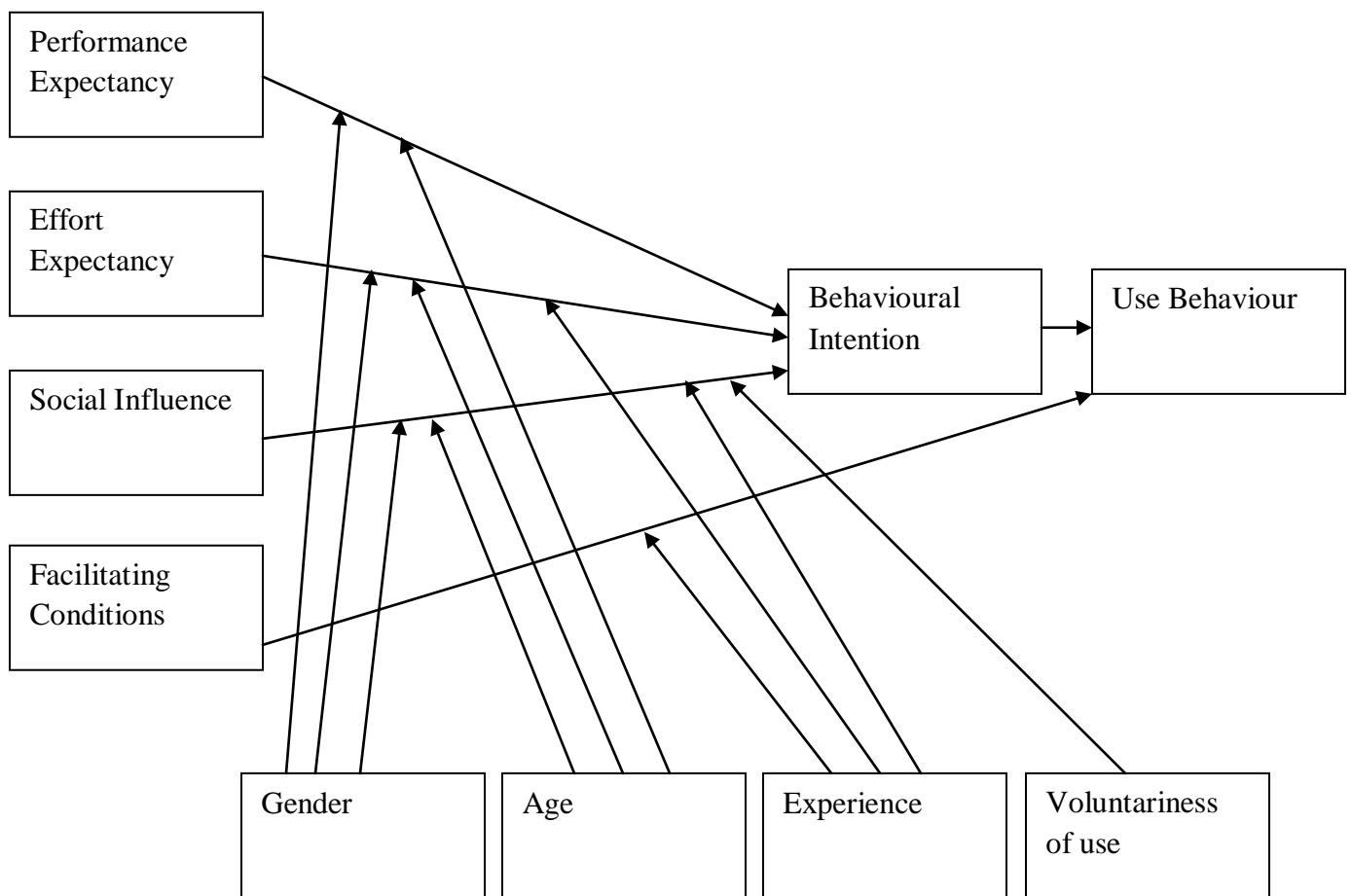
Figure 6: The Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003)

2.6.1   Acceptance of UTAUT in Technology Acceptance Studies

The UTAUT model has earned wide acceptance as a strong, flexible, and accommodating model in technology acceptance studies. The acceptance of UTAUT has not been limited to one or a few cultures, but the model has been accepted and used cross-culturally in all continents of the world. The model has found widespread use in Africa and other developing country contexts. The researcher now briefly notes some of the studies that used this model, demonstrating that the UTAUT has managed to cut across all cultures of the world.

Oshlyansky, Cairns and Thimbleby (2007) validated UTAUT cross-culturally across 9 countries in 4 continents. The countries were: Czech Republic, Greece, India, Malaysia, New Zealand, Saudi Arabia, South Africa, United Kingdom, and United States. UTAUT was found to be valid in all cultural settings. Koivumaki, Ristola and Kesti (2008) applied the UTAUT model to study the perceptions of 243 individuals in northern Finland toward mobile services and technology. Eckhardt, Laumer and Weitsel (2009) applied the UTAUT model to study social influence of workplace referent groups like superiors and colleagues on intention to adopt technology in 152 German companies. Lai, Lai and Jordan (2009) used the UTAUT model to study negative adoption behaviours among undergraduate and postgraduate students in Hong Kong. Curtis, Edwards, Fraser, Gudelsky, Holmquist, Thornton and Sweetser (2010) applied UTAUT to the adoption of social media by 409 United States non-profit organisations. Verhoeven, Heerwegh and Wit (2010) applied UTAUT to study computer use frequency in 714 university freshman in Belgium. Tibenderama, Ogao, Ikoja-Odongo and Wokadala (2010) used the UTAUT model to study the adoption of Information Communication Technology (ICT) services in several Ugandan libraries, demonstrating the model's usability in Africa. Dulle and Minishi-Majanja (2011) applied the UTAUT model to study the adoption of open access electronic journals in 6 Tanzanian universities. Dulle and Minishi-Majanja's study also targeted academics and librarians in the selected universities. Finally, Kang, Imand and Hong (2011) successfully validated the UTAUT model through cross-cultural studies in the United States and South Korea. It is evident that UTAUT can be used in a variety of situations and settings and that it is quite an applicable model for this study.

2.6.2   The Constructs of UTAUT and their Application to this Study

The UTAUT model states that four key constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions are direct determinants of usage intention and behaviour (Venkatesh et al., 2003). Gender, age, experience, and voluntariness of use are posited to mediate the impact of the four key constructs on usage intention and behaviour. The four constructs of UTAUT are now considered below and applied to this study. The constructs' relationship to the research questions, literature review, and research instruments of this study is highlighted. This demonstrates the unity between the research questions, the UTAUT model, the literature, and the research instruments. Research instruments refer to the questionnaire and interview guides that were used to collect data for this study.

2.6.2.1 Performance Expectancy

Performance expectancy is defined as the degree to which an individual believes that using the system will enhance job performance. The five constructs from the different models that pertain to performance expectancy are: perceived usefulness, extrinsic motivation, job-fit, relative advantage, and outcome expectations. Table 2 below shows the root constructs of performance expectancy and their root models and definitions:

Table 2: Performance expectancy: Root constructs, root models and definitions

Root Construct	Root Model	Definition
Perceived Usefulness	Technology Acceptance Model (TAM)	The degree to which a person believes that using a particular system would enhance his or her job performance (Davies, 1989; Davis et al., 1989).
Extrinsic Motivation	Motivational Model (MM)	The perceptions that users will want to perform an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions (Davies et al., 1992).
Job-fit	Model of Personal Computer Utilisation (MPCU)	How the capabilities of a system enhance an individual's job performance (Thompson, Higgins and Howell, 1991).

Root Construct	Root Model	Definition
Relative Advantage	Diffusion of Innovations (DOI)	The degree to which using an innovation is perceived as being better than using its precursor (Moore and Benbasat, 1991; Rogers, 1995; Rogers, 2003).
Outcome Expectations	Social Cognitive Theory (SCT)	The consequences of behaviour (Bandura, 1977; Bandura, 1986; Compeau and Higgins, 1995; Compeau, Higgins and Huff, 1999; Bandura, 2001)

Source: Venkatesh et al. (2003:448)

Table 2 above explains performance expectancy as a construct in UTAUT. It has its roots in five earlier models. The constructs of perceived usefulness, extrinsic motivation, job-fit, relative advantage, and outcome expectations are acknowledged as similar constructs by authors such as Davis et al. (1989), Thompson, Higgins and Howell (1991), Davis et al. (1992), and Compeau and Higgins (1995). The performance expectancy construct within UTAUT is therefore, a very strong construct having drawn from five models. The performance expectancy construct within each individual model remains the strongest predictor of intention and remains significant at all points of measurement in both voluntary and mandatory settings. Gender and age differences have been shown to exist in technology adoption contexts (Morris and Venkatesh, 2000; Venkatesh and Morris, 2000) and Venkatesh et al. (2003) found that these have a moderating effect on performance expectancy. The researcher has discussed literature relating to the effect of age and gender in Chapter 3 (Literature Review) under sections 3.7.2 and 3.7.3. Questions 8 and 9 of Appendix 1 (Survey Questionnaire for Academics in Selected Zimbabwean State Universities) enabled the researcher to capture the gender and age range of respondents. This allowed the researcher to ascertain the effect of these moderators on adoption and use of peer reviewed electronic journals by academics at Zimbabwean State Universities.

In this study the performance expectancy construct of UTAUT was used to interrogate the third research question: **What are the attitudes and perceptions of academics towards peer reviewed electronic journals?** The literature that addresses performance expectancy is captured in section 3.8. In order to enquire about the above mentioned research question using the UTAUT construct of performance expectancy several questions were included in the research

instruments. In the Survey Questionnaire for Academics at Selected Zimbabwean State Universities (Appendix 1) questions 34, 35, 36, 37, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 69, 70, 71, and 72 all measure different aspects of attitudes and perceptions of academics at Zimbabwean State Universities using the performance expectancy parameters of the UTAUT model. As a way of balancing and verifying the responses that were given by academics, the researcher sought to apply the same construct in interviews with Faculty Librarians and Sub-Librarians. Appendix 2 (Interview Guide with Faculty Librarians at Selected Zimbabwean State Universities) contains questions 19, 20, 21, and 22 that measure this attribute of UTAUT. In Appendix 3 (Interview Guide with Sub-Librarians for Reader Services at Selected Zimbabwean State Universities) questions 17, 18, 19, and 20 are meant to measure attitudes and perceptions of academics towards peer reviewed electronic journals and thereby applying the performance expectancy construct of UTAUT.

2.6.2.2 Effort Expectancy

Effort expectancy is defined as the degree of ease associated with the use of the system. The three constructs from the different models that pertain to effort expectancy are: perceived ease of use, complexity, and ease of use. Table 3 below shows the root constructs of effort expectancy and their root models and definitions:

Table 3: Effort expectancy: Root constructs, root models and definitions

Root Construct	Root Model	Definition
Perceived Ease of Use	Technology Acceptance Model (TAM)	The degree to which a person believes that using a system would be free of effort (Davies, 1989; Davies et al., 1989).
Complexity	Model of Personal Computer Utilisation (MPCU)	The degree to which a system is perceived as relatively difficult to understand and use (Thompson, Higgins and Howell, 1991).
Ease of Use	Diffusion of Innovations (DOI)	The degree to which an innovation is perceived as being difficult to use (Moore and Benbasat, 1991; Rogers, 1995; Rogers, 2003).

Source: Venkatesh et al. (2003:451)

The constructs of perceived ease of use, complexity, and ease of use which were used to come up with the effort expectancy construct of UTAUT were recognised to be similar in nature by researchers such as Davies et al. (1989), Moore and Bebbasat (1991), Thompson, Higgins and Howell (1991), and Plouffe, Hulland and Vandenbosch (2000).

The effort expectancy construct within each model is significant in the context of voluntary and mandatory usage. However, the construct is significant only during the first time period (post training), becoming insignificant over periods of extended and sustained usage. Effort-oriented constructs are expected to be more salient in the early stages of a new behaviour, when process issues represent hurdles to be overcome, and later become overshadowed by instrumentality concerns (Davis et al., 1989; Szajina, 1996; Venkatesh, 1999).

Venkatesh and Morris (2000) suggest that effort expectancy is more salient for women than for men. Also, increased age has been shown to be associated with difficulty in processing complex stimuli and allocating attention to information on the job (Plude and Hoyer, 1985), both of which may be necessary when using software systems. Prior research supports the notion that constructs related to effort expectancy will be stronger determinants of individuals' intention for women (Venkatesh and Morris, 2000; Venkatesh et al., 2000) and for older workers (Morris and Venkatesh, 2000).

In this study, the effort expectancy construct, together with another construct, facilitating conditions, influenced the second research question of this study: **What is the extent of use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?** Literature that addresses this research question and the construct under discussion is found in Chapter 3 under sections 3.6.1 and 3.6.2. The Survey Questionnaire for Academics at Selected Zimbabwean State Universities (Appendix 1) includes questions: 73, 74, 75, and 76 that measure the influence of effort expectancy on adoption and use of peer reviewed electronic journals by academics. Effort expectancy was crucial in addressing the mentioned research question because it affects usage intention and usage behaviour of academics.

2.6.2.3 Social Influence

Social influence is defined as the degree to which an individual perceives that important others believe he or she should use the new system. The three constructs from the different models that pertain to social influence are: subjective norm, social factors, and image. Table 4 below shows the root constructs of social influence and their root models and definitions:

Table 4: Social influence: Root constructs, root models and definitions

Root Construct	Root Model	Definition
Subjective Norm	Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TPB)	The person's perception that most people who are important to him think he should or should not perform the behaviour in question (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980; Davis et al., 1989; Ajzen, 1991).
Social Factors	Model of Personal Computer Utilisation (MPCU)	The individual's internalisation of the reference group's subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations (Thompson, Higgins and Howell, 1991).
Image	Diffusion of Innovations (DOI)	The degree to which use of an innovation is perceived to enhance one's image or status in one's social system (Moore and Benbasat, 1991; Rogers, 1995; Rogers, 2003).

Source: Venkatesh et al. (2003:452)

Thompson, Higgins and Howell (1991) used the term 'social norms' in defining their construct and acknowledge its similarity to subjective norm within TRA. While they have different labels, each of these constructs contains the explicit or implicit notion that the individual's behaviour is influenced by the way in which they believe others will view them as a result of having used the technology. None of the social influence constructs are significant in voluntary contexts; however, each becomes significant when use is mandated. Venkatesh and Davis (2000) suggested that such effects could be attributed to compliance in mandatory contexts. This compliance causes social influences to have a direct effect on intention. In contrast, social

influence in voluntary contexts operated by influencing perceptions about the technology. In mandatory settings, social influence is important only in the beginning. The role erodes over time and eventually becomes insignificant with sustained usage (Venkatesh and Davis, 2000).

The role of social influence in technology acceptance decisions is complex. It is subject to a wide range of influences (Venkatesh et al., 2003). Social influence has an impact on individual behaviour through three mechanisms: compliance, internalisation, and identification (Venkatesh and Davis, 2000). Internalisation and identification relate to altering an individual's belief structure. This causes an individual to respond to potential social status gains, while, the compliance mechanism causes an individual to simply alter his or her intention in response to the social pressure. Research suggests that individuals are more likely to comply with others' expectations when those referent others have the ability to reward the desired behaviour or punish non-behaviour (Warshaw, 1980).

The social influence construct supported another construct, facilitating conditions, in addressing the fourth research question of this study: **What factors influence the behaviour of academics at selected Zimbabwean State Universities towards peer reviewed electronic journals?** To this end the Survey Questionnaire for Academics at Selected Zimbabwean State Universities (Appendix 1) includes questions: 46, 47, 77, 78, 79, and 80 which helped to determine the effect of referents or others on the adoption and use of peer reviewed electronic journals by academics.

2.6.2.4 Facilitating Conditions

Facilitating conditions are defined as the degree to which an individual believes that organisational and technical structure exists to support his or her use of the system. The three constructs from the different models that pertain to facilitating conditions are: perceived behavioural control, facilitating conditions, and compatibility.

Table 5 below shows the root constructs of facilitating conditions and their root models and definitions:

Table 5: Facilitating conditions: Root constructs, root models and definitions

Root Construct	Root Model	Definition
Perceived Behavioural Control	Theory of Planned Behaviour (TPB)	Perceptions of internal and external constraints on behaviour and encompasses self efficacy, resource facilitating conditions, and technology facilitating conditions (Ajzen, 1991; Taylor and Todd, 1995).
Facilitating Conditions	Model of Personal Computer Utilisation (MPCU)	Objective factors in the environment that observers agree simplify an act, including the provision of computer support (Thompson, Higgins and Howell, 1991).
Compatibility	Diffusion of Innovations (DOI)	The degree to which an innovation is perceived as being consistent with existing values, needs and experiences of potential users (Moore and Benbasat, 1991; Rogers, 1995; Rogers, 2003).

Source: Venkatesh et al. (2003:454)

The facilitating conditions construct has a huge bearing on the adoption and use of peer reviewed electronic journals by academics (Ondari-Okemwa, 2004; Adomi, 2005; Ashcroft and Watts, 2005; Oduwole and Sowale, 2006; Bayugo and Agbeko, 2007, Shija, 2009; Salaam and Aderibidge, 2010). The construct was used to address all the research questions of this study as justified below.

The first research question focuses on the awareness of peer reviewed electronic journals by academics. The issue of awareness is linked to facilitating conditions. A potential user can only be aware of a technology that has been introduced in their organisation if the organisational structure, value system, and conduct deliberately promote that technology through the employment of clear marketing strategies (Pullinger, 1999; Bevilacqua, 2005; Salaam and Aderibidge, 2010). The second research question examined the extent of use of peer reviewed electronic journals at selected Zimbabwean State Universities. Extent of use of a technology is tied to facilitating conditions. The more there are barriers to use the more target users resent use of that technology (Nelson, 2001; Blecic and Weller, 2002; Agaba, Kigongo-Bukenya and Nyumba, 2004; Watts and Ibegbulam, 2006; Negahban and Talawar, 2009; Shija, 2009; INASP,

2011; Isah, 2011). The issue of barriers to use is discussed at length in Chapter 3 (Literature Review) in sections 3.6.3 and 3.9. The third research question covered attitudes and perceptions of academics towards peer reviewed electronic journals. These attitudes and perceptions are in part, shaped by the state of facilitating conditions (Kigongo-Bukenya and Nyumba, 2004; Salaam and Aderibidge, 2010). Academics who feel unsupported in their quest to use electronic journals will develop negative attitudes towards the technology. However, when conditions are conducive the positive attitudes can easily be nurtured. The fourth research question probed factors that influence the behaviour of academics towards peer reviewed electronic journals. In order to examine these factors it is important to examine facilitating conditions. The fifth research question focuses on the strategies used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics. These strategies are meant to create awareness, promote use and foster conducive conditions for the use of these resources (Pullinger, 1999; Lock, Cornell and Colling, 2001; Nelson, 2001; Stark, 2001; Wolf, 2001; Smith, 2003; Bevilacqua, 2005). The facilitating conditions construct was important in addressing this question as well.

All research instruments of this study include some questions informed by the facilitating conditions construct. The Survey Questionnaire for Academics at Selected Zimbabwean State Universities (Appendix 1) includes the following facilitating conditions linked questions: 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 81, 82, and 83. Section C of the Interview Guide with Faculty Librarians at Selected Zimbabwean State Universities (Appendix 2) is informed by this construct. The construct also informs Section C of the Interview Guide with Sub-Librarians Responsible for Reader Services at Selected Zimbabwean State Universities (Appendix 3). The construct also influenced the Interview Guide with Systems Librarians at Selected Zimbabwean State Universities (Appendix 4). This was through questions 3, 4, 5, 6, and 8. Finally, the Interview Guide with Librarians at Selected Zimbabwean State Universities (Appendix 5) included the facilitating conditions construct through question 3.

2.7 Conceptual Model for the Study: Adding another moderator to UTAUT

The argument about the suitability and application of UTAUT to this study has been articulated in the foregoing discussion. The relevance of the four major constructs of UTAUT (performance

expectancy, effort expectancy, social influence, and facilitating conditions) has been justified. The discussion has also shown that the effect of the four constructs of UTAUT on behavioural intention and usage behaviour is moderated by gender, age, experience, and voluntariness of use. However, literature suggests another key moderator in the study of adoption and use of electronic journals by academics in institutions of higher education. The *discipline* of an academic has a bearing on his or her adoption and use of electronic journals. Studies from outside Africa that have proved the influence of discipline on adoption and use of electronic journals include those of Eason, Charter, Harter, Pomfett, Philips and Richardson (1997), Bar-llan, Peritz and Wolman (2003), Gargiulo, Conti, Contino, Farinelli and Marquardt (2003), Tenopir (2003), Ibrahim (2004), Kemp and Jones (2007), and Sarasvady and Khatri (2007).

Studies that were carried out in Africa that have also shown the effect of discipline on adoption and use of electronic journals by academics include those of Kigongo-Bukenya and Nyumba (2004), Oduwole and Sowole (2006), Bayugo and Agbeko (2007), Manda (2008), Obaje (2008), Owolabi and Agboola (2010), Salaam and Aderibidge (2010), Omatayo (2010), Harle (2010), Egberongbe (2011), and Gikandi and Ndingu (2011). The point that these researchers make is that academics from disciplines such as History, Archaeology, Social Sciences, and Psychology for example have different adoption and use habits of electronic journals from academics in disciplines such as Chemistry, Physics, Geography, and Engineering, for example. Thorough discussion of the arguments associated with this debate has been done in Chapter 3 (Literature Review) under section 3.7.1 and is therefore not repeated here.

The researcher, therefore, proposes that discipline has a moderating effect on two constructs of UTAUT: performance expectancy and effort expectancy. Literature suggests that these two constructs are amenable to moderation by the discipline of an academic. While the study adopts the UTAUT model as has already been discussed the researcher wishes to modify it slightly as shown in Figure 7 below:

Performance
Expectancy

Effort
Expectancy

Social Influence

Facilitating
Conditions

Behavioural
Intention

Use Behaviour

Gender

Age

Experience

Discipline

Voluntariness
of use
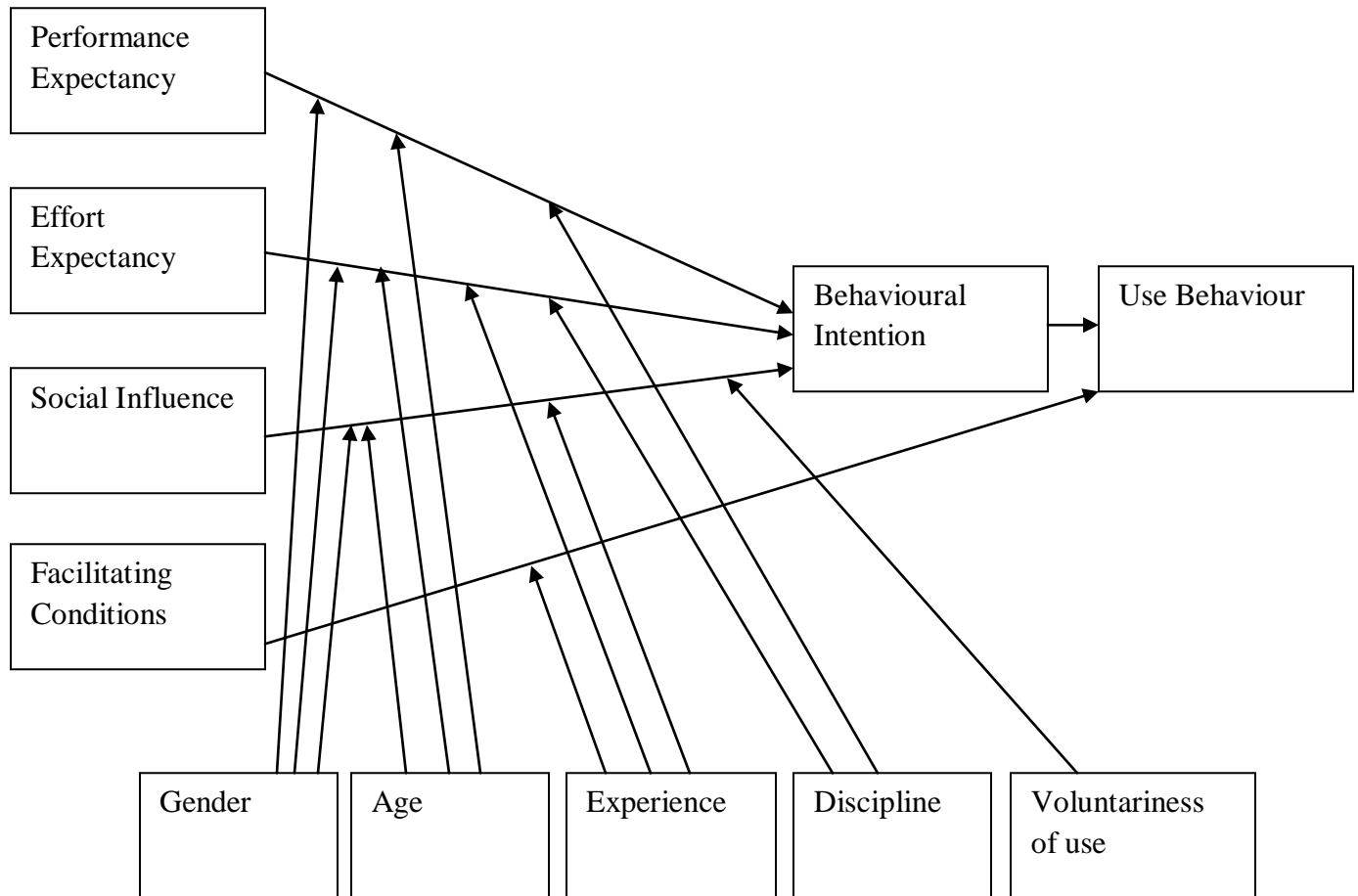
Figure 7: A conceptual model: The updated Unified Theory of Acceptance and Use of
Technology (Venkatesh et al., 2003)

The discipline variable is investigated in this study to show its influence in the updated model.
To this end, question 2 of the questionnaire asked the respondents to indicate both their
institution and their Faculty.

2.8   Summary

The chapter explained the role of theory in research. Theory helps to explain, or predict
phenomena that occur in the world. The theoretical framework identifies the theory which
undergirds a given study. It connects the researcher to existing knowledge and guides the
research by determining what will be looked for. Theoretical frameworks are important in
quantitative, qualitative and mixed methods studies. Theories relevant to the study of the

adoption and use of electronic journals were identified as: Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), Technology Acceptance Model (TAM), Diffusion of Innovation (DOI), and Unified Theory of Acceptance and Use of Technology, which is the theory used for this study. These theories were discussed and their strengths and weaknesses outlined. The superiority of UTAUT as a preferred, inclusive and flexible model was highlighted and its use in this study fully justified. The researcher proposed an additional moderator to the UTAUT, *discipline*. In justifying UTAUT cross referencing was done with research questions, Chapter 3 (Literature Review) and the research instruments that were used to collect data. This was done to show the unity and focus of the study.

CHAPTER 3

LITERATURE REVIEW

3.1   Introduction

The chapter provides a comprehensive review of literature that addresses the problem and objectives of the study. It is a critical examination, evaluation, analysis, and synthesis of literature relating to the adoption and use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities. The literature that addresses academics' level of awareness of peer reviewed electronic journals, level of use, attitudes and perceptions, factors influencing behavior towards electronic journals, and strategies used by universities to promote peer reviewed electronic journals is given priority in this review. The choice of literature was influenced by two factors: The need to capture the research problem, purpose, and objectives of the study and also the need to relate literature to the attributes of the theory adopted for this study.

The purpose of the study was to investigate the adoption and use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities. The research questions addressed in the study are as follows:

1. What is the level of awareness of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?
2. What is the extent of use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?
3. What are the attitudes and perceptions of academics towards peer reviewed electronic journals?
4. What factors influence the behaviour of academics at selected Zimbabwean State Universities towards peer reviewed electronic journals?
5. What strategies are used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics?

The study adopted the Unified Theory of Acceptance and Use of Technology (UTAUT). The major attributes of this theory also informed the literature reviewed. These are performance

expectancy, effort expectancy, social influence, facilitating conditions, usage behaviour, adoption, and user intentions.

3.2   Sources of Literature

Literature was drawn from both print and electronic sources through the following avenues: articles in refereed international journals, articles in refereed national journals, chapters in edited books, conference papers, research reports, workshop and seminar presentations, PhD and Masters' dissertations and articles in non-refereed journals.

Reviewed literature emanates from both developed and developing countries. The literature from Africa was crucial owing to its proximity to the geographical context of the study. The review was informed by literature from North America, Europe, Asia, the Middle East, and African countries such as Nigeria, Uganda, Kenya, Tanzania, Malawi, Rwanda, and Ethiopia. The geographical setting of the study is Zimbabwe. The review should have included literature generated in that country. However, there is not much available literature in Zimbabwe about the subject. In most instances, literature has been cited from other African countries.

3.3   Purpose of Literature Review

A literature review is a critical summary and assessment of the range of existing materials dealing with knowledge and understanding in a given field (Blaxter, Hughes and Tight, 1996; Graham and Neil, 1998; Wilkinson, 2000). Its purpose is to locate the research project, to form its context, background or foundation, and to provide insights into previous work. It helps to place the work of the researcher in the context of what has already been done. It allows for comparisons to be made and provides a framework for further research (Blaxter, Hughes and Tight, 1996).

The literature search and subsequent review can be of value to researchers. It helps them to regard their studies as contributions to a larger topic of which inquiry at hand is only a part, rather than isolated or esoteric collections of facts. This view is supported by Punch (2000:42) and Jankowicz (2000:159). They noted that knowledge does not exist in a vacuum, and that a researcher's work only has value in relation to other people. Wilkinson (2000:25) reinforces this.

He argues that a researcher's work will only be valued if it is apparent that it has been informed by, and has expanded upon, a rigorous and thorough attention to similar works undertaken in the past.

Nyagah (1995:167) lauds the literature review for its ability to inform the researcher of approaches that have failed before as well as identifying new trends in the field of study. Kumar (2005:30) supports Nyagah's view when he notes that literature review improves a researcher's methodology, brings clarity and focuses the research problem, broadens the knowledge base in the research area, and contextualises the researcher's findings. Busha and Harter (1980:19) give a summarised list of the importance of a literature review. The list, which is confirmed by Gray (2004:52) notes that a literature review:

    i.   Helps to narrow and more clearly delineate the research problem;

    ii.   Reveals overlooked conclusions and facts that ought to be taken into consideration before a research project is actually initiated;

    iii.   Suggests new approaches to the planning of investigations;

    iv.   Uncovers methodologies that were used successfully by other research workers;

    v.   Helps in the determination of the degree to which particular problems have already been investigated; and,

    vi.   Assists investigators to develop firmer understanding of theoretical implications of proposed inquiries.

The literature review is crucial and indispensable in the work of any serious researcher. However, Bless and Higson (2000:12) warn researchers against being unduly influenced by the results of previous research. A literature review may prejudice the manner in which one may conduct assessments in one's research. This may influence the researcher to accept what happened before without making critical judgment, a deterrent to visualising new opportunities.

The rest of this chapter is organised as follows:

- Firstly, the researcher addresses the emergence of electronic journals in scholarship;
- Secondly, the features of electronic journals and their benefit to academics are highlighted;

- Thirdly, the researcher addresses the adoption and use of electronic journals by academics. This includes the moderating factors to the adoption and use of electronic journals. This is consistent with the UTAUT model adopted for this study;
- Fourthly, the attitudes and perceptions of academics towards electronic journals are surveyed;
- Fifthly, the barriers to adoption and use of electronic journals are examined; and,
- Sixthly, the strategies used by libraries to promote electronic journals are pinpointed.

The chapter closes with a summary that brings out strengths, weaknesses, and gaps in literature and makes clear statements about how this research fills the gaps identified. The researcher shows the relevance of the literature discussed by cross-referencing it with research questions, UTAUT model, and research instruments.

3.4   The Emergence of Electronic Journals in Scholarship

Peer reviewed electronic journals first appeared in the academia in the 1990s as publishing, librarianship, and research and scholarship focused on new levels in a mutually beneficial tripartite relationship. Hovav and Gray (2002) note that the 1990s were characterised by a genesis of the widespread use of the World Wide Web (www), a development which made electronic publishing possible. However, some authors like Turoff (1978) and Turoff and Hiltz (1982) observed that electronic publishing evolved much earlier in the 1970s. These seemingly minor and insignificant maneuvers only found full manifestation and expression about two decades later.

Electronic publishing was desirable for publishers because it would result in fewer overheads, for example, they would save money and time spent on printing and distribution. Publishers would achieve faster publication as products were sent all over the world in a matter of seconds thus achieving wider visibility. This was impossible were they purely depending on their print products (Secker and Price, 2004). Librarians welcomed the development as it solved some of their problems like the increasing costs of print journals, space and shelving problems, damage and loss of library resources, and lack of access to a wide range of information resources. It was evident that with their resources and space limitations libraries were not able to physically

acquire every resource that their users, particularly in university settings would want (Simmonds and Andaleeb, 2001; Tenopir, 2003). Electronic journals offered an opportunity to deal with some of the libraries' challenges and inadequacies.

Kidd (2002) claims that the adoption of peer reviewed electronic journals by university libraries is a universal phenomenon although adoption levels may vary from continent to continent and from country to country. He points out that, in developed countries like the United Kingdom, large university and research libraries cancelled print journals in favour of online versions. In Africa, many university libraries benefitted from peer reviewed electronic journals at the turn of the millennium. They formed consortia which benefitted from group arrangements of institutions offering electronic journals such as the International Network for the Availability of Scientific Publications (INASP), World Health Organisation (WHO), Food and Agricultural Organisation (FAO), United Nations Environment Programme (UNEP), Online Access to Research in the Environment (OARE), Access to Global Online Research in Agriculture (AGORA), and Electronic Information for all Libraries (EIFL) (Dadzie, 2005; Manda, 2008; Shija, 2009; Harle, 2010). Examples of African countries that have benefitted from some of these initiatives include Ethiopia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Nigeria, Rwanda, Tanzania, Uganda, Zambia, and Zimbabwe (Dadzie, 2005; Ani and Ahiauzu, 2008; Manda, 2008; Harle, 2010; Egberongbe, 2011; INASP, 2012).

Kidd's (2002) assertion of universality in the adoption of peer reviewed electronic journals in universities is confirmed by a number of authors:
- Negahban and Talawar (2009) noted that electronic journals have become the backbone of many academic institutions in Iran;
- Bar-llan, Peritz and Wolman (2003) wrote about the adoption and use of electronic journals in Israeli universities;
- Zainab, Huzaimah and Ang (2006) reported on the adoption of electronic journals in Malaysia;
- Voorbij and Ongering (2006) noted that electronic journals were also used in the Netherlands;

- Borrego, Anglada, Barrios and Cornellas (2007) reported on the adoption and use of electronic journals in Spain;

- Bevilacqua (2005) highlighted the electronic journals' usage in Italy;

- Ibrahim (2004) reported on the adoption and use of electronic journals in the United Arab Emirates (UAE);

- Fulton (1991) predicted the coming of electronic journals to Australia;

- Mahe, Andrys and Chartron (2000) noted that electronic journals were also used in France;

- Monopoli, Nicholas, Georgiou and Korfiati (2002) stated that Greece also benefitted from electronic journals;

- Saeed, Asghar, Anwa and Ramzan (2003) saw the adoption and use of electronic journals in Pakistan;

- Zhang, Ye and Liu (2010) wrote about the adoption and use of electronic journals in China;

- Kumar and Kumar (2010) noted the adoption and use of electronic journals in India;

- INASP (2012) boasts of its existence in Latin American countries of Bolivia, Cuba, El Salvador, Hondurus, and Nicaragua as well as Asian Pacific countries of Bangladesh, Nepal, Sri Lanka, and Vietnam; and,

- Authors like Lenares (1999), Dillon and Hahn (2002) and Tenopir (2003) expressed the adoption and use of electronic journals in the United States of America.

So powerful was the uptake of electronic journals in the United States of America that Robert Bovenschulte, Director of the American Chemical Publications Division predicted in 1998 that electronic journals would dominate the serials marketplace within ten years (Wilkinson, 1998). Peter Boyce of the American Astronomical Society was even more optimistic. He predicted in 1998 that within three years, electronic access to journals would supplant print (Lenares, 1999). While these predictions may have been overly ambitious, there is clear evidence that the adoption of electronic journals in universities is universal across the globe.

**3.5	Features of Electronic Journals and their Benefit to Academics**

Literature reviewed under this section provides an insight into features and characteristics of electronic journals. These influence the behaviour of academics towards peer reviewed electronic journals. This section of literature review therefore helps to address research question number 4. In addition, the section addresses the following constructs of UTAUT: performance expectancy, social influence and facilitating conditions, constructs that have been discussed in sections 2.6.2.1, 2.6.2.3, and 2.6.2.4 respectively. Furthermore this section addresses the following questions in the questionnaire (Appendix 1): 65, 69, 70, 71, and 72.

University academics are a critical component in scholarship and need to rely on timely and efficient information to succeed in their multifaceted work. Van Zijl (2005) points out that academics have multiple functions, all of which necessitates their adoption and use of electronic journals. Firstly, academics must be involved in teaching students and other researchers. This means that academics must be knowledgeable about their disciplines. Secondly, academics are perpetual learners, who, apart from striving to stay ahead of their students, are in continual pursuit of higher qualifications. Thirdly, academics are central in the process of scholarly communication and are involved in creating, manipulating, and using information. Fourthly, academics are researchers. Morse and Clintworth (2000) refer to academics as a 'unique population' that relies on recent and timely information thereby necessitating their adoption of electronic journals that meet these qualities. It is necessary, therefore, to explore the features and characteristics of electronic journals and show their benefit to academics. This is consistent with the UTAUT model which notes that users will only adopt a technological development if they feel that their performance would be enhanced as a result of the new technology (performance expectancy):

**3.5.1	Electronic Journals in Improving Scholarly Efficiency**

Several authors agree that electronic journals provide faster and easier access to information than the print journals (SUL, 2001; Kidd, 2002; Agaba, Kigongo-Bukenya and Nyumba, 2004; Said, 2006; Negahban and Talawar, 2009). In an ethnographic study at Stanford University, academics pointed out that access to electronic articles speeded up the process of searching and retrieving relevant scholarly material (SUL, 2001). Electronic journals improve the efficiency of

scholarship by enabling searching, browsing, scanning, and retrieval of articles in a fast way, thereby making academics more productive in their work. Electronic searching also has the capacity to yield more results in a single search session. This is more efficient than traditional means of searching for information (SUL, 2001; Tenopir, 2003).

3.5.2   Electronic Journals in Enriching Scholarship

Electronic journals enrich the scholarship experience by exposing academics to a wider array of articles and by enabling them to retrieve articles they would otherwise not have accessed. Rather than accessing information in just one format, electronic journals enable information to be presented in new formats and new arenas making it more accessible and more visible. Electronic journals achieve wider circulation than print journals (INASP, 2005). This allows for more intense engagement among different scholars in different parts of the world, thereby promoting debate and collaborative enquiry of pertinent issues. Through this engagement and collaboration, academics are able to ensure transparency, accuracy, and scientific validity of research work (SUL, 2001). The wider circulation of these resources prevents duplication of research. Academics are aware of work that has already been done, thereby, positioning them to enrich the scholarship process by improving on current research rather than duplicate.

3.5.3 Electronic Journals in Improving the Flexibility of Academics

Electronic journals can act both as microscope and a telescope for academics in that they allow for both deep, narrow searching in a discipline and broad searching covering the periphery of subfields and distinct disciplines (SUL, 2001; Vaughan, 2003). This makes academics more flexible. They are no longer restricted to their core disciplines but can take the risk to explore the boundaries of their disciplines, encroaching into related fields and thereby further enriching the academic experience. The electronic environment, can therefore, be said to facilitate interdisciplinary research while helping the researcher to make connections to other fields. This virtue places research in a broader context and eliminates the limitations associated with the traditional environment.

3.5.4 Searchability and Navigability

One of the greatest benefits of electronic journals is their searchability. Egbal (2007) points out that one of the greatest blessings of electronic journals is their ability to support searching capabilities. One can search for an article using different avenues. This includes title, author, subject and keywords. The search can relate to several electronic journals at the same time. This allows for an opportunity to find more articles related to the issues of interest (Nelson, 2001; Obaje and Camble, 2008; Omatayo, 2010). Researchers also get in-built assistance when they conduct electronic searches. They receive suggestions of search terms to query and they are directed to relevant articles from a broad base of journals. Electronic journals offer facilities such as integrated text, hypertext links and multimedia to further enrich the searching experience (Agaba, Kigongo-Bukenya and Nyumba, 2004).

Authors also point out the navigability feature of electronic journals (Ibrahim, 2004; Nicholas, Huntington and Jamali, 2007; Veeramani and Vinayagamoorthy, 2010; Shahmohammadi, 2012). In an electronic environment researchers can easily and seamlessly move within a journal, within an article and across journals. One, can, for example, follow links provided in the article and return to previous reading. One can read an abstract in one article and choose to navigate to another abstract in a related article. One can easily be directed to other work by the same author and can easily follow links in the references section to get to the source of arguments raised by an author. It is possible to navigate between and from, text to audio, to video in the same article thus giving the researcher different angles of understanding the information they are seeking. Academics find these capabilities quite helpful (Upadhyay and Chakraborty, 2008).

3.5.5 Remote Accessibility

In the print environment, academics are limited by their geographical positions. A journal has to be physically available in their library or they have to physically receive a personally subscribed copy in order to benefit. However, with electronic journals geographical boundaries do not restrict access. Academics, particularly in Africa, have come to benefit from rich holdings of the developed world through online access, something that they could only dream of in the traditional environment. Several authors (Rosenberg, 2005; Dadzie, 2008; Isah, 2010; Vasishta and Navivoti, 2011) commend electronic journals for their ability to break down geographical

barriers and reach previously disadvantaged researchers in the developing parts of the world. These authors agree that although a continent like Africa grapples with infrastructural challenges which militate against use of electronic journals, a lot of benefit has already been derived from remote accessibility of research resources.

Remote accessibility has enhanced the speed and convenience of research as academics and other researchers no longer have to visit the library in order to get information (Tomney and Burton, 1998; Tenopir, 2003; Ani, 2008). Researchers can access information from their offices, in Internet cafes, from their homes, and while travelling, whether or not the library is open (Lenares, 1999; Eqbal, 2007).

3.5.6 Concurrent Access

Another feature of electronic journals is that they enable simultaneous access to one article. In the print environment academics, especially of poor universities that cannot subscribe to many copies, have to take turns to access a particular journal. This delays research and introduces frustrations. Researchers are hurried because a number of users wait for the same journal. In the electronic environment one user's access of a resource does not affect the access of another. Kumar and Kumar (2008) point out that, concurrent access allows electronic journals to be more important for the academic community. Morse and Clintworth (2000) note that simultaneous access allowed electronic journals to be used more often than print resources. The inconvenience of having to take turns to conduct research has been removed by the introduction of electronic journals.

3.5.7 No Lost or Damaged Resources

In the traditional environment academics constantly have to put up with issues of lost or damaged resources. One may fail to get a journal, not because the library does not subscribe to it, but because it is lost. In an effort to benefit beyond the confines of the library some users either smuggle journals out of the library if security is lax, or help themselves to articles of interest, thereby depriving others of the opportunity to benefit from the same resources. Some cases also include mis-shelving of library materials which makes it inaccessible to users. All these cases do not arise in the electronic environment. Academics are assured of access to the resources they

want as long as they are connected to the Internet and the institution has subscribed to the resources (Shija, 2009).

3.5.8 Currency of Information

Negahban and Talawar (2009) suggest that the use of electronic resources by academics is necessary as in comparison to print resources. The electronic resources provide better, faster, and easier access to information. Electronic information resources can be trusted to give timely information thereby upholding the quote: 'right information to right user at the right time', a creed that established librarianship. Electronic journals improve the quality of the research and of the pedagogical process by affording researchers access to cutting edge information in their disciplines. There are claims that electronic journals shorten the time between submission and publication of articles thereby making sure that published material is really current (SUL, 2001). Kortelainene (2004) argues that electronic publishing speeds the publishing process, as manuscripts can be published 'only days after acceptance'. The currency feature of electronic journals is especially crucial in the ever changing disciplines of management, science, and technology (Thanuskodi, 2011). Not only is there speed in publishing, but the electronic environment allow for faster dissemination of information as well (Shija, 2009; Thanuskodi, 2011). This is impossible in a traditional environment.

3.5.9 Manipulability

A particularly important feature of electronic journals that clearly sets them apart from traditional print resources is their manipulability. Users are able to save their research results, they can send retrieved articles to their email accounts, and they can choose to print their findings. They can highlight certain portions of their electronic documents for easier reference. They can also highlight certain words and phrases. Users can even manipulate font size, colour of text and background colour. This is very helpful in affording access to the visually impaired who may want to work with bigger font sizes (Ani, 2008; Shija, 2009). Electronic journals therefore can be regarded as more user friendly than print, which is generally difficult to manipulate.

3.6   Adoption and Use of Electronic Journals by Academics

Literature reviewed under this section addresses the adoption and use of electronic journals by academics and therefore deals with research question number 2. In dealing with research question 2, the section also deals with the UTAUT construct of effort expectancy, and the resultant user intentions and behaviour as discussed in section 2.6.2.2. The section also addresses the overarching construct of facilitating conditions as discussed in section 2.6.2.4. The questionnaire (Appendix 1) captures this section in questions 22–38, Appendix 2 (Interview Guide with Faculty Librarians at Selected Zimbabwean State Universities) captures questions relating to this section in Section B (questions 6 – 12), Appendix 3 (Interview Guide with Sub-Librarians Responsible for Reader Services at Selected Zimbabwean State Universities) has the questions in Section B (questions 7 – 11), Appendix 4 (Interview Guide with Systems Librarians at Selected Zimbabwean State Universities) considers the issue of adoption and use of electronic journals in question 2, and the Interview Guide with Librarians at Selected Zimbabwean State Universities (Appendix 5) includes question 6 which addresses this section.

3.6.1   Adoption

Research on the adoption of electronic journals show that scholars, especially those in science related disciplines, have accepted electronic journals. In a study of seven Israeli universities, Bar-llan, Peritz and Wolman (2003) discovered a high degree of acceptance of electronic journals. They, however, noted disparities among different age groups and different disciplines. In a later study, Bar-llan and Fink (2005) postulated that more than 80% of the academics at the Science Library of the Hebrew University frequently used electronic formats irrespective of their rank and age. Connell, Rogers and Diedrichs (2005) indicated that there was extensive use of electronic journals at Ohio State University. Academics in the sciences used electronic journals more extensively than other disciplines. Dilek-Kayaoglu (2008) in a survey at Instabul University in Turkey reported that many researchers supported the move from print to electronic format. Academics from the natural sciences required these resources more than those from other disciplines. In a study that covered several universities in the United Kingdom, Nelson (2001) stated that academics had eagerly adopted electronic journals.

Degener (1999) in his survey of health sciences academics noted that many had adopted electronic journals. The respondents in this study lauded the convenience and time-saving features of electronic journals. They also lauded the ease of searching and navigation among articles as well as the twenty four hour access from office, laboratory, and home. Some researchers cited the ability to print articles, including colour illustrations and figures, as reasons for their growing preference of the electronic media. Hahn, Speier, Palms and Wren (1999) wrote on a survey of three hundred business school faculty whose libraries were members of the Association of Research Libraries (ARL). The study revealed a slightly lower rate of adoption than that of the scientific community. Bar-llan, Peritz and Wolman (2003) concluded that adoption of electronic resources increases with time. They discovered in a 1997 study that only 21% of academics used electronic journals in Israel. However, in 1998 they found an adoption rate of 53% and in 2000 the number had grown to 75%.

Lenares (1999) reported on the findings of a survey of five hundred faculty members at twenty universities with ARL member libraries. The survey showed a growing acceptance of electronic journals by academics. For example, in 1999 Lenares discovered that 61% of academics in the ARL member institutions she surveyed had started using electronic journals. This is an increase from the 46% of academics who had reported adopting the same resources a year earlier, in 1998. An examination of Lenares' results by discipline shows that the number of academics using electronic journals had increased in all disciplines. The natural sciences showed a higher percentage of growth. This finding by Lenares is consistent with other early research findings by Budd and Connaway (1997:847), Morrow (1999:8), Pederson and Stockdale (1999:44), Rusch-Feja and Sieberky (1999), Nelson (2001), and Herman (2004:43). Academics in Lenares' study reported that the characteristics of convenience, timeliness and the ability to search text were the most important factors in their adoption of electronic journals. Brennan, Hurd, Blecic, and Weller (2002) found that enthusiastic adoption of electronic journals had altered the habit of academics. They were making fewer visits to the library and many claimed they were reading more than they did in the print era. Some academics stated that they were now reading more widely.

Whereas most literature from the developed world show a positive rate of adoption, some earlier studies also show some hesitation in some institutions. In 1999, only 36% of academics at Texas A & M University had adopted electronic journals (Tenner and Young, 1999). Of those disciplines that had electronic journals, only 42% of academics preferred these resources against 47% who still preferred print resources. Sixty-one percent of academics at the same time felt their library should continue to subscribe to print resources and not electronic resources. However, this earlier hesitation has since been reversed and institutions, especially in the developed world have welcomed electronic journals with open hands.

In Africa electronic journals were introduced much later than in Europe and America. The introduction of these resources was met with some acute hesitation at the beginning. This was due to challenges of access faced byacademics with many impediments spoiling the desire of African academics to use the resources. Authors like Utulu (2006), Manda and Mulkangara (2007), Shija (2009), and Harle (2010) have noted challenges involved in the adoption of electronic journals in Africa. These challenges include lack of adequate infrastructure, low bandwidth, electricity cuts, and lack of skills.

3.6.2   Use of Electronic Journals by Academics

Ibrahim (2004) defines use of electronic resources as "searching, browsing, examining, and visiting an electronic resource and/or service by a user". This is the view of use that is being taken in this study. Academics are using electronic journals for various purposes, with the most common uses being research and teaching (Brennan, Hurd, Blecic, and Weller, 2002). Ashcroft and Watts (2005) are of the view that electronic journals have had more impact on the research work of academics than on their teaching. After conducting a study of academics in the basic and health sciences at University of Illinois they concluded that, academics incorporated electronic journals in their lectures by assigning readings from these resources. They referred graduate students to these resources for their assignments. However, the resources were used more frequently in academics' own research work. Shahmohammadi (2012) report that academics use online electronic journals for various reasons. Obaje and Camble (2008) report that academics mostly use these resources to conduct literature searches while in the process of conducting their research. Omatayo (2010) in his survey conducted at Obafemi Awolowo University, Nigeria,

reported that many academics used electronic journals for literature searches in research and for professional development.

Borrego, Anglada, Barrios and Cornellas (2007) report that in the Catalan Universities in Spain, electronic journals were used for both research and teaching. However, the statistics revealed that academics were more inclined to use the resources for research rather than for teaching. The study found that 37.4% of academics used electronic journals only for research whereas a mere 2.7% used these resources for teaching only. Salaam and Aderibidge (2010) report that at the University of Agriculture, Nigeria 73.4% of those who use electronic journals use them to meet their research and publication needs, 58.9% use them in teaching, and 60.2% use them to keep abreast with current issues in their disciplines. At University of Chennai, India, most academics (71.22%) use the resources for research and writing papers (Thanuskodi, 2011). At Aligarh Muslim University (AMU) 90.24% of academics use electronic journals regularly for study and research, 84.55% use them to keep abreast with developments in their fields whereas at Banaras Hindu University (BHU) 91.81% of those academics using electronic journals use them for research and 84.48% use them to update their knowledge in their fields of specialisation. It is evident from the statistics that it is in the area of research, and not teaching, that electronic journals are used significantly. Those institutions that promote a culture of research have higher rates of electronic journals usage than those institutions which do not place much emphasis on research.

The use of electronic journals hasto be considered in terms of the levels or the extent of usage. Use of electronic journals has appreciated greatly from the time the resources were introduced when usage was low (Tenopir, 2003; Cox and Cox, 2010). In Africa, however, there are still alarmingly low levels of usage (Shija, 2009; Harle, 2010). While, in America, Europe and Asia there are higher rates of usage. In a study of 25 Italian institutions Gargiulo, Conti, Contino, Farinelli and Marquardt (2003) observed that 77.8% of academics used electronic journals at least once per week, 19.1% used the resources at least once per month, and 3.1% were not actively using the resources. At Aligarh Muslim University (AMU), India, 94.72% of academics are making heavy use of electronic journals with most using them daily (55.69%), others 2 to 3 times a week (20.33%), and others on a weekly basis (18.7%) with only 5.28% not making

effective use of the resources (Khan and Ahmad, 2009). At Banaras Hindu University (BHU) 95.25% of academics frequently use electronic journals, 47.84% use them daily, 26.69% use them 2 to 3 times a week, and 20.69% use them on a weekly basis. Only 4.75% of academics did not make much use of the resources (Khan and Ahmad, 2009). In Greece 97.4% used electronic journals regularly (Monopoli, Nicholas, Georgiou and Korfiati, 2002) and in the United Kingdom an average of 92% of academics are heavy users of electronic journals. In Iran, a study by Negahban and Talawar (2009) stated that 95.7% of academics relied on electronic journals while only 4.3% of them did not rely on the resources.

In Africa usage is low. A study by Salaam and Aderibidge (2010) revealed that at the University of Agriculture, Nigeria only 34.7% of academics made frequent use of electronic journals at the institution. At the University of Lagos usage was higher but still low when compared to usage in developed countries. Usage was recorded at 65.2% (Egberongbe, 2011). Other institutions in Africa use electronic resources infrequently (Oduwole and Sowole, 2006; Bayugo and Agbeko, 2007; Shija, 2009; Harle, 2010; Owolabi and Agboola, 2010). An in-depth exposition of the situation in Africa will be given in the section on barriers to electronic journals use.

3.6.3 Institutional Conditions and Use of Electronic Journals

The use of electronic journals must be examined in the context of institutional policies. These are important in determining the adoption and use of these resources. A study by Nelson (2001) at the University of West England opined that academics would be willing to use electronic journals more if their institution's policy encouraged the usage. Bevilacqua's (2005) University of Parma study discovered that institutional policies and the level of support that academics get from senior staff in their institutions determines the acceptability and success of these resources. In Bevilacqua's study, staff who felt supported used electronic journals more frequently than those who felt unsupported. Harle (2010) also concluded after a study of several universities in Africa that success of electronic journals depends on institutional processes and systems. He suggests that the politics of academic institutions need to be taken into account when promoting the use of electronic journals. This suggests that electronic journals have to find support at the highest level of institutions if they are to be taken seriously by academics. It is therefore important that senior members encourage the usage.

3.7 Moderating Factors to the Adoption and Use of Electronic Journals

The UTAUT model posits that there are moderators to the adoption and use of a technology. The model gives examples of moderators as gender, age experience, and voluntariness of use (Venkatesh, Morris, Davis and Davis, 2003). In this review the researcher considers the effect of moderators such as discipline, gender, and age. These moderators are considered crucial in determining the level of adoption and extent of use of electronic journals by academics (Bar-llan, Peritz and Wolman, 2003; Tenopir, 2003; Saikia, 2007). In discussing *discipline* as a moderator the researcher justifies the conceptual model proposed in section 2.7. The conceptual model proposed that *discipline* is a moderator in the same way as other moderators like gender, age and experience are. In order to capture the influence of these moderators the questionnaire includes the following questions: 2 (discipline), 6 (experience), 8 (gender), 9 (age), and 84 – 88 (voluntariness of use). This section concentrates on the following moderators: discipline, age, and gender. The moderator of voluntariness of use is discussed adequately in Chapter 2. There is inadequate literature on the moderator of experience. This study, however, addresses the gap.

3.7.1 Disciplinary Differences

Eason, Charter, Harker, Pomfett, Phillips and Richardson (1997) identified characteristics of disciplines that affect adoption and use of electronic journals. Disciplines like History, Archaeology, Social Sciences, Psychology, and Communication and Cultural Studies communicate their knowledge in text forms and if graphics are used they are basic and simple. These types of disciplines tend to consider printed journals as adequate for the representation of their needs and therefore they are slower to adopt and use electronic journals. This is in contrast to disciplines such as Chemistry, Physics, Geography, and Engineering, for example, which have embraced the use of multimedia in the representation of their information. In these disciplines the use of graphics, video, and animation is frequent and the use of electronic journals is easily accepted.

The natural sciences, which incorporate current issues and quick dissemination of research results, use electronic journals as they allow for faster publication and faster access. Disciplines that are concerned with currency of information and speed of dissemination are conducive to the adoption and use of electronic journals (Eason et al., 1997). In contrast, the humanities do not

place much emphasis on speed of publication nor do they place emphasis on currency. Many academics in the humanities have considerable interest in backlists and are more interested in ascertaining the quality and dependability of material before accepting it. In these disciplines the speed of publication is not important. Print journals seem adequate for these disciplines. Academics in some disciplines expect their students to have access to print journals in their training to enable the review and critique of articles. These disciplines include the Social Sciences and Humanities. They prefer to have physical journals and are inclined to be slower to adopt electronic journals (Eason et al., 1997). Disciplines in the natural sciences, engineering, and business do not require this review and critical analysis. They value electronic journals.

Several studies support the view of disciplinary differences in the adoption and use of electronic journals. Studies carried out in the UK by Kemp and Jones (2007) report a greater appreciation of electronic journals by academics in the disciplines of Physics, Engineering, Biological Sciences, and Mathematics. The researchers identified that the use of electronic journals in these disciplines was related to the use of specialist software that allowed for the use of moving 3D images and simulations. Kemp and Jones concluded that academics in the Sciences were more enthusiastic about electronic journals than those in Humanities. A study done in India by Sarasvady and Khatri (2007) confirmed that preference for electronic journals was related to the disciplines of scholars and their results indicated that preference was higher in Biomedicine and Engineering and much lower in Social Sciences. In this study, unlike the one done by Kemp and Jones in the UK quoted above, Mathematics posted low usage, ranking the same as Social Sciences. A study conducted by Ibrahim (2004) at the United Arab Emirates University (UAEU) demonstrated that the frequency of use of electronic journals was higher in the Colleges of Food Systems, Science, Business and Economics than in the Colleges of Humanities and Social Sciences. In Italy, Gargiulo, Conti, Contino, Farinelli and Marguardt (2003) revealed that disciplines in the sciences contributed most of the usage of electronic journals when they statistically ranked use by disciplines. In their ranking of electronic journals use Biology and Biomedical Sciences constitutes 24.6% of use, Engineering- 18%, Chemistry and Pharmacology- 13.7%, Medicine and Veterinary Sciences- 11.7%, Physics and Mathematics- 11.3%, Agricultural and Earth Sciences- 7.4%, and Social Sciences and Humanities and related fields

posted very lowly at 6.7% while the remaining 6.6% of usage could not easily be tied to any discipline.

Tenopir (2003) reviewed several electronic journals use studies and discovered that discipline was crucial to the adoption and use of these resources. Usage was particularly high in the natural sciences where usage rates of 83.3% could be achieved and low in the arts with usage wondering around 27.7%. Tenopir reports that in the High Wire eJust electronic journals' use studies, it was discovered that scholars in the fields of Medicine, Chemistry, Physics, Mathematics, and Business were early adopters of these resources and led the way in their use while those scholars in Social Sciences, Humanities, and Arts were hesitant and still showed low usage of the resources. Studies by Eqbal (2007) done at Aligarh Muslim University (AMU) revealed a higher prevalence of usage in the Faculty of Science and Faculty of Engineering with 27.96% of academics in the Faculty of Science reporting that they use electronic journals daily and 15.39% of Engineering academics also using the resources daily. Academics in both faculties use the resources 2 to 3 times a week and only 14.7% of academics in the Faculty of Science and 11.54% of academics in the Faculty of Engineering reported using the resources "occasionally". These rates of usage are normally not achieved in the Humanities, Social Sciences, and Arts. Bar-llan, Peritz and Wolman (2003) discovered in a study of Israeli universities that the disciplines in the Sciences exhibit higher level of usage than those in the Humanities, Social Sciences, and Arts. Studies conducted in different parts of Africa by researchers such as Kigongo-Bukenya and Nyumba (2004), Oduwole and Sowole (2006), Bayugo and Agbeko (2007), Manda (2008), Obaje (2008), Harle (2010), Omatayo (2010), Owolabi and Agboola (2010), Salaam and Aderibidge (2010), Egberongbe (2011), and Gikandi and Ndingu (2011) all show that there are disciplinary differences in the adoption and use of electronic journals. Like studies in America, Europe, and Asia, these studies also reveal that academics in the Sciences have more inclination to use electronic journals than those in the Humanities, Social Sciences and Arts.

3.7.2 Age
While there are studies that have not shown significant differences in the adoption and use of electronic journals according to users' age (Kortelainen, 2004; Bennett and Buhler, 2010;

Shahmohammadi, 2012) there is a lot of literature that shows that age has an impact on the adoption and use of electronic journals. Bar-llan and Fink (2005) concluded after extensive research that "increased age is inversely related to the use of electronic journals". That is, as one grows older the use of electronic journals decreases. Tenopir (2003) in her analysis of various electronic journal use studies noted that there was a strong correlation between age of users and adoption and usage rates. Younger users used the resources more frequently than the older users. Older scholars believed that electronic journals decreased the quality and rigour of research. They also tended to complain more of unfriendly interfaces than the young users. In a study that spanned institutions in east and southern Africa, Harle (2010) postulated that age does affect adoption and use of electronic journals. The younger academics showed more enthusiasm when using the resources, while older academics felt more comfortable with print.

In a wide scale study of university academics in India, Sarasvady and Khatri (2007) stated that those academics who are aged over fifty years were more attached to print journals and were very slow to accept and use electronic journals. The same study revealed that young users preferred electronic journals and showed much confidence in their abilities to effectively use the resources. They observed that academics aged over fifty years used electronic journals mainly for two reasons: teaching and research, whereas the young academics used the journals for study, teaching, research and carrier development. Gargiulo, Conti, Contino, Farinelli and Marquardt (2003) surveyed academics in 25 Italian institutions and discovered that a large percentage of the users of electronic journals fell in the 31-40 age range with 30.5% of usage. Academics under 30 used 26.1% and those in the 41-50 age group used 25.4% whereas those over 50 were the lowest at 18.1%. The Italian study resonates with the study by Bar-llan, Peritz and Wolman (2003) carried out at several Israeli universities. The Israeli study found that academics in their thirties and forties used electronic journals more than those above fifty years old. For example, 75.4% of academics in their thirties used electronic journals, 68% of those in their forties also use the resources but only 4.8% of those over fifty used the resources.

3.7.3 Gender

Literature is not conclusive on the effect of gender on the adoption and use of electronic journals. A perusal of studies on the subject of adoption and use of electronic journals by academics, in

both developed and developing countries, revealed that researchers do acknowledge that there is some effect (Sacks, Bellissino and Mergendoller, 1994; Waldman, 2003; Utulu, 2006; Manda and Mulkangara, 2007; Amkpa, 2007; McGinty and Moore, 2008; Bassi, 2010; Bassi and Camble, 2011). A study of academics in the Faculty of Education at Chennai University, India suggested that males were more frequent users of electronic journals (Thanuskodi, 2011). The study revealed that 34.61% of males used electronic journals daily compared to 13.54% of females. The majority of females used the resources sporadically. In contrast, males appeared more eager to use the resources and showed greater confidence. Only a very small proportion of male academics (3.29%) indicated they only used electronic journals intermittently while more females (8.34%) indicated they would only use electronic journals if they had no other option. This study concluded that male academics were more accepting of electronic journals than females. An earlier study by Bar-llan, Peritz and Wolman (2003) also concluded that male academics used electronic journals more than female academics in Israel. In that study, they discovered that 64.5% of male academics used electronic journals more frequently compared to 46.2% for females.

An analysis of electronic journals use studies by Tenopir (2003) revealed mixed results. Some studies suggested female academics were more frequent users of electronic journals. In one set of studies, for example, 80.4% of females reported using electronic journals for their research compared to 72% of males (Tenopir, 2003). Yet in other sets of studies reviewed by Tenopir gender differences were blurred. In some cases there were suggestions that female academics adopted electronic journals more readily than their male colleagues (Tenopir, 2003; Morse and Clintworth, 2008; Bennett and Buhler, 2010). However, once the adoption phase had passed subsequent usage was at a similar level (Nuangchalem, 2010). In a study of Greek academics by Monopoli, Nicholas, Georgiou and Korfiati (2002) both males and females seemed to show similar preference for electronic journals. Other researchers like Dilek-Kayaogulu (2008) who conducted studies in Turkey concluded that gender poses no significant electronic journals usage differences in academics. In a study of the Islamic Azad University in Iran, Shahmohammadi (2012) stated that there was no significant gender difference in the adoption and use of electronic journals. In Africa researchers were careful not to distinguish much between male and female

academics. There is therefore, not much literature on the subject (Manda and Mulkangara, 2007; McGinty and Moore, 2008; Bassi, 2010; and Bassi and Camble, 2011).

3.8   Attitudes and Perceptions of Academics Towards Electronic Journals

Literature reviewed under this section addresses research question number 3 which deals with attitudes and perceptions of academics towards peer reviewed electronic journals. The UTAUT construct relevant to this section is performance expectancy, discussed in section 2.6.2.1. Appendix 1 (Survey Questionnaire for Academics at Selected Zimbabwean State Universities) captures the issues of attitudes and perceptions in Section E (questions 52 – 68) aided by questions on performance expectancy (questions 69 – 72). Appendix 2 (Interview Guide with Faculty Librarians at Selected Zimbabwean State Universities) captures the questions in Section D (questions 19 – 22), and Appendix 3 (Interview Guide with Sub-Librarians Responsible for Reader Services at Selected Zimbabwean State Universities) also captures the issues in Section D (questions 17 – 20).

A study of attitudes and perceptions of academics towards electronic journals is important because these shape the acceptability, adoption, and use of the resources. The dynamics that influence attitudes and perceptions of academics towards electronic journals are numerous and in some instances complex for there is no one objective measure of attitudes and perceptions. Also, the mental processes that shape the attitudes of academics are not easy to pinpoint, as they are informed by different factors such as culture, age, discipline, and to a lesser extent, gender.

Earlier literature suggests that at the time of the introduction of electronic journals many academics, even in the developed world, were highly attached to print resources and were not comfortable with the envisaged dominance of electronic resources (Lenares, 1999). Electronic journals use studies that were done in the years 1997 to 2000 show a very poor perception of electronic journals by academics. However, a gradual change of attitudes saw wider acceptance of the resources inthe new millennium. At the time of the introduction of electronic journals, academics did not consider them as "real" publications worthy of their attention (Lenares, 1999). Electronic journals as sources of scholarly information were considered to be inferior to print resources. Also, scholars did not want to publish electronically as print publications were felt to

be superior. To compound this problem, universities were initially unwilling to consider submissions to electronic journals for tenure review (Budd and Connaway, 1997:846). The fact that the greatest scholars were not willing to publish electronically meant that even readers who followed the works of these scholars chose to stick with print for that is where they would get works by their preferred researchers. This scenario further threatened the survival and future of electronic journals in their early years such that it took a lot of optimism to give the resources a chance in academia.

Massey-Burzio (1999:632) found that humanists in particular were not willing to associate with electronic journals. They neither wanted to publish in them nor read them. However, a study by Nelson (2001:209) revealed that some academics began to gain confidence in the resources at the beginning of the new millennium. Another study by Herman (2001:433) revealed that 25% of academics in top United States universities were willing to switch to electronic journals. But the relationship between the changing attitudes for electronic resources and the continued reliance of scholars on print resources has not been solved yet. There is no agreement in literature as to whether the adoption of electronic journals is necessarily proved by a decrease in the use of print resources. Some researchers prefer to be neutral about the issue warning that the idea of a tradeoff between print and electronic formats of journals is misleading as both are important tools for the academic (SUL, 2001). This argument suggests that academics simply look for what is convenient and "what makes sense given their particular needs and strengths" (SUL, 2001:5). It is further argued that scholars do not see separate worlds of paper and electronic formats but work in an integrated media context. The present researcher wishes to interrogate literature further concerning the relationship between the acceptance and use of electronic journals and the continued use or lack thereof of print resources as a way of establishing attitudes and perceptions of academics towards electronic journals.

A study of literature shows conflicting results even in studies conducted at the same institution. For example, Chrzastowski (2003) conducted a survey at the University of Illinois, United States of America, in 2002 and discovered that print journals represented only 6% of all uses. The survey concluded that there had been a "stampede" to electronic journals at the expense of print journals. However, longitudinal studies conducted at the same institution (De Groote and

Dorsch, 2001; Shultz and Doranski, 2005; De Groote, 2008) came to a different conclusion. The studies revealed that electronic journals had been warmly received. However, academics were attached to print journals and would continue to use them along with electronic journals. Siebenberg, Galbraith and Brandy (2004) conducted a study at Washington State University and discovered that print journals were used more than prior to the advent of electronic journals. Brady, McCord and Galbraith (2006) conducted studies similar to Siebenberg, Galbraith and Brandy' and observed a cultural shift between the two studies. The later study showed that 94% of all journal uses was now via electronic format. At the Duke University Chemistry Library, Vaughan (2003) showed that between 1999 and 2000 the use of print journals decreased by almost 50% as academics and other users shifted to electronic journals. Rogers (2001) conducted longitudinal studies that spanned 1998, 1999, and 2000 at Ohio State University and concluded that academics were increasingly comfortable with electronic journals and were becoming less attached to print counterparts. These results seem to confirm a "law" given by Bar-llan and Fink (2005) that as attitudes and perceptions of academics towards electronic journals improve there is increased use of electronic resources and that, "the increased use of the electronic format corresponds with a decrease in the use of printed journals." But to leave the matter in a confusing state Bar-llan and Fink gave a further "law" that says, "the use of an electronic journal is not necessarily an indication of the preference of users, but may also occur because the traditional print format is no longer easily available".

To establish a position the researcher needs to review literature that unravels the mystery of whether the increased use of electronic journals that has been reported in some institutions is due to positive attitudes and perceptions of academics towards the resources, what one would call the "pulling power" of electronic journals due to their benefits, or that attitudes and perceptions have not really improved for the better but academics are experiencing a "push effect" to use electronic journals by reason of decreased accessibility of print journals. Morse and Clintworth (2000) did a study at Norris Medical Library, University of Southern California, to establish the preference of medical academics in regard to electronic resources as compared to print resources. They did this by comparing data from full-text offerings from Ovid Biomedical Journals with their print counterparts' re-shelving patterns and found online usage typically ten times that of the print counterparts, suggesting a very positive appreciation of electronic resources at this

stage. However, De Groote and Dorsch (2001) did a counter study at the Library of Health Sciences, University of Illinois, also to establish the preference of medical academics in regard to electronic resources as compared to print resources. They found that although increases were recorded in the usage of online versions of existing print journals, the usage of print journals had declined over time across the board, whether or not the library retained an electronic subscription. The later studies of De Groote and Dorsch cast doubt over the conclusiveness of the earlier study of Morse and Clintworth. This necessitates further perusal of literature to establish the trend of academics' preferences, to measure if their attitudes have indeed changed and to establish whether academics' perceptions of electronic journals have improved.

Literature suggests that the attitudes and perceptions of academics towards electronic journals improve over time. An examination of studies done from 1997 to 2012 suggests that as the years progress a number of academics cite their satisfaction with electronic journals and show appreciation for the resources. For example, Bell (1997), reports that electronic journals were widely perceived to be of lower status than print journals. Gomes and Meadows (1998) argued that academics were really concerned with the quality of electronic journals and they felt that print offered higher quality. Woodward (1998) also noted concerns of quality in studies in the UK. Lenares (1999) noted that academics were attached to print resources because they were easier to read, had better graphic quality, were easier to browse, and easier to access as compared to electronic journals which were then perceived to lack these qualities. In her 1999 study, Lenares reported that academics "do not know of any respected electronic journals in their fields". In 2000 perceptions improved a bit. Evans and Zarnosky (2000) identified electronic journals as a "mixed blessing" and expressed appreciation of their convenience. Harn (2001) recorded that academics acknowledged the improving quality in electronic journals due to peer reviewing of articles.

There was a shift in attitude in 2001. Many academics reported using electronic journals especially in India, Europe, the United States, and Middle Eastearn countries of Israel and Iran as cited in the following studies. Bar-llan, Peritz and Wolman (2003) argued in a study of several institutions done in Israel that on average 48.9% of academics preferred electronic journals compared to 28.2% who preferred the printed version while, 22.9% had no specific preference.

Disciplinary differences in attitudes and perceptions were highlighted with only 20.3% of humanists preferring electronic journals while, 45.2% of Social Scientists preferred electronic journals. In the discipline of Engineering and Natural Sciences there was a higher level of preference of 50% and 51.1% respectively. The Israeli study also exposed age and gender issues as factors which shaped attitudes and perceptions of academics towards electronic journals. Preference for electronic journals was found to decrease with age: 66.6%, 55.6%, 50.3%, and 28.7% of academics in their thirties, forties, fifties, and sixties, respectively. Fifty percent of female academics expressed positive attitudes towards electronic journals compared to 48.5% of male academics. In the High Wire eJust studies Tenopir (2003) reports that while 92% of academics "liked" electronic journals many preferred print journals. Woo (2005) reports on a survey of academics at the University of Hong Kong. The results showed that 68.8% of academics prefer to use electronic journals, compared to 31.2% who indicated preference for printed journals. In the same year 2005, 85.7% of deans at several universities in the United States agreed that electronic publications were valid in terms of their ability to make important intellectual contributions. This marked a major turning point in the shaping of academics' attitudes towards electronic journals (Hynes and Stretches, 2005; Birth and Irvine, 2009).

In India, electronic journals are highly regarded as several examples cited below show. Academics seem to have developed positive attitudes to the resources. At Tezpur University 63.4% of academics preferred electronic journals while 14.6% preferred print and 22% preferred both (Saikia, 2007). Seventy eight percent (78%) of academics indicated in the study that they would prefer to have core journals in their fields offered electronically. Khan and Ahmad (2009) did extensive studies at two Indian universities: Aligarh Muslim University (AMU) and Banaras Hindu Universities (BHU). They reported that at AMU only 16.26% of staff was dissatisfied with electronic journals while others reported a high level of satisfaction. At BHU only 10.77% reported their dissatisfaction with electronic journals while others found satisfaction in the resources. At AMU 67.89% of academics felt electronic journals were time saving, 57.72% felt they were easy to use, 29.27% felt they were easy to locate while at BHU 67.24% felt they were time saving, 47.41% said they were easy to use, and 36.64% indicated they were easy to locate. At AMU 83, 74% felt electronic journals expedited the research process, 77.24% said they improved professional competence, 86.58% said electronic journals improve access to current

information, 84.96% felt the resources gave them access to a wider range of information. High percentages were also noted at BHU with 81.03% indicating that electronic resources expedite the research process, 84.91% citing improved professional competence, 89.91% citing improved access to current information, 93.53% indicating access to a wider range of information, and 75% noting that electronic journals have brought about fast access to information.

Tyagi (2012), in a study of academics at the Institute of Technology, India stated that 56.88% of academics preferred electronic journals whereas 23.12% of academics preferred print, and 20% preferred both electronic and print journals. A very high percentage (78.38%) felt electronic journals have become a substitute for print journals while 91.89% felt electronic journals were highly satisfactory. In studies done at the University of Chennai (Thanuskodi, 2011) academics showed positive attitudes towards using the resources. In the study, 63.3% of academics indicated they were highly satisfied with electronic journals, 22.3% indicated they were satisfied, 9.72% showed a minimal level of satisfaction and only 4.68% were dissatisfied.

In Africa, attitudes and perceptions of academics vary but are mostly on the low side. This is perhaps due to the many barriers that academics face in trying to make full use of these resources. At Makerere University only 8.9% of academics felt electronic resources were an excellent way to access information (Kigongo-Bukenya and Nyumba, 2004). Many academics gave electronic journals an average ranking. At the University of Agriculture, Abeokuta, Nigeria, academics expressed a very high regard for electronic journals. They, however, identified many challenges in accessing and utilising the resources (Salaam and Aderibidge, 2010). There are challenges facing many African institutions which have affected the adoption, use and the shaping of attitudes and perceptions towards electronic journals. This will be considered separately in this review and will therefore not be given much space here.

It is evident that the attitudes and perceptions of academics towards electronic journals were initially quite negative. However, attitudes changed as academics became more familiar with using this resource. The shaping of attitudes and perceptions is affected by several factors. The more barriers academics experience in their quest to use electronic resources, the less inclined they were to view electronic journals in positive light. The literature reviewed above has also

shown that there has been a cultural shift, especially in the developed world, from print resources to electronic resources. The preference for electronic resources has resulted in a decrease in the preference and use of print resources.

3.9 Barriers to Adoption and Use of Electronic Journals by Academics

Literature reviewed under this section addresses research question number 1 which deals with awareness of peer reviewed electronic journals by academics and research question number 4 which investigates the factors that influence the behaviour of academics towards peer reviewed electronic journals. The facilitating conditions construct of UTAUT is crucial in addressing this section, supported by the social influence construct. Appendix 1 (Survey Questionnaire for Academics at Selected Zimbabwean State Universities) deals extensively with issues pertaining to this section in Section D (questions 39 – 51) and Section F (questions 81 – 83). Appendix 2 (Interview Guide with Faculty Librarians at Selected Zimbabwean State Universities) deals with the issues in Section C (questions 13 – 18), Appendix 3 (Interview Guide with Sub-Librarians Responsible for Reader Services at Selected Zimbabwean State Universities) captures the relevant issues in Section C (questions 12 – 16), Appendix 4 (Interview Guide with Systems Librarians at Selected Zimbabwean State Universities) addresses the issues in questions 1, 3, 4, 6, and 7 while Appendix 5 (Interview Guide with Librarians at Selected Zimbabwean State Universities) includes questions 3 and 4 to address the issue of barriers to adoption and use.

The UTAUT model argues that for an innovation to be adopted and used there should be "facilitating conditions". These are conditions that make it easier for the intended user to adopt and use a given technology. Absence of these conditions constitutes "barriers" to use. In this section the researcher reviews these barriers to the adoption and use of electronic journals by academics. Electronic journals have been readily accepted in countries and institutions where barriers to access and use of these resources are minimal. They have not been readily accepted in situations where users are faced with barriers. A study of literature has shown the following barriers:

- Lack of awareness;
- Lack of training;
- Lack of adequate ICT infrastructure;

- Discomfort of reading from screen;

- Information inequality;

- Lack of research culture;

- Password restrictions; and,

- Concerns with permanency of electronic resources and archiving issues.

3.9.1 Lack of Awareness

One of the greatest barriers affecting adoption and use of electronic journals especially in the developing world is lack of awareness. Statistics show that in institutions where academics reported a lack of awareness of electronic journals these resources have largely been ignored whereas in those institutions where there is a heightened awareness of the resources use has largely been positive (Schaper and Pervan, 2007; Ani and Ahiauzu, 2008). Salaam and Aderibidge (2010) report that lack of awareness of electronic journals was a major hindrance to usage at the University of Agriculture, Abeokuta, Nigeria. A survey at the university revealed that only 57.75% of academics were aware of electronic journals. Consequently, use of the resources was minimal at the institution. The researchers urged university libraries to improve the awareness of electronic journals by the academic community so as to increase the usage of these resources. They reasoned that awareness and orientation should be a continuous effort, since universities recruit new staff on a regular basis, and the range of resources available changes with new subscriptions.

In Ghana, Bayugo and Agbeko (2007) reported on a survey at the College of Health Sciences of the University of Ghana. The survey revealed academics' preference of print over electronic resources. However, they cited the lack of awareness of the range of electronic resources available. For example, results showed that, academic members were unaware of the two full-text journal databases, HINARI and PERii, which are available in their university library. In Tanzania, Shija (2009) found out that a number of academics were unaware of electronic journals therefore they were not using them. In a study of the following institutions in Kenya: Aga Khan University (AKU), Egerton University (EU), Kabarak University (KABU), International Centre of Insect Physiology and Ecology (ICIPE), Jomo Kenyatta University of Agriculture and Technology (JKUAT), University of Nairobi (UoN), and United States

International University (USIU), INASP (2011) found that lack of awareness prevented academics from using electronic journals 10 years after introduction of these resources. The INASP findings is similar to those of Agaba, Kigongo-Bukenya and Nyumba (2004) who found the lack of awareness of electronic journals as the main barrier for academics at Makerere University in Uganda. This negatively affected usage of these resources. Just a year before INASP's findings, Harle (2010) surveyed 4 universities in east and southern Africa: Chancellor College at the University of Malawi, the University of Nairobi in Kenya, National University of Rwanda, and the University of Dar es Salaam in Tanzania. His surveys concluded that one of the most visible barrier to the adoption and use of electronic journals in these institutions is lack of awareness of what is available. Many academics were unaware of the electronic resources available to them for their research in their university libraries. For example, only 40% of respondents felt that they had a good or high level of awareness of electronic resources, and almost a third (29%) felt their awareness was either unsatisfactory or non-existent. Only 16% claimed to have a high level of awareness of the electronic resources provided by their institutions. This ignorance was reflected in their low usage of electronic resources. Many academics in these institutions complained that their institutional libraries did not subscribe to relevant resources for their needs, however, when they were pressed to give examples of resources they want the libraries to provide, they mentioned resources that were already part of the electronic collection. This is an example of the level of awareness of what is available.

In Africa there is lack of awareness of electronic journals thereby low acceptance and usage. However, two African universities have seen a difference. University of Lagos and the University of Ilorin, all in Nigeria, have noted a difference as far as awareness is concerned. A study conducted by Egberongbe (2011) showed that 78.6% of academics and research scholars at the University of Lagos had intimate knowledge of the range of electronic resources that are available in their institution. Owing to this high level of awareness, about 90.6% of those who are aware professed their preference for electronic journals. At the University of Ilorin Isah (2010) found that 93% of academics were aware of the university's subscriptions to electronic databases and they were aware of their accessibility from their offices through the Internet. While by African standards the University of Lagos and University of Ilorin have shown high awareness levels literature shows that in some universities, especially in India, awareness has

reached high levels and this has helped to enhance use of electronic journals. Tyagi (2011) noted that at the Indian Institute of Technology Roorkee, all academics were aware of electronic journals and they were all using the resources on a regular basis. Khan and Ahmad (2009) observed that at two Indian universities, Aligarh Muslim University (AMU) and Banaras Hindu University (BHU) awareness of electronic journals was 89.84% for AMU and 93.96% for BHU. Consequently both universities had an impressive usage rate of the resources. Thanuskodi (2011) stated that 92.3% of academics from the Education Faculty of the University of Chennai, India are aware of electronic journals in their institutions and make regular use of them. In a study of several institutions in India, Sarasvady and Khatri (2007) noted that most academics were aware of electronic journals and were making use of them. The researchers, however, observed that senior professors were not aware of the resources and were therefore not making use of them.

The challenge of lack of awareness has affected all institutions that have introduced electronic journals (Lenares, 1999). However, if institutions take measures to ameliorate this situation awareness would heighten and acceptance and use of electronic resources would increase. Veeramani and Vinayagamoorthy (2010) show that electronic journals are being effectively used in developed countries such as the United States of America (USA), United Kingdom and Japan. However, earlier research shows that these countries also struggled with lack of awareness at one point but moved quickly to implement strategies that improve awareness and therefore usage. Lenares argued that as academics and researchers become more aware of electronic journals, their need for them increases therefore the inclination for them to use the resources increases as well.

3.9.2   Lack of Training

The adoption and use of electronic journals particularly in Africa has been hampered by lack of skills to negotiate the electronic environment. Borah, Kuchida, Lee, Lippincott and Nagaraj (2004) and Secker and Price (2004) complain about what they call the "access paradox" syndrome, where an increasing amount of information is increasingly being made available in electronic format, but that users are unable to find it because they lack the necessary skills. Secker and Price advise that users should have knowledge of information resources in their subject fields. They should be able to construct effective search strategies, critically appraise

information sources, be able to use information sources appropriately, and to cite and create references.

Ondari-Okemwa (2004), Adomi (2005), Ashcroft and Watts (2005), Okiy (2005), and Oduwole and Sowale (2006) identified problems in the adoption and use of electronic resources in Nigeria. The main problem identified was the lack of adequate Information Communication Technology (ICT) skills among academics. Shija (2009) noted that for someone to access and use electronic journals effectively and efficiently, there is need for a good command of skills of how to use the computer and Internet. He notes that the necessary skills were still inadequate in Africa but more adequate in the developed countries. Shija advises that training is necessary in Africa to enable academics to benefit from the electronic resources at their disposal. He alleges that the problem of lack of ICT skills in Africa has not yet been seriously addressed. Some institutions offer one off training workshops to researchers while others offer no training at all. Shija's findings resonate with the findings of Manda (2008) who carried out an extensive study of the following institutions of higher education in Tanzania: Centre for Educational Development in Health, Arusha (CEDHA), College of Business Education (CBE), College of Wildlife (CW), Dar es Salaam Institute of Technology (DIT), Eastern and Southern African Management Institute (ESAMI), Herbert Kariuki Memorial University (HKMU), Institute of Accountancy, Arusha (IA), Institute of Finance Management (IFM), Institute of Marine Sciences (IMS), Moshi University College of Co-operative and Business Studies (MUCCOBS), Muhumbili University College of Health Sciences (MUCHS), Mzumbe University (MU), National Institute of Medical Research (NIMR), The Open University of Tanzania (OUT), Sokoine University of Agriculture (SUA), St Augustine University of Tanzania (SAUT), Tumaini University- Iringa College (TU-IC), Tumaini University- Kilimanjaro Christian Medical College (TU-KCMC), Tumaini University- Makumira College (TU-MC), University of Dar es Salaam (UDSM), University College of Lands and Architectural Studies (UCLAS), Zanzibar State University (SUZA), and Zanzibar University (ZU). Manda stated that in all of these institutions there was insufficient expertise with formal training in computer and ICT related fields. Only 41% of these institutions reported that they had trained their users in the use of electronic resources. The reasons given for lack of training in many of these institutions included inadequate skills on the part of the library staff, a lack of interest by academics or a heavy workload which deprived academics of time to

attend formal trainings. The methods of training in these institutions seemed inadequate. Training was mainly conducted through short seminars and workshops, or informally where users were requested to register for training on a voluntary basis. The training in many of these institutions was carried out by ICT staff. They have computer skills but are mostly unaware of what the library offers as they are not librarians. In a few cases, some institutions did have ICT sections, an arrangement that benefit users as these trainers would be competent in both ICT skills and library related disciplines.

Harle (2010) in a study of universities in east and southern Africa opine that although libraries were actively engaged in training, 78% of his respondents had not received any form of electronic resource training from their university libraries. He asserts that this scenario hampers the researchers' ability to make effective use of electronic journals as the skills needed both to search and explore journals and databases are seriously underdeveloped. He urges university libraries to appraise their training methods to see if they are up to the demands of the constantly changing electronic environment. He advises that in addition to group engagements, libraries should consider individualise training sessions as well.

Ondari-Okemwa (2000) and INASP (2005) emphasises the training library members of staff and users to cope with rapid changes of ICTs especially Internet, which is a vehicle of e-resources access and use. Said (2006) says that to obtain maximum value of e-journals, specialised training to user groups like academics is essential. The teaching of relevant skills is crucial to the promotion and fostering of the use of ICTs, especially the computer and Internet which facilitate information transfer to academics and other researchers. INASP (2011) in a study of institutions in Kenya reported that lack of training lead to low ICT skills and impacted negatively on the adoption and use of electronic journals. In this study, 55% of academics had been trained and equipped with skills to navigate electronic journals and they were making efforts to use these resources. However, a large number (45%) had never been trained and had not made use of the resources. Of those that had been trained 66% indicated that training had benefitted them immensely and had enhanced their access and retrieval skills. Almost half of those trained (45%) believed that as a result of training their academic outputs had greatly improved while 42% of the trained stated that they were equipped with better referencing skills than before training.

The problem of lack of skills is not unique to African institutions. Similar challenges exist in countries that spearheaded electronic journals provision and access. Upadhyay and Chakraborty (2008) report that even though India is lauded for its great efforts in providing electronic journals, and for making their users aware of these resources, there are still some institutions that lack strong training regimes. They discovered in a survey that some institutions have as high as 62.5% of their academics not having gone through any formal training in the use of electronic journals. As a result these institutions are reporting slow adoption and use of electronic journals, with some universities registering only 21.87% usage of these resources by academics.

While formal training in the use of electronic journals is crucial for academics some researchers warn that this is a sensitive group of users and that they should be handled with care (Ashcroft and Watts, 2005; Negahban and Talawar, 2009). Brennan, Hurd, Blecic and Weller (2002) discovered in a qualitative study at the University of Illinois that nearly all academics interviewed were emphatically uninterested in formalised classroom instruction on the use of electronic resources. Several reasons have been proffered for this attitude including pride, lack of time, and a preference to learn through trial and error. This then means university libraries have to be innovative in the ways they provide instruction. They have to incorporate extra training and help features such as web based help, electronic references, chat rooms and other ways of interacting with remote users.

3.9.3 Lack of Adequate ICT Infrastructure

Several African scholars agree that one of the major hindrances to the adoption and use of electronic resources on the continent is lack of the requisite infrastructure in African institutions. Harle (2010) notes that the advent of electronic journals came as a blessing to the continent because it meant at last African scholars could access rich resources stored in developed world servers. This move, however, came with its challenges as institutions needed to upgrade their ICT facilities and infrastructure. This includes core technologies such as computers, telecommunications technologies, Internet, bandwidth, power supply, as well as peripheral technologies like printers, copiers, and scanners (SUL, 2001). In addition, institutions have to ensure they have adequate institutional contracts and licences with publishers and other libraries in order to have rights to access electronic journals. There is also a need to engage adequately

skilled administrative and support personnel. Manda (2008) notes that African institutions have largely been affected by inadequate information infrastructure and the absence of basic facilities required to access electronic resources effectively and efficiently.

Manda (2008) further notes that while most African universities have at last managed to improve academics' levels of access to computers connected to the Internet with the ratio almost 1:1, one of the major infrastructural constraint identified by many researchers is limited bandwidth. In Tanzania, for example, 69% of the institutions reported that they had bandwidth available to their libraries for downloading at less than 1 Mega Byte (1MB) per second. This adversely affects the efficiency of downloading and uploading electronic information. Shija (2009) identifies the same bandwidth problem. Low bandwidth makes access difficult, for instance, many users in Tanzania, according to Shija's research, access bandwidth ranging from 16 to 32 Kbps; few are in the range of 8-16 Kbps and even fewer use above 32Kbps. This bandwidth range is very low for Internet connectivity and access. AGORA specifies a bandwidth size from 56Kbps. This is recommended for users to access the electronic journals from its database. The problem of bandwidth and connectivity is also reinforced by Harle (2010). He points out that at Chancellor College, in Malawi, where they rely on Very Small Aperture Terminal (VSAT) satellite link, the situation is dire. The connection is slow and when downloading journals, data packets are frequently lost and files corrupted. In interviews conducted at the institution many respondents bemoaned poor connections, slow speeds, dropping connection, and the related challenge of intermittent power supply.

Elsewhere in Africa, Watts and Ibegbulam (2006) examined some of the barriers to the usage of electronic information resources available at the medical library of College of Medicine, University of Nigeria, Nsukka. Their findings revealed, that lack of an adequate ICT infrastructure posed a problem to the access and use of these resources. At the University of Agriculture, Abeokuta, Nigeria the major constraint to the use of electronic journals is the unstable supply of electricity. This problem of poor electricity supply was also reported by Chisenga (1997) and Owolabi and Agboola (2010) in their study as the biggest problem affecting the use of ICT facilities in most African institutions. At Jomo Kenyatta University of Agriculture and Technology in Kenya the use of electronic journals is hampered by lack of infrastructure

which means in spite of the marketing of electronic resources they are still not used optimally (Gikandi and Ndungu, 2011). The university has provided wireless network with a number of hot spots scattered across the university however, users are often frustrated by low bandwidth. Some campus do not have static Internet Protocol (IP) addresses which makes it a challenge to access IP based resources.

Respondents in a Kenya study identified the following challenges they were experiencing in accessing electronic resources: inadequate computers, poor Internet connectivity, delays in downloading information, and lack of support facilities such as printers (INASP, 2011). The Kenya study recommended that efforts be made towards upgrading and increasing the existing infrastructure including computers, Internet bandwidth and skilled staff. At Makerere University academics said they were hindered in the use of electronic journals by inadequate facilities, slow speed or poor bandwidth, lack of printers to print research results, and poor computer communication systems (Agaba, Kigongo-Bukenya and Nyumba, 2004). This led to poor utilisation of these resources.

The problems identified by institutions in parts of Africa were experienced by institutions globally. However, many institutions in developed countries have addressed the problems. At Stanford University Libraries scholars talk about the presence of advanced printing capabilities and access to free printing as integral to how electronic journals fit into their everyday scholarly practice. By linking electronic publications to the power of the Web, the computer, and the printer, publishers can create an environment in which scholars are able to maximise benefits of the media and potentially create new forms of scientific media (SUL, 2001). Woodward (1998) identified the following problems: the slowness of the Internet, downloading problems, lack of access to sufficiently good equipment, poor graphics, and password problems early in the life of electronic journals. The evidence suggests that except for a few institutions many of these challenges have now been addressed in developed countries. There has also been some improvement in Africa. Harle (2010) observes that Internet connectivity, particularly in some east African universities is steadily improving with the installation, in 2009 and 2010, of three new high speed undersea fibre-optic cables. However, substantial infrastructural challenges remain beyond major cities, and from coastal countries to landlocked countries.

The value of adequate infrastructural support in the adoption and use of electronic resources can be seen from a study in Iran. In a study that covered 232 Social Science academics in 7 Iranian universities, namely: Ran University, Shiraz University, Ahvaz University, Karman University, Esfahan University, Tehran University, and Mashhad University, it was reported that academics were dependent on electronic resources. However, Social Science academics in Iran were afforded adequate infrastructure to enable them to access and use electronic journals. For example, they were provided with computers and Internet facilities. Furthermore, they have been given free Internet connections at their residences through their universities. Some of the campuses are WI-FI enabled. Easy access contributes to their high dependency on electronic resources (Negahban and Talawar, 2009).

3.9.4   Discomfort of Reading from Screen

One of the drawbacks of electronic journals as continuously cited by academics in a number of surveys is reading from the screen, especially in cases where there are limitations of printing research results. Many academics report dislike for reading from the screen (Woodward, 1998; Lenares, 1999; McKnight, 2000; Nelson, 2001; Isah, 2010). Brennan, Hurd, Blecic and Weller (2002) found in a study of early adopters of electronic journals that academics were not willing to read full articles on their computer screens. Many scanned the full text for relevance but printed articles of interest, preferring the Portable Document File (PDF) versions for that purpose. Electronic journals are used more in cases where users have the leeway to print their search results. However, while academics in developed countries may readily have printing facilities the situation is not always the same in developing countries.

The reasons academics experience discomfort in reading from a computer screen are varied. One is cultural familiarity with print resources. Any medium that does not involve physically holding a document to read is easily dismissed as lacking academic weight (Nelson, 2001). Some academics feel that print had aesthetic qualities which is lacking in electronic journals. These academics use electronic journals but prefer to print their results so that they have a "print feel". Academics are also known for their disposition to annotate, that is, write notes on top of their papers as they read and highlight certain portions. The latest electronic journals allow for

annotation however, many researchers have not yet acquired the skills to do electronic annotation and they feel safer doing it on paper (McKnight, 2000).

The other complaint that researchers have about electronic journals when they read from a computer screen is, the tendency of computer screens to restrict the reader to one position, especially if it is a desktop computer. People do not sit still while they read, they often prefer to move around while reading paper articles, they shift position in their chairs or even change chairs in order to maintain a comfortable position. Some move the paper nearer or further away so as to find a comfortable reading distance. Reading from the screen confines the reader to a single position in that the screen is usually near up right and viewing distance is generally constant (McKnight, 2000; Isah, 2010).

3.9.5 Lack of Research Culture

Institutions with an entrenched research culture have higher levels of electronic journal usage than those institutions where research is not highly regarded (Suhendra, Hermana and Sugiharton, 2009). More than 50% of academics surveyed in different research pointed out that they use electronic resources mostly for research purposes (Nelson, 2001; Tenopir, 2003; Kortelainen, 2004; Bennett and Buhler, 2010; Cox and Cox, 2010; Tyagi, 2011; Vasishta and Navivoti, 2011). A survey conducted by Nelson (2001) at the University of West England, for example, revealed that those academics involved in research were more likely to use electronic journals.

There is evidence that one of the greatest challenges of African academics is lack of research culture. This contributes to the negative effect on the use of electronic journals on the continent. Harle (2010) found in a study of universities in east and southern Africa that low levels of research output impacted negatively on the use of electronic journals. He discovered that African academics were not adequately engaged with scholarly research but tended to lean towards consultancy work. African research output figures supported this. According to a Thomson Reuters report, the total annual research output of Africa stands at 27 000 papers per year. This figure, Harle notes, is insignificant and is equivalent to the output of one European country. The Netherlands alone for example, was found to be surpassing that output level. Researchers note

that the African scenario is caused by several factors including lack of infrastructure, heavy teaching loads that take time off research, failure to attract research funding, failure to attend international conferences that motivate academics to continue on the research path, and just a general lack of research culture (Dadzie, 2005; Shija, 2009; Egberongbe, 2011; INASP, 2012). This state of affairs ensures that academics in Africa are not very much motivated to use electronic resources as they feel they do not have much to use them for.

3.9.6   Password Restrictions

Some academics have reported challenges of password restrictions. This prevents them from realising the benefit of electronic journals (Nelson, 2001; Shija, 2009; Isah, 2010). Though technologies have been developed that should ensure that users do not have to remember any password as long as they are logging through a recognised Internet Protocol (IP) address it appears some institutions, especially in the developing world have not yet fully integrated these technologies for the benefit of their users. In some instances, electronic journal users are still required to memorise a cocktail of passwords in order to log in to desired databases. This requirement acts as an impediment to the use of these resources. Fortunately, most institutions have addressed this challenge so that it should not be a future problem.

3.9.7   Concerns with Permanency of Electronic Resources and Archiving Issues

One of the main concerns that electronic journals users face is archiving and long term availability of information which exist electronically (Brennan, Hurd, Blecic and Weller, 2002). Some researchers are concerned with the long term durability of electronic journals and wonder if they will still be accessible generations from now (Massad, Brown and Tuckler, 2011). There are concerns that the electronic journals that are produced presently are intended to work with current technologies therefore, any major shift in technology may render all electronic information that is currently accessible inaccessible. The information may be unreadable. Some authors like Friedlander (2008) are more fearful. They have talked of an impending "Digital Katrina" that would span nearly all scholarly disciplines. This would happen if the information infrastructure is unable to sustain the trust scholars currently have in intellectual delivery systems.

In an electronic environment continued existence of an electronic publication hinges on the continued operation of its provider. There is a difference with print journals which are permanent. In the electronic environment libraries and researchers do not literally own the electronic journal, but they receive the rights to access it. Therefore, if the publisher who provides access goes out of business then access is likely to be lost. A further concern of researchers regarding the ownership versus access model is that, while in the print environment one receives publications they have subscribed for, in the electronic environment there is a tendency to base access to journals on current subscription (Zhou, Lu and Wang, 2010). Should subscriber fail in their renewal they will lose access to both the current and previous editions of the journals concerned. This, according to many commentators, is an injustice that is being perpetrated in the electronic environment and because of such issues, some have preferred to treat print journals as "real" publications they can see, feel, touch, smell and control while they treat electronic journals as supplementary (Nelson, 2001; Massad, Brown and Tuckler, 2011).

3.10   Strategies used by Libraries to Promote Electronic Journals

Literature reviewed under this section addresses research question number 5 that deals with strategies used by state universities libraries in Zimbabwe to promote the use of peer reviewed electronic journals by academics. The section also addresses the facilitating conditions and social influence constructs of UTAUT. The questionnaire enquires about the strategies used by Zimbabwean State Universities to promote electronic journals in Section B (questions 15 – 20), the interview guide with Faculty Librarians (Appendix 2) does so in Section A (questions 1 – 5), the interview guide with Sub-Librarians Responsible for Reader Services (Appendix 3) captures the issue in Section A (questions 1 – 6), and the interview guide with Systems Librarians (Appendix 4) address the issue in question 8.

Promotion is one of the most pertinent factors leading either to the success or failure of electronic journals (Pullinger, 1999; Bevilacqua, 2005). Promotion of library material refers to any attempt at making users aware of services that are offered in that library and an encouragement to use the same resources. Universities can create an awareness through the presentation and organisation of the resources on their websites. Proper organisation of electronic journals on university libraries websites enables intended users to notice, identify, and

be attracted to the resources. A number of studies which evaluate the effectiveness of the electronic journals' presentation and organisation identified a link between low use and users' failure to locate electronic journals (Roes, 1999; McKnight, 2000; Tibenderama and Ogao, 2009). A link was also identified between low use and an insufficient level of promotion (Lock, Cornell and Colling, 2001; Nelson, 2001; Stark, 2001; Wolf, 2001; Smith, 2003; Isah, 2010). Eason and Harker (2000) explored the users' behavior towards the presentation of electronic journals and found that in seeking information users tend to adopt existing, familiar mental models and shy away from trying unknown options. Users behave according to the "Principle of Least Effort", which is an inclination to follow a path that has the probability of a useful outcome, and requires a minimum psychological effort. The way electronic journals are organised and presented on the library websites has a major implication on users' ability to notice and use the resources. The arrangement of electronic journals that is focused on an appreciation of users' requirements and disciplinary differences, is an effective way for encouraging users to make full use of the resources provided (Eason, Richardson and Yu, 2000). Studies carried out in the developed world, specifically the United States of America and the United Kingdom in the first 5 years of the introduction of electronic journals claimed that no standard criteria for organising access to electronic journals in university libraries had been established (Haas, 1998; Rich and Rabine, 1999; Shemberg and Grossman, 1999). Different libraries adopted different ways to enhance visibility of electronic resources on their websites (Ashcroft and Mclvor, 2001). However, there is debate about the most effective way to present electronic journals. Ashcroft and Mclvor (2001) found that in the UK and USA the use of A-Z web lists was popular among university libraries as a way of promoting electronic journals. Some considered establishing a mechanism to link electronic journals from university library Online Public Access Catalogues (OPACs) as an effective way. The catalogue is viewed by researchers as the most visible access tool even in the electronic environment (Calhoun and Kara, 2000; Bevis and Graham, 2003). A study conducted by Harle (2010) on universities in east and southern Africa contributed to the argument that OPACS are crucial in enhancing the users' awareness of electronic journals, ensuring that they are able to locate these resources and successfully negotiating their way to use them. About half of the respondents in the study (48%) indicated that they identify what the library holds by consulting their respective library's OPAC. Harle concluded that part of the reasons why electronic journals are not used in Africa is the poor

websites that universities have. These websites are not easy for academic users to locate and use electronic resources. To substantiate his argument, he notes that the University of Nairobi in Kenya has a relatively higher awareness, adoption and usage rates of electronic journals than other universities he studied. He notes that the University of Nairobi has a clear, up to date and easily navigable website that includes an easy to use OPAC for electronic resources.

In other institutions users experience was, their library websites did little to assist in their quest to know and be able to use electronic journals. To fill the gap users identified electronic resources through alternative means, for example, 73% of those who knew and used electronic journals indicated they learnt of them through Google, 64% were directed by references in articles or books, 32% got to know from reading lists, 23% were alerted by email lists of professional associations, 14% through library trainings and 5% learnt through social networking forums such as Facebook. A large number of users were introduced to the sites through Google. Others merely 'stumbled' upon the resources by chance as they conducted their other searches, but not actively looking for electronic journals. This trend indicates a failure by university libraries to properly organise their websites in a way that actively promotes electronic resources in general and electronic journals in particular. Better websites make for better users for these websites give users tools they need to identify and use electronic journals (Agaba, Kigongo-Bukenya and Nyumba, 2004; Salaam and Aderibidge, 2010). University websites easily gain the confidence of academics unlike other avenues which may not be trusted (Harle, 2010; Egberongbe, 2011). This is demonstrated in the following studies carried out in the developed world. Academics at the University of Illinois, Chicago indicated that their most preferred and most frequently used route to access electronic journals was through the OPACs on their university website (Brennan, Hurd, Blecic and Weller, 2002). Other universities that indicated the same preference include academics at the University of Southern California (Morse and Clintworth, 2000), University of Texas (Tenner and Yang, 2000), Leeds Metropolitan University (Hewitson, 2002), Italian universities (Gargiulo, Conti, Cantino, Farinelli and Marquardt, 2003), University of Hong Kong (Woo, 2005), University College of London (Nicholas, Huntington and Watkinson, 2005), Loughborough University (Brown, Lund and Walton, 2007), and University of Chennai (Thanuskodi, 2011).

Some critics argue that the use of OPACs does not allow users to search electronic journals separately from the rest of the library holdings. This, they claim, confuse the lay users. Others argue that OPACs, by their design, are meant to describe local physical holdings and do not offer access through hierarchical browsable directories (Antelman, 2000; Kiehl and Summers, 2000; Salarelli and Tammaro, 2000). Anderson (1999) and McDonald and Ghaphery (1999) oppose the presentation and organisation of electronic journals through OPACs on the premise that the move is both labour intensive and slow. In Harle (2010)'s study of university libraries, he argued that although users preferred to search electronic journals through the OPACs this was challenging for university libraries to maintain. Electronic journal subscriptions are not stable, they change on an annual basis according to what is included in the publishers' packages and what libraries can afford. Maintaining an up to date catalogue is therefore, a challenging and time consuming commitment which unduly increases library costs in terms of staff time and related costs.

Rich and Rabine (2001) argue that the database driven model is the best route to managing access to electronic journals. This model is lauded as providing flexible access to users while also enabling librarians to integrate electronic journals with other available electronic resources (Cohen and Calsada, 2003). However, other researchers are not in favour of a single sided approach to management and access of electronic journals. Anderson (1999) recommends a multiple access approach, providing users with varied avenues to discover electronic journals, such as a web list and the library catalogue. Yet other scholars argue that this method can present several points of failure if it is not adequately supported by effective communication and strong relationships among the library staff (Calhoun, 2000; Kiehl and Summers, 2000; Hennig, 2002). Suppliers of library management systems and library products have also joined the debate and some have offered solutions. Some of these suppliers are now offering electronic journal management systems and sophisticated library oriented portal products as a way of promoting improved integration and customisation of electronic journals (Ketchell, 2000; Thomas, 2000; Saden and Walker, 2003). Cox and Yeates (2003), carried out a study and a survey of the available portal solutions. They noted that although library portals offer common facilities and customisation, these systems have high costs and require hard work of collaborative

configuration and metadata harvesting. This means university libraries should continue to consider alternative possibilities for presenting electronic journals and other electronic resources.

The argument regarding the best way to organise and present electronic journals in order for them to be visible and easily usable will likely go on in the academic discourse. However, what is clear, as proffered by many authors is that apart from clearly presenting and dutifully organising electronic journals on university websites there is still a great need for some aggressive measures of promoting electronic journals (Aina, 2004; Kortelainen, 2004; Kumar and Kumar, 2008; Upadhyay and Chakraborty, 2008; Isah, 2010; Vasishta and Navivoti, 2011; Shahmohammadi, 2012). These measures, researchers argue, should be proactive. There are arguments that suggest just properly organising electronic resources, while crucial, is largely a covert method of promotion. This works only for those users who are actively seeking electronic journals but, do little to woo the unsuspecting and uninterested users.

University websites are valuable. It is important that these sites are promoted to allow academics and other users access. A study conducted at the University of Allalabad showed that though the list of electronic journals was provided on the university website, 65.62% of academics at the institution still depended on search engines to locate and access electronic journals. Further enquiry revealed that the university website was not well marketed and only a few academics knew of its existence and what it contained (Upadhyay and Chakraborty, 2008). Nelson (2001) conducted a study at the University of West England. He discovered that the university's website is designed to help identify and locate relevant electronic journals. The website lists electronic journals subscribed to, alphabetically, by subject and by specific electronic journal collections, with active links to the respective journals or their providers. Only a third of academics used this site. His study concluded that the website itself, although it was well designed and loaded with useful information, was "invisible". The website had to be visible first before users could benefit from what it contains. This underscores the importance of marketing university websites. A number of them are lying idle as users are not motivated to use them. As a result, they miss out on the electronic journal lists and links provided.

Apart from promoting their websites universities have other important avenues to use in promoting their electronic journals. Roes (1999) studied the introduction of electronic journals at Tilburg University, Netherlands. He concluded that some of the most useful promotional strategies include: office visits by librarians to introduce academics to electronic journals and demonstrate their use, presentations at faculty meetings, use of flyers, posters, campus magazines, stickers on hardcopy issues of journals to remind academics and other users of the existence of electronic versions of the same hardcopy journals, tailor made workshops for academics, use of emails to announce new journals or enhanced services, and newsletters offered on a monthly basis. Vasileiou and Rowley (2011) conducted a survey of 7 university libraries in the UK and reported that librarians mostly used the following ways to promote electronic journals: library websites, information literacy sessions, OPACs, induction sessions, emails, posters, announcements boards, library representatives, flyers, word of mouth, blogs, and bulletins. Studies done in India show that the most prevalent electronic journal promotion methods include the use of library websites, university newsletters, liaison with Head of Departments and academics on latest developments concerning electronic journals, inviting academics to one on one talks about electronic journals, lectures, and presentations (Upadhyay and Chakraborty, 2008).

In Africa, authors like Ondari-Okemwa (2000) and Shija (2009) note the need for aggressive promotion of electronic journals. There are concerns that some universities have no clearly laid down strategies to market their electronic resources and therefore these resources are underused. An analysis of literature reveals that those African universities that have tried their hand at promoting their electronic resources have largely adopted similar strategies used in the developed world. At Jomo Kenyatta University of Agriculture and Technology (JKUAT) there has been a noted underutilisation of INASP sponsored electronic journals. They have tried to address this by using promotional activities that include training of staff, exhibitions that include displaying of booklets with title lists, distribution of brochures, branded pens, use of social media, use of the university website, workshops and outreach to university departments and faculties. The university has also created a Google custom search facility to enable the user to search for the various electronic resources. The library website is programmed to capture and relay customer feedback on electronic resources and other library services (Gikandi and Ndungu,

2011). The efforts by JKUAT have not benefitted all service users as in the study some respondents indicated they were hearing of electronic journals for the first time. Those who are informed stated that they received information through colleagues, during library orientation, university open days and the university websites. It is therefore necessary for universities to evaluate their promotional programmes and discover which methods are user friendly, which methods need improvement and emphasis.

At Makerere University in Uganda, some respondents of a survey identified workshops as the most useful tool for publicity and staff sensitisation of electronic journals. Others cited notice boards, emails, circulars from the university librarian, and departmental meetings as valuable sources of information (INASP, 2011). In an extensive study of Tanzanian institutions, Manda (2008) discovered that 64% of the institutions only communicated vital electronic journal information to those users who approached the Library to make enquiries about the resources, 55% of the institution used library orientation, 50% used posters and flyers, 41% used library training as an opportunity to market electronic journals, 27% used their websites and only 14% used OPACs. There are concerns that the popular method is not a proactive marketing method. This creates alienation towards many potential users of electronic journals. Many institutions reported that they waited for potential users to make enquiries. Researchers favour aggressive methods that target potential users rather than waiting for the users' initiative.

At the National University of Rwanda attempts at promotion have been made through leaflets, workshops, and seminars. They organise an electronic resources week like the one held in February 2009 (Harle, 2010). The experience of National University of Rwanda is evident that successful marketing strategies are needed for electronic journals. These methods should target specific groups of academics or even specific academics. The Rwandese University, for example, reported a huge success in marketing their electronic journals through the Author Aid Programme run in partnership with INASP. The programme ran a series of workshops showing academics how citing better and more current literature can significantly improve the quality of their work. To achieve the goal of finding better and more current literature, participants were referred to electronic journals already provided by their institution. This strategy was very successful (Harle, 2010). In a study in Kenya INASP (2011) stated that academics were tired of

broad based marketing approaches instead, they prefer personalised efforts that specifically address their individual needs. They want a specific email that points them to specific resources that are beneficial to their work and research. It is unfortunate therefore, that most universities in Africa have not yet embraced technology based marketing strategies like blogs and "Rich Site Summary" or "Really Simple Syndication" otherwise known as RSS feeds. These feeds are capable of providing personalised updates to academics and other users, based on the previous searches of the targeted user (Bhatt, 2006). If, for example, a user register on a site the RSS feeds automatically notify him or her of relevant electronic articles as and when they are published. Such personalised treatment is not available to many academics in Africa. If universities become more personal in their promotion of electronic journals the use of these resources would increase (Harle, 2010; INASP, 2011).

Shija (2009) argues that to promote electronic journal usage, universities in Africa need to adopt the use of tried and tested models like AIDA, Attention/Awareness, Interest, Desire and Action (Smith, 1999). Belch and Belch (2001:148) argue that to get one to use a product the marketer must consciously bring the targeted user to the attention or awareness of the product, a stage that they call the cognitive stage. Once the targeted user knows about the product the marketer should generate the interest and desire to use the product, a stage they call the affective stage. The last stage to be achieved is the behavioural stage. At this stage the target user is unable to resist the product and that person engages in the action of using the marketed product. To achieve this, the marketer needs to be consistent and persistent, not the one off marketing tactics employed by some universities. This point was emphasised by INASP (2011) in a study of Kenyan universities. The study concluded that some of the reasons why promotional efforts especially in Africa were not successful is that they are done as one off events and there is no concerted effort. The study recommended that there is need to design effective marketing and promotional strategies. These strategies need to be presented in a regular and scheduled way. One off efforts will never work as new staff members are hired regularly in universities.

3.11 Summary
The review of literature addressed the problem that gave rise to the study. It addressed research objectives and attributes of the UTAUT theory adopted for the study. Literature was gleaned

from the following sources: refereed international and national journals, chapters in edited books, conference papers, workshop and seminar presentations, PhD dissertations, Masters degree thesis, websites, and articles in non-refereed journals. Literature reviewed originates in North America, Europe, Asia, the Middle East, and Africa. The review established that the adoption and use of electronic journals is universal but challenges of low usage affect institutions in Africa. Reasons for low use includes lack of awareness of the resources, lack of training in the use of the resources, lack of adequate ICT infrastructure, lack of research culture, and password restrictions. The review noted that in order to promote usage, university libraries need to introduce concrete strategies to market their electronic resources. The review of literature helped the researcher to identify the strengths of adoption and use of electronic journals by academics: first, there is a rich body of informative literature on the subject especially from the United States of America, Europe, Asia, and the Middle East; second, the literature encapsulates studies that used different methodologies including the survey method. However, there are also weaknesses and gaps in literature that this study helps to fill. First, there is an alarming paucity of literature on adoption and use of peer reviewed electronic journals academics in Africa with the exception of a few countries, namely: Nigeria, Uganda, Kenya, Tanzania, Malawi, Rwanda, and Ethiopia. This study therefore contributes to literature on the subject from an African perspective. Second, in tackling the issue of adoption and use of peer reviewed electronic journals by academics, most studies in literature concentrated on getting the views of academics but largely left the providers of the resources, the librarians. This study fills that gap because it addresses the issue from the viewpoint of both academics and librarians. Third, there is lack of literature on how experience of academics affects adoption and use of electronic journals. This is one of the moderators of adoption and use of technology according to UTAUT. This study examined this issue. Fourth, researchers have been unwilling to fully commit themselves to the effect of gender as a moderating factor on the adoption and use of peer reviewed electronic journals by academics. This study helps to bring more clarity and add to the body of literature on the issue.

CHAPTER 4

RESEARCH METHODOLOGY

4.1   Introduction

The chapter provides methodological justification for the study. It provides an insight into how this study was carried out, including the specific procedures followed in obtaining, organising, and analysing data (Mouton, 2001; Polit and Hungler, 2004). Mouton (1996:35) advances the notion that methodology in research is the theory of correct scientific decisions, meaning the chapter ought to explain what decisions were taken in the conduct of the study and why those decisions were taken. The strength of any research study is underpinned by correct, appropriate, and justifiable methodological decisions. Research methodology should align with the purpose of the study and research questions (Mouton, 2001).

The study investigated the adoption and use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities. The study evolved out of the realisation that despite several efforts that were being made by ZULC and individual university libraries in Zimbabwe to enhance access to peer reviewed electronic journals, the use of such journals among academics remained minimal (INASP, 2006; Harle, 2010). The methodological decisions made in this study sought to address the following research questions:

1. What is the level of awareness of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?
2. What is the extent of use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?
3. What are the attitudes and perceptions of academics towards peer reviewed electronic journals?
4. What factors influence the behaviour of academics at selected Zimbabwean State Universities towards peer reviewed electronic journals?
5. What strategies are used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics?

The rest of the chapter considers the following issues: research paradigm, research approach, research design, population of study, sampling, data collection procedures, reliability and validity of research instruments, ethical considerations, and data analysis procedures. The chapter also makes reference to the model used for the study, the Unified Theory of Acceptance and Use of Technology (UTAUT) where necessary. Cross-referencing is also done with the research instruments for the study.

4.2   Research Paradigm

Wisker (2001:123) notes that there are two main paradigms to research: positivism and interpretivism. Positivism is an epistemological position that advocates the application of the methods of the natural sciences to the study of social reality (Bryman, 2001). It is a view that social sciences should mirror, as near as possible, procedures of the natural sciences (Hughes, 2010). This view believes the researcher should be detached from the objects of research, thereby promoting the concepts of neutrality, objectivity, and value free processes in research (Willis, 2007). According to positivism, it is possible to capture, through research instruments, 'real' reality, a belief that stems from positivists' principle that true knowledge is scientific and that all things are measurable. Positivism advocates for the isolation of phenomena and holds that observations should be repeatable. For the positivists knowledge consists of identifying facts about how and why people behave as they do and, eventually making connections between different facts to produce theories and explain behaviour. For this reason, positivism favours quantitative methods because they allow for the collection of factual data (Livesey, 2006).

Interpretivism, on the other hand, is predicated on the premise that society doesn't exist in an objective, observable form; rather it is experienced subjectively because we give it meaning by the way we behave. We create and recreate a sense of the social system on a continual basis (Livesey, 2006). Interpretivists believe the social world is understood or interpreted by different people in different situations in different ways since people proceed from different cultures and from different contexts. Understanding social behaviour involves understanding how people define and interpret their particular social situation, that is, how they construct the social realities. The study of phenomena in their natural environment is key to the interpretivist paradigm, together with the acknowledgement that scientists cannot avoid affecting those

phenomena they study (Davison, 2010) since their interpretation flows from their personal, cultural, and historical experiences (Cresswell, 2009). The interpretivist paradigm leans towards the collection of qualitative data.

Positivist and interpretive paradigms are frequently believed to enhance research strategies and ways of understanding the world. Combining the two paradigms in the same research can further the goals of a study because the strategy enables the contribution of information that may have been missed by adopting only one perspective (Roth and Mehta, 2002). The problem investigated in this study required a perspective that embraces both quantitative and qualitative data. It is necessary to adopt both the positivist and interpretivist paradigms. This strategy has been used and tested in similar studies by such researchers as Lenares (1999), Rogers (2001), Sathe, Glady and Giuse (2002), Bar-llan, Peritz and Wolman (2003), Saikia (2007), and Nuangchalerm (2010).

A quick demonstration of how the two paradigms have affected the conduct of this research follows: This study started with a theory, the Unified Theory of Acceptance and Use of Technology (UTAUT), in line with a positivist view that advocates for the use of theory to guide research. Positivists argue that without theory the researcher would not know what to look at in the facts before his eyes (Willis, 2007). Positivists argue that the use of theory in social sciences is needful as it scientifically connects the facts that are happening with those that have happened. The use of theory in this study was explained fully in Chapter 2 (Theoretical Framework). Positivists also favour the collection of quantitative data with factual and closed questions. Appendix 1 (Survey Questionnaire for Academics at Selected Zimbabwean State Universities) demonstrates a true positivist view. Many of the questions are factual and closed and therefore leaning towards the positivist paradigm.

The interpretivist paradigm informed the construction of the questionnaire to a lesser extent with only questions: 19, 20, 21, and follow up to questions 29, 34, 35, 36, and 37 adopting an interpretivist outlook. However, the other research instruments, namely: Interview Guide with Faculty Librarians at Selected Zimbabwean State Universities (Appendix 2), Interview Guide with Sub-Librarians Responsible for Reader Services at Selected Zimbabwean State Universities

(Appendix 3), Interview Guide with Systems Librarians at Selected Zimbabwean State Universities (Appendix 4), and Interview Guide with Librarians at Selected Zimbabwean State Universities (Appendix 5) all demonstrate the spirit of interpretivism. Questions in these guides are open ended and flexible. This allowed respondents to be outspoken concerning the issue under study.

4.3   Research Approach

Several authors (Locke, Spirduso and Silverman, 1993:108; Creswell, 1994:1; Leedy, 1997:104; Powell, 1999:96; Bryman, 2001:20; Kumar, 2005:12) agree that research methodologies revolve around two major approaches: quantitative and qualitative. Kumar (2005:12) describes the quantitative approach, which evolve from the positivist paradigm, as a structured approach to inquiry. This is a suitable approach if the researcher wants to quantify the variation in a phenomenon, situation, problem or issue; and if information is gathered using predominantly quantitative variables; and if the analysis is geared to ascertain the magnitude of the variation. Bryman (2001) states that the quantitative strategy emphasises quantification in the collection and analysis of data. Franklin (2013) also emphasises the quantification in quantitative research. He notes that quantitative research produces data that can be counted or expressed numerically, such as expressing a certain quantity, amount, or range. In this sense, quantitative research implies that statistical operations will be applied to the data.

The qualitative approach flows from the interpretivist paradigm. It is unstructured and is suitable if the purpose of the study is primarily to describe a situation, phenomenon, problem or event; if the information is gathered through the use of variables measured on nominal or ordinal scales; and if analysis is done to establish the variation in the situation, phenomenon or problem without quantifying it (Kumar, 2005). Bryman (2001) notes that qualitative research emphasises words rather than quantification in the collection and analysis of data.

Kumar (2005:12), however, cautions against the habit of 'locking' oneself as a researcher in one approach only as both these approaches have their strengths and weaknesses. Ngulube (2003:197), inspired by works of Bryman (1988:172), Kelly (1999:431), and Cohen, Manison and Morrison (2000:112) strongly urges researchers to adopt triangulation in order to counter the

weaknesses of one particular approach. Triangulation is the use of two or more methods to study a phenomenon. It helps to bridge issues of reliability and validity (Glesne and Peshkin, 1992; Hammersley, 1992; Levine, 2000).

This study therefore adopted both the quantitative and qualitative approaches. Quantitative approach is famed as the oldest type of research that is capable of describing, predicting and explaining social phenomena and is credited for having provided a significant part of the foundation on which social sciences have been erected, established and sustained (Locke, Silverman and Spirduso, 1998:124; Ngulube, 2003:23). Qualitative approach, on the other hand, is famed for its ability to probe deeper into issues to enable a more robust understanding of the phenomena under study (Bryman, 2001).

The questionnaire (Appendix 1) shows characteristics of quantitative research as enunciated by Cresswell (2009) who argue that quantitative methods ask pre-determined, instrument based questions. He also notes that the quantitative approach mostly uses closed-ended questions. This is how the main instrument of this study, the survey questionnaire, was constructed. The quantitative approach was chosen because it is known for accurately capturing performance and attitudinal data (Cresswell, 2009) which is in line with research questions for this study. The quantitative approach also allows for statistical analysis and interpretation, virtues that are important in enabling the generalisation of results and testing of theory, in this case, the UTAUT model. Also, quantitative methods have the capacity to solicit data from a large pool of respondents. This was a major advantage for this study as it involved collecting data from academics at three (3) state universities in Zimbabwe. The level of work needed to collect such data was better handled using the quantitative approach.

The study captured in-depth data from professional librarians in different capacities. It was therefore necessary to engage the qualitative approach. The four interview guides (Appendices 2, 3, 4, and 5) that were used to collect date from professional librarians demonstrated a qualitative perspective. The qualitative approach is mostly suitable if the number of respondents is manageable. For the purpose of this study it was, since librarians are much fewer than academics in the institutions studied.

4.4   Research Design

The study adopted the survey research design because it was considered to be the most appropriate design for the purpose of the study and research questions under investigation. Kumar (2005:93) lauds the survey design as the commonly used design in social sciences. It is best suited to studies aimed at finding the prevalence of a phenomenon, situation, problem, attitude or issue. According to Busha and Harter (1980:54) survey research is characterised by the selection of random samples from large and small populations to obtain empirical knowledge of a contemporary nature. This knowledge allows generalisations to be made about characteristics, opinions, beliefs, and attitudes without the entire population being studied. Babbie (1990) in agreement with Busha and Harter state that the purpose of a survey is to generalise from a sample to a population, so that, inferences can be made about some characteristic, attitude, or behaviour of this population. For the purpose of this study the survey methodology is the best because the focus of the study is on academics in three universities. This method is the least expensive and it is time-saving. A survey allowed the researcher to work with a sample but still be able to generalise the findings back to the population. The survey was the preferred method because not only is it economical, it also has rapid turnaround in data collection (Babbie, 1990; Fowler, 2002; Cresswell, 2009; Franklin, 2013). This feature saved time for the researcher. Thus, survey research techniques can save time and money, without sacrificing efficiency, accuracy, and information adequacy in the research process (Fink, 2002).

The survey design was also preferred for this study because it allowed for cross-sectional data collection. Cross-sectional data collection entails the collection of data on more than one case and at a single point in time. This is in order to collect a body of quantitative or quantifiable data in connection with many variables, which are then examined to detect patterns of association (Bryman, 2001). Cross-sectional data collection was important for this study because it allowed the researcher to capture the views of academics at the same time. This eliminated biases and inconsistencies that may have been introduced by variations in time for data collection.

The researcher also chose the survey design because it was suited to the research questions addressed by the study. In recommending the survey design, Busha and Harter (1980:54) are emphatic about the type of information in the library and information field that this design is

renowned for. The list they created is relevant to the type of information the researcher was looking for, therefore strengthening the argument for his choice of research design. They give six crucial types of information that the survey design is well known to tackle efficiently. The points they raise are considered in turn and matched to the research questions for this study:

- First, they note that the survey design is effective in soliciting information about whether library users (or non-users) are pleased with a library's collection or services. This is in line with research questions number 2 and 3, which consider the issues of use, attitudes, and perceptions. Academics' use of electronic journals depends on whether they are happy with the collection in terms of what it offers and how accessible it is. The use of electronic journals also depends on whether the services offered in their provision are helpful to the quest of academics to use such resources (Nelson, 2001; Bevilacqua, 2005). Likewise, the extent to which academics are pleased or displeased with electronic journals shapes their attitudes and perceptions towards the resources (Kemp and Jones, 2007);

- Second, Busha and Harter (1980:50) note that the survey design is effective if the researcher wants to find out about the level of awareness of a library's collection or its services by users. This means the design chosen is effective in addressing research questions number 1 and 5. Research question number 1 enquires about the level of awareness of peer reviewed electronic journals by academics whereas, research question number 5 deals with strategies used to promote use of peer reviewed electronic journals by academics. The effectiveness of the strategies would affect awareness of the resources by academics;

- Third, the authors note that the survey design is effective in collecting data about the kinds of information needed by library users and non-users, as well as data on information sources on which users commonly rely. The strength of the survey design in addressing this information was crucial in addressing research question number 2 which deals with use of peer reviewed electronic journals by academics;

- Fourth, Busha and Harter (1980:50) note that the survey design is effective in measuring users' attitudes towards library resources. This is an important component of the study. The strength of the survey design here helped the researcher to deal with research

question number 3. This question addressed the attitudes and perceptions of academics towards peer reviewed electronic journals;

- Fifth, Busha and Harter (1980:50) note that the survey design is effective in measuring the skills level of users in using library resources and services. This was an important aspect of the study. It proceeded from research question number 4 and the facilitating conditions construct of UTAUT, a model used for this study; and,

- Sixth, Busha and Harter (1980:50) argue that the survey design is effective in ascertaining the degree to which new developments and innovations are anticipated, accepted and utilised by library users. This sixth point was the major focus of the study and it covers fully the purpose of the study and all the research questions. The strength of the survey design in determining acceptance and use of new technology like electronic journals was important for the study.

In a nutshell, the survey design was the most appropriate to study the adoption and use of peer reviewed electronic journals by academics at state universities in Zimbabwe. The same design was used by other researchers who studied adoption and use of electronic journals in universities, such as Rusch-Feja and Siebeky (1999), Morse and Clintworth (2000), Bar-llan, Peritz and Wolman (2003), Tenopir (2003), Voorbij and Ongering (2006), Zainab, Huzaimah and Ang (2006), Borrego, Anglada, Barrios and Cornellas (2007), and Kumar and Kumar (2008).

4.5 Population of the Study

The population of a study refers to the universe of units from which the sample is to be selected (Bryman, 2001; Cresswell, 2009). The population for this study involved academics and professional librarians from three (3) state universities in Zimbabwe, namely: National University of Science and Technology (NUST), Midlands State University (MSU), and Bindura University of Science Education (BUSE). These three universities were chosen from a pool of ten state universities in Zimbabwe, namely:

- University of Zimbabwe (UZ);
- National University of Science and Technology (NUST);
- Midlands State University (MSU);
- Zimbabwe Open University (ZOU);

- Lupane State University (LSU);

- Great Zimbabwe University (GZU);

- Chinhoyi University of Technology (CUT);

- Bindura University of Science Education (BUSE);

- Women's University in Africa (WUA); and,

- Harare Institute of Technology (HIT).

The three universities were chosen because apart from the UZ, which declined to participate in this study, they are the biggest in terms of the numbers of academics and students. They are also the oldest state universities in Zimbabwe and have been offering peer reviewed electronic journals for sometime. The three universities were also suitable for this study because they offer a variety of disciplines (represented as Faculties in Tables 6, 7, and 8 showing Academic Staff Totals for the three universities), a feature which was critical in testing the conceptual model proposed by the researcher in section 2.7. This conceptual model proposed an addition of *discipline* as one of the factors that moderates the effect of two UTAUT constructs: performance expectancy and effort expectancy on behavioural intention and usage behaviour of electronic journals by academics. In order to test the validity of this proposal, it was important that the study chose universities that offer a variety of disciplines. These three universities offer a wider variety of disciplines. They are only surpassed by the University of Zimbabwe, which unfortunately declined to be part of the study.

The study identified academics as the major population because they are expected to take the lead in the use of peer reviewed electronic journals in universities. If academics do not see the need to use these resources it is very unlikely that students whether undergraduate or postgraduate will see any need to use the resources (Tenopir, 2003). The definition of academics in this study refers to teaching and research staff in universities who have at least a Masters degree. In the context of Zimbabwe, teaching assistants and research assistants are excluded since they have not yet attained their Masters degrees. The population of academics as of January 2013, in the three universities chosen for the study is shown in Tables 6, 7, 8 and 9 below. The fugures for NUST and BUSE were officially given to the researcher by the Registrars of these universities. The MSU figures were taken from the university website (MSU, 2012). Appendix 6

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shows a copy of the Academic Staff Totals for the National University of Science and Technology and Appendix 7 shows a memorandum from the Registrar of Bindura University of Science Education revealing the academic totals for the university.

Table 6: Academic staff totals for NUST

Faculty	Total
Commerce	94
Applied Sciences	81
The Built Environment	12
Communication and Information Science	39
Industrial Technology	49
Medicine	27
Grand Total	**302**

Table 7: Academic staff totals for BUSE

Faculty	Total
Science	64
Science Education	30
Agriculture and Environmental Science	36
Commerce	50
Grand Total	**180**

Table 8: Academic staff totals for MSU

Faculty	Total
Arts	58
Commerce	57
Education	42
Law	13
Natural Resources Management and Agriculture	36
Science and Technology	50
Social Sciences	56
Grand Total	**312**

The total population of academics in the study was as shown in Table 9 below:

Table 9: Total population of academics from the three universities chosen for the study

University	Total
National University of Science and Technology (NUST)	302
Bindura University of Science Education (BUSE)	180
Midlands State University (MSU)	312
Grand Total	**794**

The population of the study includes professional librarians from the three universities. Professional librarians were important to the study as they are the providers of peer reviewed electronic journals to academics in the respective institutions. They offered insight on the adoption and use of peer reviewed electronic journals by academics. In addition, they provided an understanding of the environment within which academics adopt and use electronic journals. These professionals supervise the libraries that provide these resources to academics. An understanding of the environment helped the researcher understand the factors that shape the adoption and use of electronic journals by academics. This was consistent with the facilitating conditions construct of the UTAUT which underpinned this study. The inclusion of professional librarians in studies focusing on the adoption and use of electronic journals by academics was also supported by seasoned researchers such as Tenopir (2003) and Tenopir, King, Edwards and Wu (2009).

Professional librarians in university libraries in the context of Zimbabwe fall into the following categories: Assistant Librarians/Faculty Librarians, Sub-Librarians, Systems Librarians and Librarians. Assistant Librarians were included because they also work as Faculty Librarians. The arrangement in Zimbabwean State Universities is that there are Assistant Librarians who are in charge of different departments in the library like Reference Services, Circulation, Periodicals, Acquisitions, Cataloguing and Classification and other such departments. In addition to the work as departmental heads many of these Assistant Librarians also have assigned academic faculties that they oversee in providing library services. For example, an Assistant Librarian may be in charge of Circulation but at the same time serve as Faculty Librarian for the Faculty of Commerce. Such librarian sits in the Faculty of Commerce board meetings as library

representative and acts as a mediator and link between that faculty and the library. Faculty Librarians were included in the study because they deal with academics in their respective faculties. They understand their needs and aspirations more than anyone else in the library. The number of Faculty Librarians per university, however, does not necessarily match the number of Faculties in each university. Some Faculty Librarians serve more than one Faculty.

Sub-Librarians oversee and coordinate the departments headed by Assistant Librarians. This study, therefore, included all Sub Librarians in the Reader Services Sections who interact with academics from all faculties as regards their information needs. They act on those issues that the Assistant Librarians are unable to deal with. They were important in this study because they provided oversight and moderation. Systems Librarians were crucial because they offer expertise to the provision of electronic journals. They understand the technical challenges that university libraries face in providing these resources to academics. Librarians were included because they deal with policy issues that affect subscription to electronic journals and their distribution to academics.

The population of professional librarians was established from the websites of the respective universities (NUST, 2012; MSU, 2012; BUSE, 2012) and is shown in Table 10 below:

Table 10: Population of professional librarians at NUST, BUSE, and MSU

	NUST	BUSE	MSU	Total
Faculty Librarians	6	4	5	**15**
Sub-Librarians (Reader Services)	1	1	1	**3**
Systems Librarians	1	1	1	**3**
Librarians	1	1	1	**3**
Total	**9**	**7**	**8**	**24**

As shown in Table 10 above the total of Faculty Librarians from the three universities is 15. The number of Sub-Librarians (Reader Services) is one in each university. This numbers a total of 3, the same number as the Systems Librarians and Librarians. The total for professional librarians is, therefore, 24. As already noted above, the number for Faculty Librarians does not correspond

with the number of Faculties in each university as some Faculty Librarians, particularly in the case of MSU serve more than one Faculty.

4.6   Sampling

Survey designs, like the one chosen for this study, are known for using samples to collect data. The data is then generalised back to the population (Willis, 2007; Franklin, 2013). A sample is a segment of the population that is selected for investigation. It is a subset of the population (Bryman, 2001). Sampling is necessary in order to save time and money. This enables the study to be done effectively without a complete enumeration being taken (Fink, 2009).

4.6.1   Sampling in Respect of Academics

The study adopted a sampling framework developed by Bartllett, Kotrlik and Higgins (2001) to sample academics. An excerpt of this framework is shown in Table 11 below. This excerpt is for sample sizes where categories like age, gender, faculty and institution are important in analysing data. In this study all these categories are relevant to the understanding of adoption and use of peer reviewed electronic journals by academics. Discipline is especially important since it was used to test the conceptual model proposed in Chapter 2. The sampling framework shown below assumes a margin error of 0.05 or 5%. This is recommended for surveys in social research by researchers such as Krejcie and Morgan (1970).

Table 11: Excerpt of sampling framework by Bartllett, Kotrlik and Higgins (2001)

Population Size	Sample Size
600	316
700	341
800	**363**
900	382
1000	399
1500	461
2000	499

The total population of academics in the three universities is 794. This figure was rounded off to 800 so that it fits in within the sampling framework. This resulted in a sample size of 363 as highlighted in Table 11 above. Since the respondents came from different universities the

number targeted at each university was decided on a proportional basis as follows: the number of academics at each university divided by the total number of academics in the three universities multiplied by the sample size. This gives us sample sizes for the three universities as shown in Table 12 below:

Table 12: Sample sizes applied to the three universities in respect of academics

	NUST	BUSE	MSU	Total
Population	302	180	312	**794**
Sample Size	138	82	143	**363**

From Table 12 above 138 academics at NUST were targeted with questionnaires, 82 were targeted at BUSE, and 143 were targeted at MSU. In distributing questionnaires at each of the three universities the study adopted simple random sampling, with stratification by Faculty. This approach allowed the testing of the conceptual model proposed in Chapter 2 which put forward discipline as one of the factors ignored by the UTAUT. The literature suggests this is a moderator in the adoption and use of technology. In order to measure the effect of discipline, the administration of questionnaires need to be sensitive to Faculty sizes, so that no discipline is over represented or underrepresented. Proportional distribution was therefore applied across all faculties in all the three universities. The questionnaires did not have any specific benchmarks for distribution according to gender, age, academic rank, and number of years in academia. However, these categories were important in the analysis of data. The questionnaire addressed these categories. It was possible to determine how many academics were of a particular gender, age range, and academic rank. This information was vital in data analysis. However, in terms of stratification, discipline was prioritised. This enabled testing of the UTAUT in respect of the effect of discipline as a moderator. The same approach of stratifying by discipline was successfully used by Dulle and Minishi-Maganja (2011) in similar studies that focused on six Tanzanian universities. Tables 13, 14, and 15 below show how questionnaires were distributed within each university. This is in respect of disciplinary differences of academics as reflected by Faculties:

Table 13: Sample sizes applicable for distribution of questionnaires at NUST

Faculty (Discipline)	Population	Sample Size
Commerce	94	43
Applied Sciences	81	37
The Built Environment	12	6
Communication and Information Science	39	18
Industrial Technology	49	22
Medicine	27	12
Grand Total	**302**	**138**

The sample share for NUST is 138 as already shown in Table 12. Here Table 13 illustrates how that share of 138 was distributed proportionally to all the Faculties in the university. The same system was applied to the other two universities as Table 14 for BUSE and Table 15 for MSU show below:

Table 14: Sample sizes applicable for distribution of questionnaires at BUSE

Faculty (Discipline)	Population	Sample Size
Science	64	29
Science Education	30	14
Agriculture and Environmental Science	36	16
Commerce	50	23
Grand Total	**180**	**82**

Table 15: Sample sizes applicable for distribution of questionnaires at MSU

Faculty (Discipline)	Population	Sample Size
Arts	58	27
Commerce	57	26
Education	42	19
Law	13	6
Natural Resources Management and Agriculture	36	17
Science and Technology	50	23
Social Sciences	56	25
Grand Total	**312**	**143**

4.6.2   Sampling in Respect of Professional Librarians

The researcher adopted purposive sampling in respect of professional librarians. Purposive sampling, also known as judgemental, selective or subjective sampling, relies on the judgement of the researcher in selecting units for study. The main goal of purposive study is to include in a study those individuals who will be able to provide information that helps the researcher answer his or her research questions (Leedy, 1997:211). Table 10 detailed the professional librarians who constituted the population for this study: Faculty Librarians - 15 (NUST – 6, BUSE – 4, and MSU – 5), Sub-Librarians (Reader Services) – 3, one for each university, Systems Librarians 3 – one for each university, and Librarians 3 – one for each university. All these professionals were important. They were able to contribute valuable information from their respective positions. Purposive sampling allows the researcher to target every member of the population in qualitative data collection as long as each person provides the study with unique information. This study targeted all of the cited professional librarians for interviews. Eliminating other librarians would mean having to eliminate other information which only specific librarians were privy to. The librarians all provided adequate information for the issues the researcher wanted to interrogate.

4.7   Data Collection

The study adopted the use of survey questionnaires and interviews as instruments of research. These instruments were implemented simultaneously. Survey questionnaires were used as the major instrument of the study to collect data from a sample of academics from the three universities: NUST, BUSE, and MSU. A copy of the survey questionnaire is shown in Appendix 1 – Survey Questionnaire for Academics in Selected Zimbabwean State Universities. Data was also collected by interviews from Faculty Librarians (Appendix 2 – Interview Guide with Faculty Librarians in Zimbabwean State Universities), Sub-Librarians responsible for Reader Services (Appendix 3 – Interview Guide with Sub-Librarians Responsible for Reader Services in Zimbabwean State Universities), Systems Librarians (Appendix 4 – Interview Guide with Systems Librarians in Zimbabwean State Universities), and Librarians (Appendix 5 – Interview Guide with Librarians in Zimbabwean State Universities). The researcher linked the research questions of the study to sources of data and instruments used to collect the data. Table 16 below summarises the sources of data for each research question.

Table 16: Sources of data for research questions

No.	Research Question	Method(s)	Source of Data
1	What is the level of awareness of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?	Quantitative/Qualitative	Questionnaire-Academics Interviews- Faculty Librarians, Sub-Librarians, and Librarians
2	What is the extent of use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?	Quantitative/Qualitative	Questionnaire-Academics Interviews- Faculty Librarians, Sub-Librarians, and Systems Librarians
3	What are the attitudes and perceptions of academics towards peer reviewed electronic journals?	Quantitative/Qualitative	Questionnaire-Academics Interviews- Faculty Librarians, Sub-Librarians, and Librarians
4	What factors influence the behaviour of academics at selected Zimbabwean State Universities towards peer reviewed electronic journals?	Quantitative/Qualitative	Questionnaire-Academics, Interviews-Faculty Librarians, Sub-Librarians and Librarians
5	What strategies are used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics?	Quantitative/Qualitative	Questionnaire-Academics Interviews- Faculty Librarians, Sub-Librarians, Systems-Librarians, and Librarians

4.7.1   Justification for the Use of Questionnaires for Data Collection in this Study

Busha and Harter (1980:61) emphatically declare that questionnaires are often used in surveys as the primary data collection instruments. They state that questionnaires allow for the gathering of valid and reliable information so that specific hypotheses can be tested or research questions answered. Saunders (1997:51) argue that questionnaires are useful as the main data gathering tool in surveys because they can collect both quantitative and qualitative data from the sample. In

this study valid and reliable data was gathered using both the quantitative and qualitative approach.

Questionnaires were used in this study because they allowed for the collection of sensitive information from respondents (academics). Issues to do with electronic journals and how people use them are related to technology. This ability to use technology is viewed as a symbol of status. Many respondents are unwilling to display ignorance. They fear a lowering of their integrity and reputation and also fear a deflation of their ego. This could to lead to falsification of answers. The use of questionnaires, however, could minimise this. This is supported by Waldman (2003:63) who argues that sensitive areas should be investigated by anonymous questionnaires.

Tenopir (2003) states that to gain accurate responses from a survey, the researcher must use a method that is familiar to the respondents. They can feel uncomfortable and jittery with a new method. This prevents them from responding honestly. Academics are very familiar with questionnaires as they often use them in their careers. Tenner and Young (1999) value questionnaires, on the basis that they allow a researcher to contact a large sample at a relatively low cost and also in a reasonable time frame. The sample of academics targeted for the study was 363. This is a large number however, with the use of questionnaires the task was cost effective and was done in correct time frame.

Questionnaires are the best research instruments for large samples because they allow for the collection of data in a standardised way (Neal, 1999). This made the analysis of large amounts of responses easier and palatable. Questionnaires were used in this study because they are simple and quick for the respondents to complete. Nicholas (2002) alludes to the importance of a research instrument to quickly collect intended data from the targeted respondents. People are not interested in long and involving research tools. This fits well for this study because the respondents are hard pressed for time.

4.7.2 Steps Taken to Ensure the Smooth Application of the Questionnaire in Data Collection

Since the questionnaire was the primary data collection instrument in this study, it is crucial to detail steps that were taken to enable the smooth, reliable, and valid operation of this instrument. This should in turn authenticate the data collected by this instrument. The steps that were taken are now considered in turn:

4.7.2.1 Type of Questions Asked in the Questionnaire

Ritchie and Lewis (2003) note that an effective questionnaire entails writing questions or items that elicit required information. Several types of questions can be utilised, including factual, opinion and attitude, information, self-perception, and standards of action questions. Factual questions were asked in the survey so that relationships between respondent characteristics (the independent variables) and the object of the study (the dependent variable) could be determined. Further, because the purpose of the questionnaire in this research was also to test respondents' feelings, values, and related concepts, opinion and attitude questions were also used. Such questions are valuable in obtaining measures of the direction and intensity of research subjects' opinions about a topic or attitude object.

Busha and Harter (1980) mention that in a questionnaire, questions can also be classified on the basis of form and method of response, into two major categories: unstructured and structured. Unstructured questions are open ended. They allow respondents to reply freely without having to select one of the several provided responses. These types of questions were used very sparingly in this researcher's questionnaire for several reasons. Firstly, it would have been difficult to analyse the responses from unstructured questions given the large number of questionnaires distributed. Secondly, due to limited time on the part of the respondents, they would have declined to partipate if unstructured questions were many. Thirdly, the researcher would have forfeited the advantage of standardisation.

The researcher favoured structured questions. These are characterised by a number of provided fixed responses; survey participants are allowed to choose among several answers designed to reflect various views, beliefs, or feelings. Structured questions are closed because they do not

elicit unpredictable responses. Structured questions were favoured because of several reasons (Busha and Harter, 1980):

i. They enhance reliability;

ii. They are quicker and less stressful for respondents to complete so they qualify as a users friendly way of questioning;

iii. They capture and sustain the interest of respondents;

iv. They are easy and fast to analyse; and,

v. They work well with the statistical package that was used for data analysis in this research.

The type of questioning adopted in this research was objective. Leading questions that seek to influence the respondents were avoided. This was done to keep the research as objective as possible.

4.7.2.2 Sub-division of Questionnaire into Parts

One major step that was taken to make the questionnaire easy to use both for the respondents and the researcher was to sub-divide the questions into different categories. Each category represented the major research questions addressed by the study. This is in line with the recommendations given by Tenner and Young (1999) who advocate for the categorisation of a questionnaire to ensure all major parts or areas of interest are catered for. The questionnaire comprised of the following sections: Section A which deals with the demographics of the respondents, Section B (Level of awareness of electronic journals) that addresses research questions 1 and 5, Section C (Academics' use of electronic and usage behaviour) which addresses research question 2, Section D (Facilitating conditions to adoption and use of electronic journals) which addresses research question 4, Section E (Attitudes and perceptions of academics towards electronic journals) which addresses research question 3, and Section F which has summary questions that capture all the constructs of the UTAUT.

4.7.2.3 Distribution of the Questionnaires

The researcher employed research assistants to help with the distribution of questionnaires. Questionnaire distribution was efficiently and professionally handled. This enhanced the validity of the tool as the main data collection instrument in this study.

4.7.3 Steps Taken to Ensure Smooth Flow of Interviews

Interviews were held with Faculty Librarians, Sub-Librarians (Reader Services), Systems Librarians, and Librarians from the three universities under study. The following steps were taken to enhance the validity, reliability, authenticity, and usefulness of the interview as an instrument of data collection:

- The researcher conducted the interviews in person as encouraged by authors such as Busha and Harter (1980), Bryman (2001), Willis (2007), and Franklin (2013). Conducting the interviews in person allowed for uniformity. It also ensured enough probing of the issues under consideration as the researcher is familiar with the topic for which interviews were held;

- Clear and concise interview guides were prepared in advance and given to the relevant interviewees. Preparedness is vital in the quality of responses solicited from the interviews. Copies of the interview guides are given in Appendices 2, 3, 4, and 5;

- Like the questionnaire, the interview guides for Faculty Librarians and Sub-Librarians were divided into categories. This ensured every area of interest was captured and that the respondent was aware of the focus of the research;

- The interviews were held at the leisure of the interviewees to minimise distractions and to ensure the respondents were comfortable to answer objectively;

- Only one question was asked at a time. Questions were concise and clear;

- No attempt was made by the researcher to influence respondents. It was made clear from the onset that the purpose of the interviews was to get the views of the respondents, not those of the researcher; and,

- The researcher was objective. He avoided reacting to the respondents' replies by expressing approval, disapproval, surprise, or shock. The researcher was always appreciative of what the respondent provided.

4.8   Reliability and Validity of Research Instruments

Reliability refers to the consistency of an instrument (Bryman, 2001:70). To be credible, an instrument must be stable so that its use can be repeated several times with the same results. Validity refers to whether an indicator or set of indicators that is devised to gauge a concept really measures that concept (Bryman, 2001:72). The study adapted questionnaires that have been successfully used to investigate the adoption and use of electronic resources in several universities in Africa. The first set of questionnaires was developed by Mergesa and Mammo (2008) and was used to evaluate the use of electronic journals in nine institutions of higher learning in Ethiopia. The second set was developed by Manda (2008) and was used to evaluate use of electronic journals in twenty-three research and academic institutions in Tanzania. These questionnaires were consistent and valid. They were accepted by INASP, an organisation offering and advocating for the use of electronic journals. The researcher was supported by research assistants in administering questionnaires but interviews were conducted solely by the researcher as this allowed for relevant follow up questions. Interviews were recorded with the permission of the interviewees. This prevented misrepresenting of the views of those interviewed. This helped in guaranteeing credibility of interview data.

4.9   Ethical Considerations

Ethical issues were given a priority in this study. Permission was sought and granted by all the three institutions that form part of this study. Appendix 8 shows a copy of the letter of approval from the Registrar of NUST, Appendix 9 shows a copy of the letter of approval from the Registrar of BUSE, and Appendix 10 shows endorsement of approval from the Registrar of MSU. The study also got ethical clearance from the University of KwaZulu-Natal (UKZN) (Appendix 11). Participants participated on a voluntary basis, no one was coerced to take part in the research process. Prospective participants were fully informed about the purpose of the study so that those who chose to participate did so from an informed position. The researcher furnished each participant of this study with an Informed Consent Letter (Appendix 12). The letter detailed the intention of the study and informed the targeted participants of their right to refuse participation or withdraw at any stage. The study did not include any procedures that were likely to be harmful to participants. The information and views given by participants were confidential.

Participants remained anonymous as questionnaires did not require them to indicate their names. The study complied with UKZN research ethical code.

4.10   Data Analysis

The study produced both quantitative and qualitative data. Quantitative data were generated from the survey questionnaire for academics and were analysed through tables and graphs. The Statistical Package for Social Sciences (SPSS) was used to analyse quantitative data as it is a suitable package for statistical representation of information (Franklin, 2013).

Qualitative data were generated from the survey questionnaire administered to academics and from interviews conducted with Faculty Librarians, Sub-Librarians, Systems Librarians, and Librarians. The data were analysed using Nvivo, a qualitative data analysis computer software package. The package is designed for qualitative researchers working with very rich text-based or multimedia information, where deep levels of analysis on small or large volumes of data are required. The software allowed the researcher to classify, sort, and arrange information and examine relationships. Nvivo can test theories, identify trends and cross examine information in a number of ways using its search engine and query functions.

4.11   Summary

The chapter presented and justified the research methodology adopted for the study. The study rested on both the positivist and interpretivist paradigms and adopted both the quantitative and qualitative approaches. The survey design was adopted for the study. The population consisted of 794 academics from three state universities in Zimbabwe: NUST, BUSE, and MSU. The population also included 24 professional librarians from the same universities. The sample of the study was 363 academics and 24 professional librarians. Data were collected by questionnaires from academics and interviews from professional librarians. Measures were taken to enhance the reliability and validity of research instruments. The study met the ethical standards required by the University of KwaZulu-Natal. Respondents participated willingly and freely. They were guaranteed safety and anonymity. The quantitative data were analysed by SPSS to produce tables and graphs whereas qualitative data were analysed using the Nvivo package.

CHAPTER 5

DATA PRESENTATION AND ANALYSIS

5.1   Introduction

The chapter presents, analyses, and interprets data that was collected to answer the research questions of the study and to determine the trends and relationships among the constructs or variables of the Unified Theory of Acceptance and Use of Technology (UTAUT), which is the theory that underpinned this study. The study investigated the adoption and use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities. The study sought to address the following research questions:

1. What is the level of awareness of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?
2. What is the extent of use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?
3. What are the attitudes and perceptions of academics towards peer reviewed electronic journals?
4. What factors influence the behaviour of academics at selected Zimbabwean State Universities towards peer reviewed electronic journals?
5. What strategies are used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics?

The study was underpinned by both positivist and interpretivist paradigms and collected data from a sample of academics at three state universities in Zimbabwe through questionnaires and from professional librarians at the same universities using interviews. The universities studied were: National University of Science and Technology (NUST), Bindura University of Science Education (BUSE), and Midlands State University (MSU). Quantitative data were processed and analysed using the Statistical Package for Social Sciences (SPSS) to generate descriptive and inferential statistics. The SPSS is a widely used programme for statistical analysis in social sciences (Wellman, 1998:73; Levesque, 2007:47). Qualitative data were organised and analysed using Nvivo, a qualitative data analysis computer software package to generate results thematically. Moreover, using the Nvivo package enabled the researcher to classify, sort, and

arrange information and to examine relationships in the data. The findings from quantitative and qualitative data are integrated.

The rest of the chapter comprises of three main parts. The first part deals with preliminary issues such as response rate and demographics of respondents. The second part deals with descriptive statistics and qualitative findings. Data in this section were presented thematically emanating from the research questions cited above and constructs of the UTAUT. The third section deals with testing of the conceptual model, the updated UTAUT, as proposed in section 2.7 of Chapter 2. This testing is necessary in the light of data emanating from this study. It determines if the model holds true and determines the best fitting model for the adoption and use of technology in university setting in Zimbabwe.

5.2   Response Rates of Academics

The researcher distributed questionnaires to 363 academics from the three universities as was explained in Chapter 4. A total of 212 questionnaires were returned and deemed usable for the study. Table 17 below shows the response rate broken down per each university that participated in the study and also showing the overall response rate.

Table 17: Response rates in respect of academics of the three universities

	NUST	BUSE	MSU	Total
Sample Size	138	82	143	**363**
Responses	82	49	81	**212**
Percentage Response Rate	59.4	59.8	56.7	**58.4**

As shown in Table 17 above the response rates from all the three universities surpassed 50% with NUST achieving 59.4%, BUSE achieving 59.8%, and MSU returning 56.7% of the distributed questionnaires. The overall response rate was 58.4% calculated as follows: the number of total responses (212) divided by the possible responses, that is, total questionnaires distributed (363), multiplied by 100. An overall response rate of 58.4% is deemed adequate for this kind of study if we consider other published similar studies.

Lenares (1999) examined the levels of use and acceptance of electronic journals by academics at 20 United States of America (USA) research universities whose libraries were members of the Association of Research Libraries (ARL). The response rate was 26%. Tenner and Yang (2000) conducted a similar survey of academics at Texas A&M University. The response rate was 43.7%. Nelson (2001) carried out a survey at the University of the West of England (UWE) studying the attitudes of academics towards electronic journals and had a response rate of 11%. Smith (2003) conducted a survey to establish the role electronic journals played in academics' weekly reading habits at the University of Georgia, USA, and posted a 35% response rate. Vicente, Crawford and Clink (2004) had a 14% response rate when they studied the use of electronic information services by academics at Glasgow Caledonian University (GCU) in the United Kingdom (UK). Tenopir, King and Bush (2004) had a 30% response rate when they surveyed medical faculty at the University of Tennessee Health Science Centre (UTHSC) to establish how the multi-campus system use electronic journals. Korobili, Tilikidou and Delistavrou (2006) posted a 55% response rate when they examined the use of library resources, with special focus on electronic resources, by academics at the Technological Educational Institute of Thessaloniki, Greece. Borrego, Anglada, Barrios and Cornellas (2007) carried out a survey at Catalan Universities in Spain to establish how the increase in the number of electronic journals had modified academics' information behaviour and posted a response rate of 28%. Zhang, Ye and Liu (2010) carried out a study to investigate users' information behaviour at seven universities in Wuhan, a city in central China, and posted a response rate of 17%. Bennett and Buhler (2010) carried out a survey at the University of Florida focusing on Engineering faculty's past and current practices in electronic journals usage and had a response rate of 20%. The cited studies were considered adequate and results were published in peer reviewed journals. These studies were similar to this study as they investigated the adoption and use of electronic journals in university settings and used academics as major respondents.

It was important to establish representation of all faculties because *discipline* was envisaged in section 2.7 as a UTAUT moderator for the adoption and use of technology. All the six faculties at NUST posted fair response rates. The lowest response rate came from the Faculty of Applied Sciences. They had a response rate of 48.6%. The highest was recorded from the Faculty of the Built Environment which had 100%. The high response rate in this faculty can be attributed to

the fact that the faculty is small and proportionally it contributed few academics to the study, only 6 compared to big faculties such as Commerce which had a sample size of 43 academics. Details of how the sample sizes for each faculty and for each university were calculated were explained in Chapter 4. Table 18 below shows faculty response rates for NUST.

Table 18: Faculty response rates for NUST

Faculty (Discipline)	Sample Size	Number of Responses	Percentage Response Rate
Commerce	43	23	53.5
Applied Sciences	37	18	48.6
The Built Environment	6	6	100
Communication and Information Science	18	13	72.2
Industrial Technology	22	14	63.6
Medicine	12	8	66.7
Grand Total	**138**	**82**	**59.4**

At BUSE, faculty response rates were more evenly distributed across the four disciplines with the Faculty of Agriculture and Environmental Science achieving the highest with 62.5% and the Faculty of Science Education having the lowest with 57.1%. Table 19 below explains the faculty response rates at BUSE.

Table 19: Faculty response rates for BUSE

Faculty (Discipline)	Sample Size	Number of Responses	Percentage Response Rate
Science	29	17	58.6
Science Education	14	8	57.1
Agriculture and Environmental Science	16	10	62.5
Commerce	23	14	60.9
Grand Total	**82**	**49**	**59.8**

At MSU the Faculty of Law which is a small faculty that contributed only 6 academics to the study had the highest response rate of 83.3% while Natural Resources Management and Agriculture had the lowest at 47.1%. The other faculties had almost uniform rates ranging from the fifties to lower sixties. Table 20 below shows the full picture at MSU.

Table 20: Faculty response rates for MSU

Faculty (Discipline)	Sample Size	Number of Responses	Percentage Response Rate
Arts	27	14	51.9
Commerce	26	15	57.7
Education	19	10	52.7
Law	6	5	83.3
Natural Resources Management and Agriculture	17	8	47.1
Science and Technology	23	14	60.9
Social Sciences	25	15	60
Grand Total	**143**	**81**	**56.4**

As can be seen all the faculties in the three universities had respectable response rates. The faculty characteristics can be confidently analysed in the study as all the faculties responded favourably.

5.3   Response Rates of Professional Librarians

The researcher targeted a total of 24 professional librarians for interviews from the three universities. The details of the targeted professional librarians and the corresponding response rates are shown in Table 21 below. The figures to the left represent the number targeted whereas the figures to the right in brackets represent the number that was actually interviewed.

Table 21: Number of targeted professional librarians and the corresponding response rates for the three universities

	NUST	BUSE	MSU	Total
Faculty Librarians	6 (6)	4 (3)	5 (5)	**15 (14)**
Sub-Librarians (Reader Services)	1 (1)	1 (1)	1(1)	**3 (3)**
Systems Librarians	1 (1)	1 (1)	1(0)	**3 (2)**
Librarians	1 (1)	1 (1)	1(1)	**3 (3)**
Total	**9 (9)**	**7 (6)**	**8 (7)**	**24 (22)**

Only 2 out of the targeted 24 were unavailable for the interview. At NUST all the targeted 9 professional librarians were interviewed. These consisted of the Librarian, Systems Librarian, Sub-Librarian for Reader Services, and 6 Faculty Librarians for the Faculties of Applied

Sciences, Built Environment, Commerce, Communication and Information Science, Industrial Technology, and Medicine. At BUSE 5 professional librarians out of the targeted 6 were interviewed. They included: the Librarian, Systems Librarian, Sub-Librarian for Reader Services, and 3 Faculty Librarians for the Faculties of Agricultural and Environmental Science, Commerce, and Science. The researcher could not interview the Faculty Librarian for Science Education since she was on leave, however, the Sub-Librarian for Reader Services was able to help with information pertaining to this faculty. At MSU the researcher managed to interview 7 professional librarians out of the targeted 8. All 5 Faculty Librarians were interviewed as well as the Sub-Librarian for Reader Services and the Librarian. At the time of the study the Systems Librarian was on long leave and therefore could not provide the researcher with an interview. However, data that was supposed to be fetched from the Systems Librarian was provided by one of the Faculty Librarians who also serves as the Research Services Librarian and therefore was privy to information that was asked. A total of 22 interviews were conducted out of the targeted 24.

5.4   Characteristics of Respondents

There are some characteristics of respondents that may help in understanding data. These are staff category, that is, whether an academic is full time or part time, academic rank, number of years served in academia, gender and age range. These special characteristics are important in the analysis of data given that they were highlighted in literature as factors that can influence adoption and use of electronic journals. Also some of these characteristics like gender, age, and experience (number of years in academia) are posited in the UTAUT as moderators to the adoption and use of technology. It is therefore important for the reader to know how many of the respondents fell in each of these categories since these will continuously come up in the presentation of data and analysis of findings in this chapter. Response rates according to these factors are now presented below.

5.4.1   Staff Category

Of the 212 academics who responded to this study 93.4% were full-time and 6.6% were part-time. Table 22 below shows the statistics in terms of staff category.

Table 22: Responses by staff category

Staff Category	Frequency	Percent
Full time	198	93.4
Part time	14	6.6
Total	212	100

The 14 part time academic staff cited in Table 22 above were distributed as follows: NUST Faculty of Medicine – 8, BUSE Faculty of Agriculture and Environmental Science – 1, BUSE Faculty of Commerce – 1, and MSU Faculty of Law – 4.

5.4.2 Academic Rank

Most of the academics (92.4%) who responded to the survey questionnaire were lecturers. Senior lecturers constituted 5.7% while associate professors constituted 0.5% and professors constituted 1.4%. The full picture can be seen in Table 23 below.

Table 23: Responses by academic rank

Academic Rank	Frequency	Percent
Lecturer	196	92.4
Senior Lecturer	12	5.7
Associate Professor	1	0.5
Professor	3	1.4
Total	212	100

The very low number of professors in this study reflects the current situation in Zimbabwean State Universities where brain drain occurred in the years 2000 to 2010. Many experienced staff members sought greener pastures in other countries mostly South Africa, United States of America (USA), United Kingdom (UK), Australia, and New Zealand. This was due to the economic challenges experienced by Zimbabwe during these years.

5.4.3 Number of Years in Academia

Of the 212 academics who participated in this study 111 (52.4%) had 5 years experience or less, 83 (39.2%) had 6-10 years in academia, 14 (6.6%) had 11-20 years in academia, and 21 (1.9%) had over 21 years of experience. This is captured in Table 24 below.

Table 24: Responses by experience

Number of Years Served in Academia	Frequency	Percent
Below 5 Years	111	52.4
6-10 Years	83	39.1
11-20 Years	14	6.6
21 and Above	4	1.9
Total	212	100

The brain drain cited in section 5.4.2 contributed to the high number of young and inexperienced academics. Many of the experienced academics left the country. From Table 24 above it can be seen that 52.4% of respondents had 5 years experience in academia or less and 39.1% had 6 to 10 years of experience. This means that those with 10 years experience and below account for 91.5% of the respondents (52.4% + 39.1%) leaving those with 11 years experience and above to have a combined representation of 8.5%. These results resonate with those presented in section 5.4.2 above that show most academics are still in the lower ranks of the academic ladder and also connect with results in section 5.4.5 below that show most academics are fairly young, with the majority being 40 years old or less.

5.4.4 Gender

Reflecting the gender setup in Zimbabwean universities 63.7% of respondents were male and 36.3% were females. More details are captured in Table 25 below.

Table 25: Responses by gender

Gender	Frequency	Percent
Male	135	63.7
Female	77	36.3
Total	212	100

5.4.5 Age

Academics in the 31-40 years age range made up the largest number of respondents at 44.3% whereas those of 60 years and above constituted the least at 1%. Table 26 below explains this further.

Table 26: Responses by age

Age Range	Frequency	Percent
30 and below	27	12.7
31-40 years	94	44.3
41-50 Years	64	30.2
51-60	25	11.8
60 years and above	2	1
Total	212	100

5.5 Level of Awareness

The first research question of this study enquired about the level of awareness of peer reviewed electronic journals by academics. Both quantitative and qualitative data were collected to answer this question. Data were sought mainly from academics through questions 10, 11, 12, 30, and 51 of the questionnaire (Appendix 1) and also from Faculty Librarians and Sub-Librarians. Question 4 of the interview guide with Faculty Librarians (Appendix 2) and question 4 of the interview guide with Sub-Librarians (Appendix 3) helped to collect data for this research question. The relevant data are now presented in the sub-sections below.

5.5.1 General Awareness of Electronic Journals

Question 10 of the questionnaire measured the general level of awareness of academic staff regarding peer reviewed electronic journals. This is the general awareness that there exist electronic journals that are available for use within the respective universities without delving into the extent or quality of that awareness. The results for this question reveal that the majority of academics at the three universities were aware of the existence of peer reviewed electronic journals. Table 27 below shows the statistics concerning the general level of awareness of peer reviewed electronic journals by academics at the selected Zimbabwean State Universities.

Table 27: General level of awareness of peer reviewed electronic journals by academics at the selected Zimbabwean State Universities

	Frequency	Percent
Yes	204	96.2
No	8	3.8
Total	212	100

Of the 212 academics who participated in the study 204 (96.2%) indicated that they were aware of the existence of electronic journals whereas 8 (3.8%) indicated they were not aware. These statistics suggest a high level of general awareness across the three universities. However, there are different degrees of general awareness per university as will be shown below. Overall these statistics seem to confirm the belief of Sub-Librarians within these three universities who all felt that general awareness was high within their institutions. This happened after sustained periods of intense marketing of the resources. When asked about the level of general awareness of academic staff the Sub-Librarian Responsible for Reader Services at NUST responded:

> I think awareness is there, we have been marketing electronic resources for a long time. Maybe we might be taking things for granted because NUST is employing year in year out so there could be some who are not aware but I think we have done quite a lot and if you are a lecturer and you don't know the resources offered by your institution its worrying because it should work both ways, I reach you and you reach me.

This suggests that the Sub-Librarian at NUST is confident of the effort they have made to enhance awareness about electronic journals by academics at the institution. It is also important to note that the Sub-Librarian places the responsibility for creating awareness not just on the library but also on the academics themselves. The academics, she indicated, should also make an effort to reach the library rather than just wait to be reached. The Sub-Librarians for BUSE and MSU all expressed confidence that after the effort they have made most academics were now aware of electronic journals. They, however, expressed concern at the extent of awareness. They felt that most academics were just aware that there were electronic journals available for use but did not know much about the resources. The issue of quality of awareness is considered separately below.

The general awareness statistics were also considered per university. Midlands State University has the highest general awareness level with all 81 academics who participated in the study reporting that they were aware of the existence of electronic journals within their institution. The Sub-Librarian for Reader Services and all Faculty Librarians at this institution indicated that as part of induction all new academics at the institution are referred to the university library where they are introduced to library resources including electronic journals. They noted that as a matter

of policy there is no academic who starts work in any university department before they visit all induction points. The university library is one induction point they visit. This has ensured that all academics at the institutionare aware of electronic journals offered by the institution.

Forty eight (48) out of 49 academics who responded to the survey at BUSE reported that they were aware of electronic journals. One academic from the Faculty of Science Education had no knowledge of electronic journals. The general awareness level at BUSE would therefore be pegged at 98%, that is, 2 points behind MSU which had a 100% general awareness level. At BUSE the Sub-Librarian and Faculty Librarians all indicated they had mechanisms to market electronic journals to academics at the point of entry, that is, soon after being hired. The Sub-Librarian for Reader Services noted:

> We have also included library orientation as a marketing and training method. In the past we would just register new staff members assuming that they already knew electronic databases but we realised that it was a mistake. Now for a new staff member to be able to use the library they need to undergo library orientation and electronic journals are part of that. If a lecturer joins we would request that lecturer to go to the Faculty Librarian for registration and that is when they are trained.

This emphasis on marketing of electronic resources at point of entry of an academic into the institution could be responsible for the high levels of general awareness at MSU and BUSE. In addition to orientation at point of entry the Sub-Librarian at BUSE noted one more strategy that could be responsible for their high levels of general awareness. He noted when explaining further about awareness and use of electronic resources at the institution:

> The other avenue we have used to increase awareness and use of electronic journals here is we have a Teaching and Learning Committee and also library committee. We as the library wrote a position paper where we lobbied for each Course Outline to have at least one resource from the electronic journal databases; it was adopted by the library committee, the Teaching and Learning Committee, and eventually Senate. That was done in 2012 and was passed; now a Course Outline cannot pass without the inclusion of electronic resources. Now we have lecturers coming to us wanting to find out what they can include in their Course Outlines.

The above strategy seems to have put some pressure on academics at BUSE to know about electronic journals as reflected in the quantitative results on general awareness. The university with the least awareness level was NUST which had 75 of the 82 participants reporting awareness. This translates to 91.5% of academics at the institution. This means 8.5% of academics at NUST were not aware of the existence of electronic journals at their institution. Four of the 6 faculties at NUST had at least one academic who was not aware of the existence of electronic journals at their institution. The Faculty of Built Environment had 2 academics that were unaware of electronic journals. Considering that there were only 6 participants from this faculty the number of those unaware from this faculty seems to be high. The Faculty of Commerce had 3 academics that were unaware out of the faculty total of 23 that participated in the study. The Faculty of Communication and Information Science had one academic who was unaware out of the 13 that participated and the Faculty of Industrial Technology also had one unaware member out of 14 that participated. This means only the Faculties of Medicine and Applied Sciences had full general awareness of electronic journals at NUST.

The results from NUST could be understood in the light of what the Sub-Librarian and the Faculty Librarians from the institution said in interviews. There seems to be no mechanism at NUST to alert new academics concerning electronic journals. The Sub-Librarian already noted in the quote highlighted earlier that as the Library they are also waiting to be reached by academics who want to know about electronic journals. The quantitative results at NUST show that 5 out of the 7 academics who were not aware of electronic journals had been at the institution for 5 years or less. This then lends credence to concerns by Faculty Librarians at the institution that they were not aware when new academics joined the institution and would therefore take a long time to orient these to electronic journals unless if they came for scheduled training sessions that take place twice a year. The Faculty Librarian for the Built Environment, a faculty that had 2 of 6 participants being unaware of electronic journals noted:

> Unfortunately at times we don't even get to know that there are new staff members, we only get to know when we go to faculty board meetings. We would get to know if they came to the library but at times they don't come. Maybe there is need on the part of the library to be proactive, we should visit our constituency more often and find out if there are new lecturers. The idea was the library would buy us individual laptops so that it would be

easier for all the Faculty Librarians to go to the constituency and show them what we have in the library because as for now even if I go I don't have anything it will just be word of mouth.

The problem highlighted by the Faculty Librarian for the Built Environment was reiterated by other Faculty Librarians. The Faculty Librarian for Industrial Technology indicated that it was difficult to know that there was a new staff member who needed orientation or training because there was nothing that obligated new academics to visit the university library for orientation at the point they start work in the university. She indicated that their only hope is to catch academics during the normal workshops they conduct once a semester, that's twice a year, but the problem was that some academics do not come for the sessions hence some are not aware of these resources and even among those who are aware the extent of awareness is very low. The Faculty Librarian for Communication and Information Science who also acts as Reference Librarian for the institution noted that the general awareness about electronic journals by academics at NUST has improved over the past few years but the quality of awareness is still a concern as most just know that there are electronic journals but do not know much detail about the resources. He noted that they had a problem with most faculties who do not report new members in their ranks. He noted that there was currently no way of knowing if there were new academics in the respective faculties since they were not obligated to immediately register with the library when they join the university. He, however, indicated that when they get announcements of new academics in faculty board meetings they make an effort to make them aware of electronic resources at their disposal. The Faculty Librarian for Commerce also bemoaned the lack of notification from his faculty as regards new academics. He says he does not know when new staff comes in and this has affected his efforts to alert these academics to electronic resources. At NUST the faculties that stand out in terms of general awareness are the Faculties of Medicine and Applied Sciences. The Faculty Librarian for Medicine noted:

> I am satisfied with the general awareness of electronic journals by academics in my faculty following workshops I have held with them over the past few years. However, I am not satisfied with their depth of knowledge concerning these resources. At times I have to correct people when they don't know the difference between an electronic journal and an electronic book. But just in terms of general awareness I would say my faculty is exemplary in the university. What usually happens with new

members of staff within my faculty is that they are given a letter by the Department head to come and register with the library so whilst opening their library account we usually make them aware of the resources that the library has, we take them for a physical tour of the library. But we are in a fortunate position as a faculty because most of our academics are also postgraduate students so they have dealt with these resources before, they come with fore knowledge.

All academics in the Faculty of Medicine indicated that they were aware of electronic journals. It is important to note that the medical library at NUST is located away from the main library as it is housed at Mpilo General Hospital and operates almost independent of the main library. The Faculty Librarian for Applied Sciences expressed confidence in the eagerness of academics from his faculty to learn and know about electronic journals but like most Faculty Librarians bemoaned lack of effective communication between faculties and the library. He indicated that they had no policy to serve new academics and only reached them through scheduled sessions which are held once every semester.

The results of general awareness were also considered in the light of staff category, number of years in academia, gender, and age range since UTAUT envisages some of these to be moderators of adoption and use of technology. All 14 part-time academics that mainly came from the Faculty of Medicine at NUST and the Faculty of Law at MSU were aware of the existence of electronic journals whereas 190 of the 198 full time academics from all three institutions were aware. The 8 academics that were unaware came from the full time component of academics in the three institutions. When the results were considered by experience (number of years in academia) the situation was as shown in Table 28 below.

Table 28: General awareness by experience

Number of Years in Academia	No. of Academics Aware	No. of Respondents in Category	Percentage of General Awareness
5 Years and Below	106	111	95.5
6 – 10 Years	81	83	97.6
11 – 20 Years	14	14	100
Over 21 Years	3	4	75
Totals	**204**	**212**	**96.2**

As shown in Table 28 above awareness was generally high in all categories of experience but a high number of those who were unaware came from the 5 years and less category with a good number of these being from NUST as was highlighted earlier. The Sub-Librarians and Faculty Librarians for the three universities could not commit themselves on differences in awareness by experience of academics but one could infer that awareness would almost be uniform at MSU and BUSE owing to their strong strategies in capturing new academics. However, at NUST there would be a high chance that more new academics would be unaware of the resources as there is no clear policy on informing new academics of the existence of these resources.

In terms of gender 129 males of the 135 who participated in the study reported being aware of electronic journals. This represents a 95.6% general awareness level. In terms of females 75 of the 77 who took part reported being aware of electronic journals. This represents a 97.4% general awareness level. The results suggest that there is no relationship between gender and awareness. Like for experience above, Sub-Librarians and Faculty Librarians could not commit themselves on the effect of gender on awareness of electronic journals. There seems to be high levels of awareness across gender lines.

The responses were also considered by age range and the situation was as represented in Table 29 below.

Table 29: General awareness by age range

Age Range	No. of Academics Aware	No. of Respondents in Category	Percentage of General Awareness
30 Years and Below	26	27	96.3
31 – 40 Years	91	94	96.8
41 – 50 Years	63	64	98.4
51 – 60 Years	23	25	92
61 Years and Above	1	2	50
Totals	204	212	96.2

The statistics above show that awareness was generally high in all age groups while the Chi-Square test showed that there was no relationship between awareness and age ranges. However,

most Faculty Librarians especially at BUSE and MSU felt that the younger academics were more aware of electronic journals. But as the quantitative results show for these universities all age categories had general awareness of electronic journals, which may mean differences may be expressed not in general awareness but it the quality of awareness.

The statistics presented above show that there is a high level of general awareness of electronic journals by academics in Zimbabwean State Universities. The findings emanating from quantitative data agrees with qualitative data collected from Sub-Librarians responsible for Reader Services in the three universities and from Faculty Librarians in the same universities.

5.5.2   Quality of Awareness of Electronic Journals

The first research question of this study cannot be fully answered by considering general level of awareness only. This is because the general level of awareness just considers whether one knows about electronic journals or not without considering the extent of that awareness, which is the major driving force in academics' adoption and use of these resources. The researcher needed a way of ascertaining the extent of awareness that academics have concerning electronic journals. Questions that sought to measure the quality or extent of awareness were, therefore, included in the questionnaire. Obviously, academics who indicated that they were not aware of electronic journals at all do not qualify to be considered here when we deal with quality of awareness. This means the 8 academics who indicated that they were not aware of electronic journals were excluded. The focus was on the 204 academics who indicated that they were aware of the resources.

The first measure of quality of awareness was ascertained by asking the academics to list electronic databases they were aware of (Question 11 of Appendix 1) and specific electronic journals they were aware of (Question 12 of Appendix 1). This was meant to establish if academics knew what electronic databases were and what electronic journals were, to ascertain if they knew the difference between the two and also how much of each they knew. This is because for one to reach an electronic journal they normally have to pass through an electronic database since these journals are housed in databases. One would not know the specific electronic journals they would use if they do not know the databases that house those journals. On average NUST

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and BUSE have about 60 electronic databases each that house thousands of electronic journals in different disciplines. The MSU has over 200 electronic databases because they subscribe to many more databases on their own apart from those they get through the Zimbabwe University Libraries Consortium (ZULC) arrangement. Out of all these electronic databases that these universities offer the researcher asked the academics to list 10 databases and 10 electronic journals they were aware of.

The results show that the majority of academics at the three institutions were only aware of a few databases and even less were aware of specific electronic journals. Out of 204 academics who responded to these questions only 84 (41.2%) were able to mention at least 5 databases out of the required 10 while only 45 (22.1%) managed to mention at least 5 electronic journals. The findings also show that some academics confuse databases for journals and vice versa. Results also show that collectively academics were only aware of a few electronic databases with the rest remaining unknown. The most commonly cited databases were Emerald Insight, Ebsco Host Online Research Databases, Access to Global Online Research in Agriculture (AGORA), Health Internetwork Access to Research Initiative (HINARI), Online Access to Research in the Environment (OARE), African Journals Online (AJOL), Journal Storage (JSTOR) and SAGE Journals. Other databases that featured although less prominently include Access to Research for Development and Innovation (ARDI), American Institute of Physics (AIP), the Organisation for Economic Cooperation and Development (OECD), Taylor and Francis, Wiley Online Library, Science Direct, Accoustal Society of America, Cambridge Journals Online, Oxford University Press, World Bank E-Library, West Law, Science Finder, Springer and Elsevier. A lot of other databases that are offered by these institutions were never mentioned at all.

Academics at MSU were able to mention more databases and electronic journals than both NUST and MSU. The researcher also noted that academics in Science related disciplines managed to mention more databases than those in other disciplines with the worst being those in the Arts. Younger academics managed to mention more databases than the older academics while gender did not seem to influence awareness of these resources. But overall the depth of awareness of specific electronic databases and electronic journals was on the low side as shown by statistics cited above. This suggests that while many academics were generally aware of the

existence of electronic journals there remained challenges with the quality of that awareness. Many do not know the specifics about these resources yet this knowledge is important in the adoption and use of these resources. Sub-Librarians and Faculty Librarians also complained of the lack of in-depth awareness of electronic journals on the part of academics. Librarians from NUST and BUSE were especially vocal. They were in agreement that academics were not yet intimately aware of electronic journals.

The quality of awareness of electronic journals by academics was also ascertained by asking them about how they normally access these resources. Question 30 of the questionnaire sought to establish how academics search for information in electronic journals. The way that users search for information in electronic journals indicates their depth of knowledge of these resources apart from also indicating the level of the skills they have. Those without intimate knowledge of these resources prefer to search for information through general search engines such as Google or Google Scholar. If the information they would be searching for is housed in any of the databases they have access to as an institution Google would pick that and show the relevant articles from the electronic databases and also from other sources which are not peer reviewed. This is a very indirect way of using electronic journals and shows lack of intimate awareness of these resources. Some who are slightly better than the above group would do a general search on the institution's library website hoping that they would be redirected to the relevant database and journal. Those with intimate knowledge of these resources would go straight to a database that is relevant for their needs and open specific electronic journals from where they can access the information they need. In an effort to ascertain the extent of awareness academics were asked to state how they access information and the responses were as indicated below.

Eleven academics out of the 204 who earlier had indicated were aware of electronic journals reported that they did not access or use electronic journals for reasons that are considered under the next objective. Of the remaining 193 who indicated that they access these resources 118 (61.1%) access the information in these resources via Google. The high percentage of 61.1% indicates that many do not have intimate knowledge of the resources that allows them to go directly to the needed resources. Only 39 academics (20.2%) said they searched for information via the Host Database while 36 (18.7%) did a general search on the library website, also an

indication of lack of intimacy with the resources. The combined total of those who do a general search on google and on the library website is 154 (79.8%). This means the majority of academics just search and meet their required articles by accident. While this may be an indicator of their skills level it is also an indicator of level of awareness.

Lastly on the quality of awareness question 51 of the Survey Questionnaire for Academics at Selected Zimbabwean State Universities required academics to indicate the barriers that militate against their access and use of electronic journals. A total of 130 out of 193 cited awareness as a barrier to their maximum use of electronic journals with 107 citing it as a minor barrier and 23 citing awareness as a major barrier. Only 63 indicated that awareness was not a barrier to their use of electronic journals. These statistics coming from academics who had earlier on indicated their general awareness of the resources show that intimate awareness of these resources that enables one to fully benefit from the same is still lacking among most academics at Zimbabwean State Universities. The full picture of how academics responded to this question per institution is shown in Table 30 below.

Table 30: Awareness as a barrier to effective use of electronic journals

	NUST	BUSE	MSU	Total
Not a Barrier	20 (29%)	25 (56.8%)	18 (22.5%)	**63**
Minor Barrier	35 (50.7%)	12 (27.3%)	60 (75%)	**107**
Major Barrier	14 (20.3%)	7 (15.9%)	2 (2.5%)	**23**
Total	**69 (100%)**	**44 (100%)**	**80 (100%)**	**193**

An analysis of Table 30 above shows that NUST had 14 out of 69 academics complaining that awareness was a major barrier to their use of electronic journals. This represents 20.3% of academics at NUST. At BUSE 7 out of 44 academics indicated awareness as a major barrier representing 15.9% of academics at the institution and MSU had 2 out of 80 reporting awareness as a major barrier representing 2.5% of academics at the institution. Higher proportions of academics indicated that awareness was a minor barrier but nevertheless still a barrier. These statistics are consistent with other measures of extent, depth or quality of awareness employed

above and indicates that while general awareness is high the intimate knowledge of these resources is still very low at Zimbabwean State Universities.

5.6   Extent of Use of Electronic Journals

The second research question of this study addressed the extent of use of peer reviewed electronic journals by academics. Both quantitative and qualitative data were collected to answer this question. Quantitative data were sought from academics through questions 22, 23, 24, 25, 26, 27, and 31 of the questionnaire (Appendix 1). Qualitative data were collected from professional librarians in the position of Faculty Librarians, Sub-Librarians responsible for Reader Services, Systems Librarians, and Librarians. Data were collected from Faculty Librarians through questions 6, 7, 8, 9, 10, 11 and 12 of the interview guide with Faculty Librarians (Appendix 2). Sub-Librarians answered the research question by responding to questions 7, 8, 9, 10 and 11 of the interview guide with Sub-Librarians (Appendix 3). Data were also collected from Systems Librarians and Librarians through question 2 of the interview guide with Systems Librarians (Appendix 4) and question 6 of the interview guide with Librarians (Appendix 5) respectively.

This research question is addressed in two main sections. The first, section 5.6.1 establishes the number or proportion of academics that use electronic journals. The section does not attempt to establish how much academics at the selected Zimbabwean State Universities use electronic journals but focuses on **how many** academics use electronic journals. The second section, section 5.6.2 establishes **how much** those academics who would have indicated that they used electronic journals actually use these resources. The how much part is established using three critical indicators resulting in three sub-sections under the second section: number of articles consulted per week (section 5.6.2.1), frequency of use of electronic journals (section 5.6.2.2), and the major sources of information for academics in Zimbabwe State Universities (section 5.6.2.3). A detailed consideration of the two main sections cited above would comprehensively answer the second research question of this study: What is the extent of use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?

5.6.1 Number of academics who use electronic journals

Question 22 of the questionnaire asked academics to indicate if they used electronic journals or not. Of the 212 academics who responded to this study 193 (91%) indicated that they used electronic journals. Nineteen academics of the 212 academics who responded to this study did not use electronic journals at all, constituting 9% non-use. The reasons cited for non-use were varied. Eight academics indicated that they were not aware of electronic journals. This was established under the first objective where the level of awareness was addressed. This means 11 academics were aware of electronic journals but did not use them. Of these 11, 5 indicated that they were frustrated by poor Internet connection at their institutions, 2 cited a total lack of skills to navigate the electronic environment, and 4 indicated that these resources were not necessary for their work. Of the 19 non-users NUST recorded the most at 13, BUSE had 5, and MSU had 1. Results can be made clearer if we consider the situation by university and faculty. Table 31 below shows responses from NUST.

Table 31: Use of electronic journals at NUST

Faculty (Discipline)	Number of Responses	Number of Users	Number of Non Users	Percentage of Users
Applied Sciences	18	17	1	94.4
Built Environment	6	2	4	33.3
Commerce	23	19	4	82.6
Communication and Information Science	13	12	1	92.3
Industrial Technology	14	11	3	78.6
Medicine	8	8	0	100
Grand Total	**82**	**69**	**13**	**84.1**

As Table 31 above shows 69 out of 82 respondents from NUST use electronic journals. This translates to 84.1% usage. NUST therefore, is the institution with the lowest usage percentage of the three institutions in this study with 89.8% and 98.8% of academics at BUSE and MSU respectively, using electronic journals. While the percentage usage at NUST implies that a high number of academics at the institution use electronic journals the professional librarians however, were not impressed with some faculties within the institution that still have a number

of academics resisting these resources. The Librarian commented on the usage of electronic journals at NUST. She stated that:

> While I appreciate that these resources have been accepted by our management and am happy with their support I am continuously frustrated by academics. We have tried to promote these resources to them through various avenues including faculty board meetings but the majority of them are not yet using electronic journals. This problem, however, does not affect all faculties. The Faculty of Medicine is very keen to learn and the Faculty of Applied Sciences is quick to catch on to electronic initiatives. The Faculty of Communication and Information Science is also responsive. This is due to the number of librarians in that faculty. There has been little joy with other faculties.

The Sub-Librarian Responsible for Reader Services at NUST expressed her frustration with academics and how they have adopted electronic journals at the institution. She said:

> I just think our academics are way behind the level of other academics in other universities when we consider use of electronic journals. They just don't want to research. If you look at national statistics, state universities like Midlands State University (MSU) are four times ahead of us. The Midlands State University has fully embraced electronic journals and electronic learning and their academics have embraced that trend, even assignments their students don't bring papers, they communicate via email or other electronic ways. With NUST I don't understand why they don't want to use electronic resources. May be the problem is that there is general lack of research at NUST. When you look at our faculties in terms of research you can single out the faculties of Medicine, Applied Sciences, and Industrial Technology as having seasoned researchers so the use of electronic resources in these faculties is higher. The Faculty of Communication and Information Science has respectable usage but for a different reason. They don't research much but use the resources because the faculty is full of librarians who know and understand issues about these resources.

The statistics from NUST are compatible with the views expressed by professional librarians from that institution. Table 31 above shows that the Faculty of Medicine reported a 100% usage rate. Both the Librarian and Sub-Librarian for Reader Services singled out this faculty as responsive to electronic journals. The Faculty Librarian for Medicine was confident that academics in that faculty were using the resources however, he had reservations about the

seriousness of use. He felt that while academics were using the resources they were not getting the best out of them. The Faculty of Applied Sciences also reported a high user rate. They were comparable to the Faculty of Medicine with a 94.4% usage rate. Despite this high percentage the Faculty Librarian still felt there were a lot of gaps. He noted:

> The usage rate in my faculty is still lower than what I would want so I am still pushing for them to use these resources. Whatever opportunity I get of marketing these resources, in faculty board meetings and so on, I market them. I think usage statistics for my faculty are much higher than those for other faculties but usage can still be higher.

The Faculty of Communication and Information Science reported the third highest usage with 92.3%. The Faculty Librarian indicated that usage is reasonably high among academics who do publishing and conference presentations. The Faculty of Commerce reported 82.6% usage. The Faculty Librarian for Commerce was not happy with the faculty's use of electronic journals. He noted:

> A lot of academics in my faculty do not use electronic journals. An indication of use should be the queries users present to you as Faculty Librarian on issues pertaining access and use of these resources, I don't get any queries. Also, I have a number of Course Outlines and there are no electronic journals recommended there. Even when I look at publications there is nothing for Commerce, they don't publish anything, I don't know what the problem is but there is nothing for Commerce.

The Faculty of Industrial Technology reported 78.6% usage. The Faculty Librarian was not happy with usage in the faculty. She indicated:

> Despite the fact that resources for Industrial Technology are well provided in the electronic resources statistics point to the negative, academics are not using them much. Some academics are using electronic resources but I am still concerned with those who don't use these resources. On our part as the Library we try to make them use these resources but I don't know why they don't use them so much, may be they know the reasons.

The faculty with the lowest number of users at NUST is the Built Environment which reported 33.3% usage. The Faculty Librarian for the Built Environment felt her faculty was disadvantaged in terms of electronic resources. She noted:

> The Faculty of the Built Environment is somehow a special case because not all databases offer information in that area. You may find that a whole database has only one journal relevant for my area. We have a serious shortage of resources in my area. Academics in my area should make use of electronic journals a lot because the books we have in the faculty are outdated. The university does not have enough funds to buy books; we rely on donations that's why our books are so outdated and irrelevant. This situation with books should encourage academics to use electronic journals which offer more current information than books. But there is a shortage of electronic journals in my area. The problem is we subscribe as a Consortium so it becomes difficult to say we want these resources because they are suitable for Built Environment. The tendency for the Consortium is to subscribe to resources that have wide appeal to all universities and resources for Built Environment do not have much appeal since these kinds of studies are not offered by many other universities. Otherwise the majority of academics in my faculty are young and would be eager to use these resources.

The concerns of the Faculty Librarian for the Built Environment were corroborated by the Systems Librarian and the Librarian. The Systems Librarian indicated:

> Our electronic journals subscriptions are given as packages so you find that in some areas usage is low not because the people don't want to use the resources but because the resources are not available. An area like Quantity Surveying offered under the Faculty of Built Environment is not represented in the package we get through INASP or eifl or other packages. So people from such Departments might not use those resources because the kinds of resources relevant to them are not available within the packages we offer, or they may be very limited let me say.

The Librarian indicated that there were some faculties like the Built Environment which were disadvantaged. They did not have the resources as they were not covered in the packages they offer. She, however, indicated that as NUST they could not help the situation much because of shortage of funds. They could not afford to subscribe to more resources outside the ambit of ZULC and by subscribing through ZULC they accept the disadvantages inherent in that

arrangement. It is evident, based on the report given by the Faculty Librarian for Built Environment, the Systems Librarian, and the Librarian that the low usage of electronic journals in the Faculty of Built Environment is due to unavailability of resources in that area.

The situation at BUSE regarding use of electronic journals by academics is better than that at NUST. Of the 49 academics who responded to this study at BUSE 44 indicated that they use electronic journals. This translates to 89.8% usage rate. This is higher than that of NUST which sits at 84.1%. Table 32 below shows the evidence of use at BUSE.

Table 32: Use of electronic journals at BUSE

Faculty (Discipline)	Number of Responses	Number of Users	Number of Non Users	Percentage of Users
Agriculture and Environmental Science	10	8	2	80
Commerce	14	12	2	85.7
Science	17	17	0	100
Science Education	8	7	1	87.5
Grand Total	**49**	**44**	**5**	**89.8**

As shown in Table 32 above the faculties at BUSE are almost similar in their use of electronic journals. They present a more compact image than that of NUST which showed wider faculty differences in the use of the resources. At BUSE the lowest faculty, the Faculty of Agriculture and Environmental Science, reported an 80% usage rate and the highest, the Faculty of Science reported a 100% usage rate with all 17 academics in the faculty reporting using electronic journals. The Faculty of Science Education reported an 87.5% usage rate with only one of its 8 academics reporting not using the resources. The Faculty of Commerce reported an 85.7% usage rate. Only 2 of 14 academics who participated in the study from this faculty reported that they did not use the resources. When asked about the use of electronic journals at the institution the Librarian was cautiously optimistic. She indicated:

> When we started offering these resources our usage was quite low but over the years we have noted gradual increase in the use of these resources. The statistics are showing us that. Within the last year we have influenced policy in a way as the Library. Lecturers are now required to incorporate electronic

journals in the preparation of Course Outlines, its mandatory for every lecturer to include electronic resources in their Course Outlines and I think this policy has positively affected use of the resources. But we still feel even though that is mandatory you get the impression that at times this is just on paper but people are not really following through, but overall we do have support in the use of these resources including at executive level. The Vice Chancellor talks about it, he encourages academics in Senate meetings to use the resources.

The Librarian of BUSE identified two issues in her statement cited above. First, that general usage of electronic journals at BUSE has increased gradually over the years and that the number of academics who use these resources has improved significantly. This is evident in the quantitative results from academics. Second, she indicated in her statement that she was not happy with the level or seriousness of use. A number of academics are now using electronic journals but the manner in which they were using them still presents a concern.

The response from the question on disciplinary differences in the use of electronic journals revealed that the three sciences aligned faculties were enthusiastic about the resources. The Librarian expressed concerns about the Faculty of Commerce as they were not receptive. The Sub-Librarian for Reader Services at the institution also indicated that the science leaning faculties of Agriculture and Environmental Science, Science Education and the Faculty of Science were more receptive of the resources and they use them more. However, the quantitative results show that Commerce is ahead of Agriculture and Environmental Science. The Systems Librarian at BUSE reported that academics from the Faculty of Agriculture and Environmental Science are unable to use electronic journals due to poor Internet service at the Astra campus where the faculty is located. The Faculty of Commerce is housed at the Main Campus where Internet connection is satisfactory. Academics from the Science and Science Education faculties are housed at the Main Campus and the Central Business District (CBD) campus respectively. Academics from these faculties are affected to differently by Internet and electricity challenges.

The Faculty Librarians for the faculties of Agriculture and Environmental Science, Science, and Commerce were generally satisfied with the general usage of electronic journals by academics in these faculties. The Faculty Librarian for Agriculture and Environmental Science indicated:

I think they are using them because they do publish. They should be using peer reviewed materials. Like last year one of our Departments had the largest publications in the University, so they do use them.

The Faculty Librarian for the Faculty of Science said this about her faculty:

I think they use them especially off-campus ones but there are challenges here and there in terms of resources for access. But they are using them because they are publishing so they have to use them to find resources for their literature. And now there is also the issue of tenure they need to use them because now they need at least five papers so they come and ask when they are doing their researches. For some we even download for them and they come back and say they were very relevant.

The Faculty Librarian for Commerce was also optimistic that the academics in his faculty used electronic journals. He pointed to statistics that he gets from publishers of some of the databases accessed by academics in his faculty. He also indicated that his university had improved in rankings of state universities in Zimbabwe due to its use of electronic journals. He pointed to that as proof that use of electronic journals had improved drastically at BUSE in general and for the Faculty of Commerce specifically over the last few years.

The use of electronic journals by academics at MSU is significant when compared to NUST and BUSE. As Table 33 below shows 80 out of the 81 academics who responded to the study from MSU reported using electronic journals giving a usage rate of 98.8%.

Table 33: Use of electronic journals at MSU

Faculty (Discipline)	Number of Responses	Number of Users	Number of Non Users	Percentage of Users
Arts	14	14	0	100
Commerce	15	15	0	100
Education	10	10	0	100
Law	5	5	0	100
Natural Resources Management and Agriculture	8	8	0	100

Faculty (Discipline)	Number of Responses	Number of Users	Number of Non Users	Percentage of Users
Science and Technology	14	14	0	100
Social Sciences	15	14	1	93.3
Grand Total	**81**	**80**	**1**	**98.8**

As shown in Table 33 above only one academic from the Faculty of Social Sciences reported not using electronic journals. All other faculties achieved a 100% usage rate. All the professional librarians at MSU were pleased about usage rate at the institution. They were confident their institution was the highest user of electronic journals in the country. The Librarian of the institution commented:

> Here at MSU, if you look at the statistics we receive for resources monthly or quarterly we are the highest user of electronic resources in Zimbabwe. If you look at Emerald Insight for example, its unbelievable, our statistics for the past 3, 4, 5 years have been phenomenal, we have been number 1. We are really grateful to the university administration, its not us alone but we have got other players like the Information Technology people providing the bandwidth because usage is about infrastructure, the resources. Our top management in the University also fully bought into the concept of electronic journals. If you just introduce a concept without the support of your colleagues it's a problem but we have the buy in from top management, the Financial Director, Registrar, Pro-Vice Chancellor Academic, the Vice Chancellor. I think that is our strength. We are really happy with the usage of our electronic resources here at MSU.

The MSU Librarian was confident about the level of use of electronic journals at the institution. This confidence is confirmed by quantitative data collected from academics as Table 33 above shows. The Librarian identified areas that could be playing a pivotal role in the high usage of electronic journals at MSU. This includes support from top management and availability of resources. These factors are considered indepth in section 5.8 of this chapter where the researcher examines factors that influence the behavior of academics towards peer reviewed electronic journals.

All the Faculty Librarians at MSU replicated the enthusiasm of their Librarian concerning usage of electronic journals. They indicated that usage was high and that they dutifully followed up

usage statistics with publishers of the databases that they offer. They also stated that they have remained the highest users of these resources in Zimbabwean universities for a number of years. The Faculties of Commerce and Arts expressed satisfaction, although they were not the highest users. They trailed slightly behind the Sciences. The following statements were made by Faculty Librarians. The Faculty Librarian for the Faculty of Education commented:

> Right now there is a lot of use. If you get into our labs, we have one in Hellenics in town, you find a lot of academics there, they also use them in their offices because many of them now have laptops in addition to the desktops they have. The other thing is academics were encouraged to seek higher qualifications like PhDs and professorships so academics are looking for information everywhere.

The Faculty Librarian for Science and Technology stated:

> As the statistics show we are generally satisfied with use of electronic journals within our institution by all classes of users in general and by our academics specifically. Like any other university we still want to see further improvement in the use of our resources but looking at statistics we get from INASP we see that we are always above other universities.

The Faculty Librarian for Commerce reported that:

> We have traditionalists definitely but most of our lecturers have found them very useful and have come to the library to offer their gratitude. Usage has been high especially as our academics have problems getting books because we have so many students, if a book is borrowed by a student the academics won't get the book until the end of the semester so electronic journals have helped them a lot.

The Faculty Librarian for Commerce began by acknowledging that there is a tendency for resistance to electronic journals by academics who teach Commerce. He stated that at MSU they have found the resources really useful and they have embraced them. The Faculty Librarian for Arts, a faculty normally associated with low usage in other institutions, commented:

> Judging by the feedback that I get from academics the level of use of these resources is very high. While I teach academics I also teach students in the

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Faculty of Arts on how to access electronic resources. So I take this opportunity to instill a kind of dialogue in their academic work. I encourage students to make use of the electronic resources and that they cite these resources in their assignments so that in return academics see these resources being cited by students. In some cases some of the resources that the students will be using are new to academic staff so the onus is now on them to verify what students are citing. So I play with them from both sides, and this has caused usage to be very high for academics.

The Faculty of Arts has used students to encourage academics. This seems to have worked well. The Faculty Librarian for the Faculty of Law stated:

I am quite happy with usage. From time to time I get feedback both direct and indirect indicating high usage of these resources. We are very lucky here at MSU that our academics have fully embraced electronic journals and are using them well. We are proud of that as the Library because our investment is fully used.

The Faculty Librarians for the Faculty of Natural Resources Management and Agriculture and Faculty of Social Sciences who are not directly cited here all expressed satisfaction regarding use of electronic journals by academics in their faculties.

The results for general use of electronic journals by academics have been presented per university and per faculty but it is also important in view of the UTAUT to extend that presentation to experience, age and gender and establish if there is any relationship between these moderators and general usage of electronic journals at the selected Zimbabwean State Universities. Table 34 below shows usage of electronic journals by academics at the selected Zimbabwean State Universities by number of years served in academia (experience).

Table 34: Use of electronic journals by experience

Number of Years Served in Academia	Number of Respondents	Number of Users	Number of Non Users	Percentage of Users
5 Years and Below	111	102	9	91.9
6 – 10 Years	83	75	8	90.1
11 – 20 Years	14	13	1	92.9

Number of Years Served in Academia	Number of Respondents	Number of Users	Number of Non Users	Percentage of Users
21 Years and Above	4	3	1	75
Totals	**212**	**193**	**19**	**91**

As shown in Table 34 above the percentage of academics who use electronic journals is almost uniform regardless of the number of years served in academia. This uniformity relates to the percentage number of users per category of experience, and is not a measure of whether these different categories use electronic journals the same way in terms of seriousness or depth of use. The test to establish that is given in the next section. The results presented in Table 34 above suggest that there is no relationship between use of electronic journals and number of years served in academia. Academics in the 21 years and above category, however, are slightly lower users of electronic journals than others at 75%.

Most professional librarians indicated that there wasn't any marked difference in how academics of different experience made a decision to use or not use electronic journals. However, they noted that those academics who have stayed for a long time in academia began their careers before the introduction of electronic journals and they have known and trusted print resources for a long time. As a result, they resist electronic journals. Younger academics used the resources more readily as they are more attuned to technology. They also face pressure to secure their academic careers by publishing in accredited journals and presenting at conferences. These tasks require use of electronic journals which have current resources. But as professional librarians argued, the use of electronic journals by new academics would not be successful if institutions lacked the strategies to introduce them to the resources at the point of entry into academia.

Results were also considered by age and Table 35 below presents the findings.

Table 35: Use of electronic journals by age

Age Range	Number of Respondents	Number of Users	Number of Non Users	Percentage of Users
30 Years and Below	27	27	0	100
31 – 40 Years	94	87	7	92.6

Age Range	Number of Respondents	Number of Users	Number of Non Users	Percentage of Users
41 – 50 Years	64	58	6	90.7
51 – 60 Years	25	20	5	80
61 Years and Above	2	1	1	50
Totals	**212**	**193**	**19**	**91**

As Table 35 above shows, all academics in the 30 years and below age range use electronic journals, followed by those in the 31-40 years age range where 92.6% of academics use electronic journals. Academics in the 41-50 years age range have 90.7% of them using electronic journals while 80% of academics in the 51-60 age range use electronic journals. The 61 years and above age range had the least number of users at 50%. The trend that emerge from these statistics on use of electronic journals and age range of users indicate that, the percentage number of users per category decreases as the age ranges increase. This scenario can best be demonstrated by a line graph as shown in Figure 8 below:
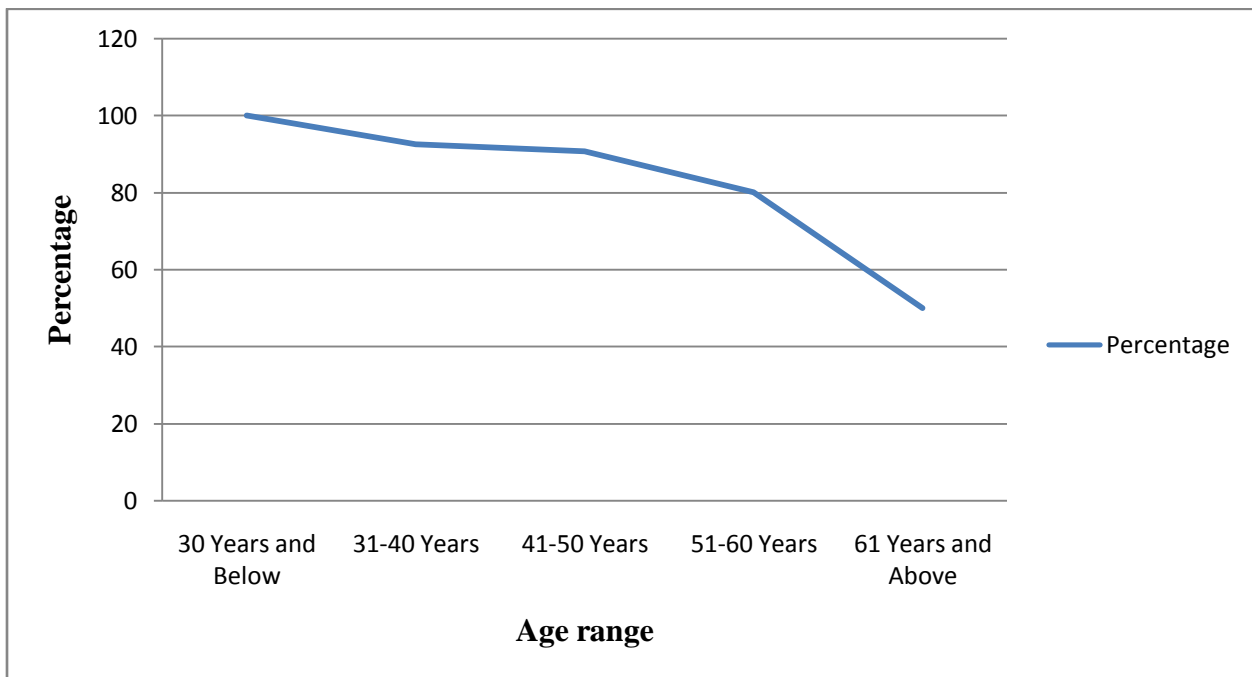
Figure 8: Use of electronic journals by age

As shown in Figure 8 above the line decreases as the age ranges increase with the sharpest decrease being witnessed between the 51-60 age range and the 61 and above age category. The decrease between these age ranges is markedly steep because the number of users decreases significantly from 80% to 50%. The line also drops in a steep fashion between 41-50 age range and 51-60 age range. This is due to a sharp decrease in the number of users from 90.7% to 80%. The line drops gently between the 30 years and below age range and the 31-40 years age category. The same level is witnessed between the 31-40 age range and the 41-50 age category. This is because the rates of decrease between these age ranges are low. The line graph establishes a pattern where it drops as it proceeds towards higher ages. This is an indication that the higher the ages the lower the number of academics who use electronic journals. However, the rate of decrease was not sharp enough to influence Chi-Square tests as they still showed that there was no relationship between age and percentage of users.

Results were also considered by gender and it was found that proportionately more males use electronic journals than females though the difference is not significant enough to establish a Chi-Square relationship. Out of 135 male academics who responded to the study 124 indicated that they used electronic journals translating into 91.9% compared to females where out of 77 academics who participated in the study 69 used electronic journals translating into 89.6%. Table 36 below shows the scenario described above.

Table 36: Use of electronic journals by gender

Gender	Number of Responses	Number of Users	Number of Non Users	Percentage of Users
Male	135	124	11	91.9
Female	77	69	8	89.6
Total	**212**	**193**	**19**	**91**

Commenting on whether gender affects the decision by academics to either use electronic journals or not most professional librarians across the three institutions did not commit themselves. Many felt gender did not have much influence but believed that other factors such as age and academic discipline were more influential.

5.6.2 Level of Use of Electronic Journals by Academics

It was established in section 5.6.1 above that 193 out of the 212 academics who responded to this study from the three institutions, used electronic journals. This current section seeks to establish the level or seriousness of use of electronic journals by those academics who use them therefore, it follows that statistics in this section were based on the 193 academics who indicated that they used electronic journals. This excludes the 19 academics who indicated that they do not use these resources.

To establish the level or seriousness of use of electronic journals the researcher included 3 critical questions that sought to measure this aspect. Question 25 of the questionnaire (Appendix 1) enquired about the number of articles academics accessed and used from peer reviewed electronic journals per week. Borrowing from usage standards established in literature the researcher classified the number of articles consulted into 5 categories. Those who consulted less than 5 articles per week were classified as **very low** users, those who consulted 5-10 articles per week were classified as **low** users, those who consulted 11-20 articles per week were classified as **average** users, those who consulted 21-30 articles per week were classified as **high** users, and those who consulted over 30 articles per week were classified as **very high** users. The second critical question, question 26 of the questionnaire sought to establish the frequency of use of electronic journals, while the third question, question 27 sought to ascertain the major source of information for academics concerning their teaching and research needs. Some supporting questions were asked in the questionnaire to aid these 3 critical questions and data from these supporting questions is cited as and when necessary. Professional librarians also explained how academics used electronic journals in their interviews. Results are presented below.

5.6.2.1 Number of Peer Reviewed Articles Consulted Per Week

Academics were asked to indicate the number of articles they consulted from peer reviewed electronic journals per week and the results show that of the 193 academics who indicated that they use electronic journals 26 (13.5%) were very low users, 32 (16.6%) were low users, 86 (44.6%) were average users, 47 (24.3%) were high users, and 2 (1%) were very high users. Table 37 below gives the details of articles consulted per week.

Table 37: Categorisation of number of articles from electronic journals per week

Level of Use	Frequency	Percent
Very Low (Less than 5 articles per week)	26	13.5
Low (5-10 articles per week)	32	16.6
Average (11-20 articles per week)	86	44.6
High (21-30 articles per week)	47	24.3
Very High (Over 30 articles per week)	2	1
Total	**193**	**100**

From Table 37 above it can be seen that the majority of academics at the selected Zimbabwean State Universities are lethargic users of electronic journals. Considering that academics are expected to use electronic journals for teaching, research, and for further studies it is somewhat surprising that as high as 13.5% of academics consult less than 5 articles from peer reviewed electronic journals per week. About 16.6% access between 5-10 articles per week while a large number of academics (44.6%) fall into the average users' category. The combined percentage of very low to average users' categories is 74.7% (13.5% + 16.6% + 44.6%) leaving only 25.3% of academics in the two high end groups: the high users and the very high users. Only 1% of academics considered themselves very high users of electronic journals. It is helpful to breakdown these levels of users into the following categories: low users, average users, and high users and explain this by using a bar graph. The length of the bars will assist the reader to appreciate the pattern of use. Figure 9 below shows the collapsed categories in a bar graph.
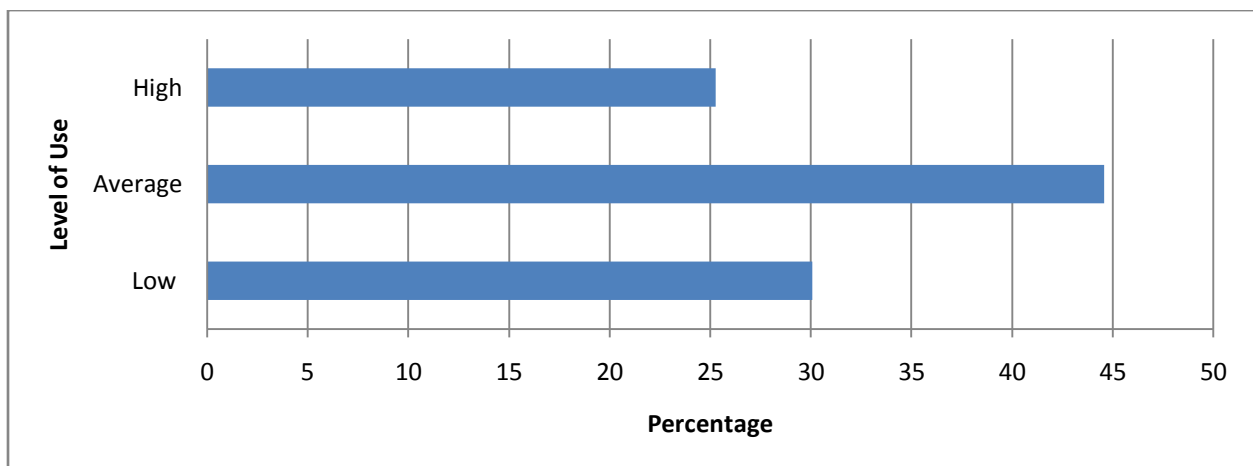
Figure 9: Categorisation of number of articles accessed from electronic journals per week

As shown in Figure 9 above the bar for high users is the shortest of the three bars indicating that very few academics are either high or very high users of electronic journals. The longest bar is for average users while the bar for very low and low users is long enough to cause challenges for those advocating for usage of electronic journals. Data from a different question in the questionnaire show that with the exception of academics from MSU the majority of academics did not intentionally choose databases and journals from which to access articles. Instead, they made general searches on Google and they are redirected to relevant articles in the databases offered by their institutions. As many as 118 academics, representing 61.1% of those academics who use electronic journals generally access peer reviewed articles through Google and not through the institutional websites or through the required databases. This shows that there is a lack of appreciation for these resources which affect their usage. Data also show that those academics that go directly to databases depend on a narrow range of databases leaving many more helpful resources unexplored.

Results for number of articles consulted by academics per week were also considered per university. Table 38 below shows the results by university.

Table 38: University categorisation of number of articles consulted per week

Level of Use	NUST	BUSE	MSU	Total
Very Low	13	13	0	**26**
Low	12	12	8	**32**
Average	23	12	51	**86**
High	20	6	21	**47**
Very High	1	1	0	**2**
Total	**69**	**44**	**80**	**193**

As shown in Table 38 above the 26 very low users come from NUST and BUSE. There are no low users from MSU. The very low users at NUST constitute 18.8% of academics at the institution whereas for BUSE the percentage is higher at 29.5%. The next category is the low users' category. This category had a total of 32 users from the three institutions. This is distributed as follows: NUST – 12, BUSE – 12, and MSU – 8. There were 17.4% low users at

NUST. This means 36.2% of academics at NUST fall into the two low end categories of very low users and low users. This leaves 63.8% of academics at the institution who are average users and higher. About 27.3% of academics at BUSE fall into the low users' category. This means 56.8% of academics at BUSE fall into the two low end categories of very low and low users. This leaves only 43.2% of academics at the institution who are average users and higher. The situation at MSU is much more favourable with only 8 of their users falling into the low users' category. This represents 10% of the academics at the institution. Given that there were no very low users at MSU it means only 10% of the academics at the institution fall into the two low end categories.

The average users' category represents a significant number of academics at MSU. The numbers of academics in the average users' category are fewer for NUST and BUSE. Many of them have fallen into the two lower end categories. Twenty three academics at NUST fall into the average users' category thus translating into 33.3% of academics at the institution. If we combine the average users' percentage with the percentages for the two low end categories it shows that 69.5% of academics at NUST fall into the very low to average users categories. This leaves only 30.5% of academics at NUST who fall into the two categories of high and very high users. Twelve academics at BUSE fall into the average users' category. This means that 27.3% of academics at the institution fall into this category. This also means 84.1% of academics at BUSE fall into the very low to average users' categories leaving only 15.9% to occupy the high and very high users' categories. Fifty one academics at MSU fall into the average users' category representing 63.8% of academics at the institution. This also means 73.8% of academics at MSU fall into the very low users to average users' categories leaving 26.2% of academics at the institution who fall into the high and very high users' categories.

Twenty academics at NUST fall into the high users' category representing 29% of academics at the institution. Only one member of the academic staff at NUST classified himself as a very high user representing 1.4% of academics at the institution. At BUSE 6 academics classified themselves as high users of electronic journals representing 13.6% of academics at the institution. Only one academic reported very high usage representing 2.3% of academics at the institution. At MSU 21 academics reported high usage representing 26.3% of academics at the

institution. None reported very high usage. The statistics show that high to very high usage is elusive for all the three institutions. While there are academics using electronic journals in the three institutions there is still much room for improvement. An analysis of how the three institutions use electronic journals can be supported by collapsing the 5 categories of very low users, low users, average users, high users, and very high users into 3 categories. The 3 categories consist of low users which comprises of very low users and low users, the average users' category which is similar to the average category in the 5 category rankings and the high users category which takes from the high users and very high users categories of the 5 category rankings. These collapsed categories are shown in Figure 10 below using a Column Graph so that the percentage of users per category is clearly visible. This enables further analysis.

	NUST	BUSE	MSU
■ Low	36.2	56.8	10
■ Average	33.3	27.3	63.8
■ High	30.5	15.9	26.2
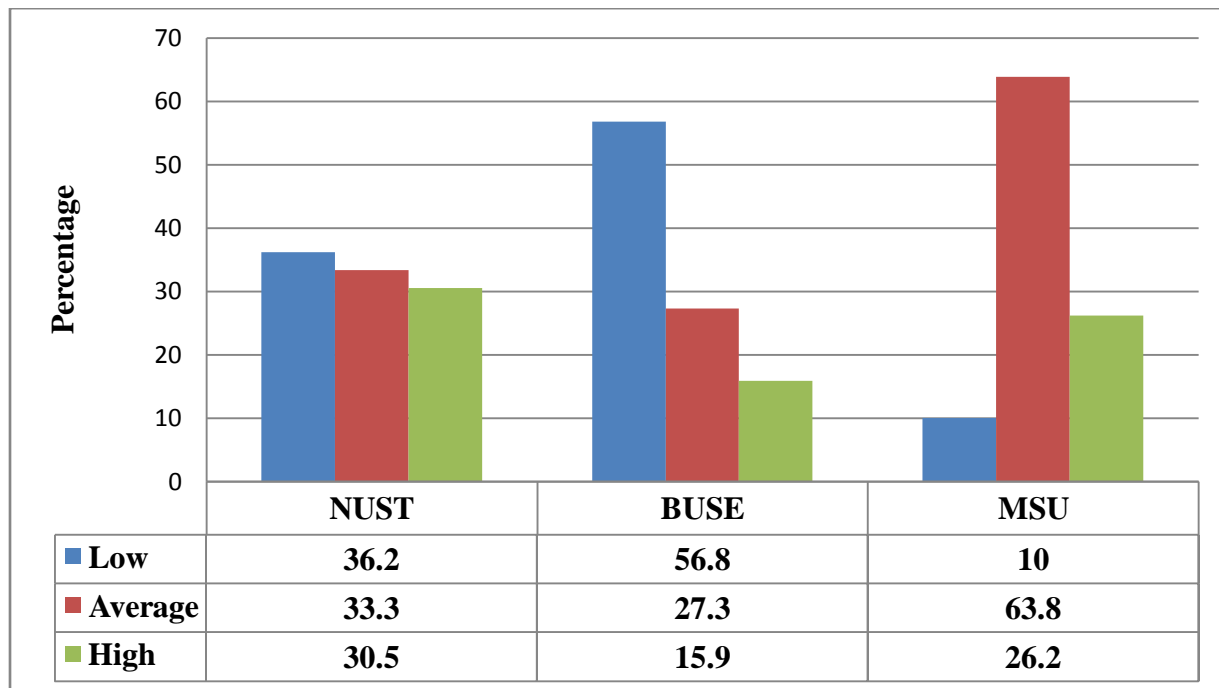
Figure 10: Percentage categorisation of number of articles consulted per week

Figure 10 above shows the pattern of usage of electronic journals by academics. Usage is more compact at NUST with slight variations among the three categories of low, average, and high users. The low users' bar is the highest for NUST closely followed by the average users' bar and lastly the high users' bar. For BUSE the low users' bar towers the rest and shows that while BUSE has a higher percentage of users of electronic journals than NUST at 89.8% compared to

84.1% as shown in section 5.6.1 above, the majority of users at BUSE are low users. Of the three institutions BUSE has the lowest percentages of average users and high users. Many of their academics are concentrated in the low users' category. NUST has the highest percentage of high users at 30.5% followed by MSU at 26.2%, and BUSE at 15.9%. A number of academics at MSU fall in the average users' category as shown by the towering centre bar. The institution recorded the least low users of the three institutions. What the results show according to Figure 10 above is that proportionally MSU academics use the highest number of electronic journal articles per week followed by NUST and lastly BUSE. This means that MSU is highest both in terms of the percentage number of users as shown in section 5.6.1 above and also in terms of the number of articles consulted per week as shown in the graph above. The overall statistics suggest that many academics at the selected Zimbabwean State Universities are low to average users of electronic journals. Very few of these academics are in the high users' category. The professional librarians within the institutions that participated in this study expressed concern at the lack of seriousness in the use of electronic journals by academics. The Librarian for NUST stated:

> It's very difficult to objectively say how much seriously our academics are using electronic journals. However, one can safely say here at NUST electronic journals are not used that much. Perhaps it's because we have a new breed of academics. Most of our academics are young and are not researching. The younger generation is not publishing, they may present a paper here and there but they are not publishing. But what worries us is that even if they are not publishing they could use these resources for teaching but they don't seem to use them that intensively. The older generation of academics is publishing but they have challenges in using electronic journals. So I would say most of our academics are casual users of electronic journals and very few are really into these resources.

The Sub-Librarian for Reader Services at NUST concurred with the Librarian. She indicated that while many academics now use electronic journals at the institution the extent of use was still low. She noted that more needed to be done to get them to intimately use these resources. The Librarian at BUSE noted that even though it is now mandatory for every Course Outline at the institution to include some electronic resources as reading references academics are just satisfying this requirement without growing in intimacy with the resources. Academics at the institution use the resource because it is mandatory; however, they are not heavy users. She

further indicated that a high number of academics at the institution still ask for print resources for which the institution has ceased subscription. This, as a way of encouraging academics to use electronic journals. The Librarian at MSU was confident that many academics at her institution had developed a culture of using electronic journals. The quantitative results cited above suggest that of the three institutions in the study, academics at MSU are the most serious users of electronic journals. However, the results also show that most users at MSU fall in the average users' group. It is evident that there is still room for high usage at MSU.

Results for number of articles consulted by academics per week were also considered per faculty. This was done as a way of establishing how faculties or disciplines used these resources. Table 39 below shows the usage level for faculties at NUST based on the number of articles consulted per week. The Table shows the number of academics who fall in a particular category per faculty. In brackets is the percentage of academics who fall in a given category for that faculty. For example, the Faculty of Applied Sciences had 17 respondents in this study and 2 of them are very low users of electronic journals. The number 2 is shown accordingly together with the corresponding percentage which is 11.8%. This is calculated as 2 divided by 17 multiplied by 100. This makes it easier to see the full picture in terms of faculty use of these resources. That picture would not be apparent if we depended on raw numbers only.

Table 39: Faculty use of electronic journals at NUST based on number of articles consulted per week

Faculty	Very Low	Low	Average	High	Very High	Total
Applied Sciences	2 (11.8%)	3 (17.6%)	3 (17.6%)	9 (53%)	0 (0%)	17 (100%)
Built Environment	0 (0%)	2 (100%)	0 (0%)	0 (0%)	0 (0%)	2 (100%)
Commerce	6 (31.5%)	4 (21.1%)	9 (47.4%)	0 (0%)	0 (0%)	19 (100%)
Communication and Information Science	4 (33.3%)	3 (25%)	2 (16.7%)	3 (25%)	0 (0%)	12 (100%)
Industrial Technology	1 (9.1%)	0 (0%)	3 (27.3%)	6 (54.6%)	1 (9.1%)	11 (100%)
Medicine	0 (0%)	0 (0%)	6 (75%)	2 (25%)	0 (0%)	8 (100%)
Total	**13**	**12**	**23**	**20**	**1**	**69**

An analysis of Table 39 above reveals that there are some notable differences in how the various disciplines at NUST use electronic journals. Academics in the two faculties of Commerce and Communication and Information Science form the highest percentage of very low and low users of electronic journals at the institution. For example, the Faculty of Commerce has 31.5% of its academics in the very low users' category and 21.1% in the low users' category. This means over half of academics in the Faculty of Commerce fall in the two lower end categories. The situation with the Faculty of Commerce is slightly more desirable than that of the Faculty of Communication and Information Science where 33.3% of academics are very low users of electronic journals and 25% are low users. This means as high as 58.3% of academics in the Faculty of Communication and Information Science occupy the two lower end categories of very low users and low users. This is compared to 52.6% for the Faculty of Commerce. However, the Faculty of Commerce's advantage over the Faculty of Communication and Information Science is neutralised by the fact that all the remaining academics in Commerce fall in the average users' group with none in the high or very high users' groups. About 16.7% of academics occupy the average users' group in Communication and Information Science and 25% occupy the high users' group. There are no users in the very high users' category. It is clear that these two faculties are well below average in their use of electronic journals. The Faculty of Built Environment is also a low user of electronic journals. The unique reasons affecting this faculty were highlighted section 5.6.1 above.

A further analysis of Table 39 above shows that the science faculties of Applied Sciences, Industrial Technology, and Medicine were better users of electronic journals than the faculties of Commerce and Communication and Information Science. The Faculty of Applied Sciences has the majority of its users (53%) in the high users' category with the very low users' category having 11.8% of academics in this faculty. The low users and average users' categories have 17.6% of academics each. The Faculty of Industrial Technology has 54.6% of its academics in the high users' category and 27.3% in the average users' category. Only 9.1% of Industrial Technology academics occupy the very low users' category with the same number also occupying the very high users' category. The Faculty of Industrial Technology has the most desirable usage patterns of all the faculties at NUST. The Faculty of Medicine also shows high use in that none of their academics fall in the very low users' and low users' categories. Seventy

five percent (75%) occupy the average users' category and 25% the high users' category. This faculty had no academics who are very high users.

The views of professional librarians at NUST seem to support the quantitative results presented above. The Sub-Librarian for Reader Services at NUST noted:

> When it comes to the way academics use electronic journals at our institution we are generally encouraged by the faculties of Applied Sciences, Industrial Technology, and Medicine. These faculties accept electronic resources; they are not like Commerce or Communication and Information Science where there are no researchers and where use of these resources is very low. For faculties like Commerce you actually struggle to get anyone for training in the use of electronic journals even if you call them. Some faculties are just not into these resources. I should underline, however, that we still hope for improvement in all the faculties as we feel academics here at NUST do not make maximum use of these expensive resources that we spend a lot of money on as the Library.

The sentiments of the Sub-Librarian for Reader Services cited above were confirmed by Faculty Librarians. The Faculty Librarian for Commerce expressed his frustration by stating:

> Commerce is a very difficult faculty to deal with. Most of the time those lecturers claim they are very busy. I remember attending their faculty board meeting and I wanted to give a talk on how to use electronic journals as a way of encouraging them to use the resources since they don't use them that much and the Dean said, 'we don't have time for this, maybe what you can do is to write a one page document explaining how we can access these journals and we will read it in our own time', so that goes a long way to show how this faculty views electronic journals.

The Faculty Librarian for Communication and Information Science had this to say about his faculty:

> In my faculty those academics that do some publications and conference presentations use electronic journals well, unfortunately I have very few of these academics. Most neither publish nor present in conferences and do not use electronic journals that much. There is correlation between the level of research and the use of electronic journals. That's why you find there is

higher usage in science disciplines because those academics research and publish a lot. It's not the same with Communication and Information Science and I am surprised because this is the faculty which houses the Department of Library and Information Science. The lecturers are trained librarians who should be leading their colleagues from the Departments of Journalism and Media Studies, Publishing, and Records and Archives Management in the use of these vital resources.

The Faculty Librarian for Applied Sciences was optimistic about the use of electronic journals in his faculty but he used a cautious tone when he said:

> Use of electronic journals in my faculty is a bit respectable if we consider usage patterns in the whole university but I should say we are still having challenges in trying to get academics to create a culture of using these resources. We are looking at academics who have been using books from the time they were learning as students so for them to use electronic journals yes, it's happening, but it's something that is happening slowly.

The Faculty Librarian for Medicine was also cautious but pointed out that great strides had been made in his faculty. He said:

> When you look at usage of electronic journals in my faculty it has been increasing steadily over the years and acceptance of these resources is encouraging. However, I still believe academics do not use the resources effectively and efficiently. They have not yet reached that point where they fully use these resources. They seem to use these resources when they present papers or write for publication but on a day to day basis they don't use them. Even for teaching they don't seem to use them because their Course Outlines do not contain these resources, they normally contain textbooks.

The Faculty Librarian for Industrial Technology expressed some measured satisfaction in the way academics in the faculty use electronic journals. He emphasised that there was still room for improvement. The Faculty Librarian for Built Environment stated that the current package of electronic journals was not adequate for her faculty. She noted that this has greatly affected usage patterns in the faculty. In its entirety, the situation at NUST reveals that the science faculties use the resources more than other faculties.

The situation at NUST shows clear faculty or discipline differences in the use of electronic journals however, this is different at BUSE where an overly uniform approach is noticed. Table 40 below reveals this scenario.

Table 40: Faculty use of electronic journals at BUSE based on number of articles consulted per week

Faculty	Very Low	Low	Average	High	Very High	Total
Agriculture and Environmental Sciences	4 (50%)	0 (0%)	1 (12.5%)	3 (37.5%)	0 (0%)	8 (100%)
Commerce	4 (33.3%)	4 (33.3%)	4 (33.3%)	0 (0%)	0 (0%)	12 (100%)
Science	5 (29.4%)	6 (35.3%)	5 (29.4%)	1 (5.9%)	0 (0%)	17 (100%)
Science Education	0 (0%)	2 (28.6%)	2 (28.6%)	2 (28.6%)	1 (14.2%)	7 (100%)
Total	**13**	**12**	**12**	**6**	**1**	**44**

The situation at BUSE is not impressive as shown in Table 40 above. Members of the faculties do not use electronic journals much. There is a difference, however, in the Faculty of Science Education where there are only 28.6% low users. The same figure is represented among those who are average and high users. However, only one academic reported being a very high user of electronic journals in the faculty. About 57.2% of academics in the Faculty of Science Education fall in the low to average users' categories and it is actually the best statistic for the faculties at BUSE. The Faculty of Agriculture and Environmental Sciences has 50% of its academics in the very low users' category, none in the low users' category and 12.5% in the average users' category. This means 62.5% of academics in that faculty fall in the very low to average users' categories with 37.5% in the high users' category and none in the very high users' category. The Faculty of Commerce has no academic in the high users and very high users' categories. All academics are distributed equally among the three low end categories: the very low users, low users, and average users. The academics in the Faculty of Science predominantly occupy the three low end categories with only one academic in the high users' category and none in the very high users' category.

The use of electronic journals at BUSE is not clearly defined by discipline. The majority of academics in all faculties at BUSE are very low users to average users of electronic journals. The Faculty of Science Education can be marginally appreciated by virtue of it having achieved 42.5% of academics in the high to very high users'categories though it is still clear that the majority of its academics are also in the three low end categories. It was noted earlier that BUSE has a very high awareness level and also does well in terms of the number of academics who use electronic journals at the university but it does poorly on the extent or level of use of electronic journals by those academics that use them.

Some Faculty Librarians at BUSE believed usage was very high in their faculties. They cited the statistics they received from ZULC. However, these statistics do not make a distinction between the different categories of users. They combine usage statistics for both undergraduate and postgraduate students, administrative members of the university staff, academics and external researchers who may have access to BUSE electronic journals by way of paying a fee to use its library. Underscoring this mix up, the Faculty Librarian for Commerce, a faculty that according to statistics cited above had really poor usage with no academics in the high and very users categories said:

> If you see the way our resources have been used there has been phenomenal growth. According to statistics we get from ZULC our downloads are now into thousands up from hundreds and I would assume academics in my faculty are using these resources a lot now.

The Faculty Librarian for Agriculture and Environmental Science said:

> When we organise workshops with academics and they attend they promise that they would always use the resources. But when you have another workshop and you ask if they used the resources they say, 'Ahh, that was the last time we used them'. But others actually use them a lot.

At MSU the two science faculties: Natural Resources Management and Agriculture and Science and Technology, are outstanding in the use of electronic journals. These two faculties have no academics in the very low users and low users' categories and there are only a minority of

academics in the average users' category. Table 41 below represent the number of academics who fall under the different user categories per faculty.

Table 41: Faculty use of electronic journals at MSU based on number of articles consulted per week

Faculty	Very Low	Low	Average	High	Very High	Total
Arts	0 (0%)	1 (7.1%)	11 (78.6%)	2 (14.3%)	0 (0%)	14 (100%)
Commerce	0 (0%)	2 (13.3%)	12 (80%)	1 (6.7%)	0 (0%)	15 (100%
Education	0 (0%)	1 (10%)	9 (90%)	0 (0%)	0 (0%)	10 (100%)
Law	0 (0%)	1 (20%)	4 (80%)	0 (0%)	0 (0%)	5 (100%)
Natural Resources Management and Agriculture	0 (0%)	0 (0%)	3 (37.5%)	5 (62.5%)	0 (0%)	8 (100%)
Science and Technology	0 (0%)	0 (0%)	2 (14.3%)	12 (85.7%)	0 (0%)	14 (100%)
Social Sciences	0 (0%)	3 (21.4%)	10 (71.4%)	1 (7.2%)	0 (0%)	14 (100%)
Total	**0**	**8**	**51**	**21**	**0**	**80**

The Faculty of Natural Resources Management and Agriculture has 37.5% of its academics in the average users' category and the majority 62.5% in the high users' category. The Faculty of Science and Technology has only 14.3% of its users in the average users' category while as high as 85.7% of its academics fall into the high users' category. While the non-science faculties of Arts, Commerce, Education, Law, and Social Sciences also fair well in the use of electronic journals if we compare them to faculties at NUST and BUSE they lag behind when compared to science faculties at their institution. While it is notable that no faculty at MSU falls within the very low users' category the non-science faculties have a number of their academics falling in the low users' category, the second worst category from the very low users'category. The Faculty of Social Sciences has the highest percentage of low users at 21.4% with 71.4% of its academics in the average users' category and 7.2% in the high users' category. The Faculty of Law has the second highest low users at 20% with 80% of its academics in the average users' category and none in the high users and very high users' categories. The Faculty of Commerce has the third highest low users at 13.3% with 80% of its academics in the average users' category

and 6.7% in the high users' category. The Faculty of Education has 10% of its academics in the low users' category and 90% in the average users' category with no representation in the high users and very high users' categories. The Faculty of Arts has 7.1% in the low users' category, 78.6% in the average users' category, and 14.3% in the high users' category.

It can also be noted that no faculty at MSU has academics in the very high users' category meaning that there is still room for improvement although this institution seems to have accepted electronic journals much more than the other two institutions which are part of this study. The non-science faculties at MSU are actually fairing better than the science leaning faculties at NUST and BUSE while the science faculties at MSU cannot be compared to any faculties in the other institutions as they use electronic resources far much more than any of the faculties from NUST and BUSE. This demonstrates the level to which MSU uses electronic journals compared to other institutions. If there is still room for improvement at MSU in the way they use electronic journals it means there is still much more room for other institutions.

The Librarian at MSU commented on the usage at her institution and why this is above average use. She said:

> Our library is small but we found that the only way to go is to have lots of electronic journals. We subscribe to a lot more resources than the ones we get through ZULC. It means we have resources for every faculty as we don't just depend on federated access to resources accessed through the ZULC arrangement, an arrangement which though good and helpful is limiting if some of the resources you need are not covered in the package on offer. We therefore pay a lot of money to get many more additional resources. We have also made sure our resources are accessible off campus so that our academics and other users can access them from wherever they will be. Funding for research is very high here at MSU so we have most of our academics engaged in research and they need to use electronic journals for. Most of our academics are also doing PhDs and they use electronic journals a lot for this purpose. I am also happy that most of our academics use these resources for teaching as they include them in their Course Outlines out of their own volition without being compelled by anyone. I think we have done really well in marketing the resources and we also involve academics in the selection of our electronic journals so they have ownership of the resources.

Other professional librarians at MSU confirmed the statement made by the Librarian. They expressed satisfaction in the usage of electronic journals across faculties. They noted that usage at their institution was higher than usage at other institutions in the country. However, they would like to see a further increase in usage. Faculty Librarians from science disciplines were especially ecstatic and commended their academics for embracing the new era of technology.

Results for number of articles consulted by academics per week were also considered by experience. This was measured by the number of years served in academia. Findings are as shown in Table 42 below.

Table 42: Academics' use of electronic journals based on number of years served in academia

Number of Years Served in Academia	Very Low	Low	Average	High	Very High	Total
5 Years and Below	15 (14.7%)	19 (18.6%)	39 (38.2%)	28 (27.5%)	1 (1%)	102 (100%)
6 – 10 Years	10 (13.3%)	12 (16%)	35 (46.7%)	18 (24%)	0 (0%)	75 (100%)
11 – 20 Years	1 (7.7%)	1 (7.7%)	10 (76.9%)	0 (0%)	1 (7.7%)	13 (100%)
21 Years and Above	0 (0%)	0 (0%)	2 (66.7%)	1 (33.3%)	0 (0%)	3 (100%)
Total	26	32	86	47	2	193

Those academics who have served for 5 years or less in academia had 14.7% in the very low users' category, 18.6% in the low users' category, 38.2% in the average users' category, 27.5% in the high users' category, and 1% in the very high users' category. When these 5 categories are collapsed into 3 categories of low users, average users, and high users this category of academics would have 33.3% of their academics in the low users' group, 38.2% in the average users' group, and 28.5% in the high users' group thus showing an almost uniform usage pattern across the different categories of usage. Academics who have served for 6-10 years have 13.3% of their academics in very low users' category, 16% in the low users' category, 46.7% in the average users' category, 24% in the high users' category, and none in the very high users' category. When divided into three categories this group of academics would have 29.3%, 46.7%, and 24% in the low, average, and high users' categories respectively. Here the average users' category is

more prominent. Academics who have served for 11 years and above are mostly average users of electronic journals. About 79.9% of academics in the 11-20 years experience group fall under the average users' category and 66.7% of those in the 21 years and above experience group also fall in the same category. Overall, the statistics do not show a major difference in users' patterns and behavior according to number of years served in academia. The same results were also considered by age. The results are shown in Table 43 below.

Table 43: Level of use of electronic journals by academics' age based on number of articles consulted per week

Age Ranges	Very Low	Low	Average	High	Very High	Total
30 Years and Below	8 (29.6%)	6 (22.2%)	8 (29.6%)	5 (18.6%)	0 (0%)	27 (100%)
31 – 40 Years	9 (10.3%)	16 (18.4%)	42 (48.3%)	19 (21.8%)	1 (1.2%)	87 (100%)
41 – 50 Years	7 (12.1%)	7 (12.1%)	22 (37.9%)	21 (36.2%)	1 (1.7%)	58 (100%)
51 – 60 Years	2 (10%)	3 (15%)	13 (65%)	2 (10%)	0 (0%)	20 (100%)
60 Years and Above	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	1 (100%)
Total	**26**	**32**	**86**	**47**	**2**	**193**

Whereas Figure 8 in section 5.6.1 above clearly revealed a pattern where the number of academics who used electronic journals decreased as the ages increased Table 43 above suggests that younger academics were actually low users of electronic journals. The statistics suggest that a number of young academics use electronic journals however, they use them sparingly. Whereas fewer academics in the older ages use electronic journals but those who use them do so in a significant way. An analysis of Table 43 above reveals that 51.8% of academics of 30 years and below can be classified into the two low end users' categories of very low users and low users whereas 28.7% of those aged 31-40 years can be classified in the same categories. 24.2% of academics in the 41-50 years age category can be classified in the very low users and low users' categories with 25% of those aged 51-60 years also falling in the same categories.

It would appear that as the age increases academics become more serious users of electronic journals although in terms of numbers more of the younger generation uses electronic journals

than the older generation. This is seemingly contradictory but it is not. Many of the younger academics use electronic journals but they are not fully committed to them. They consult fewer articles than the older generation of academics. The older generation of academics has many among their ranks who do not use electronic journals at all as shown in section 5.6.1 above (Figure 8) but those who have made a decision to use these resources do so with much commitment. The older generation of academics are 'mature' users of electronic journals whereas the younger generation are not committed to electronic journal use. They use instead, many sources of information. This claim is supported by results of question 24 that was posed in the questionnaire. The response revealed that younger academics relied on more resources than the older generation. The younger academics cited more databases whereas the older generation tended to rely on very few databases.

Professional librarians from the three institutions did not envisage this paradox where the younger academics have more members using electronic journals but consulting fewer resources than the older generation. Many professional librarians believed the younger academics were ahead in relation to the number of users of electronic journals and the level of use measured by the number of articles consulted per week. The Sub-Librarian for Reader Services at NUST said:

> In terms of use of these resources by age we find that the young academics use these resources very much. Many of them use them and they mostly depend on these resources for all their work unlike the old academics that still look to textbooks.

The view of the Sub-Librarian of NUST was shared by many of the Faculty Librarians from this institution. At BUSE the Sub-Librarian for Reader Services stated:

> There are definitely age differences in how our academics use electronic journals. The younger academics are more serious users of electronic journals. They depend on these resources a lot. The older generation is still stuck in print resources and is still resisting electronic journals.

The claim was also supported by Faculty Librarians from the same institution. Professional librarians at MSU also shared similar views. It is evident that the behavioural aspects of the use of electronic journals are more complex than many think or are willing to admit.

Results for number of articles consulted by academics per week were also considered by gender. The results do not show much variation although females slightly appear to consult more articles than males. Table 44 below shows results by gender.

Table 44: Level of use of electronic journals by gender based on number of articles consulted per week

Gender	Very Low	Low	Average	High	Very High	Total
Male	21 (16.9%)	23 (18.6%)	52 (41.9%)	27 (21.8%)	1 (0.8%)	124 (100%)
Female	5 (7.2%)	9 (13%)	34 (49.3%)	20 (29%)	1 (1.5%)	69 (100%)
Total	**26**	**32**	**86**	**47**	**2**	**193**

Table 44 above shows that more males populate the very low users' and low users' categories than females. Male academics have 16.9% of their members in the very low users' category compared to 7.2% for females. In the low users group male academics contribute 18.6% of their members whereas it is 13% for females. More females fall in the average users' group at 49.3% whereas males are at 41.9%. In the high users' categories females dominate males with a total of 30.5% when the high users and the very high users' categories are combined. This is compared to 22.6% for males. The female advantage, however, is not statistically significant enough to establish a Chi-Square relationship however, generally it is clear that female academics access more articles than male academics.

5.6.2.2 Frequency of Use of Electronic Journals by Academics at the selected Zimbabwean State Universities

So far, the second research question of this study: What is the extent of use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities? has been considered by looking at two issues. First, is the number of academics who use electronic journals. This was addressed in section 5.6.1. Second, is the level of use of electronic journals as

reflected by the number of articles accessed per week. This was examined in section 5.6.2.1. This section addresses the same question by looking at a third issue: the frequency of use of these electronic journals. This would help to establish how often academics accessed and used these resources. This is a critical factor in conclusively considering research question 2. This is because an establishment of number of articles accessed per week is not conclusive of the relation between academics and these resources because one can access many articles but do this once in a while without establishing a continual day to day relationship with the resources. The researcher needs to establish the strength of use by looking at frequency of use.

Question 26 of the questionnaire requested academics to indicate the frequency with which they use electronic journals. Here are the five options given: Almost daily, Several times a week, Once a week, Once a month, and Very Infrequently. The findings as reflected in Table 45 below show that academics at the selected Zimbabwean State Universities have not yet created a culture of frequently and consistently using electronic journals.

Table 45: Frequency of use of electronic journals by academics at selected Zimbabwean State Universities

Frequency of Use	Frequency	Percent
Almost Daily	23	11.9
Several times a week	89	46.1
Once a week	45	23.3
Once a month	7	3.6
Very infrequently	29	15.1
Total	**193**	**100**

Table 45 above reveals as high as 15.1% of academics who use electronic journals use these resources very infrequently. Some academics spend over a month without using electronic journals. Further results on the frequency of use of electronic journals are as follows:

- 3.6% of academics use electronic journals once a month;
- 23.3% of academics use electronic journals once a week;
- Only 11.9% of academics use electronic journals on an almost daily basis; and,

- 46.1% of academics use electronic journals several times a week, which may mean 2, 3 or 4 times a week.

The general outlook from data presented above reveals that electronic resources are being underutilised. The percentages cited above are slightly generous considering that they are expressed per number of academics who indicated that they used these resources. This excludes those who do not use electronic journals at all. This means the percentages are calculated on a base of 193, not 212, which is the total number of academics who responded to the study. If the percentages were calculated using 212 they would be much lower. The use of electronic journals in Zimbabwean State Universities is still relatively low.

The results of frequency of use of electronic journals by academics were considered per university. Academics at MSU were the most frequent users of electronic journals followed by those at NUST, and BUSE. About 63.8% of academics at MSU used electronic journals either almost daily or several times a week whereas less than half of academics at NUST (48%) and BUSE (43.2%) indicated using electronic journals with the same frequency. The results per faculty established that academics in science related disciplines used electronic journals more frequently than those in other disciplines such as Commerce, Arts, Social Sciences, Law, and Humanities.

The results were considered by experience, the number of years served in academia. Academics with 10 years experience or less used electronic journals more frequently than those with 11 years and above. The results by age reveals that 48.1% of academics in the 30 years and below category used electronic journals either almost daily or several times a week. It means the majority of academics in this category use electronic journals once a week, once a month, or very infrequently. This further strengthens the argument presented in section 5.6.2.1 above that whereas a large number of the younger academics use electronic journals their use of the resources is far from being mature. They are actually low users of the resources and they access them less frequently than those academics in the 31-40 years category that had 56% of their members using electronic journals either daily or several times a week. Academics in the 41-50 age category were the most frequent users with 63.8% of their academics using these resources

either daily or several times a week. Academics aged over 50 years are very infrequent users of electronic journals as only 30% of those in the 51-60 age category use electronic journals on a daily basis or several times a week. None of the academics aged over 60 years used the resources daily or several times a week. Academics aged 31 to 50 years, therefore, are the most frequent users of electronic journals at the selected Zimbabwean State Universities. There are no significant differences relating to gender.

5.6.2.3 Major Source of Information for Academics at Zimbabwean State Universities

The final element in the consideration of research question 2 which investigates the extent of use of electronic journals is determination of the extent to which electronic journals are considered as the primary sources of information by academics in Zimbabwe. Having an understanding of the major source of information for academics informs the researcher about the extent to which electronic journals are used. This helps to answer the research question under consideration.

Question 27 of the questionnaire requested academics to indicate their major source of information for teaching and research. All 212 academics responded to this question since it was an open question that was relevant to all whether they used electronic journals or not. Those who had earlier indicated that they were not aware of electronic journals together with those who knew about the resources but did not use them had an opportunity here to indicate the type of resources they mostly relied on. Results to this question are revealed in Table 46 below.

Table 46: Ranking of sources of information for academics

Source of Information	Frequency	Percent
Electronic Journals	86	40.6
Print Journals	20	9.4
Electronic Books	18	8.5
Print Books	88	41.5
Total	**212**	**100**

Table 46 show that print resources comprising of print books and print journals still dominate the academic landscape of Zimbabwe with 50.9% (41.5% for print books + 9.4% for print journals) of academics mentioning these resources as their major source of information. Electronic

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resources comprising electronic journals and electronic books are in the minority at 49.1%. In addition, 41.5% of academics regard books as their major sources of information compared to 40.6% who regard electronic journals as their major sources of information. This shows that many academics still prefer print resources. This is a concern given that most professional librarians interviewed indicated that most of their print resources were now outdated. They lack funds to keep on buying new ones. They indicated that they preferred to subscribe to electronic journals since they subscribe to these as a group of universities in the ZULC family. This makes it cheaper for each institution to access these reources.

Most universities in Zimbabwe have severely restricted subscription to print journals since they cannot afford to subscribe to both electronic and print journals. Professional librarians indicated that they have limited print journal subscription to few critical journals that are not available in electronic format. This may account for the 9.4% of academics who regard print journals as their major source of information. One may infer that if subscriptions for print journals were open, many academics would prefer them. This shows that in Zimbabwe, the use of electronic journals is not yet established. The extent of use of electronic journals is still low.

The sources of information were considered per university. MSU has the highest percentage of academics who regard electronic journals as their major source of information. Table 47 below shows that 45.7% of academics at MSU regard electronic journals as their major source of information. NUST and BUSE are at 39% and 34.7% respectively.

Table 47: Ranking of sources of information for academics per university

Source of Information	NUST	BUSE	MSU	Total
Electronic Journals	32 (39%)	17 (34.7%)	37 (45.7%)	**86**
Print Journals	3 (3.7%)	5 (10.2%)	12 (14.8%)	**20**
Electronic Books	7 (8.5%)	2 (4.1%)	9 (11.1%)	**18**
Print Books	40 (48.8%)	25 (51%)	23 (28.4%)	**88**
Total	**82 (100%)**	**49 (100%)**	**81 (100%)**	**212**

It should be noted, however, that the percentage of academics who regard electronic journals as their major source of information at MSU is still below half of the academics at the institution. This indicates that the majority still have other sources of information with 14.8% relying on print journals, 11.1% relying on electronic books, and 28.4% relying on print books. At NUST 48.8% of academics still regard print books at their major source of information. This indicates that print books are used more than electronic journals that are at 39% for the institution. At BUSE print books are popular with 51% of academics indicating that they mostly get their information from them. Only 34.7% mentioned electronic journals as their first choice source of information for their research and teaching needs. These results mirror the results already presented for level and frequency of use of electronic journals. MSU was shown to be the leading institution followed by NUST and BUSE. The results also confirm that the extent of use of electronic journals by academics at the selected Zimbabwean State Universities is still on the low side. Academics have not made good use of the resources. They regard print resources as their major source of information, at a time when universities are investing less on print and more on electronic resources.

In conclusion, research question 2 sought to establish the extent of use of electronic journals by academics at selected Zimbabwean State Universities. It is evident that the proportion of academics that make use of electronic journals in Zimbabwe is encouraging as shown by data presented in section 5.6.1. However, the use of electronic journals by academics is still minimal as shown by number of articles consulted per week in section 5.6.2.1, frequency of use of electronic journals in section 5.6.2.2, and major source of information for academics in section 5.6.2.3. In summation, it is evident that the majority of academics in Zimbabwe are now using electronic journals, however, they are not making full use of the resources.

5.7   Attitudes and Perceptions of Academics Towards Peer Reviewed Electronic Journals

The third research question of this study enquired about the attitudes and perceptions of academics towards peer reviewed electronic journals. Quantitative data were collected to answer this research question through questions 53, 54, 55, 57, 59, 60, 61, 62, 65 and 66 of the questionnaire (Appendix 1). Some questions among these were core to the answering of the

research question and are presented individually whereas some were supporting questions whose responses are cited in support of the main questions. Qualitative data were collected from Faculty Librarians through questions 19 and 20 of the interview guide with Faculty Librarians (Appendix 2) and from Sub-Librarians through questions 17, 18, 19, and 20 of the interview guide with Sub-Librarians Responsible for Reader Services (Appendix 3). Findings to this question are now presented in sections 5.7.1 and section 5.7.2 below.

5.7.1 Academics' Views on the Importance of Electronic Journals for their Work

Several questions were asked to ascertain the attitudes and perceptions of academics on the importance of electronic journals for their work. Question 53 of the questionnaire focused on the extent to which academics view electronic journals as important for their work, question 54 focused on usefulness of electronic journals for academics' needs, question 55 ascertained academics' views on the dispensability or indispensability of electronic journals and question 65 allowed academics to rank the features of electronic journals for their importance. Data from the 193 academics who indicated that they use electronic journals were considered and the results are as follows:

When asked about the importance of electronic journals academics responded as shown in Table 48 below.

Table 48: Academics' views on importance of electronic journals

Measure of Importance	Frequency	Percent
Not important at all	10	5.2
Somewhat important	17	8.8
Neutral	41	21.2
Important	68	35.2
Very important	57	29.6
Total	**193**	**100**

Table 48 above indicates that the majority of academics at the selected Zimbabwean State Universities regard electronic journals as either important or very important for their work. There is a combined total of 64.8% in these two categories. Only 10 (5.2%) of academics regard

electronic journals as not important for their work. These are mostly academics from the Faculty of Commerce at NUST. Seventeen academics (8.8%) regard electronic journals as somewhat important. This means that they recognise some importance in the resources but can do without them. About 21.2% of academics were neutral, they were unsure of the importance of electronic journals. The number of undecided academics suggests that more still needs to be done to make academics in Zimbabwe fully appreciative of electronic journals.

In the interviews a number of professional librarians indicated that the majority of academics now have a positive attitude and a good perception of electronic journals. This as a result of sustained periods of marketing of these resources. The Sub-Librarian responsible for Reader Services at NUST said:

> Though we still have challenges with some faculties like Commerce I would say the majority of our academics now appreciate electronic journals. We have not reached the concentration of usage we want maybe because of some factors that affect the use of these journals like our poor Internet connection, lack of resources in some areas, and electricity challenges but I wouldn't say our academics don't know about the importance of these resources. We note, however, that a good proportion of our academics still prefer print resources although they value electronic journals a lot.

The Sub-Librarian responsible for Reader Services at BUSE said:

> Generally I would say considering that it's a university environment where almost every academic is expected to be researching the attitude is on the positive side though we would expect more or a higher uptake of these resources.

The Sub-Librarian responsible for Reader Services at MSU had this to say concerning the attitude of academics at the institution towards electronic journals:

> The attitude is very positive. They do appreciate them because they even recommend some databases apart from the ones we subscribe to. Their perception is really good, we have not had anyone coming with negative comments. Instead, they have come to the library expressing gratitude. It has

made their lives easier, they now don't have to wait for each other to return books but they can use these electronic resources as and when they want.

Sub-Librarians from all the three institutions agree that academics appreciate electronic journals. Faculty Librarians were not as united as Sub-Librarians. The Faculty Librarians from the science faculties articulated that their academics appreciated electronic journals and had a positive attitude towards them. Faculty Librarians from non science faculties did not think that academics had a positive attitude and good perception of electronic journals. The Faculty Librarian for Commerce at NUST for example said:

> I can say our academics have a negative attitude towards electronic journals but I think what shapes it is lack of knowledge or lack of appreciation of what these resources can do for them. I think that's really the bottom line.

The views and attitudes of academics are shaped by discipline. However, the majority of academics now appreciate electronic journals. This was confirmed by supporting questions that enquired about the usefulness and indispensability of electronic journals. Most academics (66%) thought electronic journals were either useful or very useful with only 4% thinking that the resources were not useful, 11% classified the resources as somewhat useful and 19% chose to be neutral. The majority (87%) thought the resources were indispensable whereas the minority (13%) thought the resources were dispensable. The 13% who thought they could do without the resources came mostly from the Faculty of Commerce at NUST and from BUSE.

An analysis of the results by university show that MSU appreciates the importance and usefulness of electronic journals more, followed by NUST and BUSE. The results showed that attitude and perception towards the importance of electronic journals was almost uniform in all age groups up to 50 years of age. The appreciation dropped beyond 50 years of age, with many not considering electronic journals that important. Results did not show gender difference.

To ascertain how the features of electronic journals impact on the overall rating of these resources by academics the respondents were asked to rank common features of electronic

journals on a three point scale of not important, important, and very important and the results are as shown in Table 49 below.

Table 49: Ranking of features of electronic journals by academics

Features of Electronic Journals	Not Important	Important	Very Important	Total
Convenience	9 (4.7%)	88 (45.6%)	96 (49.7%)	**193 (100%)**
Timeliness of Information	8 (4.1%)	81 (42%)	104 (53.9%)	**193 (100%)**
Simultaneous access to a wide range of journals	5 (2.6%)	82 (42.5%)	106 (54.9%)	**193 (100%)**
Ability to search within an article	79 (40.9%)	72 (37.3%)	42 (21.8%)	**193 (100%)**
Ability to send search results to one's email	12 (6.2%)	84 (43.5%)	97 (50.3%)	**193 (100%)**
Easier access to information	13 (6.7%)	85 (44%)	95 (49.3%)	**193 (100%)**
Interactiveness of electronic journals	77 (39.9%)	72 (37.3%)	44 (22.8%)	**193 (100%)**
Hyperlinks to other relevant articles	7 (3.6%)	92 (47.7%)	94 (48.7%)	**193 (100%)**
Ability to print research findings	8 (4.1%)	79 (40.9%)	106 (54.9%)	**193 (100%)**
Enable fast searching	80 (41.5%)	61 (31.6%)	52 (26.9%)	**193 (100%)**
Accessibility from office or home	5 (2.6%)	85 (44%)	103 (53.4%)	**193 (100%)**
Easily adaptable for teaching	45 (23.3%)	91 (47.2%)	57 (29.5%)	**193 (100%)**
Access to full text	8 (4.1%)	82 (42.5%)	103 (53.4%)	**193 (100%)**
High image quality	47 (24.4%)	80 (41.5%)	66 (34.2%)	**193 (100%)**
Easy browsing	13 (6.7%)	88 (45.6%)	92 (47.7%)	**193 (100%)**
24 hour access	12 (6.2%)	78 (40.4%)	103 (53.4%)	**193 (100%)**
Saves space of library	88 (45.6%)	76 (39.4%)	29 (15%)	**193 (100%)**

Table 49 above shows that the majority of academics consider most features of electronic

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journals as either important or very important. Some features are considered very important. These are timeliness of information (53.9%), simultaneous access to a wide range of journals (54.9%), ability to send search results to one's email (50.3%), ability to print research findings (54.9%), accessibility from office or home (53.4%), access to full text (53.4%), and 24 hour access (53.4%). There are, however, some features that a significant number of academics considered as not important. These are ability to search within an article (40.9%), interactiveness of electronic journals (39.9%), ability of electronic journals to enable fast researching (41.5%), easily adaptable for teaching (23.3%), high image quality (24.4%), and the ability of electronic journals to save library space (45.6%). The features that a significant number of academics ranked as not important mostly betray lack of skill and confidence in how academics interact with the journals. On the whole, academics ranked the features of electronic journals in the important and very important categories. This shows that they appreciated these resources and they had a positive attitude and perception towards them.

5.7.2   Academics' Views on the Quality of Information Accessed from Electronic Journals

The attitudes and perception of academics towards electronic journals can also be measured by ascertaining the confidence with which they view information from these resources. Several questions were included in the questionnaire to establish how academics view information from electronic journals. Questions 57, 58, 59, 60, and 66 used various angles to measure the way academics view information from electronic journals.

Results show that while a significant proportion of academics have confidence in information they get from electronic journals there remains a significant percentage that are not satisfied with the content. This may be indicative of a number of issues. These issues were identified by professional librarians as:

- Lack of skills to properly search the databases and get the correct articles;
- Lack of resources in some disciplines especially for NUST and BUSE who depend on resources they get through the ZULC package. They do not cater for needs of faculties who are not included in the group arrangement; and,
- Frustration with failing to get full text articles on those journals not covered by the ZULC arrangement.

When asked about the relevancy of the information they get from electronic journals 51.8% of academics said they get relevant information and 23.3% indicated the resources are very relevant. Only 4.2% complained of getting irrelevant results. About 20.7% of academics consider these resources somewhat relevant. These academics do not commit themselves on the relevancy of information they get from electronic journals. Most academics, however, agreed that electronic journals have high quality information. About 56.5% of academics thought electronic journals were of high quality and 20% classified them as of very high quality. Only 23.5% classified these resources in the very poor to average quality categories. Most academics agreed that electronic journals are reviewed as rigorously as hard copy journals. Electronic journals are viewed as credible by academics at the selected Zimbabwean State Universities. Academics from MSU have more confidence in the resources than academics from NUST and BUSE. The challenge of use of electronic journals revealed in section 5.6.2 above does not seem to emanate from how academics view electronic journals in general, as most of them seem to have a fair view of the resources. The results presented in this section do not conflict with those presented in section 5.6.2.3 above where it was shown that academics preferred print books to electronic journals. In this section the value electronic journals were considered separately and not in comparison to print books.

5.8   Factors Influencing the Behaviour of Academics Towards Peer Reviewed Electronic Journals

The fourth research question of this study sought to establish the factors that influence the behaviour of academics towards peer reviewed electronic journals. In addressing this question the researcher was guided by the Facilitating Conditions construct of the UTAUT as was highlighted in section 2.6.2.4. The Facilitating Conditions construct is posited in UTAUT as directly affecting the Usage Behaviour of users in a technological environment. The construct argues that there are environmental factors, conditions within organisations, and personal attributes of the intended users that affect adoption and use of a given technology. To answer this research question, data were collected from all categories of respondents in this study. Data were collected from academics through questions 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 67, 68, 81, 82, and 83 of the questionnaire (Appendix 1). Data were also collected from Faculty Librarians (Questions 13, 14, 15, 16, 17, and 18 of Appendix 2), Sub-Librarians (Questions 12,

13, 14, 15, and 16 of Appendix 3), Systems Librarians (Questions 1, 3, 4, 6, and 7 of Appendix 4), and Librarians (Questions 2, 3, and 4 of Appendix 5). The findings are now presented below.

5.8.1   Infrastructure to Support Access to Electronic Journals

Academics were asked if their institutions had adequate infrastructure and resources such as desktop computers, laptops, computer laboratories and related facilities to allow unfettered access to electronic journals. About 41.4% of academics agreed that infrastructure was in place while only 5.2% strongly agreed with the statement. The majority of academics (53.4%) were not happy with the infrastructural investments their institutions had made to enable access to electronic journals. They displayed their unhappiness by disagreeing to varying degrees with the statement that suggested their institutions had adequate infrastructure to enable them to access electronic journals as shown in Table 50 below.

Table 50: Adequacy of infrastructure to support access to electronic journals

Response	Frequency	Percent
Strongly Disagree	14	7.3
Disagree	63	32.6
Neutral	26	13.5
Agree	80	41.4
Strongly Agree	10	5.2
Total	**193**	**100**

The results in Table 50 above shows that 7.3% of academics strongly disagreed with the statement, 32.6% disagreed while 13.5% chose to be neutral. This shows a lack of confidence in the resources to access and use of electronic journals. In responding to a supporting question, 38.3% of academics indicated that infrastructure was a major barrier to their use of electronic journals. About 50.8% indicated that infrastructure was a minor barrier, but nevertheless a barrier. Only 10.9% indicated the issue of infrastructure and resources did not pose a barrier to their use of electronic journals. About 22.3% of academics indicated they had problems accessing a computer to enable the use of electronic journals. Only 32.1% indicated they had full time access to computers and 45.6% reported that they had some sort of access to computers. This could be shared access which would mean that one does not have full time access to the resources that enable them to use electronic journals.

The MSU was the most infrastructurally prepared university among the three institutions considered in this study. The majority of academics at MSU (78.7%) either agreed or strongly agreed that their institution had adequate resources to enable unfettered access to electronic journals. Only 6.3% of academics disagreed while 15% chose to be neutral. At NUST the majority of academics (59.6%) either disagreed or strongly disagreed with the view that their institution had adequate resources to allow them unrestricted access to electronic journals. Only 28.9% either agreed or strongly agreed that they had the resources they needed while 11.5% chose to be neutral. At BUSE 70.5% of academics either disagreed or strongly disagreed with the view that their university had adequate resources to allow them unfettered access to electronic journals. Only 15.9% of academics at BUSE felt they had the resources they needed to access electronic journals while 13.6% chose to be neutral. The statistics regarding adequacy of infrastructure per university are summarised in Table 51 below.

Table 51: Adequacy of infrastructure to support access to electronic journals per university

Response	NUST	BUSE	MSU	Total
Strongly Disagree	5 (7.4%)	9 (20.5%)	0 (0%)	**14**
Disagree	36 (52.2%)	22 (50%)	5 (6.3%)	**63**
Neutral	8 (11.5%)	6 (13.6%)	12 (15%)	**26**
Agree	16 (23.2%)	7 (15.9%)	57 (71.3%)	**80**
Strongly Agree	4 (5.7%)	0 (0%)	6 (7.4%)	**10**
Total	**69 (100%)**	**44 (100%)**	**80 (100%)**	**193**

Professional librarians in the three universities confirmed the feelings of academics in their institutions. The Librarian for MSU, an institution whose academics were mostly happy with resources at their disposal, stated:

> We have a lot of support in the university. The IT department has made sure infrastructure is in place to support access. We have plenty of computers and other necessary gargets and the budget for these is massive. We have big and functional computer labs throughout our campuses to support access by all our users whether its academics or students. For academics we have

also campaigned that each has a computer connected to Internet in their offices while some of them have invested in laptops and are taking advantage of our wireless service. We may have a few complaints especially from new academics who may not yet have been allocated computers but the majority do have.

Other professional librarians at MSU supported the view given by the Librarian who stated that the institution had made a lot of investment in infrastructure and resources in an effort to support access and use of electronic journals. At NUST the Librarian identified challenges with resources and infrastructure. She stated:

> Yes most universities in this country have problems. True the university hasn't provided all the resources to enable access to these resources. But we shouldn't complain much about these constraints because they are common in this country and in Africa, let's use what we have.

The Sub-Librarian for Reader Services at NUST opined that the university had tried to provide the necessary resources within the constraints of economic conditions.

> Generally we have challenges with infrastructure especially for students but for academics I would say the university has tried. When a lecturer comes in they get a desktop computer that has got access to the Internet. The university has not been able to buy laptops for all lecturers but there is a facility to lend laptops out to lecturers for limited periods of time and our academics can take advantage of this facility. So for academics I would say it's much better though I would have a completely different answer for students.

Faculty Librarians and the Systems Librarian at NUST all complained about the lack of laptops for academics' use at NUST. This impacted negatively on off-campus access of these resources. At BUSE both the Librarian and Sub-Librarian for Reader Services indicated that they were not happy with the infrastructure for electronic journals access at the institution but indicated that some initiatives were in the pipeline to ease the situation. They also highlighted that academics were being encouraged to buy laptops and iPads from private companies at favourable rates negotiated by the university.

The data explains that except for MSU the other institutions do not yet have adequate resources to enable unfettered access to peer reviewed electronic journals. The lack of the necessary resources results in low usage recorded by these universities as has been shown in section 5.6.2 above.

5.8.2   Efficiency and Speed of Internet Connection

Closely related to the issue of availability of resources to use in accessing electronic journals dealt with in section 5.8.1 above is efficiency and speed of Internet connection. This influences a user's motivation to use electronic journals. The majority of academics (51.8%) indicated that they were frustrated by erratic and unreliable Internet connection. Academics especially from NUST and BUSE noted that their Internet had long periods of down time, an issue that frustrated their use of the resources. About 76.8% of academics at NUST felt Internet unreliability was a major factor negatively impacting their use of electronic journals, 18.9% pointed to the issue of Internet connection as a minor barrier while only 4.3% said the Internet connection did not constitute a barrier to their use of electronic journals. At BUSE 90.9% of academics indicated that Internet unreliability was a major barrier to their efforts to use electronic journals, 6.8% cited the issue of Internet connectivity as a minor barrier while only 2.3% felt they were not affected by Internet connectivity. Academics at MSU were satisfied with the service with only 8.6% of them citing Internet connectivity as a major barrier, 71.4% stated that it was a minor barrier, and 20% indicated that it was not a barrier at all.

It was also noted that availability of electricity played a major role in the reliability of Internet connection given that Zimbabwe has been battling critical electricity shortage for the past 10 years. There are frequent power outages. Every sector is affected including the universities. Professional librarians complained that this affected their ability to provide a reliable service. Librarians from NUST and BUSE complained more ofelectricity cuts. Librarians at NUST noted that only the Faculty of Medicine was spared the cuts since it was housed within Mpilo Central Hospital which is exempt from electricity cuts as it is a health institution. All other faculties at NUST suffer from electricity cuts. The standby generators installed at the university do not cover the whole university. Some faculties such as Applied Sciences, Industrial Technology and Communication and Information Science do not have standby generators and therefore cannot

use computers during electricity load shedding. At BUSE the librarians indicated that the problem of electricity cuts severely affected those academics based at their Astra Campus. This campus houses the Faculty of Agriculture and Environmental Science and some departments in the Faculty of Science. Those academics based at the main campus were not affected as they used standby generators. At MSU the librarians reported that load shedding did not affect their use of electronic journals as they invested in generators that cover all faculties and computer centres.

Data from the questionnaire also show that academics were concerned about Internet speed. The majority complained of low bandwidth which caused slow download speeds. About 63.2% of academics complained of slow download speeds and noted that this was a major hindrance to their use of electronic journals. Academics at NUST and BUSE were very concerned with speed whereas those at MSU were satisfied. About 65% of academics at MSU expressed content with the speed of the Internet at their institution. At NUST only 23.2% were satisfied with download speeds whereas at BUSE only 6.8% were satisfied.

In interviews, professional librarians from the three institutions seemed to agree with their academics. The Sub-Librarian for Reader Services at NUST reported that their Internet was slow owing to low bandwidth which stood at 160 megabytes per second. Considering the population of Internet users at NUST this size of bandwidth is inadequate and causes slow download speeds. To increase bandwidth they needed funds which were currently not available. The Systems Librarian at the institution also admitted that they were still operating on low bandwidth which affected download speeds however, they were hoping to increase this with adequate funding.

At BUSE both the Sub-Librarian for Reader Services and the Systems Librarian were concerned about the Internet speed though they noted efforts were being made to upgrade. Bandwidth at BUSE stood at 32 megabytes per second, far lower than the other two institutions in this study. The Sub-Librarian stated:

> There are times when the Internet is down or very slow thereby affecting usage and demoralising the academics. Something, however, is being done. From the time we introduced electronic journals until now you realise that

the bandwidth which we have been buying has been going up. A few weeks ago our IT department was carrying out tests to see how much we need to increase our speed with. For the other campuses in the past they were connecting with this main campus by radio link which was very poor and the university moved again to say lets connect by optic fibre which is better, so now we are connected by optic fibre.

The Systems Librarian at BUSE reiterated the same sentiments as the Sub-Librarian. At MSU the professional librarians were very happy with their bandwidth. The Librarian said:

> Our bandwidth is very high, now at 200 megabytes per second, we are at par with the University of Zimbabwe which is also at 200 megabytes per second but for us our speeds would be more because we have fewer users than an institution like University of Zimbabwe. We really have made massive investment in our infrastructure.

The Sub-Librarian and Faculty Librarians at MSU expressed gratitude to the university administration for subscribing to bandwidth of 200 megabytes per second. This enabled efficient use of electronic journals.

5.8.3   Skills to Negotiate the Electronic Journals Environment

The use of electronic journals is greatly affected by the level of skills of the target users. The researcher sought to establish if academics had the necessary skills to use electronic journals and included question 41 in the questionnaire. This question asked the academics to rank themselves in terms of skills. The results that are represented in Table 52 below showed that the majority of academics lie in the very low to average skills categories. About 5.2% indicated very low skills, 10.9% reported low skills, and 44.6% indicated they had average skills. This means 60.7% of academics who responded to this study were not confident users.

Table 52: Level of skills of academics in the use of electronic journals

Ranking	Frequency	Percent
Very Low	10	5.2
Low	21	10.9
Average	86	44.6
High	61	31.6

Ranking	Frequency	Percent
Very High	15	7.7
Total	**193**	**100**

Table 52 above shows that only 31.6% of academics reported high skills and 7.7% reported very high skills. This means 39.3% of academics were comfortable with their skills with the rest showing hesitation. Responses from supporting questions confirmed the above. For example only 30.1% of academics indicated that the lack of skills was not a barrier in their use of electronic journals whereas 69.9% reported that their skills level was a barrier in their use of electronic journals. When asked if they felt a need for professional development to improve their skills in the access and use of electronic journals 69.4% reported that they needed professional development while 30.6% cited that they did not need any further skills development to access and use the resources.

When the results for level of skills were considered per university the results show that academics at NUST were the most confident users. About 36.2% of them reported a high level of skills and 11.6% reported very high skills. This means 47.8% of academics at NUST fall in the high to very high skills categories compared to 35% at MSU and 34.1% at BUSE. A significant number of academics for all the institutions fall in the average users categories. Further statistics are provided in Table 53 below.

Table 53: Level of skills of academics in the use of electronic journals per university

Level of Skills	NUST	BUSE	MSU	Total
Very Low	2 (2.9%)	4 (9.1%)	4 (5%)	**10**
Low	7 (10.1%)	6 (13.6%)	8 (10%)	**21**
Average	27 (39.2%)	19 (43.2%)	40 (50%)	**86**
High	25 (36.2%)	11 (25%)	25 (31.3%)	**61**
Very High	8 (11.6%)	4 (9.1%)	3 (3.7%)	**15**
Total	**69 (100%)**	**44 (100%)**	**80 (100%)**	**193**

At NUST academics from the Faculties of Applied Sciences, Industrial Technology, Medicine and Communication and Information Science reported high skills whereas at MSU academics from the Faculties of Arts, Commerce, Education, Law, and Social Sciences did not show much confidence in their skills. At BUSE the Faculty of Commerce reported low skills. This suggests that academics from science related faculties were more confident users than academics from non science faculties. This is evident at NUST which is a science based institution.

The results were also considered by age. Academics aged 51 years and above had very low to average skills with 70% of them falling in this category. Only 30% of those aged 51 years and above reported high or very high skills. The majority of academics aged 30 years and below were concentrated in the average to high skills level with 37% of them reporting average skills and 40% reporting high skills. The majority of academics in the 31-40 years age category (51.7%) reported average skills whereas 28.7% reported high skills and 10.4% reported very high skills. The 41-50 age category has 37.9% of its academics in the average skills category and 36.2% in the high skills category. There was no significant relationship between gender and skills.

5.8.4 Library Support in Use of Electronic Journals

Continual support from library staff is important to encourage use of electronic journals. The researcher sought to establish the extent to which academics felt continuously supported by their respective libraries in their quest to access and use electronic journals. In responding to question 45 of the questionnaire 52.4% of academics did not agree that their libraries were effective in responding to their needs. Table 54 below shows responses to the statement that libraries were effective in responding to academics' individual needs concerning the use of electronic journals.

Table 54: Academics' views on support they get from their respective libraries in the use of electronic journals

Response	Frequency	Percent
Strongly Disagree	9	4.7
Disagree	45	23.3
Neutral	47	24.4
Agree	74	38.3

Response	Frequency	Percent
Strongly Agree	18	9.3
Total	**193**	**100**

As Table 54 above shows only 9.3% of academics strongly agreed that they had the support they needed from their libraries. About 38.3% just agreed and the rest were less than agreeable with 4.7% strongly disagreeing, 23.3% disagreeing, and 24.4% choosing to remain neutral. Academics at NUST were the least satisfied with the support offered by their library. About 68.2% of them were disgruntled with the way the library responds to their individual needs. Only 31.8% of academics either agreed or strongly agreed that they got enough support from their library. Academics at BUSE got the most support with 59.1% either agreeing or strongly agreeing that they had the necessary support from the library. Academics at MSU were also happy with the support they got from their library with 55% of them either agreeing or strongly agreeing that the library effectively responds to their individual needs.

A follow up question was asked to establish where academics usually turned to for help when they were stuck in their use of electronic journals. Only 20.2% of academics indicated that they turned to library staff. The majority did not readily see library staff as responsible for solving their challenges. About 33.2% said they sought help from fellow colleagues, 43% indicated they would struggle alone until they got it right through trial and error and 3.6% said they normally consulted staff from the IT department. These statistics show that the academics do not find the library supportive. Professional librarians, however, argue that they have support mechanisms in place to aid academics when they need help. The Systems Librarian for NUST said:

> In our newly launched website we have a chat facility whether you are in the United States, China, Fiji or anywhere on the world wide web you can be able to chat with a librarian at NUST. So what happens is there is a librarian who mans this facility. The user on the other side doesn't even have to log anything, the chat box is right on the landing page and they can just put in their name, they don't even need to write their real name. They just put in a name that they want to be identified with. When they do that it will then prompt the librarian who is on the NUST side. We are using a tool called 'Zoho', it's a free tool. The tool is so good that it can even allow the reference librarian to share his desktop with the user so that if the user is not understanding certain things the reference librarian can actually share his

desktop so that the user can actually see where the librarian is clicking and what he is doing so that they can understand what they have to do a lot more. That's over and above other facilities that are already there like email.

The academics at NUST, however, were unaware of this facility. This is reflected in their unhappiness with the support they get from the library. The Sub-Librarian for BUSE indicated that their library doors were always open to assist whenever users faced challenges with electronic resources. Academics, he said, were free to call the library, make personal visits or send an email. He indicated that they did not yet have a chat facility but they were eager to help using other methods. Professional librarians at MSU also indicated they were always open to help their academics if they faced challenges. Faculty Librarians at MSU indicated that their library website has pre-prepared video tutorials on how to access and use electronic journals. The tutorials address the most common challenges users face. Users can log onto the library website and access these tutorials. Those users who are faced with challenges are able to consult with their Faculty Librarian to resolve the issues. All of the three institutions in the study expressed full support for academics in their use of electronic journals however, the academics felt they were unsupported as shown by statistics cited above. This could be affecting use of these resources especially at NUST where academics were the unhappiest.

5.8.5 Friendliness of Library Website Interfaces and Specific Journals Interfaces

It was noted in section 5.5.2 above that the majority of academics who responded to this study accessed electronic journals via search engines such as Google and not via their respective libraries' websites. The friendliness of the library websites come into question insofar as they aid in the access and use of electronic journals. Less than half of academics (41.4%) felt their library website interfaces were either easy or very easy to work with. The rest faced challenges with library interfaces.

The majority of academics at NUST and BUSE felt their library website interfaces were a challenge with 36.2% of academics at NUST reporting that the interface was either difficult or very difficult to negotiate. About 30.4% of academics chose to be neutral while 33.4% said the interface was easily negotiable. At BUSE 13.6% felt their library website interface was easily negotiable while 43.2% thought the interface was either difficult or very difficult to negotiate.

An equal percentage was neutral. At MSU 63.8% of academics felt their library website interface was either easy or very easy to negotiate while 11.3% felt it was difficult and 24.9% chose to be neutral. Generally academics from Science faculties felt library websites were negotiable whereas many from non-science faculties expressed challenges. Academics aged 51 years and above tended to complain about their library website interfaces more than those who were younger.

Academics seemed to have challenges with interfaces of certain databases. They used databases they were comfortable with, whose interfaces they could easily negotiate. Professional Librarians reported that academics were more comfortable with databases such as Emerald Insight, AGORA, HINARI, and Ebsco Host. Speaking of Emerald Insight the Systems Librarian at NUST said:

> The Emerald database seems to just stand out, it seems to be in a class of its own. I have used it personally and I found it very easy to use much as I have technical background as an IT person. Users generally prefer databases that are user friendly and I think the Emerald database meets that. There are, however, other friendly databases that users may not be aware of because they haven't had experience with them. What we normally do as IT people is to give feedback to publishers of journals so that they can improve their interfaces and make it easier for the user to negotiate these resources.

Professional librarians from the other institutions also agreed that databases such as Emerald were preferred by users owing to simplicity in its use. They indicated that in their feedback to publishers they emphasise the issue of friendliness and simplicity to the user as this tends to increase usage. On the issue of library interfaces many professional librarians were not aware of any complaints against their websites. They indicated that they continuously strived to improve as a way of making it easier for the users to access electronic resources.

5.8.6 Failure to download full-text articles and challenges with relevancy of some resources

Academics especially at NUST and BUSE complained of failure to download full text articles from some of the databases on offer. Most academics indicated that they use electronic journals

to look for full-text articles however, they often end up with abstract or bibliographic details. About 68.1% of academics at NUST stated that failure to download full-text articles presented a barrier to their use of electronic journals, 50% at BUSE had similar experiences whereas academics at MSU were satisfied with the service. Only 15% of academics at MSU complained about failure to access full text articles. Professional librarians in the three universities also highlighted the issue of full text articles. They explained it in the context of the Consortium access they have through the ZULC-INASP arrangement and other arrangements that ZULC has managed to negotiate. They noted that because the institutions pay heavily discounted fees to access these databases as a Consortium the providers of the databases normally lock away some of their journals and provide full-text access to only a few of their resources. This problem was prevalent at NUST and BUSE. These institutions were unable to pay extra to access more resources. MSU paid much more including for databases outside the ZULC arrangement. This offered them more choice to access of articles.

Constraints of Consortium access affected not just the full text articles but also the range of resources on offer. Universities have to compromise and agree to subscribe to those resources that would be beneficial to most of the universities in the Consortium. This means those disciplines that are not commonly found across the state universities suffer such as the case with the Faculty of Built Environment at NUST which was cited earlier. This challenge can be solved by independently subscribing to additional resources outside the ambit of ZULC but as professional librarians from NUST and BUSE indicated there were no funds for this. MSU, however, has done well in this. The Librarian for MSU was pleased with the efforts they had made as a library to subscribe to additional resources than those offered under the ZULC arrangement. She said:

> We have a lot of support as a library from our management. Even if you look at our resources most of the universities just have the resources we pay for through Zimbabwe Universities Library Consortium but for us we have a lot extra. As we speak we are gunning to pay for a US$18000 database, it's already in the pipeline, we have pushed our papers. We have a number of databases that are not in other universities.

The MSU library is well funded. The situation is not the same at NUST and BUSE. This affects usage at these universities as academics become frustrated with failure to download full text articles and also in some disciplines, irrelevancy of resources on offer.

5.8.7 Involvement of Academics in Selection of Electronic Journals

Another problem that is closely related to the challenges highlighted in section 5.8.6 above is the issue of lack of involvement of academics in selection of electronic journals. Of 193 academics who indicated that they use electronic journals 108 (56%) indicated that they were not consulted on issues to do with selection of electronic journals for subscription. Only 44% said they were ever consulted. A follow up question was asked to establish if academics wanted to be consulted in selection of electronic journals. About 93.5% of them indicated that they wanted to take part in deciding which resources to subscribe to. Only 6.5% indicated that they were happy if their library exclusively held that right.

The challenge of non involvement of academics is prevalent at NUST and BUSE where only 13% and 11.4% indicated that they were ever consulted respectively. At MSU 88.8% said they were consulted in decisions to do with electronic journals. Professional librarians at NUST and BUSE agreed that involving academics would inculcate a sense of ownership. This would inspire academics to use the resources. However, they noted that in their case there was not much benefit in involving academics because eventually they were only able to subscribe through ZULC. This means they had to agree as a Consortium of state universities on which resources to subscribe to. They indicated that they did not have much room to select their own resources as individual universities. The Librarians agreed that subscribing to electronic resources as a Consortium create restrictions on freedom of choice and on their ability to involve academics in selection of electronic journals. They highlighted that some Faculty Librarians had sought views on which electronic journals to include for members of faculties. However, implementing those choices was a challenge. They had to make compromises in ZULC meetings. Eventually universities would have to make a decision that would benefit the majority. The Librarian for BUSE stated:

Well, I must say we have hardly involved our academics in selection. What we normally do is we are a member of Zimbabwe University Libraries Consortium and what happens is that as a group we take our suggestions to ZULC and we look at the price and we decide whether we can afford it. But here at BUSE we have hardly involved academics in the selection. We just bring it and say, 'here, use it'. And we train them how to use the resources; we haven't seriously gone to them and say which of these databases would you prefer. And the reason for that is that since we are a Consortium we are looking at sharing costs, so it's cheaper, never mind how many databases you have; it's still cheaper for the institution. Maybe if we had every institution going it alone we could involve our academics so that we get exactly what they want.

This lack of involvement could be affecting the commitment of academics to these resources.

At MSU, however, the situation is much different. This institution subscribe to additional resources. When asked about involvement of academics, the Librarian said:

We have done well as a university to involve academics in our selection of electronic journals. I will give you an example of Science Finder and Westlaw databases that we added to our portfolio of electronic journals recently. These are our own resources, not ZULC resources. Science Finder was a recommendation from the Department of Chemistry; it came through their Faculty Librarian. Westlaw was a recommendation from the Faculty of Law. We have lots of databases we subscribe to this way, when academics recommend them. What we normally do is when we get a recommendation from our academics we recommend to the Library Purchasing Committee and we get a trial for a month mostly. During the trial period we market the database and we see how it is being used. We have a marketing department in the Library, someone is there just waiting to market. After the trial period we then mostly subscribe to the database.

All other professional librarians at MSU supported the views of the Librarian. They stressed that academics were highly regarded at their institution such that their input mattered a lot in what resources to acquire. Academics they noted, knew their needs and the needs of the students well so they would be better positioned to recommend relevant resources. They indicated that they were able to finance more electronic journals than other universities in Zimbabwe. This enabled them to work with academics in finding more relevant and helpful resources.

5.8.8 Challenges with Off-Campus Access

Some academics indicated that they had challenges accessing electronic journals when they were off-campus. About 13.5% of academics cited this as a major barrier, 55.4% cited it as a minor barrier, and only 31.1% indicated that this was not a barrier. Academics from NUST and BUSE complained more of challenges with off-campus access than those from MSU. At NUST 21.8% cited challenges with off-campus access as a major barrier to their use of electronic journals. 15.9% of academics at BUSE had similar complaint while only 5% had the same complains at MSU. The Sub-Librarian for Reader Services at NUST and the Systems Librarian claimed that these challenges were mostly self inflicted. The Sub-Librarian said:

> If you are a registered NUST library user you just use your name and barcode as it appears on your NUST library card. The same resources you can access on campus you can also access off-campus. But if you have fines in your library account or outstanding books you can't access these resources. But these are barriers that have to do with the academics themselves not returning our books, or not paying fines for overdue books, it's not a problem on the library side but on users' side. Some of our academics could be affected by this and will not be able to access our resources until their accounts are cleared.

The Systems Librarian for NUST also indicated that users were only able to access electronic journals if their library accounts were free of fines and overdue books. He indicated that some academics had difficulty when accessing resources off campus. The reason was due to unpaid fines and overdue books. The librarians at NUST failed to communicate this to academics as many of them were unaware that fines and overdue books prevent them from accessing electronic journals.

The Systems Librarian for NUST also indicated that they had acquired software that allowed users to access databases remotely without the need for passwords. One had to enter his credentials on the NUST website and that person would be able to search through any database without the need of passwords for the specific databases. At BUSE the Systems Librarian reported major challenges with their off-campus access facility. He said:

We are facing challenges with our off-campus facility. The most popular databases are not available off-campus. Those that are accessed off-campus are accessed through usernames and passwords which is not very conducive because people forget usernames and passwords. We are trying to set up Federated Access or Federated Identity Management System so that users can just log in once and get access or if we can't set up that we can look for software like EZ Proxy. It does what is called network address translation. You log from outside and it sort of hacks your Internet Protocol address to the publisher and you get everything. That way people log in once, they can use their employee numbers to log in.

At MSU the professional librarians reported that their off-campus access system worked well. Users did not have to know passwords but just their credentials to get into the MSU system. This allows access to all resources.

5.8.9   Lack of Printers to Print Research Findings

Academics in the three institutions that participated in this study indicated that they needed printers to print resources accessed from electronic journals as they disliked reading information from the screens. Only 14.5% indicated that printers were not needed for use of electronic journals. About 40.9% identified lack of printers as a minor barrier and 44.6% said it was a major barrier. Academics preferred to print their research findings if printing resources were available. They indicated that they did not have access to printers in their offices. About 50.9% of academics at NUST said lack of printers was a major barrier in their effort to use electronic journals, 59.1% had the same complaint at BUSE and 31.3% of academics at MSU also had similar complaint. Academics from non-science disciplines had more preference of printing their findings than those from science disciplines. The majority of those academics aged 41 years and above preferred to print their research results while younger academics read on the screen.

Professional librarians at the three universities indicated that lack of funds contributed to insufficient printers in the offices. They indicated that the priority was to get all academics to have computers and be connected to the Internet. This indicates that librarians did not consider printers as critical resources for the access and use of electronic journals. At the moment academics who wanted to print would either visit their Departmental secretaries' offices or

would pay to print at other printers other than those owned by their universities. This extra cost may discourage some who prefer to read from print.

5.8.10 Challenges with Back Issues

Academics also expressed concern with the permanency of electronic journals. Some academics complained that they could not access back issues to some of the electronic journals that were out of circulation or that universities had stopped subscribing to. About 51.1% of academics indicated that this was a minor barrier to their use of electronic journals, 13.1% saw it as a major barrier while 35.6% did not consider this a barrier. In interviews, professional librarians admitted that they had little control over the issue of back issues as all the power resided with the publishers of these journals. They indicated that if they stopped subscribing to a database they would lose access to both the current and past issues of journals in that database. The reason given is that subscription allows for 'access' rather than ownership. The other challenge they noted was when publishers went out of business. In this case they would mostly lose access to back issues. Librarians noted that users' concerns with back issues were justified as in an electronic environment access can easily be lost. This is mostly due to non renewal of subscription and also due to the publisher going out of business.

5.8.11 Lack of Research Culture

Professional librarians bemoaned the lack of a research culture among current academics in Zimbabwe. They blamed this for the low use of electronic journals in their institutions. Librarians believed there was a correlation between the amount of research and the use of electronic journals. They justified this by stating that those academics who published articles in journals and presented in conferences as well as those pursuing higher degrees like PhDs tended to use electronic journals more than those who did not engage in any of these activities. Librarians noted that the brain drain that happened in Zimbabwe, when many experienced academics left the country during years of hyperinflation, affected research. The brain drain left much younger and inexperienced academics who did not value research. Many did not publish in journals. The little research that is taking place is focused on conference presentation and pursuing of higher degrees. Librarians also blamed lack of research funding for the dearth of research in Zimbabwean universities. This has in turn affected use of resources such as electronic

journals. The Librarian at MSU, however, stated that at her institution research is being given priority and funding has increased. Many academics are motivated to carry out research and use electronic journals. She also indicated that academics at her institution were scrambling to meet the conditions set by the higher education regulatory body of the country, the Zimbabwe Council for Higher Education (ZIMCHE). This body ordered that state university lecturers should have PhDs by 2018. This she said was influencing many to use electronic journals at her institution. Librarians from NUST and BUSE also took note of the ZIMCHE conditions. They recognised that this had improved research at their universities though they were still concerned about the general lack of research by academics in their institutions.

In summary to research question 4 the data presented above has shown that the environment and personal factors are crucial in the adoption and use of electronic journals. Factors such as infrastructure to support access to electronic journals, efficiency and speed of Internet connection, skills to negotiate the electronic environment, library support in the use of electronic journals, friendliness of library websites and specific journal interfaces, the ability to download full-text articles, involvement of academics in selection of electronic journals, challenges with off-campus access, lack of printers to print research findings, challenges with back issues, and lack of research culture are all factors that impact on the behaviour of academics towards electronic journals. When conditions are not conducive academics use less of electronic journals.

5.9   Strategies Used by State Universities Libraries to Promote Use of Peer Reviewed Electronic Journals by Academics

The fifth and final research question of this study enquired about the strategies that are used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics. The major source of information for this research question were professional librarians from the three institutions that took part in this study. Data were collected from Faculty Librarians (Questions 1, 2, and 3 of Appendix 2), Sub-Librarians (Questions 1, 2, and 4 of Appendix 3), Systems Librarians (Questions 5 and 8 of Appendix 4), and Librarians (Question 4 of Appendix 5). To balance the data from professional librarians academics were also asked to contribute to this research question through questions 15, 16, and 17 of the questionnaire (Appendix 1). Findings are now presented per university below.

5.9.1 Strategies Used to Promote Use of Electronic Journals at NUST

The findings show that the NUST Library uses a range of strategies to promote use of peer reviewed electronic journals. The strategies and methods used by NUST to create awareness of electronic journals in academics, equip academics in the use of the resources, and encourage them to use the same include the following:

- Faculty board meetings;
- Library committee meetings;
- Leaflets, posters, banners, and brochures;
- Library workshops and seminars;
- Emails;
- Trainings through information literacy programmes;
- Library websites; and,
- Online library catalogues.

The Sub-Librarian for Reader Services at NUST said of the strategies they use:

> What we have done is we have Faculty Librarians who act as liaison officers between the library and our faculties. They talk about electronic journals in faculty board meetings. We have our electronic resources online, you can access them on-campus or off-campus. We introduced the off-campus access facility in 2012. If you go to our website you will see a list of our electronic resources and we have also tried to describe these resources in brief for easier location. We have trainings of academics on how to use electronic resources, we have done training across the different faculties, we have trained them in the effective use of electronic resources. We have done pamphlets, posters, and we have also marketed the electronic resources during library committee meetings so that when committee members go back to their faculties they cascade this information to their faculty members.

The Sub-Librarian for Reader Services at NUST emphasised the role of Faculty Librarians in the promotion of electronic journals, the role of the website, the role of training, library committee meetings, pamphlets, and posters. The Systems Librarian and Faculty Librarians agreed with the Sub-Librarian that they played a major role in the promotion of electronic journals at NUST. The Systems Librarian highlighted his role in the promotion of electronic journals when he said:

We in the IT section of the Library play a crucial role in the promotion and marketing of electronic resources. Our biggest weapon is the website. Just this month (June 2013) we released a new look website where we are trying to promote electronic resources. We have listed a number of electronic resources right on the landing page with quick links so that users don't have to click on a link that shows all the resources. We are also involved in internal training where we train library staff. We have got a tool that searches through our resources using Google custom search facility, which is another way we have tried to use to promote usage of those resources. We have done that so that people are not tempted to use the generic google site. We also have subject guides that are pathfinders to quickly guide the users to the resources that they will be looking for.

The Faculty Librarians emphasised their role in Faculty board meetings and the Information Literacy Programmes they run. They also cited a range of other strategies. The Faculty Librarian for Applied Sciences said:

What we have been doing is to utilise faculty board meetings because we know that all staff members are present in those meetings. We also make displays and give brochures and leaflets to students and academics. We also have a video presentation on our website that shows the electronic resources we have, it flicks on the library website. We utilise email as well, the institutional email where we let them know what is coming. We also have banners and give away some posters that we have to faculty members so that they get to be aware of the different databases that we have. We also have workshops from time to time where they come together as academics and then we train them on Information Literacy Skills and at the same time the electronic journals.

The Faculty Librarian for the Built Environment stated:

What we have done in the past years is that we have offered Information Literacy Skills which is a combination of teaching them how to effectively and efficiently search and retrieve information and making them aware of the resources in the library especially focusing on electronic journals that the library has subscribed to. We also have Subject Plus where we have created guides for the Faculties so that it becomes easier for them to access electronic resources. These guides appear on our library website homepage.

The Faculty Librarian for Communication and Information Science also affirmed his role in the promotion of electronic journals in his faculty. He said:

> Usually what we do is first and foremost we need to raise awareness, then after that we need to have a buy in and make sure that they possess the skills to use these resources. So when we are raising awareness usually we use faculty board meetings that is where we go and highlight the electronic resources we offer and their benefits. We also design and distribute some flyers and brochures with the list of electronic resources that are pertinent to our particular faculties. We also have the Information Literacy Skills training programme where we teach academics how to locate, use and evaluate information. After that we do hands on when we train the faculty members with the actual databases that are relevant to their areas.

The Faculty Librarian for Medicine also stated that:

> The main strategy is the Information Literacy Skills training that we give to academics. Anyone is allowed to come to the library for instruction in the use of our resources. We also have Subject Plus which is a guide to certain Departments of Faculties. With Subject Plus most of the information relating to a subject area will be condensed in a way that addresses needs to those subject areas. The other is the website. The website also markets the electronic resources. There are various links on the website that shows the various electronic resources we have. When we market the electronic resources we tell academics to keep on looking to the website to see what's new and we also use posters and pamphlets. The posters are usually located where there are electronic resources in the library, especially in the Electronic Resources Centre where there are computers for electronic resources access.

The Faculty Librarians for Commerce and Industrial Technology who were not directly cited highlighted the Information Literacy Programmes and faculty board meetings as their major avenues for promoting use of peer reviewed electronic journals.

The Librarian at NUST identified the most effective marketing strategies as those that included direct contact between the academics and librarians. These strategies include Information Literacy Training Programmes. However, the major challenge was non attendance by the academics. Academics tend to avoid training sessions claiming that they were busy. She

indicated that the Library conducted two training sessions per year, once each semester, however, many academics did not attend these sessions. The concerns raised by the Librarian were also raised by the Sub-Librarian and Faculty Librarians. The Sub-Librarian reported that:

> Whereas we try to promote these resources through trainings and other such contact strategies we are frustrated that academics do not normally want to attend. The last time we had to get the intervention of the Vice Chancellor to get academics to come for our trainings. Most of them claim the trainings are not necessary and some say they are busy. But when we look at usage we see that our usage is very low whereas we pay a lot of money for these resources. Of course we use other strategies such as Library committee meetings but not all academics are members of such a committee, at times there will be one from each faculty and we don't know if he passes the information to other academics in his faculty. So it's better if they were to come to the library when we call for training.

The researcher asked professional librarians several follow up questions relating to effectiveness of strategies used in raising awareness and promoting use of electronic journals by academics at the institution. First the researcher enquired about whether the NUST Library has ever carried out an evaluation to measure the effectiveness of their training sessions and the Sub-Librarian responded:

> I think that's where we have got a weakness because we have done training but we have never really gone back. What should happen is after training maybe after 6 months we conduct a survey to see if the training was effective, but for us we have never really gone back.

It is evident that NUST conduct trainings without obtaining feedback on the effectiveness of such efforts. This feedback could be used to improve subsequent training sessions. Second, the researcher enquired about efforts made by the Library to lobby for the inclusion of electronic journals in Course Outlines. Many Faculty Librarians had indicated that their academics did not include electronic journals in Course Outlines. This affected the adoption and use of these resources. The Librarian responded:

We have no power to do that, we can only encourage. If Senate can do that because it has the authority, we try to talk about these things in the Library committee.

The response of the Librarian indicates that not much has been done by the Library to lobby for the inclusion of electronic journals in Course Outlines. The Library feels it has no power to push for this resolution. In the library committee where the Library has raised this issue there are only a few academics as noted earlier and it is not clear if this encouragement is passed to the majority of academics who are not members of this Committee.

Third, the researcher enquired about strategies to capture new academics at the point of entry into the university. The responses provided indicated that NUST did not have a clear strategy of promoting awareness and use of electronic journals to new academics. More often than not, the Faculty Librarians were unaware when new academics joined their faculties. There was no system of communication between the faculties and the Library as regards new members. The Library had no way of incorporating new academics and training them as they joined the institution. As a result, library orientation was not mentioned by professional librarians as a strategy used to promote the use of electronic journals among new academics. The Faculty Librarian for Applied Sciences offered the following summary:

I can't say we have a policy where we go to look for new staff members to train them. We mostly talk about these issues in faculty board meetings but the challenge is that these meetings are not held regularly. At times they are held once a quarter and even then it is not clear if the new academics will be in the meeting when we talk about electronic journals, they may actually be absent. I agree that we need a clear strategy of inducting new academics into the use of electronic journals.

Fourth, the researcher enquired about the tailoring of strategies to suit needs of different faculties. NUST uses generic strategies for all faculties without tailoring them for specific faculties. The strategies cited by Faculty Librarians were similar except for Subject Plus and some flyers that list resources specific to given faculties. Data from academics showed that NUST Library was not using strategies that personally target academics like office visits and

emails. They received generalised emails that were not relevant for everyone in the faculties. Academics preferred directly targeted strategies which addressed their specific research needs.

Fifth, the researcher enquired about the extent to which academics visited the library website. The professional librarians had mentioned a number of strategies that worked through the library website. The Systems Librarian confirmed that they still had challenges getting academics to use their library website. Academics themselves complained that the library website for NUST was not easily negotiable. This is expressed in statistics captured in section 5.8.5 above. This affected the effectiveness of promotional strategies at NUST in that efforts have been made to promote electronic journals through the website but only a few academics visit this site. As a result, they miss out on updates and other necessary information.

The situation at NUST is one where professional librarians believe they are working very hard to promote electronic journals. However, the efforts do not reach the academics. In data collected through the questionnaire only 17.1% of NUST academics agreed that electronic journals were adequately marketed at their institution. The rest disagreed. This shows the gap between the efforts of the professional librarians at NUST and what actually reaches the academics.

5.9.2 Strategies Used to Promote Use of Electronic Journals at BUSE

The professional librarians at BUSE employ a variety of strategies to promote use of electronic journals. Some strategies are persuasive whereas some seem to border on coercion. The persuasive strategies include library orientation, faculty board meetings, library committee meetings, leaflets, posters, library workshops and seminars, emails, training programmes, library website, and use of students to bait academics to use the resources. The coercive strategies include making it mandatory for academics to include electronic journals in their Course Outlines and unilaterally stopping subscriptions to print journals. The Sub-Librarian for Reader Services at the institution said:

> The first thing we did is we deliberately stopped subscribing to print journals. Of course it was expensive to subscribe to both print and electronic formats but our major motivation for stopping print was to encourage users to adopt electronic resources. I think now we are just subscribing to 5 print

journals that are not available in electronic form. Then we also put the electronic journal databases on our library website so that our academics and students get them easy, it's a one stop shop. If you go to our webpage apart from just listing them we make it easy for our users by describing them. We also do training; it has taken so many avenues, mostly in the form of workshops. Our training sessions are packaged differently. At times its general training whereas at times we will be focusing on a new database. In some instances we found out that we had some academics that had challenges using computers and Internet, we would go out of our way to download for them then give them a package or print for them but also tell them the same copy is available electronically in the library. Then back in the past when we introduced electronic journals we realised the groups who were quick to respond to electronic journals were young lecturers and students. So when the lecturers were not responding to training we decided to focus on the students, we hammered so much on the students to such an extent that they were so good, they were writing good assignments quoting current literature and lecturers started to say what's happening and when they were told of electronic journals some of them started coming to the library saying, 'you are training our students but you are not training us', and from there they started to have interest in the resources. We have also created some email alerts so that when new articles come we post them to the relevant lecturers. We also use leaflets, brochures, banners and posters. But one of the best strategies is what we did last year (2012), to lobby for the inclusion of electronic journals in Course Outlines. We got support from the highest level of the university. The library committee and Teaching and Learning Committee are chaired by the Pro-Vice Chancellor Academics Affairs. The proposal was pushed until it was passed in Senate so now there is no Course Outline that passes if it does not include electronic journals.

The strategies that the Sub-Librarian indicated in the quotation cited above were confirmed by other professional librarians at the institution. The Librarian was pleased with the Senate's decision to compel academics to include electronic journals in their Course Outlines. The Systems Librarian emphasised the role of IT in promoting use of electronic journals and specifically how they contributed through the website. The Faculty Librarians reiterated the strategies highlighted by the Sub-Librarian but added library orientation and faculty board meetings. They indicated that BUSE had a very strong orientation policy for new academics such that an academic could not register with the Library without going through orientation. There was efficient communication between faculties and the Library. They are aware when new academics join the staff as they are sent to the Library as part of induction. At the Library the new academics are introduced to their respective Faculty Librarians who conduct a Library tour

and orientation on the use of electronic journals. They are then registered as members of the Library.

The Faculty Librarians commended the role of faculty board meetings in promoting the use of electronic journals. They use the meetings to alert academics of new databases and journals and update them on any new developments concerning these resources. They also note queries and complaints raised by academics so they are able to address them as the Library. Inspite of these efforts, Faculty Librarians are concerned that usage remains low. They identified some of the factors frustrating the use of electronic journals as: poor Internet connection, low bandwidth, challenges with off-campus access, lack of resources, and electricity challenges.

When asked which strategies among the various strategies they use proved more effective the Faculty Librarians indicated that those strategies that enabled direct interaction between librarians and academics were more effective. The Faculty Librarian for Science stated:

> I think workshops are more effective because usually they have hands on sessions in the computer lab even though our academics face challenges after the workshops in terms of access to these resources. They usually say, 'the content you have is good but we face challenges out there, if only you could increase bandwidth that would assist in terms of the effectiveness and usage of the resources'.

The Faculty Librarian for Commerce also thought direct contact strategies were more effective than other strategies that did not involve direct interaction between librarians and academics. He emphasised that:

> One on one strategies are really effective. You can visit an academic in their office, or when they come to your office they understand better. Some are not good in understanding fast but when you take them as individuals they really understand. Workshops that provide hands on experience are also effective. When you just give someone a flyer you don't know if they will read it or not. Even if they read you are not sure if they have understood so contact strategies are much better though we try to use a variety of strategies because we can't always be meeting academics since they are busy people and we are also busy with students and other work.

Data collected from academics highlighted that they were appreciative of contact strategies such as workshops and other forms of training sessions. The majority of academics at BUSE (65.3%) also believed professional librarians at the institution were doing a good job in promoting electronic journals. However, statistics already cited in sections 5.5 and 5.6 above pointed out that the majority of academics at BUSE were aware of electronic journals but the quality of awareness and the level of use of the resources were still low at the institution. This could be due to a number of factors including barriers to use already cited in section 5.8. In addition, librarians at BUSE did not carry out evaluation programmes to determine the effectiveness of their training sessions. Also the website which is a crucial part of the promotional mix at BUSE is accused by academics at the institution of being difficult to negotiate as already stated in section 5.8.5. In a nutshell, however, it is noted that BUSE uses a wider array of strategies to promote use of electronic journals than NUST though the extent to which these strategies have worked to heighten usage is still debatable.

5.9.3   Strategies Used to Promote Use of Electronic Journals at MSU

Academics at MSU were the happiest of the three institutions in terms of electronic journals promotional efforts made by professional librarians. About 77.8% of academics at MSU felt their library had done well to promote use of these resources and many of the academics also noted that the library uses a variety of means to encourage awareness and use of electronic journals. The strategies in use at MSU include many of those used by both NUST and BUSE such as library orientation, workshops, seminars, library committee meetings, faculty board meetings, library website, office visits, posters, brochures, flyers, newsletters, and emails. Since the MSU has been shown to have both the highest level of awareness and highest level of use of electronic journals among the three institutions this section focuses on what the institution is doing differently in an effort to promote use of these resources. This is done without disregarding the understanding that use of electronic journals at MSU could be higher as a result of the elimination or minimisation of barriers to use as already noted in various previous sections of this chapter.

The first unique feature about promotion of electronic journals at MSU is that it is the only institution among the three considered in this study that has a fulltime marketing department

within their Library. This department is responsible for carrying out research to determine the needs of users of the library, recommend resources and services to meet those identified needs and market the same resources and services to users of the Library. So the strategies in use at MSU are more responsive to the needs of the academics since they are crafted by a department that specifically specialises in that area. The department even has a Facebook page where it interacts with users and gets their views on resources and services of the Library. The Librarian of MSU noted the role of the Library's marketing department and attributed their success in providing electronic journals to some of the activities of this department. Second, the MSU uses the strategy of involving the top administrators of the university in the promotion of electronic journals including the Vice Chancellor. The Librarian said:

> We have great support from the top. The Vice Chancellor himself talks about these resources in Senate and in other meetings. He challenges other academics because he uses electronic journals himself. He also understands that we pay a lot of money for bandwidth so the investment has to be used well. He is at the forefront and naturally other academics follow.

Academics at the institution mentioned that the top management at the institution was active in promoting electronic journals and was supportive in their use of the resources. This could be having a very positive effect on the use of these resources at the institution.

Third, the librarians at MSU carry out evaluation of their training programmes to establish the extent to which they were meeting their objectives. This enables them to tailor make future training programmes accordingly. These evaluations are easy for them to carry out since they already have a marketing department within their structures which is responsible for carrying out such researches. Fourth, the Faculty Librarians at MSU also indicated that they send specific emails to academics alerting them to databases and journals in their areas of research interest. The Faculty Librarians work hard to know what specific academics in their faculties were reading and researching so that they are on the lookout for relevant material that they would then email to these academics. Finally, though the MSU depends on a global pool of strategies like both NUST and BUSE their Faculty Librarians were more at liberty to tailor-make those strategies to the needs of their specific faculties. This helps to make academics more responsive to these strategies.

In concluding this section on the strategies used by universities libraries in Zimbabwe to promote use of electronic journals among academics it can be noted that they use similar variety of strategies across the institutions. The strategies are meant to promote both awareness and use of the resources. The effectiveness of these strategies differs as they are applied by different institutions. Academics at NUST felt that the library was not doing enough to promote these resources whereas those at BUSE and MSU generally felt there was concerted effort to market these resources. Acknowledgements of promotion, however, do not necessarily translate into usage as shown by the situation at BUSE. This could be an indication that though promotion is important broader factors are at play to affect adoption and use of electronic journals in universities in Zimbabwe.

5.10   Structural Equation Modelling: Testing the Conceptual Model and Determining the Best Fitting Model

In the preceding sections of this chapter both quantitative and qualitative data were presented, analysed, and interpreted to answer the five research questions of the study. In answering the research questions the researcher relied heavily on the UTAUT theory hence the constant reference to UTAUT moderators such as gender, age, experience, and the envisaged moderator, *discipline*. The UTAUT constructs (Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions) were crucial to this study as they guided the researcher in the construction of data collection tools (the questionnaire and interview guides) and also influenced the presentation, analysis, and interpretation of data through guiding the researcher on what to focus on and notice in the data as he attended to the research questions of the study.

Since UTAUT occupied a central role in this study, it is important to statistically test the model using data generated by this study as a way of establishing two issues. The first issue is to establish whether the conceptual model proposed by the researcher in section 2.7 is valid. In this proposed model the researcher included *discipline* to the moderators already given by Venkatesh et al. (2003) in the UTAUT model. The *discipline* moderator was represented by the *faculty* in the data and is used interchangeably with it in this chapter. The second issue to be determined by statistically testing the UTAUT is the establishment of the best fitting model for the adoption and use of peer reviewed electronic journals in the Zimbabwean context. This is because though the

UTAUT may be significant in explaining the adoption and use of peer reviewed electronic journals in Zimbabwe not all constructs and moderators of the theory are equally important. The theory may actually be more significant in the local context if some constructs and moderators are dropped to give a leaner and simplified version of the UTAUT.

The section is organised as follows: First, an explanation of the Structural Equation Modelling (SEM) is presented and its use in testing the proposed model and establishing the best fitting model is justified (section 5.10.1). Second, the model fit indices are explained to give clarity to the basis upon which the proposed model is tested and the basis upon which the best fitting model is established (section 5.10.2). Third, the proposed model is tested and results explained (section 5.10.3). Fourth, the best fitting model is established by retaining constructs that result in the most favourable fit indices and dropping those that push the fit indices towards unfavourable measurements (section 5.10.4).

5.10.1 Structural Equation Modelling: Explanation and Justification

Structural Equation Modelling (SEM) is a new statistical technique that combines the power of path analysis and factor analysis in testing a model or theory to establish if it fits empirical data and to determine the best fitting model for a given context (Byrne, 2001; Dion, 2008). SEM originated in the 1970s through the work of researchers such as Karl Joreskog who harnessed the features of econometrics and psychometrics and created an upgraded technique to supersede first generation statistical techniques such as regression analysis (Gefen, Straub and Boudreau, 2000; Klem, 2000; Roostika, 2009). SEM has given birth to second generation techniques such as SPSS's Analysis of Moment Structures (AMOS), a technique that is used to test the UTAUT in this study. Techniques such as AMOS offer added benefits over first generation statistical packages like factor analysis and regression analysis because they can analyse a set of interrelated research questions simultaneously and systematically (Bagozzi and Fornell, 1982; Fornell, 1987; Bacon, 1997; Gefen et al., 2000). SEM techniques enable simultaneous modelling of various interrelationships among multiple constructs (Anderson and Gerbing, 1988). This means SEM estimates all coefficients in the model simultaneously. Therefore, one is able to assess the significance and strength of a particular relationship in the context of the complete model (Dion, 2008). This quality allows the identification of the most significant relationships in

the UTAUT in section 5.10.4. SEM, therefore, allows one to eliminate weak relationships in a model to remain only with strong relationships as reflected in the data used to test the model.

According to Roostika (2009:130) SEM is considered "more powerful, illustrative and robust than multiple regression, because it covers the modelling of interactions, non linearities, correlated independents, measurement error, correlated error terms, etc". SEM also offers researchers greater flexibility in the interaction of theory and data (Chin, 1998:297; Chin and Newstead, 1999:308). SEM starts with a hypothesised model and provides great capabilities to test the validity of that model, as is the case in this study where the researcher added the moderator *discipline* to the UTAUT. SEM is used in this case to determine if the UTAUT is significant in explaining adoption and use of peer reviewed electronic journals if the moderator *discipline* is added. It is also used to establish the most significant relationships of the model according to the data collected from the three universities that took part in this study. These most significant relationships give birth to the best fitting model thereby isolating the most crucial constructs in explaining the adoption and use of peer reviewed electronic journals by academics in Zimbabwe. SEM has a set of indices that are used to establish the significance or lack of significance of a model. These indices are considered in the next section.

5.10.2 Model Fit Indices for Structural Equation Modelling

Fit indices are a set of SEM statistical outputs that are used to determine if a model is acceptable. The most used fit indices can be classified into two categories as follows: discrepancy functions such as the Chi Square test, relative Chi Square, and Root Mean Square Error of Approximation (RMSEA), and tests that compare the target model with the null model, such as the Comparative Fit Index (CFI), Normed Fit Index (NFI), Incremental Fit Index (IFI), and Tucker Lewis Index (TLI) (Bollen, 1989; Stieger, 1990; Browne and Cudeck, 1993; Byrne, 1994; Jaccard and Wan, 1996; Marsh, Balla and Hau, 1996; Hu and Bentler, 1998; Kline, 1998; Ullman, 2001; Schumacker and Lomax, 2004). Other fit indices such as Akaike Information Criterion (AIC), Browne-Cudeck Criterion (BCC), Bayesian Information Criterion (BIC), and Consistent Alkaike Information Criterion (CAIC) are rarely used by researchers in determining model fit since they are very sensitive to sample sizes (Fan, Thompson and Wang, 1999) and were therefore not considered in this study. These fit indices used in this study are briefly discussed below:

5.10.2.1   Discrepancy Functions

The discrepancy functions consist of the Chi Square, relative Chi Square and the Root Mean Square Error of Approximation (RMSEA). In AMOS, the package used to test the UTAUT in this study Chi Square is represented by the abbreviation CMIN. If the Chi Square is not significant, that is, if the CMIN value is above 0.05 the model is regarded as acceptable (Kline, 1998; Ullman, 2001). An insignificant Chi Square value shows that the observed covariance matrix is similar to the covariance matrix predicted by the model being tested. This would show that the model fits the data. However, if the Chi Square (CMIN value in AMOS) is significant (0.05 or below) it shows that the observed covariance matrix is not similar to the one predicted by the model being tested therefore showing that the model does not fit the data. A model is also acceptable if its relative Chi Square, a value that is found by dividing the Chi Square index by the degrees of freedom, is less than 2 (Ullman, 2001) or at the very worst less than 5 (Schumaker and Lomax, 2004). Relative Chi Square is represented by the abbreviation CMIN/DF in AMOS. The last criterion under the discrepancy functions is the RMSEA. RMSEA is related to the difference in the sample data and what would be expected if the model were assumed correct. Because it is a model error term lower values indicate a better fit. The accepted value of RMSEA is 0.05 or less (Stieger, 1990; Dion, 2008).

5.10.2.2   Indices that compare the target and the null models

Indices that fall under this category include Comparative Fit index (CFI), Incremental Fit Index (IFI), Normed Fit Index (NFI), and Tucker Lewis Index (TLI). CFI compares the model of interest with an alternative, such as a null or independence model in which the constructs are assumed to be uncorrelated. Model fit in this case is the difference between observed and predicted covariance matrices which is represented by the Chi Square index. CFI, therefore, represents the ratio between the discrepancies of the target model and the independence model. This means CFI represents the extent to which the target model is better than the independence model. Values that approach 1 indicate an acceptable fit (Fan, Thompson and Wang, 1999; Raykov, 2005). With the second index under this category, the IFI, which, like other indices that follow the researcher chose not to explain in detail to save the reader from too much technical detail, an acceptable fit is represented by a value above 0.90 (Bollen, 1989; Raykov, 2005). With NFI the fit index varies from 0 to 1 where 1 is the ideal (Ullman, 2001) whereas with the TLI

values over 0.90 or in a worst case scenario over 0.95 are considered acceptable (Hu and Bentler, 1998).

5.10.3 Testing the Proposed Model

Now that we have considered the fit indices that were used to establish if the UTAUT in its updated state that includes *discipline* as one of the moderators fit the data produced by this study it is time to restate the model then show the SEM results that were generated by the AMOS package. The results are then compared to model fit parameters set by the fit indices explained in section 5.10.2 above to establish if the model is significant in the Zimbabwean context. The updated UTAUT was given in Figure 7 (Chapter 2) and is now restated in Figure 11 below.
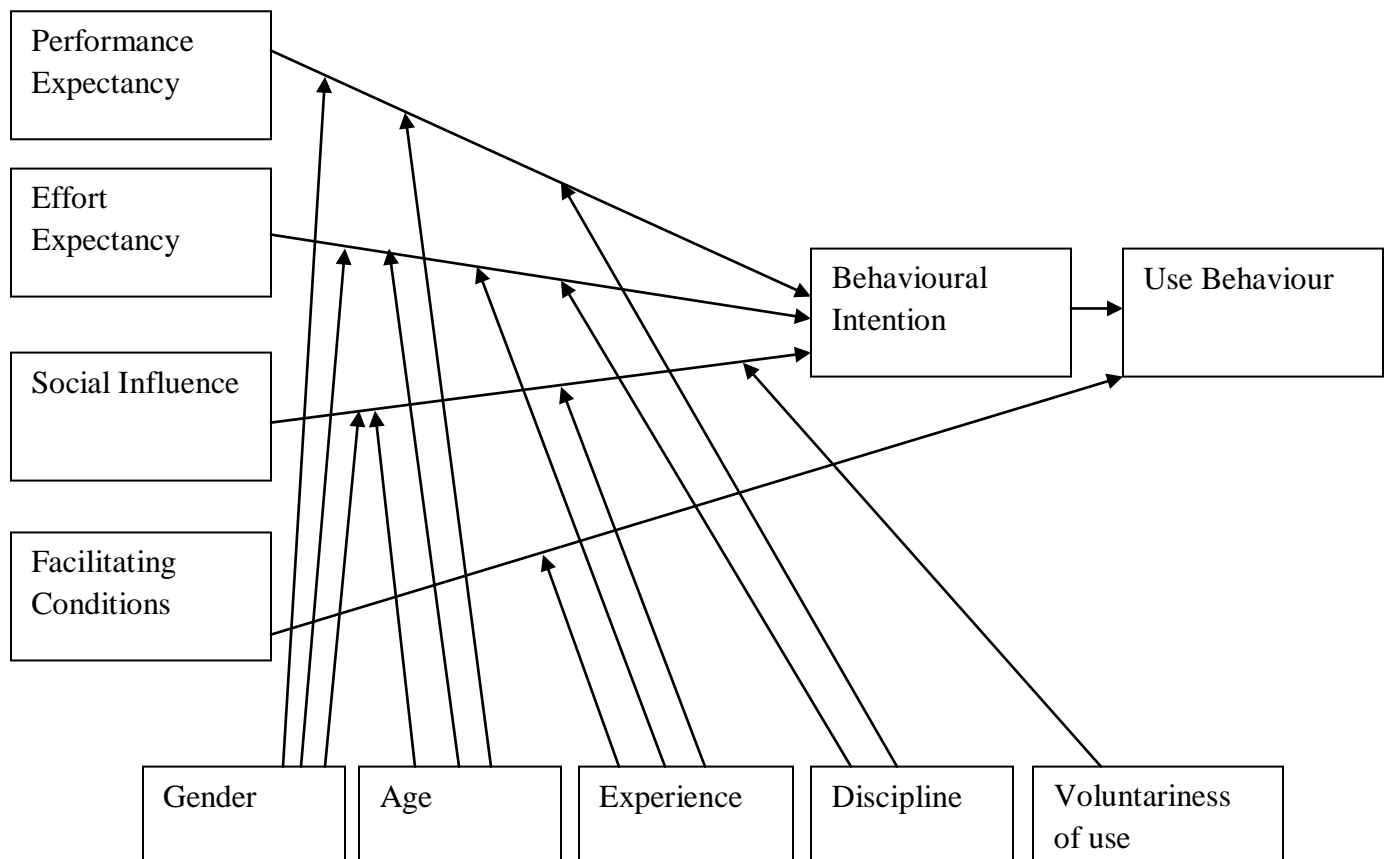
Figure 11: A conceptual model: The updated UTAUT (Venkatesh et al., 2003)

The AMOS structural equation modelling results for the UTAUT model shown in Figure 11 are shown in Table 55 below. To preserve the integrity of the SEM output Table 55 below is given

exactly as produced by the AMOS technique so the Table appears different from preceding Tables in this chapter.

Table 55: AMOS output for the UTAUT structural equation modelling

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	35	**38.508**	31	.166	**1.242**
Saturated model	66	.000	0		
Independence model	11	784.408	55	.000	14.262

Model	RMR	GFI	AGFI	PGFI
Default model	.049	.965	.926	.453
Saturated model	.000	1.000		
Independence model	.204	.544	.453	.454

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	**.951**	.913	**.990**	**.982**	**.990**
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	**.036**	.000	.068	.735
Independence model	.263	.247	.279	.000

Model	AIC	BCC	BIC	CAIC
Default model	108.508	113.175	222.702	257.702
Saturated model	132.000	140.800	347.338	413.338
Independence model	806.408	807.875	842.298	853.298

Table 55 shows the SEM output from the AMOS package that was used to test the UTAUT model shown in Figure 11. The SEM results were put to the test of the seven fit indices that were given and explained in section 5.10.2: Chi Square test, relative Chi Square, RMSEA, CFI, NFI, IFI, and TLI. The first three parameters fall under the 'Discrepancy Functions' category whereas the last four parameters fall under tests that compare the target model with a null model.

In the first test, the Chi Square test, the UTAUT model is shown to be significant and suitable for explaining the adoption and use of peer reviewed electronic journals by academics in the

Zimbabwean context. This is because the Chi Square value as shown by the CMIN value in AMOS (Table 55) is 38.508. For a model to be considered significant its Chi Square value as produced by SEM has to be insignificant (above 0.05). The AMOS CMIN value of 38.508 is well above 0.05. In the second test, the relative Chi Square test, the SEM value had to be less than 2 if the model is to be considered significant. The relative Chi Square value produced for the UTAUT in the SEM test is 1.242. This is shown by the CMIN/DF value in the Table 55. This means the UTAUT model in its updated state is significant. The third test is the RMSEA test which had to yield a value of 0.05 or less if the model is significant. The RMSEA value of 0.36 confirmed the significance of the model. The fourth test is the CFI test where values that approach 1 are acceptable for model fit. The CFI value of 0.990 confirmed acceptability of the UTAUT model. The fifth test is NFI where values ranging from 0 to 1 are acceptable but with values close to 1 considered as ideal. The NFI value in this test is 0.951 confirming acceptability of the UTAUT model. The sixth test is the IFI test. This required values to be above 0.90 if the model is to be significant. This test yielded a value of 0.990 thereby confirming significance of the UTAUT model. The seventh test is the TLI test where values over 0.90 are acceptable for model fit. The SEM test produced a TLI value of 0.982 thereby confirming acceptability of the UTAUT model.

The model fit results presented above show that the UTAUT model is significant in explaining the adoption and use of peer reviewed electronic journals in the Zimbabwean context and proves that *discipline* is a moderator as discussed in section 2.7 and supported by literature reviewed in section 3.7. The inclusion of *discipline* as a moderator did not make the model insignificant indicating that *discipline* also explains the adoption and use of peer reviewed electronic journals.

5.10.4 Establishing the Best Fitting Model

The next task is to isolate the most critical UTAUT constructs so that the best fitting model can be established for the adoption and use of peer reviewed electronic journals by academics in Zimbabwe. The best fitting model means that the power of structural equation modelling is used to determine the most critical constructs to the adoption and use of peer reviewed electronic journals by academics. This capability is one of the reasons why SEM, as a second generation technique, is considered more powerful than first generation techniques such as regression

analysis. SEM can determine the most outstanding constructs of a model in a given situation, based on given data. The determination of the best fitting model does not contradict descriptive and inferential statistics given when data were being presented for the five research questions of this study. The best fitting model in effect helps to appreciate the most crucial issues in the adoption and use of peer reviewed electronic journals by academics.

When the SEM test was run to establish the best fitting model and isolate the most crucial constructs based on the data collected from the three universities that took part in this study the AMOS package posited the Performance Expectancy and Facilitating Conditions constructs to be the most crucial in determining adoption and use of peer reviewed electronic journals. Performance Expectancy was posited to influence Behavioural Intention that would in turn affect Usage Behaviour. The Facilitating Conditions construct was posited to directly affect Usage as academics respond to barriers that militate against their use of peer reviewed electronic journals. These barriers have already been considered in section 5.8 where data for the fourth research question that enquired about the factors that influence the behavior of academics towards peer reviewed electronic journals were presented. In addition to isolating Performance Expectancy and Facilitating Conditions the test dropped all moderators thereby effectively implying that Performance Expectancy and Facilitating Conditions were critical determinants to the adoption and use of peer reviewed electronic journals by all academics regardless of their gender, age, experience or discipline. The best fitting model is presented in Figure 12 below.
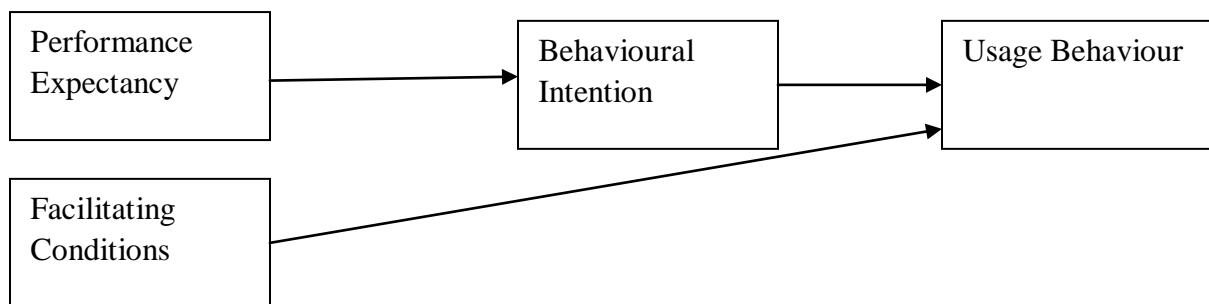
Figure 12: The best fitting UTAUT model in the context of academics in state universities in Zimbabwe

This best fitting model was proved to be the best fit through the fit indices tests conducted using the SEM package, AMOS. The model achieved Chi Square value of 39.324, relative Chi Square value of 1.219, RMSEA of 0.34, CFI of 0.992, NFI of 0.963, IFI of 0.996, and TLI of 0.985. This shows that whereas the full UTAUT model is significant is explaining the adoption and use of peer reviewed electronic journals by academics in Zimbabwean State Universities the model becomes even more significant if it is trimmed to show only the most critical constructs. The establishment of the best fitting model does not undermine descriptive and inferential statistics presented under the five research questions and statistical analysis validated the UTAUT model. All these angles are meant to work together to enable the fullest understanding of the adoption and use of peer reviewed electronic journals by academics.

5.11   Summary

The chapter presented, analysed, and interpreted data addressing the research questions of the study. The findings from quantitative and qualitative data were integrated and presented thematically emanating from the research questions of the study and constructs of the UTAUT. The conceptual model, the updated UTAUT proposed in section 2.7 was also tested by structural equation modelling and results presented. The chapter closed by establishing the best fitting UTAUT model. Results to the first research question show that while the majority of academics in the three universities were aware of the existence of peer reviewed electronic journals in their institutions they did not have in-depth knowledge and awareness of the resources. In respect to the second research question results show that while the majority of academics use electronic journals, their level of use is low as measured by the number of articles consulted per week, frequency of use of these resources, and the major source of information for academics. Academics from MSU, however, were shown to use electronic journals more than their peers from NUST and BUSE. In respect of the third research question that enquired about the attitudes and perceptions of academics towards peer reviewed electronic journals results show that attitudes and perceptions were generally on the positive side with many academics regarding the resources as important for their work. In respect of the fourth research question that enquired about the factors that influence the behavior of academics towards peer reviewed electronic journals results show that academics are affected by many barriers that frustrate their use of electronic journals. These barriers include inadequate infrastructure to support access to

electronic journals, inefficient and slow speed of Internet connection, lack of skills to negotiate the electronic journals environment, lack of library support in the use of electronic journals, unfriendly library website interfaces, difficult electronic journal interfaces, failure to download full-text articles, challenges with off-campus access, lack of printers to print research findings, and challenges with back issues. These challenges do not affect the three universities in the same way with the MSU academics being in the most favourable situation while their colleagues at NUST and BUSE seem to be facing more hindrances. In respect of the fifth research question that enquired about strategies used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics results show that libraries use a cocktail of strategies to promote use of electronic journals. These strategies include faculty board meetings, library committee meetings, leaflets, posters, banners, brochures, library workshops and seminars, emails, information literacy programmes, and library websites. The success of these strategies is different from one university to the other with strategies appearing to have the best impact at MSU. Tests carried out to determine the significance of the UTAUT model in explaining adoption and use of peer reviewed electronic journals confirmed that the model is significant in explaining usage behaviour in the local context and further shows that *discipline* has influence on how academics use electronic journals. SEM tests further show that Performance Expectancy and Facilitating Conditions were the most crucial determinants of adoption and use of peer reviewed electronic journals.

CHAPTER 6

DISCUSSION OF FINDINGS

6.1   Introduction

This chapter discusses the findings of the study that were presented in Chapter 5. Discussion of findings entails interpretation of the study's results in the context of previous researches and providing implications for policy, theory and practice of the findings produced by the current study (Oso and Onen, 2008:134). According to Fink (2002) discussing the findings allows the researcher to develop the story found in the data, making connections between the results of the current study and existing theory and research. Therefore, discussion provides an opportunity to show how results fit in with works that were done in the past by other researchers in the field, pointing out the agreements and disagreements between the current study and previous studies, and establishing reasons for disagreements (Oso and Onen, 2008:134; Franklin, 2013). In discussing findings, it is important to evaluate and interpret the implications of the study to the research problem. This necessitates the researcher to examine, interpret, and qualify the results as well as draw inferences from them (Oso and Onen, 2008:134).

The study investigated the adoption and use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities. The investigation was done through the following research questions:

1. What is the level of awareness of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?
2. What is the extent of use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?
3. What are the attitudes and perceptions of academics towards peer reviewed electronic journals?
4. What factors influence the behaviour of academics at selected Zimbabwean State Universities towards peer reviewed electronic journals?
5. What strategies are used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics?

This chapter is structured around themes emanating from the research questions of the study and organised logically to follow the order of the research questions. The research findings pertaining to the theme under discussion are briefly summarised before comparisons with other studies are drawn. Agreements and disagreements are identified and explained. In discussing the findings perspectives will be drawn from the constructs and moderators of the UTAUT, the theory that underpinned this study.

6.2   Level of awareness of peer reviewed electronic journals

The first research question of this study sought to establish the level of awareness of peer reviewed electronic journals by academics. This awareness was considered at two levels. The first was the general level of awareness which simply established the proportion or percentage of academics that were aware of the existence of electronic journals in their institutions. The second aspect of awareness considered the extent or quality of awareness of peer reviewed electronic journals by those academics that were aware of their existence. Establishing the level of awareness of peer reviewed electronic journals by academics was a crucial step in understanding the problem of academics' low use of these resources cited in Chapter 1 and goes a long way in furthering the purpose of the study. This is because awareness influences and dictates the adoption and use of electronic journals by any set of users, academics included (Agaba, Kigongo-Bukenya and Nyumba, 2004; Bayugo and Agbeko, 2007; Shija, 2009; Salaam and Aderibidge, 2010).

Results to the first research question are two fold and these are now considered in turn. First, results show that the majority (96.2%) of academics at the three Zimbabwean State Universities that took part in this study were aware of the existence of peer reviewed electronic journals in their institutions. When the results were considered per institution it was established that MSU had the highest awareness at 100%, followed by BUSE at 98%, and lastly NUST at 91.5%. Academics in Zimbabwean institutions have higher general awareness levels than most academics in fellow African countries and compete favourably with American, Asian, and European academics as is shown in comparisons made below.

A study by Agaba, Kigongo-Bukenya and Nyumba (2004) found that lack of awareness of electronic journals was the main barrier to use of the resources at Makerere University in Uganda. At the time of the Makerere University study less than 50% of academics at the institution were aware of the existence of electronic journals. Bayugo and Agbeko (2007) found that only a minority of academics were aware of electronic journals at the University of Ghana. A 2009 study of Tanzanian universities found that most academics were not aware of electronic journals and were therefore not using them (Shija, 2009). In Nigeria, Salaam and Aderibidge (2010) found that only 57.75% of academics were aware of electronic journals at the University of Agriculture in Abeokuta. The issue of low levels of awareness of electronic journals has been reported to afflict universities in most African countries (Harle, 2010). However, a few universities in Nigeria posted awareness levels that are comparable to levels established for academics in Zimbabwe. Isah (2010) found that 93% of academics at the University of Ilorin were aware of electronic journals whereas Egberongbe (2011) found that 90% of academics at the University of Lagos were aware of the resources. These two Nigerian universities are slightly lower in general awareness than academics from the MSU and BUSE in Zimbabwe and almost at par with NUST.

The superiority of general awareness of peer reviewed electronic journals by academics in Zimbabwe over academics in other African institutions could be explained by a number of factors. The first factor is one of the UTAUT moderators, 'age' (Venkatesh et al., 2003). According to several researchers (Tenopir, 2003; Kortelainen, 2004; Bennett and Buhler, 2010; Shahmohammadi, 2012) younger academics are generally more aware of electronic journals than older academics. In Zimbabwe, the majority of academics are young since most of the older and more experienced academics left the country during years of economic and political difficulties for the country. As shown in Table 26 (section 5.4.6) the majority of academics in Zimbabwe are 40 years and below with those below 30 years accounting for 12.7% of academics and those in the age range 31-40 years constituting 44.3% of academics to give a total of 57% for academics aged 40 years and below. Only 12.8% of academics in Zimbabwe were 50 years and above at the time of data collection for this study. The age dynamics cited here could tilt the scales of electronic journals awareness in favour of Zimbabwean institutions since younger academics are more likely to be aware of these resources than the older academics. Some of the younger

academics completed their own university education after the introduction of these resources and they used them as students. Now after transitioning to be academics this young generation would already be aware of these resources. Most of the older academics who are the majority in other African institutions outside Zimbabwe completed their university education before the introduction of peer reviewed electronic journals so a number of them are still not aware of these resources. The age factor is therefore significant in explaining differences between academics in Zimbabwe and academics in the rest of Africa when it comes to general awareness of electronic journals.

The second factor that could be tilting general awareness of electronic journals in favour of academics in Zimbabwe is academic rank. Most academics in Zimbabwe (92.4%) are junior lecturers with senior lecturers constituting 5.7% and professors only adding up to 1.9% of academics as shown in Table 23 (section 5.4.2). The junior lecturers have a lot of ambition to grow and rise up the academic ladder so they are actively searching for information. They need electronic resources to enable them to publish in respected jounals and their embracement of electronic journals should be higher than academics in most African universities who are mostly already at senior level and have less pressure to advance. Most of these academics in many African institutions attained their professorships even before the advent of electronic journals and may be less inclined to find out about these resources (Owolabi and Agboda, 2010). Also the fact that most academics in Zimbabwe are at entry level of academic development means the majority of them do not yet have PhDs and are working towards attaining this vital academic qualification. They would be better positioned to know about electronic journals since to successfully complete the PhD qualification one would need access to current literature, most of which is found in electronic journals (Tenopir, 2003; Sarasvady and Khatri, 2007).

The third factor that could be differentiating the results of academics in Zimbabwe from their colleagues in the rest of Africa on the subject of general awareness about electronic journals is linked to the issue of time of data collection. Awareness about the existence of electronic journals grow with the passage of time (Tenopir, 2003; Kemp and Jones, 2007; Ibrahim, 2004; Omatayo, 2010; Gikandi and Ndingu, 2011). Data for this study were collected in 2013, much later than for other African studies cited in this study. Since awareness grows by passage of time

the later studies are likely to bring more favourable results in terms of awareness than earlier studies. It may be that if data were collected again for some of these African universities their results would show an improved situation. This would have been influenced by the passage of time.

Whereas the factors cited above could have tilted general awareness results about electronic journals in favour of Zimbabwean institutions over institutions from the rest of Africa the same factors do not seem to have succeeded in giving academics in Zimbabwe advantage over academics in developed countries. Researchers such as Veeramani and Vinayagamoorthy (2010) report that as early as 2009 most institutions in the USA, UK, and Japan had attained 100% general awareness about electronic journals. Academics in India were also reported to be highly aware of electronic journals. Sarasvady and Khatri (2007) studied several institutions in India and found that the majority of academics in those institutions were aware of electronic journals. Khan and Ahmad (2009) studied two Indian universities: Aligarh Muslim University (AMU) and Banaras Hindu University (BHU) and found that general awareness levels were already approaching saturation for the two institutions. Tyagi (2011) studied academics at Indian Institute of Technology Roorkee and found that they were all (100%) aware of electronic journals. Evidence from past studies therefore suggest that academics in developed countries and the fast developing country of India are more aware of electronic journals than academics in Africa in general and Zimbabwe in particular. Other institutions in Africa, however, such as MSU in Zimbabwe have distinguished themselves in terms of general awareness, also attaining 100%. What all this shows is that the problem of low usage of electronic journals as reported in Chapter 1 (Introduction) and Chapter 3 (Literature Review) will be affected less by issues to do with general awareness of these resources going into the future as research suggests that general awareness is progressing towards saturation, where every academic would be aware of the existence of these resources. The issue may remain with the quality of that awareness as it is also a major factor that affects adoption and use of these resources.

The second aspect of results to the first research question show that while general awareness was high the academics did not have intimate awareness and knowledge of the resources. Results presented in Chapter 5 revealed that only 41.2% of academics in the participating universities

were able to mention five or more electronic databases while only 22.1% managed to mention five or more specific electronic journals. About 67.3% of academics cited awareness of electronic journals as either a minor or major barrier to their use of these resources with only 32.7% indicating that issues to do with awareness were not a barrier to their use of the resources (Table 30 in section 5.5.2). In yet another show of lack of intimacy with the resources, 79.8% of those academics who use electronic journals reported accessing these resources either via Google or through conducting a general search on their university website. Only 20.2% accessed electronic journals directly from the Host Databases. These summarised results show that academics in Zimbabwe do not have in-depth awareness of electronic journals though they know of the existence of the resources as already discussed. These findings mirror results of other studies in Africa as presented in the next paragraph.

Harle (2010) surveyed four universities in east and southern Africa: Chancellor College at the University of Malawi, University of Nairobi in Kenya, National University of Rwanda, and University of Dar es Salaam in Tanzania. He found that lack of intimate awareness of electronic journals was a major hindrance to the adoption and use of the resources and was at the core of the problem of low use mentioned by the institutions. Only 16% of academics in that study indicated having a high level of awareness of electronic journals with the rest unsure of themselves. The same results were found by INASP (2011) in a study of seven institutions in Kenya: Aga Khan University (AKU), Egerton University (EU), Kabarak University (KABU), International Centre of Insect Physiology and Ecology (ICIPE), Jomo Kenyatta University of Agriculture and Technology (JKUAT), University of Nairobi (UoN), and United States International University (USIU). In these studies INASP confirmed that academics did not have intimate awareness of electronic journals. Their quality of awareness was very poor and this reflected in the way they used the resources. Other researchers in different countries of Africa such as Shija (2009) in Tanzania, Bayugo and Agbeko (2007) in Ghana, and Salaam and Aderibidge (2010) in Nigeria tell the same stories of academics' poor quality of awareness of electronic journals. These researchers revealed that academics in the institutions they studied could not name most of the databases that were offered by their institutions and most considered issues to do with awareness as major barriers to their use of the resources. Bayugo and Agbeko (2010) report a situation in Ghana where the majority of academics at the College of Health

Sciences of the University of Ghana were not aware of the availability of the HINARI database at their institution when in fact this database had been available for years and is the most renowned database the world over in terms of health information. This would suggest that Africa in general still grapples with inadequate awareness of these resources and the situation in Zimbabwe is similar. There could be several causes to this state of affairs in Zimbabwe and Africa in general including:

- Poor promotion strategies for these resources (Bevis and Graham, 2003; Smith, 2003; Bevilacqua, 2005; Thanuskodi, 2011);

- Lack of research culture by academics (Kortelainen, 2004; Bennett and Buhler, 2010; Cox and Cox, 2010; Tyagi, 2010; Vasishta and Navivoti, 2011);

- Lack of skills which prevents academics from seeking to know more about electronic journals since they would not use them anyway (Ondari-Okemwa, 2004; Secker and Price, 2004; Oduwole and Sowale, 2006); and,

- Lack of infrastructure and resources to have much exposure to electronic journals (Watts and Ibegbulam, 2006; Manda, 2008; Shija, 2009; Harle, 2010; Owolabi and Agboola, 2010).

The situation in Zimbabwe in terms of quality of awareness about electronic journals is less enviable than that of academics in developed countries in North America, Europe, and some parts of Asia and the Middle East. Researchers from these countries point to high quality of awareness of these resources by academics (Veeramani and Vinayagamoorthy, 2010). As early as 2003 Chrzastowski (2003) reported high levels of intimate awareness of electronic journals at the University of Illinois in the USA. Tenopir, King and Bush (2004) did a study of several institutions in the USA and also found encouraging levels of in-depth knowledge and awareness of the resources. Studies carried out in 25 institutions in Italy also revealed high quality awareness about electronic journals (Gargiulo, Conti, Contino, Farinelli and Marquardt, 2003). Ibrahim (2004) found high levels of intimate awareness of electronic journals from academics in science related disciplines at the United Arab Emirates University. Bar-llan and Fink (2005) found academics at Hebrew University in Israel to be very much knowledgeable about electronic journals whereas Dilek-Kayaoglu (2008) found the same at Istanbul University in Turkey. Shahmohammadi (2012) found academics at Islamic Azad University in Iran to be highly

conversant with electronic journals. The same results were witnessed in several institutions in India (Khan and Ahmad, 2009; Thanuskodi, 2011; Tyagi, 2011). The fact that the above cited studies which showed in-depth appreciation of electronic journals by academics were all done before the current study yet they still reveal better understanding of the resources than the current study shows the gap of intimate awareness of these resources between African academics in general and Zimbabwean academics in particular and academics from the developed world. Academics from the developed world may have an advantage over African academics in intimately knowing these resources owing to abundance of infrastructure and resources in their institutions, entrenched research culture, and much improved perceptions of the resources by academics from these countries. These factors encourage in-depth understanding of these resources on the part of academics.

6.3   Extent of Use of Electronic Journals

The second research question enquired about the extent of use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities. The question was addressed in two parts as represented in sections 5.6.1 and 5.6.2. In section 5.6.1 the researcher established the number or percentage of academics who use electronic journals, in other words, the 'adoption rate' and in section 5.6.2 the researcher established the level of use of these resources by those academics who have adopted them as measured by the number of articles consulted per week (section 5.6.2.1), frequency of use of electronic journals (section 5.6.2.2), and the major sources of information for academics at the selected Zimbabwean State Universities (section 5.6.2.3). The second research question of this study, therefore, first established **how many** academics use electronic journals (or have adopted electronic journals) then proceeded to the second aspect, that of interrogating extent of use of these resources by academics. Overall results for these two aspects of this research question show that the majority of academics have adopted electronic journals but their level of use is low as measured by the number of articles consulted per week, frequency of use, and the major sources of information used by academics. Detailed discussion of the stated findings to the two aspects of this research question now follow in that order.

Out of a total 212 academics who responded to this study 193 indicated that they use electronic journals thus giving an adoption rate of 91%. This electronic journals adoption rate is much

higher than rates previously found for other universities in Africa but is still lagging behind institutions in America, Europe and Asia. Salaam and Aderibidge (2010) revealed that only about 50% of academics used electronic journals at the University of Agriculture in Nigeria. Egberongbe (2011) did a study at the University of Lagos in Nigeria and discovered that adoption stood at 65.2%. Other studies carried out in Africa by researchers such as Oduwole and Sowole (2006), Bayugo and Agbeko (2007), Shija (2009), Harle (2010), and Owolabi and Agboola (2010) reveal that adoption of electronic journals is still a challenge in institutions on the continent with the majority of universities still below 50% in terms of the number of academics who use electronic journals. The situation for Zimbabwean institutions in terms of adoption of electronic journals is therefore, much better than for institutions in the rest of Africa with the exception of South Africa (Harle, 2010).

There could be several reasons that account for the difference in electronic journals adoption rates between institutions in Zimbabwe and those in other parts of Africa. Most of these reasons have already been cited in the discussion about the level of awareness of peer reviewed electronic journals in section 6.2 and will only be highlighted here and not discussed in detail to avoid unnecessary repetition. It was noted that the majority of academics in Zimbabwe are young owing to the massive brain drain that nearly emptied Zimbabwean institutions of older and more experienced academics who trekked to more stable countries at the height of Zimbabwe's political and economic challenges of 2000 to 2010. Now researchers such as Tenopir (2003), Kortelainen (2004), Bennett and Buhler (2010), and Shahmohammadi (2012) agree that younger academics are quicker to adopt electronic journals than the older generation of academics and this could be one of the reasons why Zimbabwean academics have a very high electronic journals adoption rate. Most academics in Zimbabwe are still junior lecturers who have pressure to establish themselves academically by engaging in studies for higher degrees and carrying out research in order to boost their publications. This in a way forces them to adopt electronic journals since universities in Zimbabwe are failing to update their print resources stocks due to financial constraints as noted in Chapter 1 and as several professional librarians interviewed for this study alluded to in Chapter 5. Adoption of electronic journals, in a way, becomes an escape route propelled by "push factors'' of lack of current print resources.

Authors such as Lenares (1999), Bar-llan, Peritz and Wolman (2003), Tenopir (2003), Kemp and Jones (2007), Ibrahim (2004), Omatayo (2010), and Gikandi and Ndingu (2011) are in agreement that like awareness, adoption of electronic journals increases with time and the fact that the current study was conducted at a later date than the corresponding studies cited for Africa gives the Zimbabwean institutions an advantage in terms of their adoption rates. To demonstrate this principle of time the researcher here cites two cases. Lenares (1999) published results of a two year longitudinal study of the adoption of electronic journals in the Association of Research Libraries (ARL) institutions in America. The results showed that in 1998 there was an adoption rate of 46% but when the same study was done in 1999 the rate had increased to 61%. Bar-llan, Peritz and Wolman conducted a series of studies to measure the rate of adoption of electronic journals in Israeli universities over several years. Their results show that in 1997 adoption stood at 21%, in 1998 it had increased to 53%, and in 2000 it had further increased to 75%. A study conducted later by Bar-llan and Fink (2005) for the same Israeli situation revealed that adoption had further increased to over 80%. The last reason why Zimbabwean institutions have higher adoption rates than other institutions in Africa could be the effects of intensive electronic journals promotion programmes particularly by institutions such as the MSU as discussed in section 6.6 below. Several researchers have complained of a lack of promotion of electronic journals and cited this as a major hindrance to the adoption of these resources on the African continent (Ondari-Okemwa, 2004; Shija, 2009). The situation in Zimbabwe regarding promotion of electronic journals though still needing a lot of attention, can be said to be better in many respects than for other African institutions and this could be contributing to the differences in adoption rates.

The 91% average adoption rate achieved by Zimbabwean institutions is high but still lags behind institutions in the developed world with most of them having already achieved the 100% mark. As early as 2002 a study in Greece revealed that institutions there had already attained an average of 97.4% electronic journals adoption rate (Monopoli et al., 2002) while a 2003 study conducted in 25 Italian universities found that the average adoption rate was also approaching saturation at 96.9% (Gargiulo et al., 2003). In Iran the adoption rate was recorded to be at 95.7% following a study of several institutions (Negahban and Talawar, 2009). Researchers such as Eqbal (2007), De Groote (2008), Khan and Ahmad (2009), Bennett and Buhler (2010), Cox and

Cox (2010), Thanuskodi (2011), Tyagi (2011), and Vasishta and Navivoti (2011) speak of several institutions in Europe, Asia and America that have already achieved saturation point. The only institution in the current study which would almost match such levels of electronic journals adoption is the MSU which had a rate of 98.8% if considered independently from other institutions. NUST had a rate of 84.1% while BUSE sits at 89.8%, rates which are much lower than those achieved by institutions in the developed world.

There are several reasons why institutions in the developed world boast of higher adoption rates than Zimbabwean institutions. First, electronic journals were first introduced in the developed world before they came to Zimbabwe. Electronic journals were first introduced in Zimbabwe in 2003 as noted in Chapter 1. This is more than half a decade after these resources had been introduced in most developed world institutions. This time lag reflects in adoption rates as institutions in the developed world have had more time to familiarise with the resources and appreciate their benefit. Second, academics in Zimbabwe, like academics in most African institutions, face barriers in their quest to use electronic journals. This affects adoption rates as users are sceptical of a technology that is not well supported by conditions on the ground (Bar-llan, Peritz and Wolman, 2003; Hynes and Stretches, 2005; Woo, 2005; Watts and Ibegbulam, 2006; Saikia, 2007; De Groote, 2008; Khan and Ahmad, 2009; Shija, 2009; Harle, 2010; Thanuskodi, 2011). In the current study the 9% that do not use electronic resources cited reasons such as lack of awareness, frustration with poor Internet connection, and lack of skills for their non adoption of the resources. The issue of barriers is fully discussed in section 6.6. Third, the level of research in Zimbabwe does not match research that is done in developed world institutions and the adoption of electronic journals is proportionate to the level of research going on since researchers form the core users of these resources (Nelson, 2001; Tenopir, 2003; Kortelainen, 2004; Bennett and Buhler, 2010; Cox and Cox, 2010; Tyagi, 2011; Vasishta and Navivoti, 2011). Fourth, the level of promotion of electronic journals is more intense and mature in developed world institutions than in Africa in general and Zimbabwe in particular. Adoption of electronic journals is affected by promotion and those institutions with strong promotionprogrammes achieve higher adoption and usage rates for these resources (Lock, Cornell and Colling, 2001; Nelson, 2001; Stark, 2001; Wolf, 2001; Smith, 2003; Aina, 2004;

Kortelainen, 2004; Kumar and Kumar, 2008; Upadhyay and Chakraborty, 2008; Isah, 2010; Vasishta and Navivoti, 2011; Shahmohammadi, 2012).

This study confirms results of previous studies that showed that the adoption of electronic journals is influenced by moderating factors such as discipline, age, and gender. The *discipline* factor was originally not a UTAUT moderator but was proposed by the researcher in Figure 7 (Chapter 2) following strong indications from literature that it greatly influenced adoption and use of technology in university settings. This claim was supported by results of this study and the *discipline* moderator was retained in Figure 11 (Chapter 5) after Structural Equation Modelling (SEM) was applied to test the UTAUT based on the results of this study. The effect of discipline on adoption and use of electronic journals is supported by studies conducted at various universities such as Israeli Universities (Bar-llan, Peritz and Wolman, 2003), Ohio State University, USA (Connell, Rogers and Diedrichs, 2005), Catalan Universities, Spain (Borrego et al., 2007), Indian universities (Eqbal, 2007; Thanuskodi, 2011), Tanzanian universities (Shija, 2009), and Kenyan universities (Harle, 2010; INASP, 2011). All these studies revealed that academics in science disciplines were more receptive to peer reviewed electronic journals than academics in other disciplines. Reasons for such behaviour were mostly given by researchers such as Eason et al. (1997) and are fully considered in section 6.4 below that deals with attitudes and perceptions of academics towards peer reviewed electronic journals.

Results of this study also confirm a "law" given by Bar-llan and Fink (2005) that "increased age is inversely related to the use of electronic journals". The percentage number of academics who indicated using electronic journals decreased as age increased. This also agrees with what other researchers apart from Bar-llan and Fink (2005) found. Tenopir (2003) noted in her analysis of High Wire eJust studies that there was strong correlation between the age of users and adoption and usage rates. Gargiulo et al. (2003) found in a study of Italian universities that a large number of users of electronic journals fell in the 31-40 years age category whereas those academics aged over 50 were the lowest users. Sarasvady and Khatri (2007) also discovered that those academics aged over 50 had their umbilical cords attached to print journals and were very slow to adopt and use electronic journals. The same study revealed that younger academics were more enthusiastic of electronic journals than the older generation. Several other studies confirm the same. The

reasons why younger ages are more comfortable with electronic journals than the older ages are considered in section 6.4.

This study found that proportionally, more males than females had adopted electronic journals at the selected Zimbabwean State Universities but the statistics are a close call. About 91.9% of male academics reported using electronic journals compared to 89.6% of females. However, the difference in adoption rates for males and females is small. Academics in Zimbabwe, both male and female, face the same challenges of lack of current print resources and also face the same barriers in their adoption of electronic journals such that their behaviour towards the resources is mostly informed by similar experiences. The UTAUT recognises gender as a moderator to the adoption and use of technology but was careful to avoid pinpointing which gender adopts and uses technology more. This is because this issue was never settled and is still a contentious one even in literature. Bar-llan, Peritz and Wolman (2003) and Thanuskodi (2011) believe male academics are more ready adopters of electronic journals. Tenopir (2003) argues that female academics are more ready adopters and users of electronic journals. Monopoli et al. (2002), Dilek-Kayaoglu (2008), and Shahmohammadi (2012) state that there is no significant difference between the way male and female academics adopt and use electronic journals. Commenting on Table 36 (Chapter 5), the Table that represented the adoption of electronic journals by gender the researcher noted that proportionally more male academics use electronic journals than female academics but the difference was not significant enough to establish a Chi-Square relationship, a relationship that allows one to suggest that "more of this gender adopts and uses electronic journals than the other gender". Gender is a moderator of adoption and use of electronic journals but its specific behaviour is not general or universal, it is revealed on a case by case basis. In some situations usage behaviour between male and female academics may even appear confusing or contradictory. For example, while this study found that proportionally, more male academics adopted electronic journals than female academics the results also show that female academics were actually more serious users of these resources with most of them occupying the average to high users' group whereas the majority of male academics populated the very low and low users' categories.

The discussion now turns to the second aspect of this research question that focus on the level of use as measured by the number of articles consulted per week, frequency of use, and the major source of information for academics. The findings of this study show that on all three parameters cited above academics at the selected Zimbabwean State Universities rank lowly in their use of electronic journals though many of them have adopted the resources. As shown in Table 37 (Chapter 5) 74.7% of academics are low to average users of electronic journals. They consult as low as less than five articles per week to 20 articles per week. Only 24.3% of academics considered themselves high users of electronic journals consulting 21-30 articles per week. Just 1% of academics regarded themselves as very high users of electronic journals consulting over 30 articles per week. Figure 9 (Chapter 5) depicts in a bar graph form, usage patterns based on number of articles consulted per week and the high users graph is the shortest of them all. When use was considered based on frequency it was established, as shown in Table 45 (Chapter 5), that only 11.9% of academics use electronic journals on an almost daily basis. About 42% of academics use electronic journals once a week, once a month or very infrequently. The study also revealed that academics still regarded print resources as their preferred major source of information with 50.9% of them citing either print books or print journals. Only 40.6% of them cited electronic journals as their major source of information while 8.5% preferred electronic books (Table 46 in Chapter 5). The effect of the above cited statistics is to show that though the majority of academics at the selected Zimbabwean State Universities have adopted electronic journals with a 91% adoption rate as the foregoing discussion has shown in actual fact these academics are lethargic users of electronic journals. They rank much lower than usage rates attained by other universities especially in the developed world.

Khan and Ahmad (2009) reported that 94.72% of academics at Aligarh Muslim University (AMU), India, are heavy users of electronic journals with as high as 55.69% accessing these resources on a daily basis and consulting up to 50 articles per academic per week. About 20.33% of academics accessed the resources 2 to 3 times a week but still used the resources extensively as they consulted over 30 articles per week. Only 18.7% of academics were found to be consulting electronic journals once a week but in that episode they still downloaded about 10 articles. Khan and Ahmad (2009) also did a study at Banaras Hindu University (BHU) and found that 95.25% were heavy users of electronic journals with 47.84% of them using the resources on

a daily basis and consulting close to 50 articles per academic per week. About 26.69% used the resources 2 to 3 times a week and consulted about 20 to 30 articles per week. At these two universities Khan and Ahmad found that electronic journals were the major source of information for academics. Thanuskodi (2011) did the same study at the same institutions as Khan and Ahmad and confirmed the heavy use of electronic journals by academics. He cited that most of the academics at the two institutions were prolific researchers and made use of electronic journals to achieve this. Studies in the UK, Spain, Italy, Iran, Pakistan, Israel and USA have also shown results that are almost similar to the Indian studies where use of electronic journals has grown considerably over the years (Gargiulo et al., 2003; Bar-llan and Fink, 2005; Borrego et al., 2007; De Groote, 2008; Negahban and Talawar, 2009; Cox and Cox, 2010). These examples are clearly well above the usage levels demonstrated by academics in Zimbabwe. Academics in Zimbabwe, however, have counterparts in other African institutions where researchers such as Watts and Ibegbulam (2006), Manda (2008), Shija (2009), Harle (2010), Salaam and Aderibidge (2010), Gikandi and Ndungu (2011), and INASP (2011) noted that the levels of use were still on the low side.

The reasons Africa in general and Zimbabwe specifically still lag very much behind in their use of electronic journals are varied but hinge mostly on barriers to use as discussed in section 6.5. The issue of barriers also came to the fore when the best fitting UTAUT model was established in section 5.10.4. The Facilitating Conditions construct together with the Performance Expectancy construct were considered the most critical in determining usage patterns of electronic journals by academics in Zimbabwe (Figure 12 of Chapter 5). Facilitating Conditions speak of the factors on the ground that either encourage or discourage use of these resources. In Africa and in Zimbabwe academics have to negotiate numerous constraints to use electronic journals and this puts a dent on their efforts to use these resources. As reflected by the best fitting UTAUT model the Performance Expectancy construct also emerged strongly as a determinant of behavioural intention and that is part of the reasons why academics in the science related disciplines used these resources more than those academics from non-science disciplines. Academics in science related disciplines believed that use of electronic journals would enhance their performance whereas academics from non-science disciplines did not readily see the connection between use of electronic journals and their job performance. This scenario is

consistent with what was found in previous studies by researchers such as Gargiulo et al. (2003), Tenopir (2003), Bar-llan and Fink (2005), and Sarasvady and Khatri (2007). This demonstrates that academics in Zimbabwe still need to recognise the value of electronic journals to their daily academic work. While attitudes and perceptions of academics towards peer reviewed electronic journals have been shown to be positive it seems that academics have not fundamentally linked electronic journals to their performance and as a result have sought to succeed in their careers without making much use of electronic journals. This is probably why the inexperienced younger academics were shown to use electronic journals less than the older generation though they adopted the resources more than the older generation, something which the researcher termed a "paradox" when presenting results in section 5.6.2.1. Other reasons why academics in Zimbabwe and Africa use electronic journals less than their counterparts in the developed world include poor quality of awareness of these resources as discussed in section 6.2 which revealed that while the majority of academics in Zimbabwe were aware of the existence of electronic journals their quality of awareness was not satisfactory and this affects usage. The issue of promotion is also crucial as discussed in section 6.6 which shows that though university libraries in Zimbabwe have made efforts to promote electronic journals their efforts still lag behind that of developed world institutions.

6.4   Attitudes and Perceptions of Academics Towards Peer Reviewed Electronic Journals

The third research question of this study enquired about the attitudes and perceptions of academics towards peer reviewed electronic journals. A study of attitudes and perceptions of academics towards electronic journals is important because these are some of the factors that shape the acceptability, adoption, and use of these resources (Chrzastowski, 2003; Hynes and Stretches, 2005). The majority of academics at the selected Zimbabwean State Universities have positive attitudes and good perceptions of peer reviewed electronic journals. About 64.8% of academics in the current study regarded electronic journals as either important or very important for their work. Most academics (66%) thought electronic journals were useful for the tasks they had to carry out as academics while 87% considered the resources indispensable in academic work. About 76.5% of academics considered electronic journals to be either of high or very high quality, thus showing their confidence in the resources. The most valued features of electronic

journals, which academics ranked as very important, were convenience (49.7%), timeliness of information (53.9%), simultaneous access to information (54.9%), ability to send search results to one's email (50.3%), hyperlinks to other relevant articles (48.7%), ability to print research findings (54.9%), accessibility from office or home (53.4%), access to full text (53.4%), and 24 hour access (53.4%).

The attitudes and perceptions of academics in Zimbabwe towards peer reviewed electronic journals agree with attitudes and perceptions displayed by academics elsewhere, especially in developed countries where academics' opinion of these resources has improved drastically over the last fifteen years (Woo, 2005; De Groote, 2008; Tyagi, 2012). Researchers agree that the attitudes and perceptions of academics towards electronic journals improve with time (Bar-llan, Peritz and Wolman, 2003; Tenopir, 2003; Hynes and Stretches, 2005; Woo, 2005; Saikia, 2007; Thanuskodi, 2011). Previous studies show that at the time of the introduction of electronic journals academics were really sceptical about them but their view has changed with the passage of time as they experience the resources more and as barriers to use are minimised, especially in the case of academics in developed institutions where barriers that militate against the use of these resources have been successfully tackled over the years (Khan and Ahmad, 2009; Salaam and Aderibidge, 2010). Studies done between 1997 and 2000 show that academics had a poor view of electronic journals but improvement in attitudes and perceptions was first noticed at the turn of the millennium and this improvement is still continuing on an upwards spiral. For example, Bell (1997) reports that electronic journals were widely perceived to be of lower status than print journals. Gomes and Meadows (1998) discovered that academics were really concerned with the quality of electronic journals and felt that print offered higher quality. Woodward (1998) also noted concerns of quality in studies in the UK. Lenares (1999) noted that academics were attached to print resources because they were easier to read, had better graphic quality, were easier to browse, and easier to access as compared to electronic journals which were then perceived to lack these qualities. In her 1999 study, Lenares actually recorded academics saying, "they do not know of any respected electronic journals in their fields".

However, in 2000 perceptions improved a bit. Evans and Zarnosky (2000) identified electronic journals as a "mixed blessing". While still pointing out issues of quality researchers like Evans

and Zarnosky expressed appreciation of the convenience brought about by electronic journals. In 2001 researchers like Harn (2001) recorded academics saying they noted improving quality in electronic journals due to peer reviewing of articles. In Israel, Bar-llan, Peritz and Wolman (2003) argued in a study of several institutions that on average 48.9% of academics preferred electronic journals compared to 28.2% who preferred the printed version while 22.9% had no specific preference. In the High Wire eJust studies Tenopir (2003) reports that 92% of academics "liked" electronic journals whereas Woo (2005) noted that 68.8% of academics at the University of Hong Kong preferred to use electronic journals. At Tezpur University, India attitudes and perceptions towards electronic journals were found to be healthy and 63.4% of academics said they preferred electronic journals (Saikia, 2007). Khan and Ahmad (2009) did extensive studies at 2 Indian universities: Aligarh Muslim University (AMU) and Banaras Hindu Universities (BHU) and discovered that academics highly valued electronic journals due to their features such as their ability to enable fast searching, high image quality, and 24 hour access. Studies by Thanuskodi (2011) and Tyagi (2012) at the University of Chennai and Indian Institute of Technology respectively also showed positive attitudes by academics towards electronic journals with a marked improvement compared to results of earlier studies at the same institutions. Results of the current study should also be read in the same context where the passage of time leads to an improvement of attitudes and perceptions as academics become more exposed to electronic resources and become acquainted with their advantages. The poor extent of use of peer reviewed electronic journals discussed in section 6.3 above seems not to be caused by attitudes and perceptions but is most likely indicative of frustration with many barriers to use.

The attitudes and perceptions of academics in Zimbabwe towards electronic journals are much better than for other academics in Africa. At Makerere University, for example, only 8.9% of academics felt electronic resources were an excellent way to access information (Kigongo-Bukenya and Nyumba, 2004). The Makerere University study was, however, conducted a decade ago so the results may not be holding now since we have already established that attitudes and perceptions improve with the passage of time. But if we consider studies done in Africa up to the last 3 years, the situation about attitudes and perceptions, though much improved, is still worrying. Researchers who conducted studies in African institutions in countries such as Malawi, Kenya, Tanzania, Nigeria, and Rwanda still complained of poor attitudes and

perceptions though they note some marked improvement from when the resources were first introduced (Watts and Ibegbulam, 2006; Manda, 2008; Shija, 2009; Harle, 2010, Salaam and Aderibidge, 2010; Gikandi and Ndungu, 2011; INASP, 2011). This state of affairs is mostly blamed on many barriers to adoption and use that academics in Africa have to contend with. Perhaps that is the reason why in this current study an uncomfortably high percentage of 35.2% of academics did not consider electronic journals as either important or very important. While the focus may be on the 64.8% who indicated that electronic journals were either important or very important for their academic work one has to ask why 35.2% of academics still think differently over a decade after the introduction of these resources in Zimbabwean universities. One also has to ask why 24.9% of academics in Zimbabwe complain of getting irrelevant results when they search electronic journals. One has to ask why 23.5% of academics in Zimbabwe think electronic journals are of poor quality when researchers laud these resources for being of high quality. The answers to may reside in several factors that are characteristic of Africa including lack of skills to search the databases and get the correct results, lack of resources in some disciplines owing to compromises made when subscribing to electronic journals through Consortium arrangements, and the several barriers that militate against use of these resources.

The issue of barriers affecting attitudes and perceptions of academics towards electronic journals is proved by results of this study. Academics at MSU, an institution that has done a lot to eliminate barriers to use as was shown in Chapter 5 have a much higher regard of electronic journals than academics at NUST and BUSE who still face a myriad of challenges in their quest to use these resources. This is consistent with arguments advanced by researchers who say that the issue of barriers impacts negatively on the attitudes and perceptions of users towards electronic journals (Bar-llan, Peritz and Wolman, 2003; Hynes and Stretches, 2005; Woo, 2005; Watts and Ibegbulam, 2006; Saikia, 2007; De Groote, 2008; Khan and Ahmad, 2009; Shija, 2009; Harle, 2010; Thanuskodi, 2011). Apart from barriers, attitudes and perceptions are also shaped by other factors such as discipline and age. Results of the current study show that academics from science related disciplines appreciated electronic journals more than their counterparts in non-science disciplines. This is consistent with several studies highlighted in literature. Bar-llan, Peritz and Wolman (2003) study of Israeli universities argued that academics from Engineering and Natural Sciences preferred electronic journals more than academics from

Humanities and Social Sciences. Studies carried out in the UK by Kemp and Jones (2007) showed a greater appreciation of electronic journals by academics in the disciplines of Physics, Engineering, Biological Sciences, and Mathematics. A study done in India by Sarasvady and Khatri (2007) showed that preference for electronic journals was related to the disciplines of scholars and their results show that preference was higher in Biomedicine and Engineering and much lower in Social Sciences. Studies conducted in different parts of Africa by researchers such as Kigongo-Bukenya and Nyumba (2004), Oduwole and Sowole (2006), Bayugo and Agbeko (2007), Manda (2008), Obaje (2008), Harle (2010), Omatayo (2010), Owolabi and Agboola (2010), Salaam and Aderibidge (2010), Egberongbe (2011), and Gikandi and Ndingu (2011) reveal that academics in science related disciplines of Chemistry and Pharmacology, Physics, Geography, Engineering, Biological Sciences, Mathematics, Biology and Biomedical Sciences, Medicine, and Veterinary Sciences appreciated electronic resources more than academics in disciplines such as History, Archaeology, Social Sciences, Psychology, and Communication and Cultural Studies.

The reasons for disciplinary differences in the appreciation of electronic journals are well explained by Eason et al. (1997). Disciplines like History, Archaeology, Social Sciences, Psychology, and Communication and Cultural Studies communicate their knowledge in text forms and if graphics are used they are basic and simple. These types of disciplines tend to consider printed journals as adequate for the representation of their needs and therefore generally appreciate electronic journals less. This is in contrast to disciplines such as Chemistry, Physics, Geography, and Engineering, for example, which have gone on to embrace the use of multimedia in the representation of their information. With these disciplines the use of graphics, video, and animation has become common place and to accommodate such developments the use of electronic journals is readily accepted. There are other disciplines, like the natural sciences which may be described as "hot" and are mostly interested in current issues and are especially concerned with the quick dissemination of their research results. These types of disciplines find a lot of benefits in the use of electronic journals for they allow for faster publication and faster access. Types of disciplines that are concerned with currency of information and speed of dissemination are favourable to the adoption and use of electronic journals and have positive attitudes and perceptions towards these resources (Eason et al., 1997). By contrast most of the

humanities do not place much emphasis on speed of publication nor do they place great significance on currency (Eason et al., 1997). Most academics in the humanities have considerable interest in backlists and are more interested in ascertaining the quality and dependability of material before accepting it. In these disciplines the speed of publication is not much of a concern and print journals seem to play the needed roles very well thereby decreasing the urgency of the need of electronic journals. Academics in some disciplines such as Social Sciences and Humanities expect their students to have access to print journals as part of their training so they learn to review articles and also get acquainted with critical analysis. They are inclined to regard electronic journals with less esteem than for print journals (Eason et al., 1997). Disciplines in the natural sciences and in engineering and business have less need for this review and critical analysis and would find much value in electronic journals.

This study also revealed that age was a factor in academics' attitudes towards electronic journals. Kortelainen (2004), Bennett and Buhler (2010), and Shahmohammadi (2012) studies were inconclusive on the effect of age on attitudes and perceptions towards electronic journals, however, there are many studies whose results are consistent with the results of this study. Bar-llan, Peritz and Wolman (2003) found in a study of Israeli universities that preference for electronic journals decreased with age. Their study found that 66.6%, 55.6%, 50.3%, and 28.7% of academics in their thirties, forties, fifties, and sixties, respectively, preferred electronic journals and had positive attitudes towards them. In a wide scale study of university academics in India, Sarasvady and Khatri (2007) discovered that those academics who are aged over fifty years had their umbilical cords attached to print journals and had negative attitudes towards electronic journals. The same study revealed that young users preferred electronic journals and showed much confidence in their abilities to effectively use the resources. Studies by researchers such as Gargiulo et al. (2003), Tenopir (2003), Bar-llan and Fink (2005), and Harle (2010) also found age differences in the attitudes and perceptions of academics towards electronic journals. There are several reasons why younger academics have more positive attitudes towards electronic journals than their older counterparts. The younger academics got into academia after the introduction of electronic journals and some of them used them as students so they appreciate them better. The older academics depended on print resources for most of their careers and the sudden introduction of electronic journals came as a 'disruption' to the order they were used to.

They are more comfortable retaining their old ways because that is what they are used to. The younger academics, as reflected by this study, want to access a number of resources for their work though they are not loyal to any. Electronic journals allow them to consult many resources. The older academics prefer to be loyal to a few resources and the electronic environment is too unstable for them. The younger academics are more confident of their skills whereas the older academics feel threatened, they are slow to learn the skills needed to negotiate the electronic environment and would regard print as better.

6.5 Factors Influencing the Behaviour of Academics Towards Peer Reviewed Electronic Journals

The fourth research question of this study sought to establish the factors that influence the behaviour of academics at selected Zimbabwean State Universities towards peer reviewed electronic journals. In tackling this question the researcher was guided by the Facilitating Conditions construct of the UTAUT as was highlighted in section 2.6.2.4. The Facilitating Conditions construct is posited in UTAUT as directly affecting the Usage Behaviour of users in a technological environment. The findings show that academics in Zimbabwe operate within an unfavourable environment as they face a lot of barriers in their quest to adopt and use peer reviewed electronic journals. These barriers include inadequate infrastructure to support access to electronic journals, inefficient and slow speed of Internet connection, lack of skills to negotiate the electronic journals environment, lack of library support in the use of electronic journals, unfriendly library website interfaces, difficult electronic journal interfaces, failure to download full-text articles, challenges with off-campus access, lack of printers to print research findings, and challenges with back issues.

The majority of academics in Zimbabwe (53.4%) were not happy with the infrastructural investments their institutions had made to enable access to electronic journals. About 89.1% of academics considered the issue of infrastructure as a barrier in their efforts to use electronic journals. Only 32.1% of academics indicated having full time access to computers to use in accessing the electronic resources whereas 45.6% depended on shared access while 22.3% indicated having serious problems accessing machines. Professional librarians interviewed particularly at NUST and BUSE complained of lack of infrastructure to support adoption and use

of peer reviewed electronic journals. The infrastructural situation in Zimbabwe mirrors the story of most African institutions. Several African scholars agree that one of the major hindrances to the adoption and use of electronic journals on the continent is the lack of infrastructure in African institutions. Harle (2010) notes that while the advent of electronic journals came as a blessing to the continent for it meant African scholars could access rich resources stored in developed world servers, the move came with its challenges. All of a sudden institutions needed to upgrade their ICT facilities and infrastructure that includes core technologies such as computers, telecommunications technologies such as printers, copiers, and scanners. This was a major challenge owing to financial constraints most African academic institutions face. Most of the necessary upgrades were never made in most institutions across the continent and necessary equipment is hard to come by. Researchers such as Watts and Ibegbulam (2006) and Manda (2008) agree that African institutions have largely been affected by inadequate infrastructure and the absence of basic facilities required to access electronic resources effectively and efficiently. They blamed this on the poverty that strangles the aspirations of the continent in general and academic institutions in particular.

Lack of funding is a hindrance to technological ambitions of institutions in Africa in general and Zimbabwe in particular. Watts and Ibegbulam (2006) examined the barriers to usage of electronic journals at the College of Medicine of the University of Nigeria and came to a conclusion that lack of funding had undermined technological infrastructure at the institution and impeded access and use of electronic journals. Shija (2009) came to the same conclusion in a study of Tanzanian academic institutions. Owolabi and Agboola (2010) found the same issue of lack of funding as negatively affecting efforts to adopt and use electronic journals in several Nigerian universities. Harle (2010) noted the same challenges in his study of east and southern African universities though he noted efforts were being made to improve the situation. What this shows in a nutshell is that Zimbabwe is in the same basket with fellow African countries when it comes to financial challenges that result in mediocre investments in ICT infrastructure and equipment. Apart from South Africa most African countries are constrained when it comes to ICT infrastructure and this will continue to be a major determinant of the rate of adoption and use of electronic journals on the continent (Harle, 2010). Whereas most institutions have made efforts to provide desktop computers to their academics (Shija, 2009) this was inadequate

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investment as unfettered access to electronic journals at work and at home requires far more than a desktop computer.

When the situation in Zimbabwe and in Africa is contrasted with what is obtaining in more developed continents of North America, Europe and Asia it becomes apparent that the scales are not even and academics from the African continent are working from a point of disadvantage. The major game changer is the issue of resources (Tenopir, 2003). These richer continents have more funding and can set up sophisticated infrastructure and equipment to support access and use of electronic journals. Bar-llan, Peritz and Wolman (2003) wrote about the adoption and use of electronic journals in Israel and pointed to large investments in infrastructure though at that time more than a decade ago more still needed to be done to make use of these resources smoother. Now African institutions are still struggling to match the standards set by Israeli universities a decade ago. Zainab, Huzaimah and Ang (2006) revealed large technological investments made in Malaysian universities in an effort to enable access to electronic journals. Voorbij and Ongering (2006) also noted technological investments made in institutions in Netherlands whereas Borrego et al. (2007) point to large infrastructural and technological investments in universities in Spain. Zhang, Ye and Liu (2010) spoke of efforts made in China. In all these cases these countries are well ahead of Zimbabwe and Africa in terms of investments to enable adoption and use of peer reviewed electronic journals.

Another factor that determines the adoption and use of peer reviewed electronic journals in Zimbabwe is the issue of efficiency and speed of Internet connection. This factor is closely related to the issue of infrastructure discussed above since the quality and speed of connection is dependent on the infrastructure and equipment available. About 51.8% of academics in the institutions studied in Zimbabwe expressed frustration with unreliable Internet connection with the majority of academics at NUST and BUSE expressing reservations about the quality of connection at their institutions. There was also an outcry over electricity cuts that affected use of electronic journals. These problems affect most academic institutions in Africa. Harle (2010) pinpointed the issues of low bandwidth and power supply as major challenges bedevilling institutions in Africa. Manda (2008) singled low bandwidth as a major challenge affecting downloading of articles from electronic journals in Tanzania with a claim that 69% of

institutions in the country depend on less than 1 megabyte per second of bandwidth. This claim by Manda (2008) is supported by Shija (2009) who found bandwidth sizes as low as 8 to 32 kilobytes per second in some institutions in Tanzania, far lower than 1 megabyte per second. These bandwidth sizes are very low and would even make the situation in Zimbabwe better since MSU boasts of 200 megabytes per second, NUST has 160 megabytes per second and BUSE has 32 megabytes per second. One has to note that the issue of bandwidth is relative, depending on the number of users. Except for MSU other institutions in Zimbabwe complained of low bandwidth though their sizes would seem much higher than the situation in Tanzania for example. This is because these institutions (NUST and BUSE) have many users who all scramble for the available bandwidth resulting in slow download speeds. Elsewhere in Africa researchers continue to isolate the issues of bandwidth, electricity challenges and unreliable connection as major drawbacks to the adoption and use of peer reviewed electronic journals (Dadzie, 2005; Watts and Ibegbulam, 2006; Ani and Ahiauzu, 2008; Harle, 2010; Owolabi and Agboola, 2010; Egberongbe, 2011; INASP, 2012). The challenge in Africa in general and Zimbabwe in particular remain that of poor funding of universities that result in poor infrastructural development and archaic equipment that cause unreliable Internet connections, poor funding affecting the size of bandwidth institutions can have access to, and general economic challenges in African countries that manifest themselves in energy challenges resulting in constant electricity cuts such as those experienced in Zimbabwe and several other African countries.

Outside Africa many researchers point to marked efforts to increase bandwidth resulting in high speed Internet and reliable connections. The issue of electricity cuts is generally unheard of and in rare cases where institutions may be cut there are always standby generators. This desirable state of affairs can be seen in studies by Smith (2003), Tenopir (2003), Tenopir, King and Bush (2004) and Tenopir et al. (2009) in the United States of America, Ibrahim (2004) in United Arab Emirates, Bevilacqua (2005) in Italy, and Kumar and Kumar (2010) in India. This again shows uneven scales with academics in Africa and Zimbabwe operating under difficult circumstances owing to the economic position of the continent.

The issue of skills to negotiate the electronic environment and make maximum use of electronic journals featured strongly in this study with 60.7% of academics expressing lack of confidence in their abilities. Researchers all over the world agree that skills in handling and negotiating the electronic journals environment are crucial in promoting use of these resources by targeted users (Ondari-Okemwa, 2000; INASP, 2005; Said, 2006; Upadhyay and Chakraborty, 2008; Shija, 2009; Harle, 2010; Spiro and Henry, 2010). Researchers like Borah et al. (2004) and Secker and Price (2004) bemoan the challenge of lack of skills by users and blamed it for low use of electronic journals in most institutions. Ondari-Okemwa (2004), Adomi (2005), Ashcroft and Watts (2005), Okiy (2005), and Oduwole and Sowale (2006) identified problems in the adoption and use of electronic journals in Nigeria. Chief among the problems identified was the lack of adequate ICT skills among academics. Manda (2008) carried out an extensive study of 23 institutions of higher education in Tanzania and in all these institutions of different sizes and disciplinary orientation it was found that there was an alarming lack of skills with only 41% of these institutions reported to have trained their users in the use of electronic resources. INASP (2011) found in a study of 7 institutions in Kenya that lack of training and lack of skills were prevalent and this impacted negatively on the adoption and use of electronic journals.

The issue of skills seems to be a cross cutting challenge for academics all over the world. Researchers in other parts of the world highlighted this as an area that needs attention if the use of electronic journals is to be maximised. Upadhyay and Chakraborty (2008) report that even though India is lauded for its great efforts in providing electronic journals and for making users aware of the these resources there are still some institutions that lack strong training regimes. Some institutions in India have as high as 62.5% of their academics not having gone through any formal training in the use of electronic journals. Researchers from China, Italy, United Arab Emirates, Israel, Malaysia, Netherlands, Spain, Greece, Pakistan, and United States of America all raised some concerns with the level of skills that their academics have (Monopoli et al., 2002; Bar-llan, Peritz and Wolman, 2003; Saeed et al., 2003; Zainab, Huzaimah and Ang, 2006; Borrego et al., 2007; Spiro and Henry, 2010; Zhang, Ye and Liu, 2010). Due to greater access to technology, however, academics from developed countries have a higher chance of being more technologically competent. But the challenge of academics' unwillingness to undergo formal training in the use of electronic journals and poor training strategies by university libraries means

that in general,academics continue to rely on less than optimum skills in their use of electronic journals (Brennan et al., 2002; Tyagi, 2012). Professional librarians in Zimbabwe complained of non-attendance to training by academics with most of them said to be claiming to be busy always and some simply uninterested. This problem was noted by researchers in the rest of the world. It seems academics look down upon librarians as trainers in the use of electronic journals. This affects their responsiveness to training and the seriousness with which they take it. This problem affects academics from both developed and developing countries.

Academics in Zimbabwe cited lack of support from their respective university libraries as one major hindrance to their adoption and use of peer reviewed electronic journals. About 52.4% of academics in the current study were not happy with the support they get from their libraries. Only 20.2% turned to library staff for help when they faced challenges in their use of electronic journals. This shows lack of confidence in the help they would get from library staff. Academics preferred to seek help from fellow colleagues (33.2%) and to struggle alone until they got it right (43%). Researchers agree that continuous library support is crucial in encouraging and enabling use of electronic journals (Bar-llan, Peritz and Wolman, 2003; Voorbij and Ongering, 2006; Kumar and Kumar, 2010). University libraries in most parts of the world have support measures for their electronic resources users that includes email, telephone help, office visits, and instant chat facilities (Nicholas, Huntington and Watkinson, 2005; Isah, 2010; INASP, 2011). According to professional librarians in Zimbabwe most of the support measures referred to above are also available to academics but judging from the feeling of academics themselves it seems there is a lack of communication between librarians and academics such that academics are not fully aware of the help they have at their disposal hence their failure to seek help from librarians when they are stuck. This problem was visibly manifest at NUST for example where librarians boasted of an instant chat facility which academics did not seem to be aware of. The effectiveness of some of these strategies that work through library websites depend on the popularity of the websites themselves (Brown, Lund and Walton, 2007; Negahban and Talawar, 2009). In Zimbabwe, as in other African institutions, academics do not yet seem to be loyal visitors to their university websites such that they miss on some support measures that are offered through this channel (Gikandi and Ndungu, 2011; INASP, 2011). In Europe and other developed continents the challenge of perceived lack of library support is still manifest through in smaller proportions than

in Africa (Nicholas, Huntington and Watkinson, 2005; Vasishta and Navivoti, 2011; Shahmohammadi, 2012). The reason academics in general feel not well supported by librarians is the general lack of trust between the two groups of professionals (Kortelainen, 2004) but due to general lack of resources in Africa academics on the continent feel more neglected than their counterparts in America, Europe, and Asia (Aina, 2004; Zainab, Huzaimah and Ang, 2006).

Academics in this study also felt that their institutions' library website interfaces and specific journals interfaces were not friendly. Less than half of academics (41.4%) felt their library website interfaces were either easy or very easy to work with whereas the rest felt the interfaces were unfriendly. This affects use of electronic journals in as much as it affects academics' propensity to seek help from facilities provided through websites such as instant chat facilities. A number of electronic journals use studies found a link between the easy navigation of a website and use of electronic journals (Lock, Cornell and Colling, 2001; Nelson, 2001; Stark, 2001; Wolf, 2001; Smith, 2003). These early studies are supported by later studies by researchers such as Negahban and Talawar (2009), Harle (2010) and INASP (2011). Studies in several institutions found that academics who felt that their library websites were friendly visited the sites more and subsequently used electronic journals more. Gargiulo et al. (2003) did a study in several Italian universities and found that the organisation of websites had a strong bearing on the use of electronic journals. Nicholas, Huntington and Watkinson (2005) conducted a study at the University College of London and found that those academics who felt the institution's website was well organised and those who could easily navigate the specific electronic journals used these resources more than those who felt otherwise. Upadhyay and Chakraborty (2008) studied adoption and use of electronic journals by academics at the University of Allalabad (2008) and found that the navigability and friendliness of a library website had a large influence on the use of electronic journals. Thanuskodi (2011) did a study at the University of Chennai (2011) and concluded that friendly and easily navigable websites and easy to use electronic databases inspired and encouraged use of electronic journals. In Africa, Gikandi and Ndungu (2011) did a study at Jomo Kenyatta University of Agriculture and Technology and found that academics were frustrated by the complicated websites and electronic journals interfaces. In the current study academics from NUST and BUSE mostly complained of difficult interfaces and subsequently used less of electronic journals. Academics at MSU, who were shown to appreciate

electronic journals better, also applauded the ease of navigability of their institution's library website. The importance of designing easy to use websites is therefore appreciated by academicsas they quest to find information in a simple, easy and friendly manner. Even for journal interfaces this study found out from academics and professional librarians that the most popular databases are Emerald Insight, AGORA, HINARI, and Ebsco Host. These databases are renowned for their friendliness and simplicity.

Academics in this study also complained of their failure to download full-text articles and issues to do with relevancy of some resources owing to the fact that they access electronic journals through a Consortium arrangement where more often than not compromises are necessary in the selection of resources so that all institutions are catered for. These problems resulted in another challenge, that of lack of involvement of academics in the selection of electronic journals. These problems were prevalent at NUST and BUSE since these institutions did not subscribe to additional resources apart from those they get through the ZULC arrangement. The situation at MSU was helped by the fact that the institution has made additional investments in the resources such that its resources are relevant to the disciplines it offers with most of the resources allowing full text access. Also the initiative by MSU to subscribe to more resources apart from those subscribed through the ZULC arrangement allows it to involve academics in the selection of electronic journals. But MSU is one of a few exceptional cases in Africa. The majority of African universities still depend on Consortium access and in turn have to do with the attendant challenges of failure to download full text articles in some cases, irrelevant materials, and lack of involvement of academics in selection of electronic resources (Manda, 2008; Gikandi and Ndungu, 2011).

Agaba, Kigongo-Bukenya and Nyumba (2004) reported that Makerere University in Uganda accessed electronic journals through a Consortium arrangement with other institutions of higher learning in the country and therefore had to accept resources that are favourable to all institutions. This meant it could not easily involve its own academics in selection of resources, had to accept resources that are not too relevant to its own needs, and had to do with abstracts and not full text articles for some resources since in a Consortium arrangement providers of electronic journals normally lock away some of their resources and only allow full access to

those resources covered under the Consortium agreement (INASP, 2011). Watts and Ibegbulam (2006) found a similar challenge at the University of Nigeria. Manda (2008) conducted a study of 23 institutions of higher learning in Tanzania and found that they all depended on Consortium access and were therefore open to Consortium access challenges already alluded to above. Harle (2010) studied the Chancellor College at the University of Malawi, University of Nairobi in Kenya, National University of Rwanda, and University of Dar es Salaam in Tanzania and stated that they all depended on Consortium access. They reeled under the same challenges that institutions relying on Consortium access face. Gikandi and Ndungu (2011) found the same challenges at Jomo Kenyatta University of Agriculture and Technology where electronic journals are accessed through Consortium arrangement.

Institutions in Africa have to depend on Consortium access and accept its attendant challenges due to lack of funding which prevents them from freely subscribing to resources of their choice on an individual institution basis. However, studies carried out in several North American, European, and Asian institutions show that they mostly depend on individual subscription as opposed to Consortium subscription (Smith, 2003; Tenopir, 2003; Nicholas, Huntington and Watkinson, 2005; Brown, Lund and Walton, 2007). The few institutions that depend on group arrangements have managed to negotiate comprehensive access packages owing to their strong financial backbone (Upadhyay and Chakraborty, 2008; Negahban and Talawar, 2009; Thanuskodi, 2011). The conditions facilitating the adoption and use of electronic journals differ according to financial muscle and those institutions in developing countries are in a disadvantaged state as they are forced into many compromises due to lack of funding. Institutions in Africa in most cases have to make a choice between having none of the resources and at least having those they can access through group arrangements although the selection of resources in group arrangements come with a lot of compromises and resulting problems and challenges.

Academics in this study also complained of the challenges they face in accessing electronic journals off-campus, lack of printers to print their research findings, and challenges with back issues. About 68.9% of academics in the current study considered the challenges they face with off-campus access of electronic journals as either minor or major barriers to their adoption and

use of these resources while only 31.1% indicated this was not a barrier. As high as 85.5% of academics in Zimbabwe expressed their desire to have printers in their offices so they could print their research findings since they were not comfortable reading too much material on the screen. They bemoaned the lack of printers and cited this as a barrier in their adoption and use of electronic journals. About 64.2% of academics in the current study were concerned about failure to access back issues of electronic journals if their universities stopped subscription to those particular electronic journals or if publication of the same is discontinued. These challenges of off-campus access, lack of printers, and concerns with permanency of electronic journals are highlighted in literature. The challenges of off-campus access and lack of printers are mostly present in African institutions due to funding problems whereas the concern with permanency of electronic journals is a universal fear for academics in institutions all over the world.

Off-campus access requires institutions to enable remote access to the resources without the need for passwords as users cannot remember passwords for all databases. Off-campus access also requires users to have Internet access wherever they would be accessing those resources from. It is also crucial to have well managed support systems to help users having problems accessing electronic resources off-campus. These conditions for off-campus access are rarely met in Africa due to economic constraints (Harle, 2010; Gikandi and Ndungu, 2011). A number of institutions in Africa have still not acquired software that enables users to log in once and bypass the need for passwords (Egberongbe, 2011). Academics in Africa also struggle to pay for Internet access from their own resources and mostly prefer accessing these resources within their institutions since it would be 'free' for them (Isah, 2010). Institutions in Africa do not afford to pay for academics' access to the Internet off-campus. Negahban and Talawar (2009) did a study at 7 Iranian universities: Ran University, Shiraz University, Ahvaz University, Karman University, Esfahan University, Tehran University, and Mashad University, and discovered that academics were provided with free Internet connections at their residences by their universities. This allowed them to access electronic journals at home without incurring any personal costs. Such privileges still seem far off in most African institutions in general and Zimbabwean universities in particular and this affects the adoption and use of electronic journals. Also the level of technological investment and support that is needed to keep off-campus access working smoothly is yet to be achieved in most African institutions (Shija, 2009). In richer countries

academic institutions can better support off-campus access thereby encouraging use of electronic journals from wherever academics would be.

The issue of lack of printers also affect academics in Africa more than those from richer countries due to lack of resources. Academics resent reading long articles on screen and would rather prefer printing (McKnight, 2000; Nelson, 2001; Brennan et al., 2002; Isah, 2010; Thanuskodi, 2011). The challenge in African institutions is lack of funding to enable acquisition of printing facilities for every academic (Oduwole and Sowale, 2006; Said, 2006). Academics from richer institutions have better access to printing facilities such that those academics that dislike reading from the screen can still use electronic journals but have the choice of printing their research findings.

The other challenge of concerns with permanency of electronic journals is a universal challenge for all academics. Researchers such as Brennan et al. (2002), Friedlander (2008), and Massad, Brown and Tuckler (2011) have voiced their worry with the permanency of electronic journals. Some have even talked of an impending "Digital Katrina" that would span nearly all scholarly disciplines if the information infrastructure were to prove to be unable to sustain the trust scholars currently have in intellectual delivery systems. Challenges also have to do with the continued existence of publishers for in an electronic environment the continued existence of an electronic publication hinges on the continued operation of its provider. It is unlike with print journals which, if you receive a copy, even if the publishing house ceases to operate the next day one already has a copy as a permanent record. In the electronic environment libraries and researchers do not literally own the electronic journal, but they receive rights to access it. If the publisher who provides access goes out of business then access is likely to be lost. A further concern of researchers regarding the ownership versus access model is that while in the print environment one receives publications they have subscribed for, meaning that even if they fail to renew their subscription they will still continue to have access to journals they received while they were still subscribed, in the electronic environment there is a tendency to base access to journals on current subscription. This means that if one fails to renew their subscription they will not only lose access to the current journals but also to those journals they subscribed for. This, according to many commentators, is an injustice that is being perpetrated in the electronic

environment and because of such issues, some have preferred to treat print journals as "real" publications they can see, feel, touch, smell and control while they treat electronic journals as supplementary (Nelson, 2001; Massad, Brown and Tuckler, 2011).

This study also found that academics in Zimbabwe generally lack a culture of research with most of them still young and inexperienced in scholarly research matters. Researchers all over the world agree that adoption and use of peer reviewed electronic journals is dependent on the amount of research going on as these resources are mostly used by those engaged in research. More than 50% of academics surveyed in different studies pointed out that they use electronic resources mostly for research purposes (Nelson, 2001; Tenopir, 2003; Kortelainen, 2004; Bennett and Buhler, 2010; Cox and Cox, 2010; Tyagi, 2011; Vasishta and Navivoti, 2011). A survey conducted by Nelson (2001) at the University of West England, for example, revealed that those academics involved in research were more likely to use electronic journals. There is evidence that one of the greatest challenges of African academics is lack of research culture, an attribute that has had a negative effect on the use of electronic journals on the continent. Harle (2010) found in a study of universities in east and southern Africa that low levels of research output impacted negatively on the use of electronic journals. He discovered that African academics were not much engaged with scholarly research but tended to lean towards consultancy work. According to a Thomson Reuters report, the total annual research output of Africa stands at 27 000 papers per year. This figure, Harle notes, is insignificant and is equivalent to the output of one European country. The Netherlands alone for example, was found to be surpassing that output level. Researchers note that the African scenario is caused by several factors including lack of infrastructure, heavy teaching loads that take time off research, failure to attract research funding, failure to attend international conferences that motivate academics to continue on the research path, and just a general lack of research culture (Dadzie, 2005; Shija, 2009; Egberongbe, 2011; INASP, 2012). This state of affairs ensures that academics in Africa are not very much motivated to use electronic resources as they feel they do not have much to use them for. This is unlike in America, Europe, and Asia where research is done on a big scale with a lot of funding being availed for such purposes and researchers having to use electronic journals to achieve their goals.

In section 5.10 Structural Equation Modelling was used to test the conceptual model and to establish the best fitting model for the adoption and use of peer reviewed electronic journals in the Zimbabwean context. The Facilitating Conditions construct of the UTAUT was retained in the best fitting model established in Figure 12 of Chapter 5. This demonstrated that the adoption and use of peer reviewed electronic journals in Zimbabwe is still very much affected by barriers that militate against the use of these resources. To achieve an optimum level of adoption and use of electronic journals in Africa in general and Zimbabwe in particular, there is great need to work at reducing barriers to adoption and use.

6.6 Strategies Used by State Universities Libraries to Promote Use of Peer Reviewed Electronic Journals by Academics

The fifth and final research question of this study enquired about the strategies that are used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics. Promotion is recognised as one of the most pertinent factors leading to either the success or failure of electronic journals (Pullinger, 1999; Bevilacqua, 2005). A number of electronic journals use studies found a link between low use of electronic journals and an insufficient level of promotion (Lock, Cornell and Colling, 2001; Nelson, 2001; Stark, 2001; Wolf, 2001; Smith, 2003) hence the need to ascertain how Zimbabwean universities were doing on the promotion front. Researchers such as Aina (2004), Kortelainen (2004), Kumar and Kumar (2008), Upadhyay and Chakraborty (2008), Isah (2010), Vasishta and Navivoti (2011), and Shahmohammadi (2012) have called for aggressive measures of promoting electronic journals if these resources are to be used by academics and other kinds of users.

Results of this study show that state universities libraries use a cocktail of strategies to try and bring awareness to their peer reviewed electronic journals and encourage their use. The common strategies across the three universities studied are faculty board meetings, library committee meetings, leaflets, posters, banners, brochures, library workshops and seminars, emails, trainings through information literacy programmes, library websites, and Online Public Access Catalogues (OPACs). While NUST solely depends on the above mentioned strategies, BUSE and MSU have additional strategies. BUSE uses students to encourage academics to use the resources. They instituted rigorous awareness and training campaigns for students in the hope that this would put

pressure on the academics to also want to be conversant with these resources. BUSE also has a strong orientation regime for academics such that new academics are promptly introduced to electronic journals, that is absent at NUST. BUSE has also instituted some coercive strategies like making it mandatory for academics to include electronic journals in their Course Outlines and unilaterally stopping subscriptions to print journals as a way of pushing academics towards electronic journals. The MSU has gone further than its two sister institutions in its efforts to promote use of peer reviewed electronic journals. In addition to strategies already cited it also uses office visits, newsletters, library orientation, Facebook page, involvement of top administrators of the university like the Vice Chancellor, and tailor made strategies for different faculties. MSU is the only institution among the three universities that took part in this study that has a fully fledged marketing department within the Library. The department is responsible for carrying out research to determine the needs of users, recommend resources and services to meet users' needs, market library resources, and carry out evaluation programmes to establish the extent to which promotional strategies and programmes were meeting their objectives with a view to enable improvement of such strategies and programmes.

The strategies used by universities libraries in Zimbabwe to promote awareness and use of electronic journals are mostly similar to strategies used by other universities in Africa and beyond though universities outside Africa have slightly more options. In Africa, Manda (2008) did a survey of 23 Tanzanian universities and found that common promotional strategies were library orientation, posters, flyers, library training, library websites, and OPACs. These strategies are also used by universities in Zimbabwe though NUST was found wanting on library orientation. Harle (2010) found that leaflets, workshops, seminars, and events such as the electronic journals week were the strategies of choice at National University of Rwanda. The electronic journals week was not cited by state universities in Zimbabwe and this suggests that the strategy was either not used or was not common. Gikandi and Ndungu (2011) found that trainings, exhibitions, brochures, branded pens, use of social media, university website, workshops, and office visits were the dominant promotion strategies at Jomo Kenyatta University of Agriculture and Technology. Except for branded pens and in the case of NUST and BUSE, use of social media, these strategies cited by Gikandi and Ndungu are similar to strategies used in Zimbabwe. INASP (2011) did a study at Makerere University and found that notice

boards, emails, circulars from the Librarian, and faculty meetings were the most used strategies. Analysis of strategies used in Africa show that universities used almost the same tactics to promote electronic journals and in comparison to other African institutions, universities in Zimbabwe are doing well in terms of the strategies they use. This is particularly true in the case of MSU which clearly depends on a more robust cocktail of strategies to market its electronic resources.

When compared to strategies used by universities outside Africa the strategies that are used by universities in Zimbabwe fair well though these richer universities depend on more strategies owing to their financial muscle. Studies carried out at several institutions like Tilburg University (Roes, 1999), University of Southern California (Morse and Clintworth, 2000), University of Texas (Tenner and Young, 2000), Leeds Metropolitan University (Hewitson, 2002), University of Illinois (Brennan et al., 2002), Italian universities (Gargiulo et al., 2003), University of Hong Kong (Woo, 2005), University College of London (Nicholas, Huntington and Watkinson, 2005), Loughborough University (Brown, Lund and Walton, 2007), and University of Chennai (Thanuskodi, 2011) show that apart from all the strategies already cited for universities in Zimbabwe these institutions also make use of campus magazines, stickers on hard copy issues of journals to remind academics and other users of the existence of electronic journals, bulletins, electronic announcements boards, blogs, and "Rich Site Summary" or "Really Simple Syndication" (RSS feeds) to promote and market their electronic journals. The wider strategies used by these cited universities that are outside Africa could be indicative of the enhanced skills of their professional librarians, that they can manage many and different promotion strategies all at once, some of which require intimate use of technology. It could also be indicative of better funding of these universities, something which allows them to employ more strategies, most of which require money to institute. The promotion of electronic journals in most developed countries has also matured since these resources were first introduced there before they came to Africa. This means that the promotion strategies have evolved for a longer time in developed countries than in developing countries of the African continent where researchers such as Ondari-Okemwa (2004) and Shija (2009) have expressed concern that some universities have not yet developed clearly laid down strategies to market their electronic resources.

Whereas universities libraries in Zimbabwe are employing a variety of strategies to market their electronic resources and are comparing well with other universities in Africa this does not necessarily mean that those strategies are effectively used. It does not necessarily mean the strategies are bearing the desired results. For example, only 17.1% of academics at NUST were happy with electronic journals promotion efforts being made by their university library, meaning that as high as 82.9% were not impressed. There are several challenges that could be affecting electronic journals promotion efforts by universities in Zimbabwe. The first challenge is an over-reliance on broad based marketing approaches instead of personalised efforts that specifically address individual needs. This challenge was also voiced by academics in Kenya in studies carried out by Harle (2010) and INASP (2011). While broad based approaches are necessary to introduce and acquaint academics with electronic journals more intimate loyalty to the resources is created by personalised promotion strategies (Bhatt, 2006). It is, therefore, unfortunate that none of the universities in Zimbabwe cited using RSS feeds as a promotion and marketing strategy as is the case with most universities in developed countries that use such feeds. RSS feeds are capable of providing personalised updates to academics and other users based on the previous searches of the targeted user (Bhatt, 2006). If, for example, a user searched on a certain query in the near past, the RSS feeds would automatically notify the user of relevant electronic articles as and when they come out so that the user can add to his or her base of information to tackle the problem at hand. Such personalised treatment is what academics in Zimbabwe and in Africa are missing. However, if universities could become more personal in their promotion of electronic journals, the use of these resources would increase (Harle, 2010; INASP, 2011). Whereas the universities in Zimbabwe used email to promote electronic journals most of the use is not personalised. Except for MSU, which use email for personalised service the other institutions, NUST and BUSE, use email to send out broadcast messages. This is not good enough as academics prefer librarians who have specific knowledge of their needs and address those needs in a specific and individual manner (Kumar and Kumar, 2008). Also it was noted in the current study that except for MSU promotional efforts are not really targeted to specific faculties and disciplines. Librarians mostly use the same approaches for all academics instead of tailoring strategies to the needs of different categories of users as is recommended by researchers such as Nicholas, Huntington and Watkinson (2005), Woo (2005), Brown Lund and Walton (2007), and Thanuskodi (2011). This failure to promote electronic journals in a personalised way

may be affecting the receptiveness of these resources by academics therefore impacting negatively on their adoption and use.

The second challenge in the promotion of electronic journals in Zimbabwe if viewed in the light of what researchers, both in Africa and in developed countries say, is the fact that some avenues like library websites that librarians normally use for promotion purposes are not well visible to the intended beneficiaries. This study revealed that academics at NUST and BUSE do not visit their institutional websites that much as they accuse the sites of being unfriendly and difficult to navigate yet professional librarians from these institutions indicated that a lot of marketing efforts are offered via this channel. This means a lot of effort is being concentrated on a channel that is not usually accessed by the academics who are supposed to benefit from such marketing initiatives. This problem was highlighted by researchers both in and outside Africa. Harle (2010) argued that while websites were a crucial channel to promote electronic journals the effectiveness of this channel was compromised by lack of traffic to these sites. This lack of traffic, he blamed on poor websites that universities have that do not make it easier for academic users to locate and use electronic journals. Egberongbe (2011) shared the same sentiments and urged librarians to simplify their websites and market them so that they are visible to users. Outside Africa, Upadhyay and Chakraborty (2008) conducted a study at the University of Allalabad in India and discovered that though the list of electronic journals was provided on the university website, 65.62% of academics at the institution still depended on search engines to locate and access electronic journals. Further enquiry revealed that the university website was not well marketed and only a few academics knew of its existence and what it contained. Some of those who knew about the website indicated that they had stopped visiting it because it was difficult to navigate. Situations like this cast doubt on the strength of the website to promote electronic journals. A lot of effort is needed to make promotional channels like the website fruitful; it is not just a matter of uploading promotional material on the site. Challenges of library websites were also highlighted by other researchers such as Kumar and Kumar (2008), Isah (2010) and Shahmohammadi (2012). In Africa challenges of using the website for promotion are also magnified by Internet connection problems since this avenue requires that one be connected to the Internet. This does not necessarily disqualify the website as a proper promotion channel,

but it means that in institutions in Africa in general and Zimbabwe in particular librarians may have to work more than expected to get their information across to users.

The third challenge that researchers all over the world agree on is the resistance by academics to attend contact sessions such as training sessions, workshops, and seminars (Aina, 2004; Kortelainen, 2004; Vasishta and Navivoti, 2011). Researchers agree that direct contact sessions are more effective in promoting awareness and use of electronic journals but the frustration is that academics normally do not attend these sessions when invited (Brown, Lund and Walton, 2007; Thanuskodi, 2011). This problem was also highlighted by professional librarians in the current study where they expressed their frustration at the non-attendance of academics when invited for contact sessions. Researchers such as Bevilacqua (2005) and Nicholas, Huntington and Watkinson (2005) argue that relations between academics and librarians have not always been positive. Academics look down upon librarians who in most cases will be having lesser academic qualifications. This feeling was expressed by Faculty Librarians who were interviewed in this study. They felt academics despised them and did not take their invitations for training seriously. Academics had to be forced by senior administrators such as the Vice Chancellor or respective Deans of Faculties to attend training seminars.

The fourth challenge highlighted in literature and also found in the current study is lack of evaluation of promotional programmes. Researchers argue that university libraries need to evaluate their promotional efforts to determine if they were meeting their intended objectives (Roes, 1999; Eason and Harker, 2000; Eason, Richardson and Yu, 2000; Bevis and Graham, 2003). In this study only MSU was found to be carrying out evaluations of their promotional programmes. Part of the reason why this state of affairs is obtaining is lack of staff with marketing skills in libraries. At MSU where they evaluate their promotional strategies and programmes they have a fully fledged Marketing Department that does this. This is not the case at NUST, BUSE and many other universities in and out of Africa (Thanuskodi, 2011). The result is institutions continue with strategies they are not sure of their effectiveness to the detriment of both intended beneficiaries and the institution itself.

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The fifth and final challenge is lack of involvement of top administrators in the promotion of electronic journals. In this study the problem was mostly visible at NUST whereas at BUSE and MSU top administrators like the Vice Chancellors were crucial in encouraging use of the resources through the forums they meet academics or their representatives such as Senate meetings. Researchers agree that users want encouragement from senior staff to appreciate the importance of an initiative (Tenopir, 2003; Woo, 2005). The UTAUT theory that underpinned this study has the Social Influence construct that speak of the influence of friends and senior staff in organisations on the behaviour of users towards an innovation. Users are mostly likely to adopt and use a technology if they feel senior staff in their organisations is supportive of their adoption and use of such technology and to do this senior staff have to be seen encouraging such use. Morse and Clintworth (2000), Hewitson (2002), and Gargiulo et al. (2003) speak of the role senior staff played in America and Europe to get academics to join the electronic journals bandwagon. This level of support has only been forthcoming in a few universities in Africa (Harle, 2010). The reason could be that senior administrators in Africa feel disconnected from library activities. However, since they are all working to build strong universities with commendable academic records it would not hurt if they took a bit of time from their busy schedules to encourage use of electronic journals in relevant meetings they do with academics.

6.7   Summary

The chapter discussed the findings of the study that were presented in Chapter 5, interpreting them in the context of previous researches that were done in and outside Africa. Comparisons were made to identify similarities and differences between the current study and previous studies and reasons were advanced to explain differences. The discussion revealed that academics at the selected Zimbabwean State Universities had a high general awareness of the existence of peer reviewed electronic journals surpassing that of most African institutions and comparing favourably with academics in developed world institutions. However, many academics in Zimbabwe did not have intimate knowledge of the resources as their counterparts in developed world institutions. This lack of intimate knowledge of electronic journals was identified as a major drawback to the use of these resources. It was shown that adoption of electronic journals by academics in Zimbabwe was high, much higher than most African institutions but still lagging behind institutions in the developed world. The level of use was established to be low as

measured by number of articles consulted per week, frequency of use, and what academics consider as their major source of information. Academics in Zimbabwe, like most academics in Africa, are generally slow users of electronic journals and are still a long way to match usage standards established by academics in developed world institutions. The discussion on attitudes and perceptions of electronic journals towards peer reviewed electronic journals revealed that attitudes and perceptions improve with the passage of time and were now in positive mode for academics in Zimbabwe surpassing many African institutions and comparing favourably with developed world institutions. Academics from science related disciplines were shown to appreciate electronic journals more in Zimbabwe and beyond whereas age was also proved by the current study and previous studies to be a crucial factor in shaping the attitudes and perceptions of academics towards electronic journals. The adoption and use of peer reviewed electronic journals is still affected by barriers that militate against the use of these resources. The barriers identified included: inadequate infrastructure to support access to electronic journals, inefficient and slow speed of Internet connection, lack of skills to negotiate the electronic journals environment, lack of library support in the use of electronic journals, unfriendly library website interfaces, difficult electronic journal interfaces, failure to download full-text articles, challenges with off-campus access, lack of printers to print research findings, challenges with back issues, and lack of research culture. Institutions in North America, Europe, and some parts of Asia and the Middle East were shown to have successfully addressed these barriers and are enjoying more usage for their electronic journals than institutions in Africa in general and Zimbabwe in particular. The strategies that are used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics compare favourably with other universities on the continent but fall behind institutions in developed countries. It was noted that having many strategies does not necessarily mean promotion is effective and a lot has to be done to ensure that the strategies in use are used effectively and efficiently to bear the desired results.

CHAPTER 7

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

The chapter provides a summary of the findings of this research work and details the conclusions and recommendations of the study. The researcher begins by reiterating the purpose and research questions of the study before summarising each of the preceding chapters of this work. The researcher summarises the findings and highlights the conclusions and recommendations of the study. The chapter proceeds to discuss the originality of this study and its contribution to policy, practice and theory. To conlude, the researcher outlines the research directions.

7.2 Purpose of the Study and Research Questions

The purpose of the study was to investigate the adoption and use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities. Despite several efforts that were being made by individual university libraries in Zimbabwe to enhance access to peer reviewed electronic journals, the use of such journals among academics was minimal (INASP, 2006; Harle, 2010). By doing this study the researcher was able to understand the extent of the problem of non or low use of these resources by academics in Zimbabwe. Besides helping to understand the existing problem, the study unearthed the critical issues that affect adoption and use of electronic journals in Zimbabwe. If the problem was left unattended universities and other funding agencies would continue to invest money into resources that are not used and for which the dynamics affecting their adoption and use are not understood. A culture of indifference to electronic journals would be entrenched and perpetuated in universities in Zimbabwe. This would affect academics' own research interests apart from negatively affecting the quality of teaching and learning in universities in Zimbabwe. The study, therefore, intervened into an existing problem. To enable deeper understanding of the problem and subsequently address it the study posed the following research questions:

1. What is the level of awareness of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?

2. What is the extent of use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities?

3. What are the attitudes and perceptions of academics towards peer reviewed electronic journals?

4. What factors influence the behaviour of academics at selected Zimbabwean State Universities towards peer reviewed electronic journals?

5. What strategies are used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics?

7.3   Summary of Chapters

Chapter 1 was introductory in nature and set the tone for the succeeding chapters. It provided the background of the study defining the concept of "electronic journals" and explaining their emergence in academia in general and in Zimbabwean State Universities in particular. The chapter went on to isolate the research problem, that of low use of electronic journals by academics despite concerted efforts to invest in these resources by universities libraries in the country. Consequences of non attendance to this problem were given. The chapter also outlined the purpose, objectives, research questions, delimitation, significance, theoretical framework, and methodology of the study.

Chapter 2 (Theoretical Framework) discussed the role of theory in research and reviewed the following technology adoption and use theories: Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), Technology Acceptance Model (TAM), and Diffusion of Innovation (DOI). The strength and weaknesses of these theories were highlighted as given by several researchers (Botha and Atkins, 2005; Miller and Khera, 2007; Ratten and Ratten, 2007; Al-Quesi, 2009). The researcher isolated the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by four scholars: Viswanath Venkatesh, Michael G. Morris, Gordon B. Davis, and Fred D. Davis (Venkatesh et al., 2003) as the theory of choice for this study. The UTAUT combined the force of eight technology adoption and use models to overcome weaknesses inherent in each of them if used in isolation. The eight models are:

- Theory of Reasoned Action (TRA);
- Theory of Planned Behaviour (TPB);

- Technology Acceptance Model (TAM);

- Diffusion of Innovation (DOI);

- Social Cognitive Theory (SCT);

- Motivational Model (MM);

- Model of Personal Computer Utilisation (MPCU); and,

- Combined Theory of Planned Behaviour/Technology Acceptance Model (TPB/TAM).

The suitability of the UTAUT to this study was discussed and its constructs were applied to the research questions of the study. The chapter ended with a proposal of an additional moderator, *discipline*, to the UTAUT. This, to improve the power of the theory in explaining adoption and use of peer reviewed electronic journals in the Zimbabwean context.

Chapter 3 (Literature Review) gave a critical examination, evaluation, analysis, and synthesis of literature addressing the research problem, research questions, and constructs of the UTAUT. Literature was gleaned from refereed international and national journals, chapters in edited books, conference papers, workshop and seminar presentations, PhD dissertations and Masters Degree thesis, websites and articles in non-referred journals. The review found that the adoption and use of electronic journals was universal but challenges of low usage afflict institutions in Africa. Reasons for low use includes lack of awareness of the resources, lack of training in the use of the resources, lack of adequate ICT infrastructure, lack of research culture, and password challenges. The review found that in order to promote usage, university libraries need concrete strategies to market their electronic resources while minimising barriers to use.

Chapter 4 (Research Methodology) presented and justified methodological choices for the study. The chapter dealt with research paradigm, research approach, research design, population of the study, sampling, data collection instruments, reliability and validity of research instruments, ethical considerations and data analysis issues. The study was constructed on both the positivist and interpretivist paradigms and adopted both the quantitative and qualitative approaches. The survey design was adopted for the study and the population consisted of 794 academics from three state universities in Zimbabwe: National University of Science and Technology (NUST), Bindura University of Science Education (BUSE), and Midlands State University (MSU). The

population also included 24 professional librarians from the same universities. The sample of the study was 363 for academics whereas all the professional librarians were considered for the study. Data were collected by questionnaires from academics and interviews from professional librarians. To enhance the reliability and validity of the main data collection tool of the study, the questionnaire, the researcher adapted questionnaires that were successfully used to investigate adoption and use of electronic resources in several universities in Africa (Manda, 2008; Mergesa and Mammo, 2008). In terms of data collection from professional librarians the researcher personally conducted interviews so he could ask relevant follow up questions. All interviews were recorded with permission from interviewees. In terms of ethics the researcher got permission from the three universities involved and proof of authority to conduct research are given in Appendices 8, 9, and 10. The study also got ethical clearance from the University of KwaZulu-Natal (UKZN) (Appendix 11). Also, all participants participated on a voluntary basis. Quantitative data were analysed using the Statistical Package for Social Sciences (SPSS) and qualitative data were processed using the Nvivo package.

Chapter 5 presented, analysed, and interpreted data addressing the research questions of the study. The findings from quantitative and qualitative data were integrated and presented thematically emanating from the research questions of the study and constructs of the UTAUT. Results to the first research question show that while the majority of academics at the three universities were aware of the existence of peer reviewed electronic journals in their institutions they did not have intimate knowledge and awareness of the resources. Findings to the second research question demonstrated that while the majority of academics at the selected Zimbabwean State Universities have adopted electronic journals their level of use is low as measured by the number of articles consulted per week, frequency of use of these resources, and the major source of information for academics. Academics from MSU, however, were shown to use electronic journals more than their peers from NUST and BUSE. Results for the third research question that enquired about the attitudes and perceptions of academics towards peer reviewed electronic journals show that attitudes and perceptions were generally on the positive side with many academics regarding the resources as important for their work. Findings to the fourth research question that enquired about the factors that influence the behaviour of academics towards peer reviewed electronic journals results show that academics in Zimbabwe are affected by many

barriers that frustrate their use of electronic journals. In respect of the fifth research question that enquired about strategies used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics results show that libraries use a cocktail of strategies to promote use of electronic journals. The success of these strategies, however, differs from institution to institution. Tests carried out to determine the significance of the UTAUT model in explaining adoption and use of peer reviewed electronic journals show that the model is significant in explaining usage behaviour in the Zimbabwean context and further identifies that *discipline* has influence on how academics use electronic journals. SEM tests further show that Performance Expectancy and Facilitating Conditions were the most crucial determinants of adoption and use of peer reviewed electronic journals in Zimbabwe.

Chapter 6 discussed the findings of the study that were presented in Chapter 5, interpreting them in the context of previous researches that were done in and outside Africa. Similarities and differences between the current study and previous studies were identified and reasons given to explain differences. In general, academics in Zimbabwe were better than academics in other parts of Africain terms of general level of awareness. However, like other African academics, they struggled when it came to in-depth awareness and knowledge of the resources. Academics in Zimbabwe were found to have adopted electronic journals more than academics in other parts of Africabut still posted low usage especially if considered against academics in North America, Europe, and parts of Asia and the Middle East. The attitudes and perceptions of academics were found to compare favourably with those of academics in and out of Africa though it was noted that the issue of barriers militated heavily against the adoption and use of electronic journals. In terms of promotion the discussion revealed that universities in Zimbabwe compared favourably with other African institutions but were still behind the promotion efforts of developed institutions.

7.4   Summary of Findings

The main findings of the study are summarised below, organised according to research questions. The first research question of this study sought to establish the level of awareness of peer reviewed electronic journals by academics at selected Zimbabwean State Universities. This awareness was considered at two levels. The first was the general level of awareness which

simply established the proportion or percentage of academics that were aware of the existence of electronic journals in their institutions. The second aspect of awareness considered the extent or quality of awareness of peer reviewed electronic journals by those academics who were aware of their existence. Findings for the first aspect of this research question show that out of the 212 academics who participated in the study from the three institutions 204 (96.2%) were aware of the existence of electronic journals whereas 8 (3.8%) were not aware. When considered per university MSU had the highest percentage of general awareness with all 81 academics who took part in this study from the institution reporting awareness. This translates to 100% general awareness for the institution. The Sub-Librarian for Reader Services and all Faculty Librarians at this institution indicated that as part of induction all new academics at the institution are referred to the university library where they are introduced to library resources including electronic journals. They noted that as a matter of policy there is no academic who starts work in any university department before they visit all induction points, of which the university library is one key point they visit. According to them, this has ensured that all academics at the institution, whether old or new, are aware of electronic journals offered by the institution.

Out of the 49 academics that participated in this study from BUSE 48 (98%) were aware of electronic journals. The Sub-Librarian and Faculty Librarians at BUSE all indicated they had mechanisms to market electronic journals to academics at the point of entry, that is, soon after being hired. In addition to orientation at point of entry and other promotion strategies that are used to enhance general awareness of electronic journals at the institution professional librarians at BUSE also indicated that by a resolution of the University's Senate after strong lobbying from the Library it was mandatory for Course Outlines to include electronic journals as references or reading lists. This was cited as one of the major causes of the high general awareness at the institution as academics had to be aware of the resources in order to find something to include in the Course Outlines.

Out of 82 academics who participated in this study from NUST 75 (91.5%) were aware of electronic journals while 7 (8.5%) were not aware. Four of the 6 faculties at NUST had at least one academic who was not aware of the existence of electronic journals at their institution. The Faculty of Built Environment had 2 academics that were unaware of electronic journals out of

the 6 academics that participated in the study from that Faculty. The Faculty of Commerce had 3 academics that were unaware out of the faculty total of 23 that participated in the study. The Faculty of Communication and Information Science had one academic who was unaware out of the 13 that participated and the Faculty of Industrial Technology also had one unaware member out of 14 that participated. This means only the Faculties of Medicine and Applied Sciences had full general awareness of electronic journals at NUST. Unlike the MSU and BUSE there were no mechanisms to harness new academics at NUST and introduce them to electronic journals. Orientation, according to professional librarians at the institution, was poor and inconsistent with the problem precipitated by poor communication between Faculties and the Library.

When findings for general awareness were considered by experience it was discovered that those academics with 5 years experience and below had 95.5% of their members being aware of electronic journals. Those academics of 6-10 years experience had 97.6% of their members being aware of electronic journals whereas academics in the 11-20 years experience category had 100% general awareness while the over 21 years experience category had the least of their members being aware of electronic journals at 75%. In terms of gender 129 of the 135 male academics who participated in this study reported being aware of electronic journals. This represents a 95.6% general awareness level. In terms of female academics 75 of the 77 who took part in the study reported being aware of electronic journals to give a general awareness level of 97.4%. When general awareness was considered by the age categories of academics those academics aged 30 years and below had 96.3% of their members being aware of electronic journals. The 31-40 years age category had 96.8% general awareness, the 41-50 years age category had 98.4% general awareness, the 51-60 age category had 92% general awareness whereas the 61 years and above category had 50% of their members being aware of the existence of electronic journals.

In the second aspect of the first research question, that of quality of awareness, academics generally demonstrated a lack of in-depth awareness and knowledge of electronic journals. Out of 204 academics who had indicated that they were aware of electronic journals only 84 (41.2%) were able to mention at least 5 databases out of the required 10 while only 45 (22.1%) managed to mention at least 5 electronic journals. The findings also show that some academics confuse

databases for journals and vice versa. Collectively, academics were only aware of a few electronic databases with the rest remaining unknown. A lot of databases that are offered by these institutions were never mentioned at all. There were differences, however, in the quality of awareness depending on various factors. Academics at MSU were able to mention more databases and electronic journals than both NUST and BUSE. Academics in Science related disciplines managed to mention more databases than those in other disciplines with the worst being those in the Arts. Younger academics managed to mention more databases than the older academics while gender did not seem to influence awareness of these resources.

The quality of awareness of electronic journals by academics was also ascertained by establishing how they normally access these resources because the way users search for information in electronic journals indicates their depth of knowledge of these resources. Those without intimate knowledge of the resources would prefer to search for information via general search engines such as Google or Google Scholar. Out of the 193 academics who reported using electronic journals 118 (61.1%) access the information in electronic journals via Google. This highlighted a glaring gap of knowledge. Only 39 academics (20.2%) search for information via the Host Database while 36 (18.7%) do a general search of their university library's website, also an indication of lack of intimacy with the resources. At total of 130 academics out of 193 who used electronic journals cited awareness as a barrier to their maximum use of electronic journals. Only 63 (32.6%) of those academics who use electronic journals indicated that awareness was not a barrier to their use of electronic journals. In a nutshell, the overall depth of awareness of electronic journals was on the low side as shown by statistics summarised above. This would suggest that while many academics were generally aware of the existence of electronic journals there remained challenges with the quality of that awareness.

The second research question of this study enquired about the extent of use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities. The question was addressed in two parts. The first part established the number or percentage of academics who use electronic journals, in other words, the 'adoption rate' and the second established the level of use of these resources by those academics who have adopted them as measured by the number of articles consulted per week, frequency of use of electronic journals, and the major sources of

information for academics. In a nutshell, the second research question of this study established **how many** academics have adopted electronic journals and **how much** use academics make of the resources.

The summary of findings now focuses on the first part of the second research question. This part deals with how many academics have adopted or use electronic journals. Of the 212 academics who responded to this study 193 (91%) indicated that they used electronic journals. Nineteen academics out of the 212 who responded to this study do not use electronic journals at all, constituting a 9% non-use. The reasons cited for non-use were varied. Eight academics indicated that they were not aware of electronic journals, 5 were frustrated by poor Internet connection at their institutions, 2 cited a total lack of skills to navigate the electronic environment, and 4 indicated that these resources were not necessary for their work. Of the 19 non-users NUST had the most at 13, BUSE had 5, and MSU had 1. Looking at it from a positive angle, NUST, had an 84.1% electronic journals adoption rate, BUSE had 89.8% while MSU had the highest at 98.8%.

When electronic journals adoption rates were considered by years of experience those academics of 21 years experience and above were found to be the least adopters at 75%. Those with experience of 5 years and below, 6-10 years, and 11-20 years had almost similar adoption rates at 91.9%, 90.1%, and 92.9%, respectively. Considered by age, adoption rates were found to decrease as age increased with rates of 100%, 92.6%, 90.7%, 80%, and 50% for age ranges of 30 years and below, 31-40 years, 41-50 years, 51-60 years, and 61 years and above respectively. Proportionally, more male academics use electronic journals than female academics though the difference was not significant enough to establish a statistical relationship. Out of 135 male academics who responded to the study 124 indicated that they used electronic journals translating into 91.9% adoption rate compared to female academics where out of 77, 69 reported having adopted the resources to five a rate of 89.6%.

The summary of the findings now turns to the second part of this research question that deals with how much academics use electronic journals. This was measured by three parameters: the number of articles consulted per week, frequency of use, and the major source of information for academics. The findings of this study show that on all three parameters cited above academics at

the selected Zimbabwean State Universities rank lowly in their use of electronic journals. The findings show that of the 193 academics who indicated that they use electronic journals 26 (13.5%) were very low users consulting less than 5 articles per week, 32 (16.6%) were low users consulting 5-10 articles per week, 86 (44.6%) were average users consulting 11-20 articles per week, 47 (24.3%) were high users consulting 21-30 articles per week, and only 2 (1%) were very high users consulting more than 30 articles per week. The combined percentage of very low to average user categories is 74.7% (13.5% + 16.6% + 44.6%). This leaves only 25.3% of academics in the two high end groups: the high users and the very high users. Findings were considered per institution. Most of the very low and low users came from NUST and BUSE while academics from MSU mostly fell in the average users' category. The findings revealed that academics from science oriented disciplines consult more articles per week than those from non science disciplines. When findings were considered by age, unlike results for adoption where rates were inversely related to age, younger academics were actually low users of electronic journals consulting very few articles per week. For example, 51.8% of academics of 30 years and below fell into the two low end users categories of very low users and low users whereas 28.7% of those aged 31-40 years fell in the same categories. In the 41-50 years category 24.2% of academics fell into the very low users and low users categories. About 25% of those aged 51-60 years also fell in the same categories. It seems that as their age increased, academics tend to become more serious users of electronic journals although in terms of numbers more of the younger generation use (or have adopted) electronic journals. It was, however, found that younger academics depended on a wider array of electronic journals than the older academics that were loyal to fewer resources. When the findings were considered by gender it was established that female academics consulted more articles per week than male academics though more of the male academics use electronic journals than female academics as has been highlighted earlier.

As high as 15.1% of academics who use electronic journals in Zimbabwean State Universities use these resources very infrequently. About 3.6% of academics use the resources once a month and 23.3% once a week. Only 11.9% use electronic journals on an almost daily basis whereas 46.1% use them several times a week. About 63.8% of academics at MSU used electronic journals either almost daily or several times a week whereas less than half of academics at NUST

(48%) and BUSE (43.2%) use electronic journals with the same frequency. When findings were assessed by discipline it was established that academics in science related disciplines used electronic journals more frequently than those in disciplines such as Commerce, Arts, Social Sciences, Law, and Humanities. The findings also showed that frequency of use increased with age thereby buttressing findings already established that young academics were not serious users of electronic journals.

Turning to the major source of information for academics in Zimbabwean State Universities, the findings established that print resources comprising of print books and print journals still dominate the academic landscape of Zimbabwe with 50.9% (41.5% for print books + 9.4% for print journals) of academics mentioning these resources as their major source of information. Electronic resources comprising electronic journals and electronic books were in the minority at 49.1%. About 45.7% of academics at MSU regard electronic journals as their major source of information whereas the corresponding percentages for NUST and BUSE were 39% and 34.7% respectively. The findings also revealed that the major UTAUT drivers of adoption and use of peer reviewed electronic journals by academics at the selected Zimbabwean State Universities are the two constructs of Performance Expectancy and Facilitating Conditions.

The third research question of this study sought to assess the attitudes and perceptions of academics towards peer reviewed electronic journals. The majority of the academics had positive attitudes and good perceptions of peer reviewed electronic journals. About 64.8% of them regarded electronic journals as either important or very important for their work. Most academics (66%) thought electronic journals were useful for the tasks they had to carry out as academics while 87% considered the resources indispensable in academic work. About 76.5% of academics considered electronic journals to be either of high or very high quality, thus showing their confidence in the resources. The most valued features of electronic journals, which academics ranked as very important, were convenience (49.7%), timeliness of information (53.9%), simultaneous access to information (54.9%), ability to send search results to one's email (50.3%), hyperlinks to other relevant articles (48.7%), ability to print research findings (54.9%), accessibility from office or home (53.4%), access to full text (53.4%), and 24 hour access (53.4%). Findings also established that academics from science related disciplines appreciated

electronic journals more than their counterparts in non-science disciplines. The study confirmed that age was a factor in academics' attitudes towards electronic journals. Academics aged 50 years and below almost uniformly held electronic journals in high esteem whereas those beyond 50 years did not consider electronic journals as important for their work. Although the majority of academics showed positive attitudes and perceptions towards electronic journals the dissenting voices could not be ignored. About 35.2% of academics did not consider electronic journals as either important or very important. About 24.9% of complained of getting irrelevant results when they search electronic journals and 23.5% thought electronic journals were of poor quality. Part of the reasons for these dissenting voices could be the barriers that militate against smooth use of these resources.

The fourth research question of this study sought to establish the factors that influence the behaviour of academics towards peer reviewed electronic journals. The findings show that academics operated within an unfavourable environment as they faced a lot of barriers in their quest to adopt and use peer reviewed electronic journals. About 53.4% of them were unhappy with infrastructural investments their institutions had made to enable access to electronic journals and 89.1% considered the issue of infrastructure as a barrier to their use of electronic journals. Only 32.1% of academics indicated that they had open access to computers, 45.6% depended on shared access, and 22.3% indicated having serious problems accessing machines. About 51.8% expressed frustration with unreliable Internet connection. The majority of the frustrated academics were from NUST and BUSE. About 63.2% of academics complained of slow download speeds owing to low bandwidth whereas there was also an outcry over electricity cuts that affected use of electronic journals. About 60.7% expressed lack of confidence in their abilities to negotiate the electronic environment and make maximum use of electronic journals. Academics aged 51 years and above were especially ill equipped to use electronic journals with 70% of them indicating lack of skills. Those in non-science disciplines also complained bitterly of lack of skills. Academics also cited lack of support from their respective universities libraries as one major hindrance to their adoption and use of peer reviewed electronic journals. About 52.4% of academics were not happy with the support they get from their libraries. In a show of lack of confidence in library staff and the support that they offer only 20.2% of academics turned to librarians for help when they faced challenges in their use of electronic journals. Academics

also felt that their institutions' library website interfaces and specific journals interfaces were not friendly. Less than half of them (41.4%) felt their library website interfaces were either easy or very easy to work with whereas the rest felt the interfaces were unfriendly.

Academics in Zimbabwe also complained of their failure to download full-text articles and issues to do with relevancy of some resources owing to the fact that they access electronic journals through a Consortium arrangement where more often than not compromises are necessary in the selection of resources so that all institutions are catered for. The Consortium arrangement also resulted in a lack of involvement of academics in the selection of electronic journals. These problems were prevalent at NUST and BUSE since these institutions did not subscribe to additional resources apart from those they get through the ZULC arrangement. Academics also complained of the challenges that they faced in accessing electronic journals off-campus, lack of printers to print their research findings, and challenges with back issues. About 68.9% of them considered the challenges they face with off-campus access of electronic journals as barriers to their use of these resources while only 31.1% indicated this was not a barrier. About 85.5% of academics expressed their desire to have printers in their offices so they could print their research findings since they were not comfortable reading too much material on the screen. They bemoaned the lack of printers and cited this as a barrier in their use of electronic journals. About 64.2% of academics were concerned about failure to access back issues of electronic journals if their universities stopped subscription to those particular electronic journals or if publication of the same was discontinued. The study also found that academics generally lack a culture of research with most of them still young and inexperienced in scholarly research matters. This affected use of electronic journals as these resources are mostly used by researchers.

The fifth and final research question of this study enquired about the strategies that are used by state universities libraries in Zimbabwe to promote use of peer reviewed electronic journals by academics. The findings show that state universities libraries used a cocktail of strategies to try and bring awareness to their peer reviewed electronic journals and encourage their use. The common strategies across the three universities studied are Faculty board meetings, Library committee meetings, leaflets, posters, banners, brochures, library workshops and seminars, emails, trainings through information literacy programmes, library websites, and Online Public

Access Catalogues (OPACs). While NUST solely depends on the above mentioned strategies, BUSE and MSU have additional strategies. BUSE uses students to bait academics to use the resources. They instituted rigorous awareness and training campaigns for students in the hope that this would put pressure on the academics to also want to be conversant with these resources. BUSE also has a strong orientation regime for academics such that new academics are promptly introduced to electronic journals, something that lacked at NUST. BUSE has also instituted some coercive strategies like making it mandatory for academics to include electronic journals in their Course Outlines and unilaterally stopping subscriptions to print journals as a way of pushing academics towards electronic journals. The MSU has gone further than other local institutions in its efforts to promote use of peer reviewed electronic journals. In addition to strategies already cited it also uses office visits, newsletters, library orientation, Facebook page, involvement of top administrators of the university like the Vice Chancellor, and tailor made strategies for different faculties. MSU is the only institution among the three universities that took part in this study that has a fully fledged marketing department within the Library. The department is responsible for carrying out research to determine the needs of users, recommend resources and services to meet users' needs, market library resources, and carry out evaluation programmes to establish the extent to which promotional strategies and programmes were meeting their objectives with a view to enable improvement of such strategies and programmes.

There are several challenges that could be undermining electronic journals promotion efforts by universities in Zimbabwe. The first challenge is an over-reliance on broad based marketing approaches instead of personalised efforts that specifically address individual needs. The second challenge is that institutional websites that universities libraries in Zimbabwe normally use for promotion purposes are not visible to the intended beneficiaries. The study revealed that academics at NUST and BUSE do not visit their institutional websites that much as they accuse the sites of being unfriendly and difficult to navigate yet professional librarians from these institutions indicated that a lot of marketing efforts are offered via this channel. The third challenge is the resistance by academics to attend contact sessions such as training sessions, workshops, and seminars. Professional librarians expressed their frustration at the non attendance of academics when invited for contact sessions. They reported that in some cases academics had to be forced by senior administrators such as the Vice Chancellor or respective Deans of

Faculties to attend. The fourth challenge is lack of evaluation of promotional programmes. This afflicted NUST and BUSE as MSU had a Marketing Department in the Library that carried out this task. The fifth challenge is lack of involvement of top administrators in the promotion of electronic journals. In the current study this problem was mostly visible at NUST whereas at BUSE and MSU top administrators like the Vice Chancellors were crucial in encouraging use of the resources through the forums they meet academics or their representatives such as Senate meetings.

7.5 Conclusions

The following conclusions can be drawn from the findings of this study:

7.5.1 Level of awareness of peer reviewed electronic journals

The study concludes that the general level of awareness of electronic journals by academics at the selected Zimbabwean State Universities is high with little disparities emerging out of the UTAUT moderators of experience, age, discipline, and gender. The study also concludes that there are still disparities across institutions with NUST being the weakest. The efforts being made by state universities libraries in Zimbabwe to introduce academics to electronic journals have been largely successful though more efforts are needed for an institution like NUST. The study further notes that the high general awareness of electronic journals by academics did not translate into high quality awareness of the resources. Despite being generally aware of electronic journals academics in Zimbabwe still lack intimate and in-depth knowledge of the resources to enable them to benefit fully from them. Accordingly, it is concluded that the use of peer reviewed electronic journals by academics in Zimbabwe is still being negatively affected by poor quality awareness of these resources.

7.5.2 Extent of Use of Electronic Journals

The study concludes that the adoption rate of peer reviewed electronic journals by academics at the selected Zimbabwean State Universities in high. The researcher acknowledges the relationship between general awareness cited in section 7.5.1 and adoption as it appears that high level of general awareness is breeding ground for high adoption of electronic journals. The adoption rates still vary by institution with MSU being the highest adopter and NUST being the

least in this study. The researcher also observes that though not statistically significant the UTAUT moderators of experience, age, discipline, and gender drive the adoption of electronic journals.

The study further concludes that like the case of awareness above high adoption of peer reviewed electronic journals by academics in Zimbabwe did not translate into high usage of the resources. On the whole, academics in Zimbabwe are still low, lethargic, and poor users of electronic journals despite their high adoption rates. In addition to attitudes and perceptions, barriers to use, and promotion effects, the quality of awareness of electronic journals affects the level of use of these resources. It was observed that the highest adopters of electronic journals are not necessarily the heaviest users as reflected by the UTAUT moderators of age and gender in this study. The study noted that the experience and discipline moderators influence the heaviness of use of electronic journals and that the UTAUT constructs of Performance Expectancy and Facilitating Conditions determined usage more than the Effort Expectancy and Social Influence Constructs though the whole UTAUT was found to be significant in explaining adoption and use of peer reviewed electronic journals in the Zimbabwean context.

7.5.3   Attitudes and Perceptions of Academics Towards Peer Reviewed Electronic Journals

The study concludes that attitudes and perceptions of academics towards peer reviewed electronic journals are, on the whole, positive though there are efforts still needed to bring an uncomfortably high number of sceptical academics on board. The universities have successfully inculcated positive views of electronic journals in their academics but institutional differences are still evident. It is also noted that the many barriers to use that academics have to contend with in their use of electronic journals militate against the efforts universities are making to encourage positive views of these resources. It was alsoobserved that discipline and age have an effect on attitudes and perceptions of academics towards electronic journals.

7.5.4 Factors Influencing the Behaviour of Academics Towards Peer Reviewed Electronic Journals

The study concludes that whereas the majority of academics have adopted electronic journals their use of these resources and the attendant behaviour are greatly affected by the many barriers and other factors that they have to contend with. These include inadequate infrastructure to support access to electronic journals, inefficient and slow speed of Internet connection, lack of skills to negotiate the electronic journals environment, lack of library support in the use of electronic journals, unfriendly library website interfaces, difficult electronic journal interfaces, failure to download full-text articles, challenges with off-campus access, lack of printers to print research findings, challenges with back issues, and lack of research culture. These debilitating factors affect academics in different Zimbabwean institutions to different degrees with MSU academics in a better position than their counterparts at NUST and BUSE. On the whole, the universities in Zimbabwe have not yet done enough to eliminate the challenges that discourage usage of electronic journals.

7.5.5 Strategies Used by State Universities Libraries to Promote Use of Peer Reviewed Electronic Journals by Academics

The study concludes that state universities libraries use a cocktail of strategies to promote electronic journals to academics with the most common strategies across the three universities studied being faculty board meetings, library committee meetings, leaflets, posters, banners, brochures, library workshops and seminars, emails, trainings through information literacy programmes, library websites, and Online Public Access Catalogues (OPACs). The study notes that despite these promotional efforts and strategies there is still much room for improvement as there are many factors that militate against the effectiveness and efficiency of promotional efforts. The researcher notes that there are institutional differences in promotional efforts with MSU topping the list, followed by BUSE, and lastly NUST.

7.6 Recommendations

The study investigated the adoption and use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities. Factors that drive and determine such adoption and use were unearthed. Based on the findings and conclusions of this study the researcher now presents

recommendations aimed at improving policy, practice, and managerial decision making in matters pertaining to adoption and use of peer reviewed electronic journals.

In order to improve usage of electronic journals by academics in Zimbabwe it is important that the academics be made fully aware of these resources. University libraries should consistently employ strategies that successfully introduce academics to electronic journals. To this end, Faculty Librarians and Sub-Librarians should consider seeking the cooperation of Chairpersons of Departments and Deans of Faculties in harnessing new academics so that they are introduced to their institutional libraries during their induction period and be made aware of these resources. While this was already being implemented at BUSE and MSU the system was not working well at NUST. It is recommended, therefore, that all university libraries in Zimbabwe establish fluid and effective communication procedures between themselves and their respective academic faculties such that the libraries would be aware when new staff join and would quickly orient these in electronic journals. At the moment such communication is lacking especially at an institution like NUST. Researchers like Hynes and Stretches (2005), Saikia (2007), and Salaam and Aderibidge (2010) note that awareness and orientation should be a continuous effort as universities recruit new staff on a regular basis. The authors also note that to facilitate orientation there should be flawless communication between libraries and academic faculties.

Beyond orientation that brings general awareness to academics, university libraries should consider crafting strategies that increase the depth of knowledge of these resources by academics as it was found that in all the institutions that took part in this study the quality of awareness was poor. To this end, university libraries should review the specific information they are giving to their academics when they promote these resources to determine whether they are the right kind of information needed. This is because universities could be giving out wrong or inadequate information that may compromise the quality of awareness of electronic journals. All university libraries in Zimbabwe therefore should consider establishing departments or units that deal specifically with marketing of library resources as has been done at MSU. These units would work hand in hand with the rest of the library staff in promoting electronic journals and would be instrumental in carrying out evaluations of promotion efforts since Sub-Librarians and Faculty Librarians would not have time for these evaluation studies as they have other responsibilities.

This would mitigate one crucial finding of this study that universities in Zimbabwe generally do not evaluate their promotion efforts yet researchers like Smith (2003), Aina (2004), Bevilacqua (2005), Kumar and Kumar (2008), and Isah (2010) emphasise that electronic journals promotional efforts should be evaluated to determine their effectiveness so that in the case of negative results corrective action can be taken. Through this process the university libraries would be able to review their electronic journals promotion strategies and also review the information that they are sharing to ensure that they are meeting the real needs of the academics.

University libraries in Zimbabwe, through Sub-Librarians, Faculty Librarians, and Systems Librarians, should consider employing more personalised marketing and promotion strategies such as RSS feeds, targeted emails, and targeted office visits to augment the broad based strategies they are currently using. These targeted strategies are regarded by researchers such as Nicholas, Huntington and Watkinson (2005), Woo (2005), Brown Lund and Walton (2007), and Thanuskodi (2011) as highly effective in promoting in-depth awareness of electronic journals, encouraging use of the resources, and shaping positive attitudes and perceptions of the resources. Personalised strategies also makes it possible to target academics based on different UTAUT moderating factors such as age, discipline, gender, and experience. For example, this study found that academics with work experience of 21 years and above were the least aware of electronic journals as much as it found that academics aged 61 years and above were the least adopters of electronic journals. A targeted approach would make it possible to communicate separately to these special groups and bring them to the same level with other user groups. It also becomes possible to communicate separately to academics from non-science disciplines because the study has demonstrated that they are slow users of electronic journals. It would also be possible to communicate separately to the young academics so that they are not just high adopters of electronic journals but also become passionate users of the resources. Targeted strategies would instill a sense of importance in the different academics and would certainly shape positive attitudes and perceptions of the resources and improve usage. It would also be possible to get the concerns of the different categories of academics concerning these resources such that university libraries would be in a better position to attend to specific needs and grievances raised by academics.

University libraries should consider roping in the use of social media as recommended by INASP (2011) and Shahmohammadi (2012). Social media such as Facebook has been successfully used to promote and encourage use of electronic journals in developed countries (Nicholas, Huntington and Watkinson, 2005; Woo, 2005; Brown, Lund and Walton, 2007; Thanuskodi, 2011) and should work in Zimbabwe especially with young academics. Librarians, Sub-Librarians and Faculty Librarians should work hard to promote their websites to academics and Systems Librarians should consider making the websites more user friendly. This study found that many academics do not visit their institutional websites yet a lot of information about electronic journals is posted on these sites. It is, therefore, a waste that the most used avenue is not visible to the intended beneficiaries and university libraries should quickly address this. Researchers such as Kumar and Kumar (2008), Upadhyay and Chakraborty (2008), Harle (2010), and Egberongbe (2011) agree that university library websites are crucial tools in the promotion of electronic journals and that these sites have to be promoted themselves so that the content they carry is easily sold to the intended beneficiaries. University libraries in Zimbabwe should also follow the recommendations of seasoned researchers such as Tenopir (2003) and Woo (2005) to involve top university administrators in the promotion of electronic journals. It is understandable that these administrators such as Vice Chancellors are busy people but they can briefly talk about electronic journals in some of the fora they meet academics such as Senate meetings. MSU is already using this strategy and other universities in Zimbabwe should consider following this example. The UTAUT construct of Social Influence recognises promotional efforts by top administrators within organisations as crucial determinants in the adoption and use of technology.

University Librarians should consider revisiting the model they use to subscribe to peer reviewed electronic journals. In order to contain costs and reap the benefits of Consortium access state universities libraries currently subscribe to the same resources under the banner of ZULC. While this model has worked to enable subscription to electronic journals it has its challenges. These challenges include subscription to unwanted resources as a compromise to accommodate institutions that would benefit from those resources, failure to download full text articles when database providers lock away the prime resources, and non inclusion of academics in electronic journals subscription decisions. These challenges discourage usage and negatively affect the

attitudes and perceptions of academics towards these resources. It is important that university libraries maintain their Consortium arrangement however, they should negotiate with electronic journal providers such as INASP that within that arrangement and for the same Consortium fees each university be allowed to pick resources that are most relevant to its needs. The database providers would then impose a limit or maximum number of resources that each individual university can pick. An arrangement like this would ensure that though they are benefiting from the same Consortium the university libraries are not necessarily subscribing to the same resources. Each university would pick what is most relevant for its needs and leave out what is not relevant. This arrangement would ensure institutions pay for and get what is relevant for their needs. It also ensures that resources would mostly be full text and that academics can participate in the selection of relevant resources.

The Consortium model recommended is workable because it results in a win-win situation. Providers of electronic journal databases will not lose because they just avail to the Consortium the resources that they can choose from then establish the maximum resources each institution can subscribe to based on the amount the Consortium would have paid. But in doing so institutions are more flexible as to what they can choose for their subscriptions rather than being bound to resources they do not need just because sister institutions need those resources. This arrangement would insulate institutions from being charged for resources that are irrelevant to their areas of focus. Institutions should also sacrifice and be willing to pay a little more than their Consortium fees to get additional resources that are relevant to their needs. Researchers such as Smith (2003), Tenopir (2003), Nicholas, Huntington and Watkinson (2005), Brown, Lund and Walton (2007), Upadhyay and Chakraborty (2008), Negahban and Talawar (2009), and Thanuskodi (2011) note that one of the reasons why usage is high in developed countries is that their institutions mostly have relevant resources for their needs and it is important that universities in Zimbabwe explore all possible ways to subscribe to and maintain electronic journals that are relevant to their users.

Universities in Zimbabwe should work to eliminate all forms of barriers that militate against the use of peer reviewed electronic journals in the country. Creative solutions should be employed to deal with the scourge of lack of infrastructure and equipment. Every academic should be

afforded a computer to use in accessing the resources and not rely on shared access. Bandwidth size should be improved, printers should be acquired to support those academics that want to print their findings, and off-campus access should be enhanced. Admittedly, these issues require funding that universities in Zimbabwe are mostly starved of. However, creative solutions can be found. For a start, universities can lobby the government for import tax exemptions when they import crucial equipment such as that used to enable access to electronic journals. This will significantly reduce the cost of acquiring equipment and the cost of building an infrastructural base to support access to peer reviewed electronic journals. Universities can also court private sector help then negotiate with government to have the participating organisations enjoy tax rebates to the tune of the amounts they would have used to acquire equipment and other infrastructure for universities. University administrators need to consider reconfiguring their priorities and do budgets that are favourable to electronic journals access. It will not help universities in Zimbabwe to continuously mourn of lack of funding and fail to come up with creative solutions to their challenges.

The training for new academic hires should be made mandatory; it should form part of their contracts. The cooperation of Registrars, Deans of Faculties, and Chairpersons of Departments is important to achieve this. Sub-Librarians and Faculty Librarians should also consider making the training of academics in the use of electronic journals an ongoing process as journal interfaces change and new skills are demanded of users, even those previously trained. This is supported by researchers such as Bar-llan, Peritz and Wolman (2003), Saeed et al. (2003), Zainab, Huzaimah and Ang (2006), Borrego et al. (2007), Zhang, Ye and Liu (2010), and Spiro and Henry (2010) who all note that continuous training should be part of every electronic journals programme in order to equip users to confidently use these resources. The training should be sensitive to challenges of different age groups and different disciplines. For example, it was found in this study that academics aged over 50 were especially ill equipped to use electronic journals as they lacked the requisite skills. It was also found that academics in non science disciplines tended to struggle with their skills. Training should take cognisance of these factors and address each special group accordingly. To encourage academics to respond to training university policy should make it mandatory for academics to include electronic journals in their Course Outlines.

University Librarians need to lobby their respective university Senate for such a policy. This was successfully done at BUSE and should be possible with all other state universities.

The last recommendation is that universities in Zimbabwe through their Research Boards should consider providing more funding for research and reward academics who excel in this endeavour as it has been proved by researchers such as Nelson (2001), Tenopir (2003), Kortelainen (2004), Bennett and Buhler (2010), Cox and Cox (2010), Tyagi (2011), and Vasishta and Navivoti (2011) that academics that have a culture of research use electronic journals far more than those who do not research. One of the reasons accounting for low research in Zimbabwean institutions is poor funding. Academics would be encouraged to do research if more funding for the purpose was availed and if those academics who excel are rewarded. This will encourage high usage of electronic journals in Zimbabwean universities and at the same time improve the academic standing of universities in the country.

7.7   Originality of the Study

A PhD study is expected to be original (Phillips and Pugh, 2005:62). The originality of this study resides in four factors: context, methodology, results, and theoretical impact. This study has contextual originality because no study of this nature had been done before in Zimbabwe. Studies had been done before in countries such as Tanzania, Kenya, Malawi, Nigeria, Ethiopia, Israel, India, United Kingdom and United States of America by researchers such as Morse and Clintworth (2000), Bar-llan, Peritz and Wolman (2003), Dillon and Hahn (2003), Tenopir (2003), Borrego et al. (2007), Madhusudhan (2007), Kumar and Kumar (2008), Manda (2008), Mergesa and Mammo (2008), Sharma (2009), Cox and Cox (2010), Harle (2010), Spiro and Henry (2010), and Zhang, Ye and Liu (2010) but no similar study had been done in Zimbabwe. The Zimbabwean context provided a unique outlook of the research problem because of the cultural, technological, and economic differences the country has with other countries, especially those in the developed world. The findings, conclusions and recommendations that emerge out of this study are contextually relevant and should enhance the situation of the Zimbabwean academic. The study was methodologically original in that it not only captured the views of academics, but considered the input of professional librarians as well. To that end this study relied on both quantitative and qualitative strategies, a departure from many of the previous

studies that were mostly just quantitative in nature. Some of the results of this study are unique and will help subsequent researchers to view the issue of adoption and use of peer reviewed electronic journals in a completely new way. For example, previous researchers have always assumed that younger academics use electronic journals more than the older academics but this study revealed a paradoxical situation where the younger academics were found to be more adopters of electronic journals but low users of the same. A result like this can be considered groundbreaking and provides avenues for further inquiry. The study also managed to make an original impact on theory as it added *discipline* as a moderator of UTAUT. The study also established the best fitting model for the Zimbabwean context. The theoretical originalities are further considered under contributions of the study to theory in section 7.8.1 below.

7.8   Contributions of the Study

The contributions of this study to theory, policy, and practice are considered below:

7.8.1   Contribution to Theory

This study made major contributions to theory. First, it confirmed the suitability of the UTAUT as a theoretical model in explaining the adoption and use of peer reviewed electronic journals in developing country contexts in general and the Zimbabwean context in particular. Second, the study added *discipline* as a UTAUT moderator and established the updated UTAUT as shown in Figure 11 under Section 5.10.3. The issue of the effect of discipline on the adoption and use of technology in general and adoption and use of peer reviewed electronic journals in particular has been a subject of speculation and arguments in literature. This study has proved through empirical evidence that discipline indeed is a factor in the adoption and use of peer reviewed electronic journals. Third, the study established the best fitting UTAUT model for the adoption and use of peer reviewed electronic journals in the Zimbabwean context as shown in Figure 11 under Section 5.10.4. This best fitting model revealed that the most crucial UTAUT constructs in the adoption and use of electronic journals are Performance Expectancy and Facilitating Conditions. This confirms observations made by several authors such as Davis et al. (1989), Szajina (1996), Venkatesh (1999), and Venkatesh et al. (2003) that UTAUT constructs such as Effort Expectancy and Social Influence are more salient in the early stages of a new behaviour but their effect tend to diminish with the passage of time.

7.8.2 Contribution to Policy

The study is expected to influence university libraries in Zimbabwe to craft alternative collection development policies for electronic journals since it has been found that the one size fits all approach that university libraries are currently using in subscribing to electronic journals through the Consortium strategy fronted by ZULC is inadequate and problematic if used on its own or if used purely in its current form without some modifications. The study is also expected to encourage universities in Zimbabwe to craft policies that will lead to significant reduction or if possible, total elimination of barriers to the use of peer reviewed electronic journals.

7.8.3 Contribution to Practice

The study, being the first of its kind in Zimbabwe, has demystified the issue of peer reviewed electronic journals in the country and is expected to further help shape positive attitudes towards the resources thereby impacting positively on research culture in Zimbabwean universities while improving the quality of teaching and research by academics in the county. The study should help university libraries to know factors affecting the adoption and use of peer reviewed electronic journals thereby enabling them to tailor make their services in a way that makes them appealing to users. Electronic journals promotion efforts by university libraries will now be more focussed since they are now aware of the dynamics affecting use of these resources.

7.9 Areas of Further Research

This study investigated the adoption and use of peer reviewed electronic journals by academics at selected Zimbabwean State Universities. Due to time and financial constraints the study excluded representative institutions from private universities, Teachers' Colleges, and Polytechnics. It is recommended that further study be conducted and expanded to these institutions as they are all important educational institutions in Zimbabwe whose adoption and use of these resources is crucial to the overall academic position of the country. The current study focussed on academics, but there is need to study students as well as these form the greatest population of users of these resources in universities, Teachers' Colleges, and Polytechnics. Understanding the adoption and use of peer reviewed electronic journals by students will likely trigger the greatest revolution in the use of these resources in Zimbabwe. This study revealed that there are some electronic journal databases that are more popular than

others with academics while others are rarely used. The explanation from professional librarians pointed to differences in friendliness and simplicity of the databases. However, there is need for an in-depth qualitative study to determine what exactly informs users' choice of databases. A study of this nature could not be carried out under the current study as it is a different study altogether and is involving such that it needs its own space.

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Appendix 1: Survey questionnaire for academics at selected Zimbabwean State Universities

Please indicate your answers by ticking the relevant box(es) and providing further explanation where required.

Section A: Demographics of Respondents

No.	Questions	Coding Categories				
1	University	1	National University of Science and Technology (NUST)			
		2	Midlands State University (MSU)			
		3	Bindura University of Science Education (BUSE)			
2	Faculty	1	NUST	1	Applied Sciences	
				2	Built Environment	
				3	Commerce	
				4	Communication and Information Science	
				5	Industrial Technology	
				6	Medicine	
		2	MSU	1	Arts	
				2	Commerce	
				3	Education	
				4	Law	
				5	Natural Resources Management and Agriculture	
				6	Science and Technology	
				7	Social Sciences	
			BUSE	1	Agriculture and Environmental Science	
				2	Commerce	
				3	Science	
				4	Science Education	
3	Staff Category	1	Full time			
		2	Part time			
4	Academic Rank	1	Lecturer			
		2	Senior Lecturer			
		3	Instructor			
		4	Associate Professor			
		5	Assistant Professor			
		6	Professor			
5	Numbers of Years in Academia	1	5 Years and Below			
		2	6-10 Years			
		3	11-20 Years			

		4	21 years and above	
6	Number of years in Current University	1	1 Year and less	
		2	2-5 Years	
		3	6-10 Years	
		4	11 Years and above	
7	Besides your role as an academic do you also serve in an administrative role, e.g. Dean of Faculty or Chairperson of a Department	1	Yes If Yes, please state……………………………………………………………	
		2	No	
8	Sex	1	Male	
		2	Female	
9	Age Range	1	30 Years and Below	
		2	31-40 Years	
		3	41-50 Years	
		4	51-60 Years	
		5	61 Years and Above	

Section B: Level of Awareness of Electronic Journals

10. Are you aware of electronic journals available to you through electronic databases subscribed to by your university?

   Yes [   ]   No [   ]

   If your answer is Yes please proceed to Q11 below, if it's No proceed to Q16.

11. Please list the **electronic databases**offered by your university from which you can access electronic journals.

   1……………………………………………………………………………………………..

   2……………………………………………………………………………………………..

   3……………………………………………………………………………………………..

   4……………………………………………………………………………………………..

   5……………………………………………………………………………………………..

   6…………………………………………………………………………………………….

   7……………………………………………………………………………………………..

   8……………………………………………………………………………………………..

9…………………………………………………………………………………………..

10………………………………………………………………………………………………

12. Please list the **specific electronic journals** that you are aware of from your academic discipline from which you access your scholarly material.

1…………………………………………………………………………………………..

2…………………………………………………………………………………………..

3…………………………………………………………………………………………..

4…………………………………………………………………………………………..

5…………………………………………………………………………………………..

6…………………………………………………………………………………………..

7…………………………………………………………………………………………..

8…………………………………………………………………………………………..

9…………………………………………………………………………………………..

10………………………………………………………………………………………………

13. Were you first introduced to electronic databases and journals in your current university or you had prior knowledge to these resources before you joined?

I was first introduced in my current university   [   ]

I had prior knowledge before I joined this university   [   ]

14. When were you first introduced to electronic databases and journals?

Less than 6 months ago	[ ]	6 months to 2 years ago	[ ]
2 to 3 years ago	[ ]	3 to 5 years ago	[ ]
5-10 years ago	[ ]	Over 10 years ago	[ ]

15. How did you come to know about electronic databases and journals?

Leaflets/Newsletters/Flyers	[ ]	Posters	[ ]
Library Workshop	[ ]	Library Website	[ ]
Told by a librarian	[ ]	Through library orientation	[ ]
Told by a colleague	[ ]	Library online catalogue	[ ]
By accident	[ ]	E-mail from the library	[ ]

Other (please specify)………………

16. How do you find out about new electronic databases and journals and general developments pertaining to these resources?

Leaflets/Newsletters/Flyers	[ ]	Posters	[ ]
Meetings/Committees	[ ]	Library Website	[ ]
Told by a librarian	[ ]	Through library orientation	[ ]
Told by a colleague	[ ]	Library online catalogue	[ ]
Targeted e-mail from the library	[ ]	I don't get informed	[ ]

Other (please specify)………………

17. Electronic journals are adequately marketed in my current institution.

Strongly disagree	[ ]	Disagree	[ ]
Neutral	[ ]	Agree	[ ]
Strongly agree	[ ]		

18. If your answer to Q17 above is either agree or strongly agree please provide a list of the strategies that are being used to promote these resources in your institution.

1…………………………………………………………………………………......

2…………………………………………………………………………………..

3…………………………………………………………………………………..

4…………………………………………………………………………………..

5…………………………………………………………………………………..

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7…………………………………………………………………………………..

8…………………………………………………………………………………..

9…………………………………………………………………………………..

10…………………………………………………………………………………

19. To what extent is senior library management (librarian, deputy librarian, sub-librarians, assistant librarians) involved in the marketing of electronic journals in your institution?

………………………………………………………………………………………

………………………………………………………………………………………

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....

20.   Please comment on the role of senior managers like Chairpersons of Departments and Deans of Faculties in the marketing of electronic journals in your university.

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....

21.   What could be done to improve academics' awareness of electronic journals?

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....
....
....
....
....
....

Section C: Academics' Use of Electronic Journals and Usage Behavior

22.   Do you use electronic journals subscribed to by your institution?

Yes [   ]   No [   ]

If your answer is Yes please proceed to Q24, if your answer is No please answer Q23 below and proceed to Q34.

23.   If your answer to Q22 above is No why is that so?

*Please pick only **one** factor which you consider to be the major hindrance to your use of electronic journals.*

I am not aware of the availability of electronic journals   [   ]

I am aware of electronic journals but I have no time to access   [   ]

My Internet connection is poor   [   ]

I lack the skills to access the electronic journals   [   ]

Electronic journals are not necessary for my work   [   ]

I lack equipment to access electronic journals   [   ]

Other reasons (please specify)…………………………………………………..

24. If your answer to Q22 above is Yes please indicate in the following Table, the host electronic databases you use and the titles of the electronic journals themselves. *Please note that you are not required to match the electronic journals you use to their host electronic databases, just give the two as independent lists.*

	Electronic Databases		Electronic Journals
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	

25. Using the guidelines provided in brackets in the options below, please rank your level of use of electronic journals. *Use is being defined as searching, browsing, reading or downloading an article from an electronic journal.*

Very Low (Less than 5 articles per week)   [   ]

Low (5-10 articles per week)   [   ]

Average (11-20 articles per week)   [   ]

High (21-30 articles per week)   [   ]

Very High (Over 30 articles per week)   [   ]

26. How often do you access and use electronic journals?

Almost daily	[ ]	Several times a week	[ ]
Once a week	[ ]	Once a month	[ ]
Very infrequently	[ ]	Other *(please specify)*……………	

27. What is your **major** source of information for your teaching and research needs?

Electronic journals	[ ]	Print journals	[ ]
Electronic books	[ ]	Print books	[ ]

Other sources (please specify)……………………………………………………………...

28. Where do you normally access and use your electronic journals from?

Office	[ ]	Library	[ ]
Home	[ ]	Internet Café	[ ]

Other (please specify)…………………….

29. Where would you prefer to access and use your electronic journals from?

Office	[ ]	Library	[ ]
Home	[ ]	Internet Café	[ ]

Other *(please specify)*…………………….

Please give a reason for your answer:

………………………………………………………………………………………………
………………………………………………………………………………………………

30. How do you normally access articles in electronic journals?

I go via Google/ Google scholar	[ ]
I go straight to the host database then access the required journal then the article	[ ]
I do a general search on the library website then I am directed to the article I need	[ ]
Someone else has to search for me	[ ]

Other *(please specify)*……………………………………………………………………

31. For what purpose do you use electronic journals?

Teaching only	[ ]	Research only	[ ]
To further my studies only	[ ]	Teaching and Research only	[ ]

Teaching, Research, and further studies[   ] Other *(please specify)*……………

32. What type of electronic information do you normally access from electronic journals?

Full-text articles   [   ]   Abstracts   [   ]

Bibliographic information   [   ]   Other *(please specify)*…………………..

33. Do you have access to other electronic journals apart from those subscribed to by your institution?

Yes [   ]   No [   ]

If Yes, please specify where…………………………………………………………………

34. If a journal is available in both print and electronic format and the library could only afford to subscribe to one format, which format would you prefer?

Print   [   ]   Electronic   [   ]

Please briefly justify your answer:

…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………

35. Do you think electronic journals will ever completely replace the print journals?

Yes [   ]   No [   ]

Please briefly justify your answer:

…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………

36. In your opinion is there a correlation between high research and publication output and the use of electronic journals as opposed to other media?

Yes   [   ]   No   [   ]

Please give a brief reason for your answer:

…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………

37. Would you recommend electronic journals to your students?

Yes   [   ]   No   [   ]

Please give a brief reason for your answer:

....
....
....

38.   Do you include electronic journals as references in your Course Outlines?

Yes [   ]   No [   ]

Section D: Facilitating Conditions to Adoption and Use of Electronic Journals

39.   Have you taken any training in the use of electronic journals?

Yes [   ]   No [   ]

If your answer is No please give a reason as to why you have not taken any training in the use of electronic journals...

40.   If your answer to Q39 above is Yes, please indicate your trainer.

Library staff   [   ]

Fellow academic colleagues   [   ]

Staff from the IT department   [   ]

Self training through trial and error   [   ]

Other (please specify)..

41.   How would you rank your level of skill in searching articles in electronic journals?

Very Low   [   ]   Low   [   ]   Average   [   ]

High   [   ]   Very High   [   ]

42.   Do you feel the need for professional development in the use of electronic journals?

Yes [   ]   No [   ]

43.   Where do you get help when you are stuck in your use of electronic journals?

Library staff   [   ]

Fellow academic colleagues   [   ]

Staff from the IT department   [   ]

I struggle alone until I get it right   [   ]

Other (please specify)..

330

44. The Library provides adequate training in how to use electronic journals:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

45. The library staff is effective in responding to my individual needs concerning the use of electronic journals:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

46. I get enough support from senior management in my use of electronic journals:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

47. Support from senior management is crucial in my decision to adopt and use electronic journals:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

48. The University has adequate infrastructure to allow me unfettered access to electronic journals:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

If your answer is Strongly disagree, Disagree or Neutral please cite some measures you would like to see put in place to improve your experience of electronic journals:

1…………………………………………………………..

2…………………………………………………………..

3…………………………………………………………..

49. How do you rate the typical access time when you search an electronic resource on your university network?

Very Slow [ ] Slow [ ] Somewhat fast [ ]

Fast [ ] Very Fast [ ]

50. How do you rate the usability of the interface of your university library website for electronic journal access?

Very difficult [ ] Difficult [ ] Somewhat easy [ ]

Easy [ ] Very easy [ ]

51. Which of the following would you say are barriers that militate against your access and use of electronic journals? *Please tick corresponding barrier weight against each factor.*

	Not a Barrier	Minor Barrier	Major barrier
Inadequate infrastructure to support access	[ ]	[ ]	[ ]
Erratic Internet connection	[ ]	[ ]	[ ]
Bandwidth congestion- Slow Internet connection	[ ]	[ ]	[ ]
Lack of computer access	[ ]	[ ]	[ ]
Lack of printers to print research findings	[ ]	[ ]	[ ]
Lack of skills to search electronic journals	[ ]	[ ]	[ ]
Lack of awareness of electronic journals	[ ]	[ ]	[ ]
Stringent password restriction to access	[ ]	[ ]	[ ]
Failure to remember access passwords	[ ]	[ ]	[ ]
Hatred of reading from screen	[ ]	[ ]	[ ]
I cannot get back issues of electronic journals	[ ]	[ ]	[ ]
Lack of software to download needed articles	[ ]	[ ]	[ ]
Failure to download full-text articles	[ ]	[ ]	[ ]
Not much relevant material	[ ]	[ ]	[ ]
Inconvenient to use	[ ]	[ ]	[ ]
Lack of constant power supply, electricity cuts	[ ]	[ ]	[ ]

You may cite other barriers that are not included in the above list:

1…………………………………………………………..

2…………………………………………………………..

3…………………………………………………………..

Section E: Attitudes and Perceptions of Academics towards electronic journals

52.   Computer literacy is important to successfully use electronic journals:

Strongly disagree   [   ]   Disagree   [   ]   Neutral[   ]

Agree   [   ]   Stronglyagree   [   ]

53.   How do you rank the importance of electronic journals in your work?

Not important at all   [   ]   Somewhat important [   ]

Neutral   [   ]   Important   [   ]

Very important   [   ]

54.   What would you say is the usefulness of electronic journals in academic work?

Not useful at all   [   ]   Somewhat useful   [   ]

Neutral   [   ]   Useful   [   ]

Very useful   [   ]

55.   Would you say electronic journals are indispensable in academic work?

Yes [   ]   No [   ]

56.   To what extent are you satisfied with electronic journals provided by your University?

Very dissatisfied   [   ]   Dissatisfied   [   ]

Neutral   [   ]   Satisfied   [   ]

Very satisfied   [   ]

57.   How do you evaluate search results of electronic journals you have used?

Very irrelevant   [   ]   Irrelevant   [   ]

Somewhat relevant   [   ]   Relevant   [   ]

Very relevant   [   ]

58.   How do you rate the quality of information you acquire from electronic journals in your institution?

Very poor quality	[ ]	Poor quality	[ ]
Average quality	[ ]	High quality	[ ]
Very high quality	[ ]		

59. A journal that is published only electronically is as academically rigorous as one that is published in hard copy form:

Strongly disagree	[ ]	Disagree	[ ]
Neutral	[ ]	Agree	[ ]
Strongly Agree	[ ]		

60. Electronic journals are as rigorously peer reviewed as journals that are offered in hard copy form:

Strongly disagree	[ ]	Disagree	[ ]
Neutral	[ ]	Agree	[ ]
Strongly agree	[ ]		

61. As an academic I cannot do well without electronic journals:

Strongly disagree	[ ]	Disagree	[ ]
Neutral	[ ]	Agree	[ ]
Strongly agree	[ ]		

62. Electronic publications are 'real' publications:

Strongly disagree	[ ]	Disagree	[ ]
Neutral	[ ]	Agree	[ ]
Strongly agree	[ ]		

63. I would gain more respect from my peers by publishing my work in electronic journals rather than printed journals:

Strongly disagree	[ ]	Disagree	[ ]
Neutral	[ ]	Agree	[ ]
Strongly agree	[ ]		

64. The university library should continue developing electronic collections in preference to print resources:

| Strongly disagree | [ ] | Disagree | [ ] |

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

65.   How do you rank the importance of the following features of electronic journals? *Please tick corresponding feature weight against each factor.*

	Not Important	Important	Very important
Convenience	[ ]	[ ]	[ ]
Timeliness of information	[ ]	[ ]	[ ]
Searchability of articles	[ ]	[ ]	[ ]
Simultaneous access to a wide range of journals	[ ]	[ ]	[ ]
Ability to search within an article	[ ]	[ ]	[ ]
Ability to send search results to one's email	[ ]	[ ]	[ ]
Easier access to information	[ ]	[ ]	[ ]
Interactiveness of electronic journals	[ ]	[ ]	[ ]
Hyperlinks to other relevant articles	[ ]	[ ]	[ ]
Ability to print research findings	[ ]	[ ]	[ ]
Enable fast researching	[ ]	[ ]	[ ]
Accessibility from office or home	[ ]	[ ]	[ ]
Easily adaptable for teaching	[ ]	[ ]	[ ]
Access to full text	[ ]	[ ]	[ ]
High image quality	[ ]	[ ]	[ ]
Easy browsing	[ ]	[ ]	[ ]
24 hour access	[ ]	[ ]	[ ]
Saves shelf, floor space of library	[ ]	[ ]	[ ]
Provision of hyperlink to cited references	[ ]	[ ]	[ ]

Please indicate any other advantages of electronic journals not cited above:

1……………………………………………………..

2……………………………………………………..

3……………………………………………………..

66. Please evaluate electronic journals based on the criteria shown in the Table below. *Tick corresponding weight value against each evaluation criterion.*

Type of Evaluation	Low	Average	High
Credibility [written by known or respected authority]			
Accuracy [correct, up to date, comprehensive]			
Reasonableness [fair, balanced, objective, well reasoned]			
Support [listed sources, claims supported]			

67. Does the library consult you on decisions regarding the inclusion and exclusion of electronic databases and journals on the list subscribed to by your institution?

Yes [   ]   No [   ]

68. If you answered No to Q67 above would you want to be consulted on decisions regarding inclusion and exclusion of electronic databases and journals on the list subscribed to by your institution?

Yes [   ]   No [   ]

Section F: Summary Questions Aligned to the Unified Theory of Acceptance and Use of Technology (UTAUT) Model

Performance Expectancy

69. I would find electronic journals useful in my job:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

70. Using electronic journals enables me to accomplish tasks more quickly:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

71. Using electronic journals increases my productivity:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

72. If I use electronic journals, I increase my chances of getting a promotion:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

Effort Expectancy

73. My interaction with electronic journals is clear and understandable:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

74. It is easy for me to become skillful in using electronic journals:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

75. I find electronic journals easy to use:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

76. Learning to use electronic journals is easy for me:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

Social Influence

77.   People who influence my behavior think I should use electronic journals:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

78.   People who are important to me think I should use electronic journals:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

79.   The senior management of my university has been helpful in my use of electronic journals:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

80.   In general, the university has supported the use of electronic journals:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

Facilitating conditions

81.   I have the resources necessary to use electronic journals:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

82.   I have the knowledge necessary to use electronic journals:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

83. Someone is available to assist me when I face problems using electronic journals:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

Voluntariness of Use

84. Using electronic journals is compulsory in my job:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

85. My superiors in the University require me to use electronic journals:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

86. My superiors expect me to use electronic journals:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

87. My use of electronic journals should be voluntary, as opposed to it being a requirement by my superiors:

Strongly disagree   [   ]   Disagree   [   ]

Neutral   [   ]   Agree   [   ]

Strongly agree   [   ]

88. Please provide any other comments you may have pertaining your adoption and use of electronic journals.

…………………………………………………………………………………………

…………………………………………………………………………………………

Thank you so much for your time and cooperation.

Appendix 2: Interview guide with Faculty Librarians at selected Zimbabwean State Universities

Section A: Strategies used by libraries to enhance awareness of electronic journals by academics

1. What strategies do you use to make academics in your faculty aware of electronic journals?

2. What would you say is the effectiveness of these strategies in engendering awareness and appreciation of electronic journals by academics in your faculty?

3. Do you rely on library wide strategies in promoting electronic journals to your faculty or you also have your own faculty specific strategies?

4. To what extent would you say academics in your faculty are aware of the range of electronic journals available to them?

5. At what stage of an academic's life in the university are they introduced to electronic journals?

Section B: Use of electronic journals by academics

6. What would you say is the level of use of electronic journals by academics in your faculty?

7. Do you have any strategies to measure the level of use of electronic journals by academics in your faculty?

8. Where do academics in your faculty mostly access the library's electronic journals from?

9. What factors affect the use of electronic journals by academics in your faculty?

10. Are you satisfied with the level of use of electronic journals by academics in your faculty?

11. What measures are you taking to increase usage of electronic journals in your faculty?

12. Are there any noticeable trends in electronic journal choices by academics in your faculty and what would you say are the causes of such choices?

Section C: Facilitating conditions to adoption and use of electronic journals

13. What training do you offer academics in your faculty to equip them with skills in the use of electronic journals?

14. How responsive are academics in your faculty to training?

15. How is your training structured? Do you conduct one off training sessions or you have a sustained programme in place?

16. To what extent are conditions conducive for the access and use of electronic journals by academics in your faculty?

17. What support measures have you put in place to help academics in their use of electronic journals?

18. What barriers would you say militate against the use of electronic journals by academics in your faculty?

Section D: Attitudes and perceptions of academics towards electronic journals

19. What would you say is the general perception of academics in your faculty towards electronic journals?

20. Do you think academics consider electronic journals crucial for their work?

21. In your view what factors shape the attitude and perceptions of academics in your faculty towards electronic journals?

22. What measures have you taken to shape positive attitudes and perceptions of electronic journals in your faculty?

Thank you

Appendix 3: Interview guide with Sub-Librarians for Reader Services at selected Zimbabwean State Universities

Section A: Strategies used by libraries to enhance awareness of electronic journals by academics

1. What strategies has your library put in place to promote electronic journals to academics in the university?
2. What would you say is the effectiveness of these strategies in engendering awareness and appreciation of electronic journals by academics in the university?
3. Do you have a targeted approach to promotion of electronic journals to academics in different faculties or you have relied largely on a wholesale approach?
4. What would you say is the awareness level of electronic journals by academics in the university?
5. Are there any faculty differences in awareness and appreciation of electronic journals and if there are, what are the causes of such differences?
6. How do you moderate different initiatives by respective faculty librarians in their quest to promote electronic journals to academics in their faculties?

Section B: Use of electronic journals by academics

1. What is the level of use of electronic journals by academics in the university?
2. Are there any faculty and gender differences in the use of electronic journals by academics in the university?
3. If there are any faculty and gender differences what would you say are the causes of such differences?
4. What measures have you taken at university wide level to promote use of electronic journals by academics?
5. What are the barriers that militate against the use of electronic journals by academics in the university?

Section C: Facilitating conditions to adoption and use of electronic journals

6. What training strategies are in place to equip academics in the university with skills necessary to access and use electronic journals?

7. How do you assess the effectiveness of your training strategies?

8. Do you think the university has adequate infrastructure to enable access and use of electronic journals by academics in the university?

9. What major barriers do you see impeding the use of electronic journals by academics in the university?

10. What measures have you put in place to minimise barriers to electronic journals?

Section D: Attitudes and perceptions of academics towards electronic journals

11. What are the general attitudes and perceptions of academics towards electronic journals?

12. To what extent has the library shaped the current attitudes and perceptions of academics towards electronic journals?

13. How has different faculties regarded electronic journals in their work?

14. Why do you think there are different attitudes and perceptions of electronic journals amongst academics from different faculties?

Thank you

Appendix 4: Interview guide with Systems Librarians at selected Zimbabwean State Universities

1. How efficient is your Internet connection and how does the quality of Internet connection affect the use of electronic journals by academics in the university?
2. Do you technologically monitor downloads of electronic journal articles and if so, how is the usage level like among academics from different faculties of the university.
3. What is the level of technological competence among academics in the university?
4. What would you say are technological barriers that militate against the use of electronic journals by academics in the university?
5. What steps are in place to keep academics aware of new developments in electronic journals?
6. How conducive is the library website interface to the access and use of electronic journals?
7. What measures have you put in place to enable both on and off campus access to electronic journals?
8. What is the role of your department in the promotion, adoption and use of electronic journals?

Thank you

Appendix 5: Interview guide with Librarians at selected Zimbabwean State Universities

1. Do you think the concept of electronic resources has received wide support in the university since you introduced these resources?

2. What is the library policy regarding subscription to these resources? How do you choose the resources to subscribe to and to what extent are academics or their representatives relevant in the making of such decisions?

3. Would you say the general conditions in the university are conducive for the adoption and use of electronic journals by academics?

4. As top management to what extent are you involved in building confidence of electronic journals in academics in the university?

5. Do you feel the efforts of the library have been complemented by other policy makers in the university as far as the acquisition, maintenance, promotion and use of electronic journals is concerned?

6. Since the introduction of electronic journals what would you say is the general trend in their adoption and use?

Thank you

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

ACADEMIC STAFF TOTALS

FACULTY	TOTAL
COMMERCE	94
APPLIED SCIENCES	81
THE BUILT ENVIRONMENT	12
COMMUNICATION AND INFO SCIENCE	39
INDUSTRIAL TECHNOLOGY	49
MEDICINE	27
Grand total	**302**

NATIONAL UNIVERSITY
OF SCIENCE AND TECHNOLOGY
REGISTRAR
P.O. BOX AC 939, ASCOT BULAWAYO

Appendix 7: Academic staff totals for Bindura University of Science Education (BUSE)

BINDURA UNIVERSITY OF SCIENCE EDUCATION

REGISTRY DEPARTMENT

MEMORANDUM

TO: Registrar

Cc: Acting Vice Chancellor
                 Bursar
                 Registrar

From: Deputy Registrar, Human Resources

Date: 5 December 2012

SUBJECT: **REQUEST FOR RESEARCH INFORMATION – MR T MACHIMBIDZA**

The abovementioned has requested the information outlined below as regards BUSEacademic members of staff by faculty.

Faculty	No of Permanent Academic Staff
Faculty of Science	64
Faculty of Science Education	30
Faculty Agriculture and Environmental Science	36
Faculty of Commerce	50

Thank you

E Manhando (Mrs)

Appendix 8: Authority to conduct research – NUST approval letter

National University of Science and Technology

P. O. Box AC 939, Bulawayo, Zimbabwe
Cnr. Gwanda Road/Cecil Avenue

Telephone: 263-9-282842/288413/39/58
Fax: 263-9-289057

From Registrar F. Mhlanga Dip Edu, BEd, MSc(UZ); MBA (NUST)

FM/sm

21 June, 2012

Mr Takawira Machimbidza
Department of Library and Information Science
National University of Science and Technology
P O Box AC 939
Ascot
BULAWAYO

Dear Mr Machimbidza

RE: REQUEST FOR PERMISSION TO CONDUCT A RESEARCH FOR A PhD PROGRAMME

Reference is made to your letter dated 12 May, 2012 on the above request.

We would like to inform you that we have granted you permission to conduct a research as requested, on the following topic: *"The adoption and use of peer reviewed electronic journals by academics in Zimbabwe State Universities",* for your PhD Programme.

The University wishes you the best in your studies.

Yours sincerely

F Mhlanga
Registrar

cc   Librarian
        A/Dean – Faculty of Applied Science
        Dean – Faculty of Communication and Information Science
        Dean – Faculty of Commerce
        Dean – Faculty of The Built Environment
        Dean – Faculty of Industrial Technology
        Dean – Faculty of Medicine
        Chairperson – Department of Library and Information Science

Appendix 9: Authority to conduct research – BUSE approval letter

REGISTRY DEPARTMENT

P Bag 1020
BINDURA, Zimbabwe

Tel: 071 – 7531-6, 7621-4
Fax: 263 – 71 – 7534

BINDURA UNIVERSITY OF SCIENCE EDUCATION

HUMAN RESOURCES

19 July 2012

Mr Takawira Machimbidzika
University of KwaZulu Natal
Private Bag X01
Scottsville 3209
Petermaritzburg
SOUTH Africa

Dear Mr Machimbidzika

RE: APPLICATION FOR PERMISSION TO CARRY OUT EDUCATIONAL
 RESEARCH AT BINDURA UNIVERSITY OF SCIENCE EDUCATION IN THE
 DEPARTMENT OF LIBRARY

Permission to carry out Research on:

THE ADOPTION AND USE OF PEER REVIEWED ELECTRONIC JOURNALS BY
ACADEMICS IN ZIMBABWEAN STATE UNIVERSITIES

Bindura University of Science Education has granted you the permission on the following
conditions.

a)   That in carrying out this research you do not disturb the programmes of the
  Department.
b)   That you avail to the University a copy of your research findings.
c)   That the permission can be withdrawn at any time by the Registrar or by any higher
  officer.

I wish you success in your research work and in your University College studies.

Yours faithfully

TF Rumhuma (Mrs)
REGISTRAR

BINDURA UNIVERSITY
SCIENCE EDUCATION
HUMAN RESOURCES
PRIVATE BAG 1020, BINDURA
TEL: 0271-7616
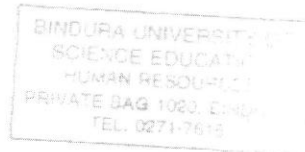
Appendix 10: Authority to conduct research – MSU endorsement letter

The Registrar
Midlands State University (MSU)
P. Bag 9055
Gweru
Zimbabwe

RE: Introducing Mr. Takawira Machimbidza – PhD Student at University of KwaZulu Natal

This letter serves to introduce and confirm that Mr. Takawira Machimbidza is a duly registered PhD (Information Studies) candidate at the University of KwaZulu Natal. The title of his PhD research is **'The adoption and use of peer reviewed electronic journals by academics in Zimbabwean State Universities'**. The outcome from the study is expected to improve practice, inform policy and extend theory in this field of study. As part of the requirements for the award of a PhD degree he is expected to undertake original research in an environment and place of his choice. The UKZN ethical compliance regulations require him to provide proof that the relevant authority where the research is to be undertaken has given approval.

We appreciate your support and understanding to grant Mr. Takawira Machimbidza permission to carry out research in your organisation. Should you need any further clarification, do not hesitate to contact me.

Thank you in advance for your understanding

MIDLANDS STATE UNIVERSITY
REGISTRAR

1 5 JUN 2012

PRIVATE BAG 9055,
GWERU   ZIMBABWE
TEL. 054 - 260536 FAX: 054: 260735

Prof Stephen Mutula (Information Studies Programme)
Supervisor and Academic Leader, Development Cluster
University of KwaZulu Natal
Private Bag X01 Scottsville 3209
Pietermaritzburg
Email: mutulas@ukzn.ac.za
Tel: +27 33 260 5571; +27 712 750 109

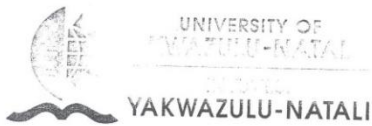# Appendix 11: Ethical clearance from the University of KwaZulu-Natal (UKZN)

UNIVERSITY OF
KWAZULU-NATAL
YAKWAZULU-NATALI

Research Office, Govan Mbeki Centre
Westville Campus
Private Bag x54001
DURBAN, 4000
Tel No: +27 31 260 8350
Fax No: +27 31 260 4609
snymanm@ukzn.ac.za

30 May 2012

Mr T Machimbidza (212548182)
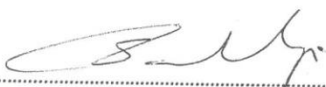School of Social Sciences

Dear Mr Machimbidza

Protocol reference number: HSS/0201/012D
Project title: The adoption and use of peer reviewed electronic journals by academics in Zimbabwean State Universities

In response to your application dated 30 March 2012, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number. Please note: Research data should be securely stored in the school/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

Professor Steven Collings (Chair)
Humanities & Social Science Research Ethics Committee

cc Supervisor: Professor S Mutula and Dr Ruth Hoskins
cc Academic Leader: Professor Victor Muzvidziwa
cc Mrs B Jacobsen

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Appendix 12: Informed consent letter

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KWAZULU-NATAL

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YAKWAZULU-NATALI

<div align="right">

University of KwaZulu-Natal (UKZN)
Pietermaritzburg Campus
Private Bag X01
Scottsville 3209
Denison Residence
Phase 5
Block B
Room 3

12 May 2012

</div>

Dear Respondent

Informed Consent Letter

Researcher: Takawira Machimbidza
Institution: University of KwaZulu-Natal
Telephone number: Zimbabwe- 00263 772 760 383
South Africa- 0027 73 544 0362
Email address: tmachimbidza@gmail.com

Supervisor: Prof. Stephen Mutula   Dr. Ruth Hoskins
Institution: University of KwaZulu-Natal   University of KwaZulu-Natal
Telephone number: 033-260 5571   033 260 5093
Email address: Mutulas@ukzn.ac.za   Hoskinsr@ukzn.ac.za

I, Takawira Machimbidza, of the University of KwaZulu-Natal (UKZN), South Africa, kindly invite you to participate in the research project entitled **The adoption and use of peer reviewed electronic journals by academics in Zimbabwean State Universities.**

This research project is undertaken as part of the requirements of the PhD, which is undertaken through the University of KwaZulu-Natal, Information Studies Department.

The aim of this study is to investigate the adoption and use of peer reviewed electronic journals by academics in Zimbabwean State Universities.

Participation in this research project is voluntary. You may refuse to participate or withdraw from the research project at any stage and for any reason without any form of disadvantage. There will be no monetary gain from participating in this research project. Confidentiality and anonymity of records identifying you as a participant will be maintained by the Department of Information Studies, at the University of KwaZulu-Natal.

If you have any questions or concerns about participating in this study, please feel free to contact myself or my supervisor at the numbers indicated above.

It should take you about 15 minutes to complete the questionnaire.

Thank you for participating in this research project.

12 May 2012

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Signature   Date

I .... hereby consent to participate in the above study.

Name: .... Date: .... Signature: ....

Supervisor's details

Prof S. Mutula
Information Studies Program
Academic Leader Development
School of Social Sciences
University of KwaZulu-Natal
(UKZN)

Dr. R. Hoskins
Information Studies Program
Academic Leader (T&L)
School of Social Sciences
University of KwaZulu-Natal
(UKZN)

Student's details

Takawira Machimbidza
Doctoral Student
Information Studies
School of Social Studies
University of KwaZulu-Natal
(UKZN)